TESTING, ADJUSTING AND BALANCING BUREAU
"THE PROFESSIONAL'S CHOICE"℠

www.tabbcertified.org

Testing, Adjusting and Balancing Bureau (TABB)

Responses to California Energy Commission (CEC)
Questions for its February 27, 2012 Workshop

Introduction: TABB is pleased to have the opportunity to submit its views with respect to questions posed by CEC, for CEC's February 27, 2011 workshop pertaining to acceptance testing. TABB would be pleased to provide supplemental information if requested by CEC. Any such request may be directed to:

Anthony Picarazzi, TABB Administrator
601 North Fairfax Street, Suite 250
Alexandria, VA 22314

Telephone: 703/739-7100, ext. 602

Email: tpicarazzi@nemionline.org

Questions and TABB Answers:

Q-1. Is it appropriate for the Standards to limit who can serve as an acceptance testing Field Technician to only persons who meet specific training and certification requirements?

TABB – A-1. The TABB certification program was designed and developed on the premise that certified persons should test, adjust and balance building environmental and pertinent energy systems, in order to assure that the systems operate to optimal efficiency consistent with their design – that is, "Highest Efficiency". The TABB certification program rests on the conviction that building environmental and energy systems will operate to Highest Efficiency when testing, adjusting and balancing ("TAB") is performed in the field by skilled, knowledgeable and experienced technicians, who are supervised by skilled, knowledgeable and experienced supervisors, working for contractors who have the necessary resources, competence and high integrity. Performance of any element of TAB work by persons who do not have the requisite skill, knowledge and experience is counter to maximum energy efficiency. It can lead to

HVAC EXPERTISE
601 N. Fairfax Street, Suite 240 • Alexandria, Virginia 22314 • 703/299-5646 • 703/683-7615, fax • 800/458-6525

results that fall short of design standards. Thus, the best designs can nonetheless be frustrated and limited by deficient testing, adjusting and balancing. To achieve the Highest Efficiency, the skill, knowledge and experience of a Field Technician who performs acceptance testing must be objectively determined. That determination can best be done by credible training and certification requirements.

Q-2. Would persons who currently are allowed to serve as acceptance testing Field Technicians be disadvantaged by training and certification requirements? How should training and certification requirements be designed to provide a reasonable path for these persons to become qualified?

TABB – A-2. Whenever training and certification requirements are implemented and enforced in any field, it can be said that someone who cannot meet the requirements is "disadvantaged" by the mere fact that the requirements exist. However, if the goal is to assure high quality acceptance testing, for Highest Efficiency HVAC operation, that goal is best served by implementing and enforcing appropriate training and certification requirements. The goal is <u>not at all</u> served by allowing persons who cannot meet those requirements to perform acceptance testing.

TABB has designed its training and certification requirements to provide a reasonable path for persons to become qualified. Nationwide there are now more than 800 TABB Certified Technicians. This number has increased by 300 over the past five years. Currently there are 186 TABB Certified Technicians in California, alone. The very number of TABB Certified Technicians evidences that TABB certification represents a reasonable path to qualification to perform TAB work. However, that is not to say that TABB's requirements are the <u>only</u> acceptable requirements. Other nationally recognized TAB certification bodies represent alternative paths to levels of qualification.

Q-3. How would training and certification requirements for acceptance testing Field Technicians help to address concerns related to any lack of enforcement by building departments of the acceptance requirements?

TABB – A-3. TABB certification comes with a Code of Conduct that requires certified professionals to meet standards of work performance and documentation; to ensure that results are substantiated and verified; to encourage continuing education, peer counseling and interaction with professionals; to meet pertinent work-related standards and procedures; to ensure the certified professional's own safety as well as the safety of others while also being respectful to the property of employers and building owners; and to meet other expectations. TABB professionals are held to compliance with this Code of Conduct regardless of local enforcement practices.

Q-4. Are certified general electricians who are also certified by the California Advanced Lighting Controls Training Program (CALCTP) uniquely qualified to serve as acceptance testing Field Technicians for lighting controls? Are those CALCTP certified general electricians only uniquely qualified for this service if they are employed by lighting contractors who are also CALCTP certified?

TABB – A-4. TABB certification does not extend to electrical lighting controls. TABB certification does extend to reading and interpreting electrical use and consumption by HVAC equipment and controls for HVAC systems. This is also noted in TABB's answer to question 15.

Q-5. Should any electricians who are not certified general electricians (e.g., C-10 licensed electrical contractors, or electricians working for school districts or plants, which are not required by state law to be certified general electricians), be allowed to serve as acceptance testing Field Technicians for lighting controls?

