
10-103-A – NONRESIDENTIAL LIGHTING CONTROLS ACCEPTANCE TEST TRAINING AND CERTIFICATION

- (a) **Scope.** The requirements of this section apply to nonresidential lighting control Acceptance Test Technicians and Employers, and the Certification Providers that train and certify them.
- (b) **Industry Certification Threshold.** Lighting Controls Acceptance Test Technician and Employer certification requirements shall take effect when the Energy Commission finds that each of the following conditions are met. Until such time that Section 10-103-A(b)1 and 10-103-A(b)2 are met, Field Technicians are allowed to complete the acceptance test requirements in Section 130.4 without completing the Acceptance Test Technician certification requirements.
1. **Number of Certified Acceptance Test Technicians.** There shall be no less than 300 Lighting Controls Acceptance Test Technicians certified to perform the acceptance tests in Building Energy Efficiency Standards, Section 130.4. The number of certified Acceptance Test Technicians shall be demonstrated by Certification Provider-prepared reports submitted to the Energy Commission.
 2. **Industry Coverage by Certification Provider(s).** The Certification Provider(s) approved by the Energy Commission, in their entirety, shall provide reasonable access to certification for technicians representing the majority of the following industry groups: electrical contractors, certified general electricians, professional engineers, controls installation and startup contractors and certified commissioning professionals who have verifiable training, experience and expertise in lighting controls and electrical systems. The Energy Commission will determine whether in their entirety reasonable access to certification is provided 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.
- (c) **Qualifications and Approval of Certification Providers.** The Acceptance Test Technician Certification Providers (ATTCPs) shall submit a written application to the Energy Commission with a summary and the related background documents to explain how the following criteria and procedures have been met:
1. **Requirements for Applicant ATTCPs to Document Organizational Structure.** ATTCPs shall provide written explanations of the organization type, by-laws, and ownership structure. ATTCPs shall explain in writing how their certification program meets the qualification requirements of Title 24, Part 1, Section 10-103-A(c). ATTCPs shall explain in their application to the Energy Commission how their organizational structure and procedures include independent oversight, quality assurance, supervision and support of the acceptance test training and certification processes.
 2. **Requirements for Certification of Employers.** The ATTCPs shall provide written explanations of how their program includes certification and oversight of Acceptance Test Employers to ensure quality control and appropriate supervision and support for Acceptance Test Technicians.
 3. **Requirements for Applicant ATTCPs to Document Training and Certification Procedures.** ATTCPs shall provide a complete copy of all training and testing procedures, manuals, handbooks and materials. ATTCPs shall explain in writing how their training and certification procedures include, but are not limited to, the following:
 - A. **Training Scope.** Both hands-on experience and theoretical training such that Acceptance Test Technicians demonstrate their ability to apply the Building Energy Efficiency Standards acceptance testing and documentation requirements to a comprehensive variety of lighting control systems and networks that are reflective of the range of systems currently encountered in the field. The objective of the hands-on training is to practice and certify competency in the technologies and skills necessary to perform the acceptance tests.
 - B. **Lighting Controls Acceptance Test Technician Training.**
 - (i) **Curricula.** Acceptance Test Technician Certification Provider training curricula for Lighting Control Acceptance Test Technicians shall include, but not be limited to, the analysis, theory, and practical application of the following:

