BEFORE THE

CALIFORNIA ENERGY COMMISSION

In the Matter of,	)	
	)	Docket No. 10-BSTD-01
Workshop on Proposals for	)	
Certification of Acceptance	)	
Testing Field Technicians	)	

Lead Commissioner Workshop on Proposals for Certification of Acceptance Testing Field Technicians For Mechanical Systems and Lighting Controls

CALIFORNIA ENERGY COMMISSION

HEARING ROOM A

1516 NINTH STREET

SACRAMENTO, CALIFORNIA

MONDAY, FEBRUARY 27, 2012

1:07 P.M.

Reported by:
Peter Petty

Commission Staff Present:

Karen Douglas
David Hungerford

Staff Present

Martha Brook
Mazi Shirakh
Pippin Brehler
Ryan Ware
Ron Yasny

Also Present (*on phone/WebEx):

Stakeholders
Scott Wetch, IBEW
Erik Emblem, Western States Council
Mark Hydeman, Taylor Engineering, LLC
Thomas Enslow, Adams, Broadwell Joseph & Cardozo
Cesar Diaz, State Building Trades Council
Dan Magyar, Magyar Electric
Brian Jacoway, Valley Pacific Electric
Tom Meredith, IBEW Local 340
Ron Mitchell, Bay Area SMACNA
Mark Paavola, Northern California SMWTC
Tom Meyer, NEBB
Chris Ruch, Final Air Balance Co., Inc.
Art De Leon, Final Air Balance, Co., Inc
Gary Andis, TABB
Jim Taylor, AABC
Michael Siminovitch, Cal LTNG Technology
Bernie Kotlier, CALCTP
Ellen Avis, UC Berkeley Donald Vial Center on Employment in the Green Economy
Josh Allen, Allen Electrical Contracting
Dave Dias, SMW Local 104
James Page, International Training Institute
Robert Helbing, Air Tro
Mark Ouellette, ICF International
Dale Gustavson, Better Buildings, Inc.
Chris Walker, CAL SMACNA
Bob Wiseman, Institute of Heating & Air Conditioning Industries
Mike Outerbridge, Outerbridge Electric
Keith Dias, SMW Local 104
Randy Young, SMW, Local 162
Lisa Hoyos, Blue Green Alliance

Also Present (cont'd):

Charles Knuffke, WattStopper
Darlene Besst, NECA
Eddie Bernacchi, NECA
Richard Markuson, WECA, PHCC & ACTA
Richard Garbrick, Schetter Electric
Dennis Morrin, JATC
Victoria Rome, NRDC
Patrick Splitt, App-Tech
Jon McHugh, McHugh Energy Consultants
Patrick Pico, Advantage Construction Services
Matt Tyler, PECI
*George Nesbitt, CalHERS

I N D E X

P R O C E E D I N G S

FEBRUARY 27, 2012 1:07 p.m.

COMMISSIONER DOUGLAS: Good to see quite a few people here interested in talking about the proposal that we're here to discuss this afternoon.

I'd like to welcome everyone to coming and thank you for coming to this workshop to discuss potential Certification of Acceptance Testing Field Technicians for Mechanical Systems and Light Controls.

Since 2005, Title 24 has required acceptance testing of lighting and mechanical systems in new buildings, major renovations and equipment change-outs. Acceptance testing is a mechanism for ensuring HVAC and lighting systems are installed and calibrated so that they're in conformance with applicable codes as specified in the building design, and also contribute to meeting the State's energy policy goals, energy efficiency goals.

Compliance with the testing requirement is enforced by local governments. Last September the California Commissioning Collaborative published a report evaluating the efficacy of acceptance testing under Title 24 and the report identified a number of deficiencies with current acceptance testing methodologies, including a lack of clarity as to who is the responsible party, issues with lack of resources for enforcing the requirements of

building departments, difficulty in interpreting the acceptance test requirements and so on. And around the same time the California Energy Efficiency Strategic Plan was released. And this report indicates the amount of energy use consumed by commercial buildings which consume more electricity than any other end-use sector in California, represent about 5 billion square feet and about 38 percent of the electricity and 25 percent of the natural gas use in the state. So it's a pretty significant sector.