TABB – A-5. As noted above, TABB certification does not extend to electrical lighting controls.

Q-6. Should other licensed engineers or contractors who are not CALCTP certified be allowed to serve as acceptance testing Field Technicians for lighting controls?

TABB – A-6. Again, TABB certification does not extend to electrical lighting controls.

Q-7. Should CALCTP certified general electricians, who are not employed by lighting contractors who also are CALCTP certified, be allowed to serve as acceptance testing Field Technicians for lighting controls?

TABB – A-7. TABB certification does not extend to electrical lighting controls.

Q-8. Are testing, adjusting and balancing (TAB) contractors, who meet all of the apprenticeship, experience and testing requirements of the Associated Air Balance Council (AABC), National Environmental Balancing Bureau (NEBB) or the Testing Adjusting and Balancing Bureau (TABB), uniquely qualified to serve as acceptance testing Field Technicians for HVAC equipment and controls?

TABB – A-8. TABB Certified Contractors are highly qualified to perform acceptance testing for HVAC equipment and controls because:

- A TABB Certified Contractor must employ both a Certified Technician and a Certified Supervisor, and is encouraged to employ enough Certified Technicians and Supervisors to perform/supervise any and all testing, adjusting and balancing work;
- A TABB Certified Contractor must own and maintain, including maintaining required calibrations, a sufficient spectrum of testing, adjusting and balancing equipment and instruments to ensure a capability to perform all testing, adjusting and balancing work;
- A TABB Certified Contractor must perform testing and adjusting and balancing work in accordance with pertinent SMACNA standards, or federal, state or local codes if they supersede those standards;
- A TABB Certified Contractor must have in place a customer satisfaction procedure, must have completed a minimum number of testing, adjusting and balancing projects to attain certification, and must have furnished favorable references vouching for the contractor's competence and integrity in testing, adjusting and balancing;
- The Certified Technicians employed by the TABB Certified Contractor must have completed a course of training that includes classroom and on-the-job training, and must successfully complete both a written and a performance examination that demonstrate proficiency with a comprehensive testing, adjusting and balancing knowledge base; and
- The TABB Certified Supervisor must have a specific academic degree and/or work experience in HVAC installation or design, or work experience in testing, adjusting and balancing if the Supervisor does not have the academic degree in engineering or HVAC, must successfully complete a supervisor examination, and must maintain the Supervisor's skill level by completing at least 12 continuing education units every two years.

The combination of (1) contractor certification that assures, among other things, the right tools and equipment, and demonstrated integrity and reputation in testing, adjusting and balancing, plus (2) a supervisor whose academic and/or experiential training and whose proficiency is determined by reference to clear, objective criteria, plus (3) a technician who in turn must have completed classroom and field training as well as a written and performance examination, ensures that every facet of acceptance testing by a TABB Certified Contractor and its personnel will be performed in a high quality manner. The technical expertise and abilities of TABB certified professionals are bolstered and supported by the assurance of integrity through the Code of Conduct, and the customer responsiveness demonstrated by the TABB requirement that every contractor must have a customer satisfaction policy.

The attributes of every TAB certification program should be considered. Qualification need not be limited to one, but requiring a recognized certification is better assurance of Highest Efficiency HVAC than no requirement.

A-9. Should licensed mechanical contractors who are installing contractors, start-up contractors, or service contractors and not certified TAB contractors be allowed to serve as acceptance testing Field Technicians for HVAC equipment and controls?

TABB – A-9. If licensure is the sole criterion for allowing service as acceptance testing Field Technicians for HVAC equipment and controls, then the licensure requirements must in and of themselves ensure appropriate levels of skill, knowledge and experience on the part of the individuals who will perform acceptance testing, and/or supervisors of that work. If the licensure requirements alone are not that comprehensive, a bare licensure requirement, without more, simply cannot ensure that acceptance testing will indeed confirm that HVAC equipment and controls operate to Highest Efficiency. TABB certification is designed to assure qualified individuals are performing in the field, and are supervising field work, regardless of whether licensure requirements meet those same standards or not.

Q-10. Should licensed mechanical engineers be allowed to serve as acceptance testing Field Technicians for HVAC equipment and controls?

TABB – A-10. TABB's response is the same as to question 9, above, since this question also asks about licensure requirements.

Q-11. Should building commissioning providers be allowed to serve as acceptance testing Field Technicians for HVAC equipment and controls and for lighting controls?

TABB – A-11. TABB would answer this question in the same manner as question 9, above, but with reference to whatever standards may now be required of building commissioning providers. The essential question is whether those standards are an acceptable substitute for training and certification requirements.