- a) Lamp and ballast systems;
 - b) Line voltage switching controls;
 - c) Low voltage switching controls;
 - d) Dimming controls;
 - e) Occupancy sensors;
 - f) Photosensors;
 - g) Demand responsive signal inputs to lighting control systems;
 - h) Building Energy Efficiency Standards required lighting control systems;
 - i) Building Energy Efficiency Standards required lighting control system-specific analytical/problem solving skills;
 - j) Integration of mechanical and electrical systems for Building Energy Efficiency Standards required lighting control installation and commissioning;
 - k) Safety procedures for low-voltage retrofits (<50 volts) to control line voltage systems (120 to 480 volts);
 - l) Accurate and effective tuning, calibration, and programming of Building Energy Efficiency Standards required lighting control systems;
 - m) Measurement of illuminance according to the Illuminating Engineering Society's measurement procedures as provided in the IESNA Lighting Handbook, 10th Edition, 2011, which are incorporated by reference;
 - n) Building Energy Efficiency Standards lighting controls acceptance testing procedures; and
 - o) Building Energy Efficiency Standards acceptance testing compliance documentation for lighting controls.
- (ii) **Hands-on training.** The ATTCP shall describe in their 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.
- (iii) **Prequalification.** Participation in the technician certification program shall be limited to persons who have at least three years of verifiable professional experience and expertise in lighting controls and electrical systems as determined by the Lighting Controls ATTCPs, to demonstrate their ability to understand and apply the Lighting Controls Acceptance Test Technician 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 Energy Commission.
- (iv) **Instructor to Trainee Ratio.** A sufficient ratio of instructors to participants in classroom and laboratory work to ensure integrity and efficacy of the curriculum and program. The ATTCP shall document in its application to the Energy Commission why its instructor to trainee ratio is sufficient based on industry standards and other relevant information.
- (v) **Tests.** A written and practical test that demonstrates 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.
- (vi) **Recertification.** Requirements and Procedures for recertification of Acceptance Test Technicians each time the Building Energy Efficiency Standards is updated with new and/or modified acceptance test requirements.
- C. Lighting Controls Acceptance Test Employer Training.** Training for Lighting Controls Acceptance Test Employers shall consist of a single class or webinar consisting of at least four

hours of instruction that covers the scope and process of the acceptance tests in Building Energy Efficiency Standards, Section 130.4.

- D. Complaint Procedures.** The ATTCPs shall describe in their applications to the Energy Commission procedures for accepting and addressing complaints regarding the performance of any certified acceptance test technician or employer, and explain how building departments and the public will be notified of these procedures.
- E. Certification Revocation Procedures.** The ATTCPs shall describe in their applications to the Energy Commission procedures for revoking the certification of Acceptance Test **Technicians and Employers** 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.
- F. Quality Assurance and Accountability.** The ATTCP shall describe in their application to the Energy Commission how their certification business practices include quality assurance, independent oversight and accountability measures, such as, 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 Building Energy Efficiency Standards, Section 130.4. Independent oversight may be demonstrated by accreditation under the ISO/IEC 17024 standard.
- G. Certification Identification Number and Verification of ATT Certification Status.** 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 the ATTCP 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 Sections 10-103-A, 10-102, 10-103(a)4, and the Reference Joint Appendix JA7.
- (d) **Requirements for ATTCPs to Provide Annual Reports.** The ATTCP shall provide an annual report to the Energy Commission summarizing the certification services provided over the reporting period, including the total number of Acceptance Test Technicians and Employers certified by the ATTCP (a) during the reporting period and (b) to date. The ATTCP shall report to the Energy Commission what adjustments have been made to the training curricula, if any, to address changes to the Building Energy Efficiency Standards Acceptance Testing requirements, adopted updates to the Building Energy Efficiency Standards or to ensure training is reflective of the variety of lighting controls that are currently encountered in the field, no less than six months prior to the effective date of any newly adopted, or amendment to existing, Building Energy Efficiency Standards. All required reports shall contain a signed certification that the ATTCP has met all requirements for this program.
- (e) **Interim Approval of Lighting Controls Acceptance Test Technician Certification Provider.** The California Advanced Lighting Controls Training Program (CALCTP) shall be approved as an authorized Lighting Controls Acceptance Test Technician Certification Provider subject to the following conditions:
1. Interim approval shall be conditioned upon submittal of an application that contains the information required by subdivision (c)(1)-(3), including documentation demonstrating that the certification includes training and testing on the Building Energy Efficiency Standards lighting control acceptance testing procedures and the Building Energy Efficiency Standards acceptance testing compliance documentation for lighting control systems.
 2. Technicians who have been certified by CALCTP prior to the inclusion of training on the Building Energy Efficiency Standards acceptance testing procedures and compliance documentation shall qualify as Lighting Control Acceptance Test Technicians upon successful completion of a class or webinar consisting of at least four hours of instruction on the Building Energy Efficiency Standards acceptance testing procedures and compliance documentation.
 3. Employers who have been certified by CALCTP prior to the inclusion of training on the Building Energy Efficiency Standards acceptance testing procedures and compliance documentation shall qualify as a Lighting Control Acceptance Test Employer upon successful completion of a class or

webinar consisting of at least four hours of instruction on the Building Energy Efficiency Standards acceptance testing procedures and compliance documentation.