The Strategic Plan called out the issue of improper installation of mechanical systems as a barrier to achieving the efficiency goals that we're trying to achieve in the state and so that's another area where this issue has been identified.

And so today's Workshop is the first step of a proceeding in which we're trying to clarify our own understanding of these deficiencies with the current acceptance testing methodologies and identify potential solutions, including the possible adoption of appropriate criteria to ensure that individuals performing acceptance tests are properly trained and qualified. Our intention is to develop a proposed regulation for the Building Standards Commission on this topic essentially by the end of the year if we are able to do so. And our ability to

do so depends quite a lot on the ability of stakeholders to come forward and help us really understand both your views on the nature of the problem, the extended standing scope and significance of the problem and the ability of the proposed solution to help us address the concern.

So I appreciate your interest in this important matter, look forward to working with you and let me, at this time, ask the staff from the Building Standards to identify themselves and, I guess, you might want to provide your own basic introduction and the usual logistics that we go over. And, I guess, then you'll have a presentation?

MS. BROOK: Yeah. This is Martha Brook and that was not an emergency signal so we do not have to exit the building.

I'm Martha Brook. I'm a Senior Mechanical Engineer and I'm one of the program leads for the 2013 update of Title 24 Part 6. Mazi?

MR. SHIRAKH: I'm Mazi Shirakh. Martha and I are the leads for this round of standards.

MR. BREHLER: Pippin Brehler, Senior Staff Counsel for the Energy Commission and I've been advising staff on the development of the Building Standards.

MS. BROOK: So I'm just going to go through the slide deck which is basically just an overview of what we

had in the Notice as far as background information and then it will introduce the questions that we also had in the Notice. And then what we're going to do is basically spend the whole Workshop getting your comments and what we're going to ask you to do is try to address the questions to the best that you can because we really think that's going to be the most help for the Commission as we go forward to consider where we are now and where we need to be.

So going forward we had our introduction from Karen Douglas and I'm just going to overview the background and the questions like I said and then we'll conclude at the end of the day.

Just correct me if I'm wrong, Commissioner Douglas, but we're anticipating that you're going to call people up one at a time using those blue cards?

COMMISSIONER DOUGLAS: That's correct. I'll call people up. We have a stack of blue cards and we'll definitely be happy to take more so if anyone didn't get around to filling out a blue card please do so.

MS. BROOK: Right. And another thing we want to do is make sure we have time for the WebEx callers to also chime in at some point during the afternoon.

COMMISSIONER DOUGLAS: Okay.

MS. BROOK: So this will all be review if you

read our Notice. Basically where we're starting with background here is that in the 2005 update to the Building Energy Efficiency Standards we included nonresidential acceptance tests. And then it was really an attempt to include construction inspections and functional testing components of Building Commissioning at standard requirements. So we're really looking at the whole body of Building Commissioning and trying to figure out what we could take of that Building Commissioning process and include in as standard requirements and so that's where we started.

And in the evaluation of these acceptance test requirements, how they're enforced and how effective they are, was completed by the California Commissioning Collaborative and the final report was published in September 2011. It included 31 interviews of building officials, testing contractors, design engineers and building owners.

So basically, the findings from this study is that building departments, testing contractors, design engineers and building owners really need an approved understanding of the test requirements, the procedures, the forms that need to be completed and the methods for reviewing and approving the acceptance test once they are completed. The responsible party that's named in the

standards is often not specified on the forms and this makes it unclear about who is actually responsible for completing the forms and this leads to and contributes to the admission of the test actually getting completed.

Another finding is that only contractors who typically perform duct leakage tests have easy access to the equipment needed for the test that includes airflow measurements and that also that mechanical contractors that are most familiar with the mechanical acceptance tests that were studied in this review were those who performed test and balance tasks regularly.