Q-12. If persons other than those that are proposed by IBEW or the Sheet Metal Workers are allowed to serve as acceptance testing Field Technicians, should they be certified for professional qualifications? If so, what certifications would be appropriate for each of the licensed contractors, engineers or building commissioning providers?

TABB – A-12. Yes, persons other than those proposed should be certified for professional qualifications. Field Technicians for acceptance testing of HVAC

equipment and controls should be certified by a nationally recognized TAB certification agency that provides for certification of the contractor-employer, supervisory personnel, and field personnel-technicians. Independent third-party accreditation or other recognition of the certification of the hands-on field personnel may be considered as a valuable independent means of assuring the credibility of that certification.

TABB submits this answer only as to persons serving as acceptance testing Field Technicians for HVAC equipment and controls since TABB certification does not extend to electrical lighting controls.

Q-13. Related to the proposal from IBEW, what are the requirements or prerequisites for certified general electricians and CALCTP certification in terms of:
a. Training and Education
i. For the certification course
ii. Prerequisites required to qualify for taking the certification course
iii. Costs associated with each of the above
b. Professional experience
c. Registration, certification or licensing fees
d. Professional licensing or certification
e. Continuing education
f. Renewal
g. Other key qualification requirements
Should these requirements be different for licensed engineers or persons with other qualifications that allow for waiving of some of the requirements? If so, how?

TABB – A-13. As noted above, TABB certification does not extend to electrical lighting controls. The scope of TABB certification does include electrical use readings by HVAC equipment and controls for HVAC systems, as noted in TABB's answers to questions 4 and 15.

Q-14. Related to the proposal from the Sheet Metal Workers, what are the requirements or prerequisites for certification by AABC, by NEBB, and by TABB in terms of:
a. Training and Education
i. For the certification course
ii. For demonstration of the trainees' mastery of testing requirements in the field
iii. Prerequisites required to qualify for taking the certification course
iv. Costs associated with each of the above
b. Professional experience
c. Registration, certification or licensing fees
d. Professional licensing or certification

e. Continuing education
f. Renewal
g. Other key qualification requirements

Should these requirements be different for licensed engineers or persons with other qualifications that allow for waiving of some of the requirements? If so, how?

TABB – A-14. TABB certification is pursuant to a comprehensive ICB Certification Manual.* Portions of the following answer summarize pertinent provisions from that Manual or the TAB Manual of the International Training Institute for the Sheet Metal and Air Conditioning Industry (ITI). Persons who actually seek certification should refer to the pertinent Manual for more comprehensive statement of certification requirements.

A. Training and Education.

TABB does not require specific training or education of TABB Certified Contractors. To qualify for the TABB Supervisor Certification Exam, the applicant must meet one of the following eligibility criteria:

- Has a college/university degree in engineering with at least one (1) year experience in HVAC installation or design work, OR

- Has a two (2) year associate degree in HVAC with at least three (3) years experience in HVAC installation or design work, OR

- Is an ICB Certified Tab technician and has five (5) or more years experience in HVAC installation or design work (which may include apprenticeship), at least one (1) of which must include testing, adjusting and balancing work, OR

- Has at least three (3) years' experience in TAB work and is recommended in writing for the Exam by the applicant's employer. The employer must be an ICB Certified Contractor, or be eligible to be an ICB Certified Contractor except only for the requirements to employ a Certified Technician and/or an ICB Certified Supervisor.

TABB recognizes ITI TAB Technician certification. Local joint apprenticeship training committees offer significant training for ITI Participants in testing, adjusting and balancing, as well as other disciplines within the sheet metal industry.

B. Professional Experience.

* "ICB" is the International Certification Board which administers a number of certification programs. Indeed, although references generally made to "TABB Certification," and that reference has been continued in these answers for simplicity, in point of fact the "TABB Certification" is in fact an ICB certification.

Contractor eligibility for TABB certification requires, among other things, that the contractor own and maintain required equipment and instruments, and maintain required calibration; that the contractor has completed a minimum of three testing, adjusting and balancing projects; and that the contractor can furnish five references from local architects, building owners, consulting engineers or contractors who will vouch for the contractor's competence and integrity in testing, adjusting and balancing work. TABB professional experience requirements with respect to Supervisors are those noted in item A, above. There are no specific professional experience requirements as to ITI TAB Technician Certification.