4. Interim approval for all ATTCPs shall end on the later date of, July 1, 2014 or six months after the effective date of the 2013 California Building Energy Efficiency Standards. The Energy Commission may extend the interim approval period for up to six additional months total, if it determines the threshold requirements in Section 10-103-A(b) have not been met for the certification requirements to take effect. If the Energy Commission determines that an extension is necessary, its determination shall be approved at a publicly-noticed meeting.
 5. During the interim approval period, including any possible extensions to this interim period, the Energy Commission may approve additional ATTCP providers-meeting the requirements of 10-103-A(c).
- (f) **Application Review and Determination.** The Energy Commission shall review Acceptance Test Technician Certification Provider applications according to the criteria and procedures in Section 10-103-A(c) to determine if such providers are approved to provide acceptance testing certification services.
1. Energy Commission staff will review and validate all information received on Acceptance Test Technician Certification Provider applications, and determine that the application is complete and contains sufficient information to be approved.
 2. The Executive Director may require that the applicant provide additional information as required by staff to fully evaluate the Provider application. The Executive Director shall provide a copy of its evaluation to interested persons and provide a reasonable opportunity for public comment.
 3. The Executive Director shall issue a written recommendation that the Energy Commission designate the applicant as an authorized Acceptance Test Technician Certification Provider or deny the Provider application.
 4. The Energy Commission shall make a final decision on the application at a publicly noticed hearing.

(g) **Review by the Energy Commission.**

If the Energy Commission determines there is a violation of these regulations or that an Acceptance Test Technician Certification Provider is no longer providing adequate certification services, the Energy Commission may revoke the authorization of the Acceptance Test Technician Certification Provider pursuant to Section 1230 et. seq. of Title 20 of the California Code of Regulations.

NOTE: Authority: Sections 25402, 25402.1, 25213, Public Resources Code. Reference: Sections 25007, 25402(a)-(b), 25402.1, 25402.4, 25402.5, 25402.8 and 25910, Public Resources Code.

10-103-B – NONRESIDENTIAL MECHANICAL ACCEPTANCE TEST TRAINING AND CERTIFICATION

- (a) **Scope.** The requirements of this section apply to nonresidential mechanical Acceptance Test Technicians and Employers and the Certification Providers that train and certify them.
- (b) **Industry Certification Threshold.** Mechanical Acceptance Test Technician and Employer certification requirements shall take effect when the Energy Commission finds that each of the following conditions are met. Until such time that Sections 10-103-B(b)1 and 10-103-B(b)2 are met, Field Technicians are allowed to complete the acceptance test requirements in Section 120.5 without completing the Acceptance Test Technician certification requirements.
 1. **Number of Certified Acceptance Test Technicians.**
 - A. There shall be no less than 300 Mechanical Acceptance Test Technicians certified to perform all of the acceptance tests in Building Energy Efficiency Standards, Section 120.5, except as provided in Subsection 10-103-B(b)1.B, below. The number of certified Mechanical Acceptance Test Technicians shall be demonstrated by Certification Provider-provided reports submitted to the Energy Commission.

B. If there are less than 300 Mechanical Acceptance Test Technicians certified to perform all of the acceptance tests in Building Energy Efficiency Standards, Section 120.5, then there shall be at least 300 Mechanical Acceptance Test Technicians certified to complete the following tests:

- (i) NA7.5.1 Outdoor Air Ventilation Systems
- (ii) NA7.5.2 Constant Volume, Single Zone Unitary Air Conditioners and Heat Pumps
- (iii) NA7.5.4 Air Economizer Controls
- (iv) NA7.5.5 Demand Control Ventilation Systems
- (v) NA 7.5.6 Supply Fan Variable Flow Controls
- (vi) NA7.5.7, NA7.5.9 Hydronic System Variable Flow Controls
- (vii) NA7.5.10 Automatic Demand Shed Controls

The number of certified Mechanical Acceptance Test Technicians shall be demonstrated by Certification Provider-provided reports submitted to the Energy Commission.

2. **Industry Coverage by Certification Provider(s).** The Mechanical Acceptance Test Technician Certification Provider(s) approved by the Energy Commission, in their entirety, provide reasonable access to certification for technicians representing the majority of the following industry groups: Professional engineers, 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.