Another aspect of the background we're trying to present is that the California Workforce Education and Training Needs Assessment that was done by UC Berkeley for the California Public Utility Commission in 2011 actually identified the California Advanced Lighting Controls Training Program as a nationally recognized model for improving work quality of already highly trained contractors who need training in specific energy efficiency applications.

This needs assessment reviewed CALCTP and found that the training is widely available throughout the state. It's available through the IBEW 23 joint apprenticeship and training centers, Community College Advanced Transportation Technology and Energy Campuses are

providing this training as well as some of the investor-owned utility's energy training centers.

Another aspect that Karen mentioned of the relevant background is our Strategic Plan and the Lighting Action Plan that the Public Utility Commission has published that really supports training efforts such as CALCTP to train and certify licensed electrical contractors and state certified general electricians in the proper design, installation and commissioning of advanced lighting control systems.

And then in the fall of 2011 there were proposals to the Energy Commission from IBEW and the Sheet Metal Workers that advocate that only individuals that are trained and certified by specific certification programs should be allowed to perform these acceptance tests. The California Advanced Lighting Controls Training Program certified contractors should be the only ones that can complete the lighting control tests and the testing, adjusting and balancing technicians. Three different certifications, AABC, NEBB and TABB certified professionals, would be appropriate for completing the HVAC acceptance tests.

So onto the questions that we included in the Workshop Notice, and this is really – these were drafted by Commission staff so that we could really get to

potentially developing a set of criteria that would be appropriate for approving industry certifications for acceptance tests, or even if such criteria is necessary. So I'm just going to read these 18 questions and then we'll be ready for Public Comment.

The first question is should the standards require Field Technicians who perform acceptance testing to meet specific training and certification requirements?

2. Would current Field Technicians who perform acceptance testing be disadvantaged by training and certification requirements? If they would be disadvantaged, how should training and certification requirements be designed to provide a reasonable path for these professionals to become qualified?

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

4. Are certified general electricians, who are also certified by the CALCTP program and who are performing work while employed by a California contractor who holds a CALCTP contractor certification, uniquely qualified to serve as acceptance testing Field Technicians for lighting controls?

5. Should electricians who are not certified general electricians - for example, 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?

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

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

8. Are TAB contractors uniquely qualified to serve as acceptance testing Field Technicians for HVAC equipment and controls?

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?

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

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

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 (for example, licensed contractors, engineers, or building commissioning providers)?

13. Related to the proposal from IBEW, what are the existing requirements or prerequisites for certified general electricians and CALCTP certification, in terms of Training and Education; Professional experience; Registration, certification or licensing fees; Professional licensing or certification; Continuing education; Renewal; Other key qualification requirements and Eligibility to waive or fulfill any of the above requirements with other licenses, degrees or qualification.

14. Related to the proposal from the Sheet Metal Workers, what are the existing requirements or prerequisites for certification by AABC, by NEBB, and by TABB in terms of the same - Training and Education; Professional experience; Registration, certification or

licensing fees; Professional licensing or certification; Continuing education; Renewal; Other key qualification requirements and the Eligibility to waive or fulfill any of the above requirements with other licenses, degrees or qualification.

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

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?

17. What is the number, location and coverage of persons meeting the certification requirements advocated by IBEW and the Sheet Metal Workers? Specifically the number of certified professionals statewide, in what cities are the certified persons located? What locations of the state do not have certified persons within 50 miles? What locations of the state have only a limited number of certified persons to cover the expected demand for acceptance testing?

And finally, 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 Energy 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, and

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.

Oh, I’m not done yet.

To continue, should the criteria for certification include 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 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 conflicts 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,

Or any other recommended criteria that you would like us to consider.