C. Registration, Certification or Licensing Fees.

TABB's current applicable fee schedule:

Home Study Course	$95 (no charge to ITI TAB Technicians via local JATC)
Application Fee (Technician)	$0
Application Fee (Supervisor)	$50
Application Fee (Contractor)	$50
Retesting Fee (Supervisor)	$25
Retesting Fee (Technician)	$0
Lost Stamp Fee	$50 (will end as electronic stamps replace manual stamps)

(Above fee schedule remains subject to change.)

D. Professional Licensing or Certification.

TABB has no generally applicable licensing or certification requirement beyond having appropriate TABB Certification.

E. Continuing Education.

Continuing education is required for renewal of TABB Supervisor Certification. It is not required for Contractor or Technician Certification but the Code of Conduct encourages continuing education.

F. Renewal.

TABB certification is generally valid until the December 31st that is two full years from the certification date. Applicants that meet all qualifications and requirements as for initial certification, when certification expires, can renew. Timely action by a certified person to renew will mean that renewal can be done without additional testing or re-testing, but as noted above continuing education requirements must be met by supervisors.

G. Other Key Qualification Requirements.

ITI TAB Technician certification is available to ITI Participants who successfully complete written and performance tests. TABB Supervisor certification is "active" (authorizing the supervisor to sign reports or otherwise use the certification) only while the supervisor is employed by a TABB Certified Contractor and otherwise compliant with applicable certification requirements. Loss of qualifying employment suspends the right to use the certification, until returned qualifying employment with a TABB Certified Contractor, or expiration of the certification. A TABB Certified Contractor must be signatory to a collective bargaining agreement that provides for contributions directly to TABB's parent organization, and must be current with financial obligations under that collective bargaining agreement; must employ Certified Technicians and Certified Supervisors; must perform work to applicable standards; must have a required Customer Satisfaction Procedure; and must meet other requirements noted above. Again it is noted that there are relatively comprehensive Certification Manuals issued by ICB and ITI, which detail all certification requirements.

TABB provides the above information solely as to the TABB certification program. The specific certification program structures of the nationally recognized TAB certification bodies vary from one to another. A person with the required skills, knowledge and experience should be able to obtain at least one of the nationally recognized TAB certifications. If CEC recognizes that a person seeking to perform acceptance testing of HVAC equipment and controls as a Field Technician must hold, or must work under supervision or employment of a person holding, certification by any one of these nationally recognized certification bodies, there should be no need for waiver of requirements.

Q-15. If TAB certification is required for acceptance testing by a Field Technician, should that be limited to acceptance testing related to airflow?

TABB – A-15. TAB certification should not be limited to acceptance testing related to airflow. Acceptance testing goes beyond just airflow.

A TAB certification should be limited only by the scope of the certification body's own knowledge base and proficiency standards for its certification. For example, proficiency standards for TABB certification include proficiencies in specific mathematical functions, fluid flow, heat flow, psychometrics, general comprehension of HVAC system performance, air and hydronic distribution systems, automatic control systems related to testing, adjusting and balancing and electrical systems pertinent to testing, adjusting and balancing including understanding of voltage, current, resistance, reactants, capacitants, Ohm's law and Bhp, instrumentation, specific computer skills and specific testing, adjusting and balancing procedures.

Q-16. If CALCTP certification is required for acceptance testing by a Field Technician, should that be limited to the acceptance testing related to advanced controls that

are the subject of CALCTP training?

TABB – A-16. Because this question pertains to electrical work, TABB has no comment.

Q-17. What is the number, location and coverage of persons meeting the certification requirements advocated by IBEW and the Sheet Metal Workers (answer separately for AABC, NEBB, and TABB) that are in California? Specifically:
a. Number statewide
b. In what cities are the certified persons located?
c. What locations of the state do not have certified persons within 50 miles?
d. What locations of the state have only a limited number of certified persons to cover the expected demand for acceptance testing?

TABB – A-17: TABB has 186 TABB Certified Technicians in California. TABB submits a list by certification type, and city, of TABB Certified Technicians, Supervisors and Contractors in California. A TABB Certified Technician may well work for a contractor-employer that itself is not a TABB Certified Contractor. In that case, however, the TABB Certified Technician remains subject to the requirements of the Code of Conduct and other applicable TABB standards.

TABB has not categorized its data per item c. of this question 17. TABB does not know the expected demand for acceptance testing, in order to enable it to answer item d. of question 17. However, TABB has demonstrated that it can increase the number of certified TABB Technicians significantly over a relatively short period of time. That should provide confidence that expected demands can be met once requirements for HVAC equipment and controls acceptance testing are known.