(c) **Qualifications and Approval of Certification Providers.** The Acceptance Test Technician Certification Providers (ATTCPs) shall submit a written application to the Energy Commission with a summary and the necessary background documents to explain how the following criteria and procedures have been met:

1. **Requirements for Applicant ATTCPs to Document Organizational Structure.** ATTCPs shall provide written explanations of the organization type, by-laws, and ownership structure. ATTCPs shall explain in writing how their certification program meets the qualifications of Building Energy Efficiency Standards, Section 10-103-B(c). ATTCPs shall explain in their application to the Energy Commission how their organizational structure and procedures include independent oversight, quality assurance, supervision and support of the acceptance test training and certification processes.

2. **Requirement for Certification of Employers.** The ATTCPs shall provide written explanations of how their program includes certification and oversight of Acceptance Test Employers to ensure quality control and appropriate supervision and support for Acceptance Test Technicians.

3. **Requirements for Applicant ATTCPs to Document Training and Certification Procedures.** ATTCPs shall provide a complete copy of all training and testing procedures, manuals, handbooks and materials. ATTCPs shall explain in writing how their training and certification procedures include, but are not limited to, the following:

A. Both hands-on experience and theoretical training such that Acceptance Test Technicians demonstrate their ability to apply the Building Energy Efficiency Standards acceptance testing and documentation requirements to a comprehensive variety of mechanical systems and controls that is reflective of the range of systems currently encountered in the field.

B. Mechanical Acceptance Test Technician Training.

(i) Curricula: Acceptance Test Technician Certification Provider training curricula for Mechanical Acceptance Test Technicians shall include, but not be limited to, the analysis, theory, and practical application of the following:

- a) Constant volume system controls;
- b) Variable volume system controls;
- c) Air-side economizers;
- d) Air distribution system leakage;

- e) Demand controlled ventilation with CO₂ 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; and
 - t) Building Energy Efficiency Standards acceptance testing compliance documentation for mechanical systems.
- (ii) Hands-on training. The ATTCP shall describe in their 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.
- (iii) Prequalification: 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 Acceptance Test Technician 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 Energy Commission.
- (iv) Instructor to Trainee Ratio. A sufficient ratio of instructors to participants in classroom and laboratory work to ensure integrity and efficacy of the curriculum and program. The ATTCP shall document in its application to the Energy Commission why its instructor to trainee ratio is sufficient based on industry standards and other relevant information.
- (v) Tests. A written and practical test that demonstrates 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.
- (vi) Recertification. Requirements and Procedures for recertification of Acceptance Test Technicians each time the Building Energy Efficiency Standards is updated with new and/or modified acceptance test requirements. *Recertification requirements and procedures shall only apply to those specific elements that are new and/or modified in future updates to Building Energy Efficiency Standards.*
- C. Mechanical Acceptance Test Employer Training. Training for Mechanical Acceptance Test Employers shall consist of a single class or webinar consisting of at least four hours of instruction that covers the scope and process of the acceptance tests in Building Energy Efficiency Standards, Section 120.5.

- D. Complaint Procedures. Procedures described in writing for notifying building departments and the public that the Acceptance Test Certification Provider will accept complaints regarding the performance of any certified acceptance test technician or employer, and procedures for how the Provider will address these complaints.
 - E. Certification Revocation Procedures. Procedures described in writing for revoking the certification of Acceptance Test Technicians and Employers 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.
 - F. Quality Assurance and Accountability. The ATTCPs shall describe in their applications to the Energy Commission how their certification business practices include quality assurance, independent oversight and accountability measures such as 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 Building Energy Efficiency Standards, Section 120.5. Independent oversight may be demonstrated by accreditation under the ISO/IEC 17024 standard.
 - G. Certification Identification Number and Verification of ATT Certification Status. 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 the ATTCP 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 Sections 10-103-B, 10-102, 10-103(a)4, and Reference Joint Appendix JA7.
- (d) **Requirements for ATTCPs to Provide Annual Reports.** The ATTCP shall provide an annual report to the Energy Commission summarizing the certification services provided over the reporting period, including the total number of Acceptance Test Technicians and Employers certified by the agency (a) during the reporting period and (b) to date. The ATTCP shall report to the Energy Commission what adjustments have been made to the training curricula, if any, to address changes to the Building Energy Efficiency Standards Acceptance Testing requirements, adopted updates to the Building Energy Efficiency Standards or to ensure training is reflective of the variety of lighting controls that are currently encountered in the field, no less than six months prior to the effective date of any newly adopted, or amendment to existing Building Energy Efficiency Standards. All required reports shall contain a signed certification that the ATTCP has met all requirements for this program.
- (e) **Interim Approval of Mechanical Acceptance Test Technician Certification Providers.** The Associated Air Balance Council (AABC), National Environmental Balancing Bureau (NEBB), and the Testing Adjusting and Balancing Bureau (TABB) shall be conditionally approved as authorized Mechanical Acceptance Test Technician Certification Providers, each separately subject to the following conditions:
- 1. Interim approval shall only apply to Mechanical Acceptance Test Technicians completing the following mechanical acceptance tests required in Building Energy Efficiency Standards, Section 120.5. Mechanical Acceptance Test Technicians certified by one of the above organizations do not have interim approval to complete all other mechanical acceptance tests in Building Energy Efficiency Standards, Section 120.5.
 - A. NA7.5.1 Outdoor Air Ventilation Systems
 - B. NA7.5.2 Constant Volume, Single Zone Unitary Air Conditioners and Heat Pumps
 - C. NA7.5.4 Air Economizer Controls
 - D. NA7.5.5 Demand Control Ventilation Systems
 - E. NA 7.5.6 Supply Fan Variable Flow Controls