Okay. Now, Karen, you can go ahead and do your —

COMMISSIONER DOUGLAS: Thank you. So before we get started with the list of people who are here to comment I just wanted to see if we have representatives from all of the certification agencies that we're talking about today in the room. I see that we have a representative from — Tom Meyer, Technical Director of NEBB. Good, okay. And Gary Andis, Director of TABB. T-A-B-B. Good. Representing the California Advanced Lighting Controls Program. Okay. Are you Bernie Kotlier? Kotlier? Kotlier. Good. And is there anybody here from AABC? Okay, good. So you haven't filled out a blue card but it's just good for me to know that you're here. So I

will – as questions come up that pertain to the certification programs that you offer it would be great if you remember when it's your time to come up to answer them and hopefully I will remember to ask them. But I just wanted to make sure that we had somebody in the room.

Could the representative of AABC, could you tell me your name just so that I – Jim Taylor. Okay, good. All right. So with that let me ask Scott Wetch if you could help us kick this off. Representing IBEW and the Pipe Trades.

MR. WETCH: Thank you, Madam Chair. Actually, Scott Wetch. I'm representing today the State Association of Electrical Workers, the California Coalition of Utility Employees and the California State Pipe Trades Council. And we have many witnesses today that can speak to many of the very specific questions and technical questions that you've raised.

I'd just like to sort of provide the 30,000 foot view on why we brought the proposal before the Commission. You already cited the more recent Commissioning study but in addition, as you're well aware, in 2008 the CEC study on HVAC installation and performance for residential and small commercial found that 90 percent of installations did not meet Title 24 code requirements or manufacturer specifications. And that the study attributed increased

energy use in just HVAC systems alone to 20-30 percent greater use of energy because of improper installation and commissioning.

So it's the – the study further found that in 2010, for 2010, that's the equivalent of the largest two fossil fuel power plants built in California.

So collectively the State Association of Electrical Workers and the California State Pipe Trades Council and the Coalition of Utility Employees and the Western State Council of Sheet Metal Workers brought forward this proposal because we believe it's completely consistent with where the Commission has gone in the most recent version of Title 24 and is a very, very modest step; and one that the industry could meet with very little capital investment.

As you know, for the last three years, the Title 24 has listed as a recommendation that, to the extent possible, the industry provide installers and technical personnel who meet these various requirements on the HVAC side, TABB, NEBB or AABC. We feel that taking the next step toward requiring the acceptance testing be performed by similarly certified personnel is the logical next step. And I want to make a couple of points very clear. We're not talking about a contractor having to have an entire workforce that meets this certification. We're talking

about each contractor, be it a five person shop or be it a 200 person shop, have one certified person who is qualified to do this acceptance testing. In our minds eye, it's completely inconsistent that the Commission would require that there be certified, qualified personnel performing testing on very small residential systems under the HERS system but not advance the state's interests similarly in large commercial settings.

I'd like to make it clear as well that this is simply not, although some have tried to portray it as, this is not a union or a non-union issue. All of the — two of the three certifications that we are recommending that are the nationally recognized certifications for heating and air conditioning text are open and regularly certify both non-union and unionized technicians.

CALCTP who, as you know, is a collaborative that includes the state's utilities, the University of California, the community colleges, this very Energy Commission, is open to and continues to certify both non-union and union contractors as well as non-union and union personnel.

So we believe that this is a very logical next step and one that can be achieved very modestly with very little capital impacts as I stated. In one of the questions that was cited in the Staff Report was, well,

should contractors themselves, licensed contractors, C20 or C10 contractors, be allowed to do the acceptance testing without additional certifications. Certainly there are plenty of contractors out there in C20 and C10 categories that are more than qualified to be able to do the acceptance testing but that doesn't mean that they all are. As you can imagine we have tens of thousands of contractors in those various classifications and all of them have various specialties so to suggest simply having a C10 or a C20 qualifies someone to do the acceptance testing is simply not the case. There's varied contractors that specialize in certain areas and if, in fact, they do have the technical expertise we don't see that being a huge obstacle to gaining the appropriate certifications.

We do have folks from all four of the certifications to answer technical questions. I'll be here as well to answer any as you get into the specific questions.