Q-18. Should the Energy Commission adopt criteria for approval of industry certification programs? If so, what should the criteria be? What qualifications of current certification programs should be included? Should the criteria include the following:
a. Approval by the Commission of the curriculum for the certification program to include training in the acceptance testing requirements that are applicable to that program
b. Demonstration of the trainee's mastery of the acceptance testing requirements in the field
c. Quality assurance to ensure ongoing quality performance in completing the acceptance testing
d. Complaint resolution to address concerns regarding certified Field Technician performance
e. Documented evidence of actions by the certification program to correct

improper performance, provide remedial training, provide coaching or mentoring, provide penalties or decertification of certified persons who repeatedly fail to provide quality acceptance testing
f. Field experience prior to certification; field experience required to be under the supervision of a certified person
g. Certification open to both union and non-union technicians
h. Certification program administered by non-profit organization which encourages wide participation and is certified by ANSI, ISO or other appropriate accreditation body
i. Certification program free of conflict of interests and maintains code of ethics
j. Certification actively works with local building departments to promote compliance and enforcement of acceptance requirements and provides acceptance requirement training free of cost to local building department personnel in conjunction with training to technicians
k. Other recommended criteria

TABB – A-18. There are nationally recognized TAB certification agencies which certify contractors/employers, supervisory personnel and field personnel/technicians. TABB suggests that CEC accept such certifications as assuring the skill, experience, knowledge base and overall capability of duly certified individuals and companies. If CEC does consider adopting its own criteria, TABB's position is that the criteria should focus on criteria pertaining to substantive knowledge and skill requirements (clauses (a) – (c), above), and perhaps on processes pertaining to quality-of-work (clauses (c) and (d), above). The other criteria noted above are program structure criteria. Those may be unique to different certification programs; indeed, they should be unique so that there is more than one pathway to certification. The specific design of a certification program should be measured not in its individual facets, but by whether it certifies persons whose skill, experience, knowledge and overall capabilities gives confidence that their acceptance testing will mean that the HVAC equipment and controls are operating at Highest Efficiency. TABB's certification criteria program does just that.

International Training Institute Accredited Training Centers – California
(ICB/TABB Certification Centers)

Alameda/Contra Costa County Sheet Metal JATC
1700 Marina Blvd., San Leandro, CA 94577
Phone - (510) 483-9035 | Fax - (510) 483-1415

Fresno Area Sheet Metal Workers JATC
4585 E. Floradora, Fresno, CA 93703
Phone - (559) 255-3665 | Fax - (559) 255-6450

Kern, Inyo, Mono and Northern Los Angeles Counties
AC & SMW JATC
601 Eureka Avenue, Bakersfield, CA 93305
Phone - (661) 323-4461 | Fax - (661) 323-3286

Modesto Area Sheet Metal Workers JATC
841 Lone Palm Avenue, Suite A, Modesto, CA 95351
Phone - (209) 523-1323 | Fax - (209) 523-1242

Monterey, Santa Cruz & San Benito Counties Sheet Metal JATC
11060 Commercial Parkway, Castroville, CA 95012
Phone - (831) 933-6151 | Fax - (831) 633-3585

North Bay Sheet Metal Workers JATC

North Bay and Humbolt, Delnorte, Trinity Counties
1250 Petaluma Blvd. North, Petaluma, CA 94952
Phone - (707) 762-0181 | Fax - (707) 762-7104

Sacramento Valley Sheet Metal JATC
1624 Silica Avenue, Sacramento, CA 95815
Phone - (916) 922-9381 | Fax - (916) 922-3574

Sheet Metal JATC of San Diego
4596 Mission Gorge Place, San Diego, CA 92120
Phone - (619) 265-2758 | Fax - (619) 265-7638

San Francisco County Sheet Metal JATC
1939 Market Street, San Francisco, CA 94103
Phone - (415) 431-1676 | Fax - (415) 255-8727

San Mateo County Sheet Metal JATC
860 Hinckley Road, Burlingame, CA 94010
Phone - (650) 652-9672 | Fax - (650) 652-9638

Santa Barbara JATC

ƒåSan Luis Obispo, Santa Barbara & Ventura Counties
2500 Channel Drive, Ventura, CA 93003
Phone - (805) 648-2220 | Fax - (805) 648-3613

Santa Clara County Sheet Metal JATC
2350 Lundy Place, San Jose, CA 95131
Phone - (408) 263-1712 | Fax - (408) 263-1723

Southern California Sheet Metal JATC

Orange, Riverside & San Bernardino Counties
633 N. Baldwin Park Blvd. City of Industry, CA 91740
Phone - (626) 968-3340 | Fax - (626) 968-3379

Stockton Sheet Metal JATC
2707 East Fremont Street, Suite #2, Stockton, CA 95205
Phone - (209) 939-9375