



Taylor Engineering

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To: California Energy Commission
From: Mark Hydeman, PE, Principal at Taylor Engineering, LLC
Subject: Taylor Engineering's Responses to the CEC Staff Questions on T24 HVAC Acceptance Tests
Date: March 4, 2012

The following paragraphs provide Taylor Engineering's responses to the Staff Questions which were distributed during the February 27th 2012 hearing on the acceptance tests. Please note that we have only addressed the general questions and those specifically addressing the mechanical system acceptance tests. We did not provide specific responses to the questions related to lighting and CALCTP as we are not content experts in this area.

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?

Response:

Yes, it is appropriate for the Standards to require that any person who performs these tests must demonstrate experience for performance of similar tests and to have demonstrated that they fully understand all of the following:

- The test procedure.
- The underlying standard requirements that are being tested.
- The components, equipment and systems that are being tested.

We would support some form of certification with criteria for minimum work experience or training as long it is not limited to just one discipline as proposed by the Sheet Metal Contractor's Union and the IBEW. These tests should be able to be done by any competent individual regardless if they are union, non-union, contractor, engineer or other profession with experience in the performance of similar testing.

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?

Response:

It is likely that some of the people who are currently performing these tests are not fully trained on the systems, components, equipment, or Standard requirements. Taylor Engineering has already developed educational materials for these mechanical acceptance tests that were developed for the Pacific Energy Center and NEEB certification classes that will be provided



free of license or charge to any testing agency or individual that wants to use it. There is also material already in the Non-Residential Compliance Manual that could also be used for this purpose. We believe that the IOUs through their Codes and Standards support would likely support development of a comprehensive training program that could be used for this purpose. It is likely that further support for training materials and providers will come from other sources including ASHRAE, the California Commissioning Collaborative and SMACNA.

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

Response:

It wouldn't directly. To increase enforcement of the acceptance testing by building departments we recommend that the CEC reach out to the engineering community, the contracting community and the IOUs to get resources to do in-house training at building departments on the acceptance tests. The same materials referred to in our response for Question 1 could be used for that purpose. We have discussed this with Cal SMACNA and they are interested in helping with this training if it moves forward. This will likely increase the demand for acceptance tests which will address one of the key concerns raised by the Unions. Since it would improve compliance with the Standards, the IOUs are likely to provide resources as well.

In addition to training the building officials, we recommend providing free over the shoulder peer reviews of Title 24 documentation for building departments to help them get used to what to look for.

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?

Response:

In our opinion for the majority of the tests, our opinion the answer is no due to the need to override the control systems in the performance of the tests and to understand the operation of the mechanical and control systems on built up systems. The two tests that they should be well qualified for are NA7.5.1 Outside Air and NA7.5.3 Air Distribution Systems. The Standards currently require NA7.5.3 to be performed by HERs raters. In our opinion most TAB contractors could perform this work just as well.



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

Response:

Our answer is yes if they demonstrate the experience and knowledge of the tests as described in the answer to question 1.

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

Response:

Our answer is yes if they demonstrate the experience and knowledge of the tests as described in the answer to question 1.

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

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Response:

Our answer is yes if they demonstrate the experience and knowledge of the tests as described in the answer to question 1.

12. If additional 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 the additional persons (e.g. licensed contractors, engineers, or building commissioning providers)?

Response:

We believe that the requirements for all testing parties should be the same whether they are TAB technicians, engineers, contractors, commissioning agents, building operators or other parties. We also believe that the certification process should use a uniform set of material that is specific to the Title 24 Acceptance Tests and is available either for free or at a low nominal charge. Existing certification groups or agencies like AABC, NEBB, TABB, ASHRAE, AEE and others could be leveraged for this effort. In addition to the trade organizations, the training could also be done at CSU and community college campuses.

The criteria could include, minimum years of experience in the building trades, some level of certification (such as certified TAB technician, licensed contractor, certified CXA or PE), and a



passing grade in a certification test that was specific to the Title 24 acceptance tests. A group of interested parties representing the various disciplines should be convened to hammer out the details.

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

Response:

We don't believe that it is in the public's best interest to require TAB certification for any of the acceptance tests. However if it is deemed politically necessary to undertake this, it should be limited to NA7.5.1 Outside Air and NA7.5.3 Air Distribution Systems. There are many parties that are not TAB contractors that routinely own and use balometers, pitot tubes, hydronic manometers, power meters and other TAB instrumentation. In fact many of these tools are available free of charge at the PG&E Pacific Energy Center Tool Lending Library.

Our field experience is that not all certified TAB technicians are proficient in using these tools, diligent in their field work, or are they cognizant of the requirements of the Title 24 Acceptance Tests. This is the reason that we believe any certification should be constrained to the Title 24 Acceptance Tests and to the systems and equipment to which they are applied.

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?...

Response:

We think that this issue should be addressed by an industry coalition that includes at a minimum representation by the following parties:

- The CEC
- The IOUs
- ASHRAE
- The California Commissioning Collaborative
- The Unions (Sheet Metal Contractors and IBEW)
- SMACNA
- The TAB agencies (NABB, AABC and TABB)
- The CEC consultants who developed the acceptance tests

We offer our services to assist in this working group.