COMMISSIONER DOUGLAS: Thank you.

MR. SHIRAKH: Can I ask a question? You mentioned, like, in a shop of maybe 20 technicians only one needs to be certified. How does that — can you elaborate?

MR. WETCH: Yeah, I'll elaborate. What we often

find is that at the end of a job the person who gets assigned to the acceptance testing is the same either superintendent or foreman who is responsible with doing the final punch list and more often than not we found the — just the motivations are that they're trying to get the project closed out and so too often it's rushed through or it's assigned to a subordinate who simply isn't qualified to perform that acceptance testing. I think that it's been born out by both the Commission studies.

So each contractor who performs in this particular capacity needs to have one person on their staff because, remember, the acceptance test is only being done at the conclusion of the project so, again, if you're a small shop or if you're a large shop, you have one dedicated personnel who's qualified who's gone through the certification then you'd be more than prepared to address this need.

MR. SHIRAKH: The tests are done by the certified technician. It's not like a non-certified can do the test and the responsible person can be —

MR. WETCH: It's our intent that the person who is signing under penalty of perjury on the 300 pages of acceptance forms be the person who is actually doing the testing, the calibrating and the balancing.

MR. SHIRAKH: All right. Thank you.

COMMISSIONER DOUGLAS: All right. Thank you. Excuse me. Erik Emblem with the Western State's Council Joint Committee on Energy and Environmental Policy.

MR. EMBLEM: Good afternoon, Commissioner Douglas. Appreciate the opportunity to speak to you again today, and to talk a little bit about our proposal.

Before I get started I'd like to commend the Commission and the staff and Mazi and Martha and Bill on the great work that they do. I've enjoyed working with them for the five years that I've been in California now after leaving DC and they're a great staff; they do a lot of great work. They need to be complimented on their diligence.

As we've pointed out, you know, we've identified problems in meeting the objective of installing HVAC systems consistently with quality and obtaining the energy saving objectives with those savings and meeting the requirements of Title 24. The essence of our proposal is to try to meet this problem with a reasonable solution. As Scott pointed out, in the residential sector it was determined it was necessary to create the whole industry to do third-party verification of HVAC systems in residential and other building systems in the HERS Rating systems.

Conversely, in the nonresidential commercial

section we have been doing this for years and has been industry supported and put together within our own industry. And the three programs that we put forth as a suggestion and we feel is a solution of certification that being the Associated Air Balance Council, the National Environmental Balancing Bureau and the Testing, Adjusting and Balancing Bureau, have been around for many, many years. They are industry supported. They have created organizations that have developed knowledgebases and certification processes at the technician level and the supervisor level and the engineer level. And along with that have created code of ethics and customer satisfaction policies and warranties to back them up.

They're readily accessible and used throughout the industry day in and day out across the United States, around the world, for that matter. So we're saying that you don't need to recreate the wheel here. We have the system. It's been determined by the industry itself, by architects, by engineers, by specifiers, by the Department of Defense, by the Corps of Engineers, by the GSA and by MASTERSPEC of the NIA, that these three entities deliver a quality process consistently day in and day out. So we feel that by bringing this to California it's a natural extension. Again it's been determined to be cost effective in the commercial, nonresidential sector even

today. In the building we're in today. We're doing a retrofit of this building today. And in order to do those services in this building today, the retrofit, you've got to be certified by one of those three entities. Through the Energy Commission, to be exact, and the GSA in California.

So we're just saying it's a natural succession to say let's take this down now and let's look at commissioning reports and let's look at acceptance reports as part of the commissioning process and say the person performing the test needs to have a great grounding and understanding and knowledgebase of the system he's testing. And we're not talking residential. We're talking very complicated built up systems in nonresidential applications. So it's not — it's apples and oranges compared to residential. So when we start talking about the person performing that test not only do they have to understand the theory and the process and the system that they're testing they have to understand the necessary instruments and the process for recording the data.