- F. NA7.5.7, NA7.5.9 Hydronic System Variable Flow Controls
 - G. NA7.5.10 Automatic Demand Shed Controls
2. Interim approval shall be conditioned upon submittal of an application that contains the information required by subdivision (c)(1)-(3), including documentation demonstrating that the certification includes training and testing on the Building Energy Efficiency Standards mechanical acceptance testing procedures and the Building Energy Efficiency Standards acceptance testing compliance documentation for mechanical systems.
 3. Technicians who have been certified by AABC, NEBB, or TABB prior to the inclusion of training on the Building Energy Efficiency Standards acceptance testing procedures and compliance documentation shall qualify as a Mechanical Acceptance Test Technicians upon successful completion of a class or webinar on the Building Energy Efficiency Standards acceptance testing procedures and compliance documentation.
 4. Employers who have been certified by AABC, NEBB, or TABB prior to the inclusion of training on the Building Energy Efficiency Standards acceptance testing procedures and compliance documentation shall qualify as a Mechanical Acceptance Test Employer upon successful completion of a class or webinar consisting of at least four hours of instruction on the Building Energy Efficiency Standards acceptance testing procedures and compliance documentation.
 5. Interim approval for all ATTCPs shall end on the later date of July 1, 2014 or six months after the effective date of the 2013 California Building Energy Efficiency Standards. The Energy Commission may extend the interim approval period for up to six additional months total, if it determines the threshold requirements in Section 10-103-B(b) have not been met for the certification requirements to take effect. If the Energy Commission determines that an extension is necessary, its determination shall be approved at a publicly-noticed meeting.
 6. During the interim approval period, including any possible extensions to this interim period, the Energy Commission may approve additional ATTCP providers meeting the requirements of Section 10-103-B(c).
- (f) **Application Review and Determination.** The Energy Commission shall review Acceptance Test Technician Certification Provider applications according to the criteria and procedures in Section 10-103-B(c) to determine if such providers are approved to provide acceptance testing certification services.
1. Energy Commission staff will review and validate all information received on Acceptance Test Technician Certification Provider applications, and determine that the application is complete and contains sufficient information to be approved.
 2. The Executive Director may require that the applicant provide additional information as required by staff to fully evaluate the Provider application. The Executive Director shall provide a copy of its evaluation to interested persons and provide an opportunity for public comment.
 3. The Executive Director shall issue a written recommendation that the Energy Commission designate the applicant as an authorized Mechanical Acceptance Tester Certification Provider or deny the Provider application.
 4. The Energy Commission shall make a final decision on the application at a publicly noticed hearing.
- (g) **Review by the Energy Commission.**
- If the Energy Commission determines there is a violation of these regulations or that an Acceptance Test Technician Certification Provider is no longer providing adequate certification services, the Energy Commission may revoke the authorization of the Acceptance Test Technician Certification Provider pursuant to Section 1230 et. seq. of Title 20 of the California Code of Regulations.

NOTE: Authority: Sections 25402, 25402.1, 25213, Public Resources Code. Reference: Sections 25007, 25402(a)-(b), 25402.1, 25402.4, 25402.5, 25402.8 and 25910, Public Resources Code.