Let's face it. The bottom line is what we want to do with this report is gather data and assurance that those systems are working properly but also to gather data to assure that the requirements itself is cost effective

for future generations of the code cycle.

So that data is crucial. If the data is flawed, if it's not accurate and if the motivation behind the data is, "Let's just get this project finished," then the people may or may not collect the forms anyway, that's why we have what we have today. So we're saying the status quo is unacceptable. Let's move forward. Let's start reviewing the objectives of the energy policy of the State of California and let's start matching practices to the skills of the people doing them.

One thing that I'd like to clarify when it comes to the three certification entities, I have a little bit of institutional background with them. They are not anti-engineering professionals. All three certifications have been built off of engineers and engineering principles. All three of the certifications certify engineers and supervisors within their own certifications themselves. And some have higher requirements than others as far as what that process that engineer has in the process. So we may not have been clear in our proposal but I want to be clear today that the intention is not to preclude engineers from doing acceptance testing. What we're asking is that the people who perform the test be certified that they have the background, the knowledge and the expertise to perform the test. All three of these

entities certify engineers day in and day out within their normal book of business.

Today in the room we have supporters for this for many of the contractor bases and many of the Air Balance people. We're going to have technical expertise to answer technical questions that may be leveled from the audience or from staff that I may or may not be – probably won't be able to address but we have people in the room that can address it.

So to me, again, I've worked with many of the people in this room. Most of the people in this room I consider friends and we work with on various committees around the state whether it be the HVAC Performance Alliance, the California Commissioning Collaborative or the Energy Commission itself. And the objective has always been the same: how do we do quality work, quality maintenance on a consistent basis in the HVAC industry? And we don't want to vary from that.

I think that's my proposal today. I'd be happy to answer any questions.

COMMISSIONER DOUGLAS: Thank you. Mazi?

MR. SHIRAKH: Erik, so if there is a professional mechanical engineers are performing this test what does he need to do in order to get certified by one of these three organizations?

MR. EMBLEM: Well each of the three organizations has basic knowledgebase and criteria for professionals to become certified. They're all a little bit different but most of them would require that they provide evidence of their professional certification with the entity they're at and have a period of experience in HVAC design or installation along with it and sit for a test.

MR. SHIRAKH: And that test is just a one day test or is it a —

MR. EMBLEM: Depends on the organization but most of them are less than a day. A lot of times it's online. It depends on the organization so I'll let each of them come up and answer to their specific organization on how they do their process for that.

MR. SHIRAKH: Thank you.

COMMISSIONER DOUGLAS: Thank you. That is going to be one of the questions that we'll ask of the certification agencies.

MR. EMBLEM: Thank you.

COMMISSIONER DOUGLAS: Thank you.

All right. So let me ask, speaking of professional engineers, maybe Mark Hydeman with Taylor Engineering if you are here.

MR. HYDEMAN: I thank you for giving me a moment

to share my thoughts on this issue. Just a little bit of background, if I could, just to make sure that everybody understands where I'm coming from.

I'm a Principal at Taylor Engineering. We're a relatively small firm, about 24 engineers. My partners include a past officer of Cal ACCA and several gentlemen who worked as design build contractors so we're a little different than most consulting engineering firms. I have extensive, along with my partners, extensive industry education experience including the UC Berkeley HVAC R-Certificate Program, which I sat on and Steve Taylor sat on as advisors and have taught for almost 20 years. And we are teaching TAB contractors, engineers, commissioning agents and others.

We also have extensive experience at ASHRAE and also at the IOUs, PG&E and SMUD and others, teaching everyone about energy efficiency methodologies and techniques.

I was one of the primary authors of the Acceptance Tests including the 2005, 2008 and the proposed changes to the test in 2013. I and my partners are all very active in ASHRAE. I'm a past Vice-Chair of 90.1. I've received the distinguished service and had the honor of being named an ASHRAE fellow.

I support what we've heard here today which is

let's button these tests up and let's get the word out to the building departments so that people are looking for the acceptance test forms and know what needs to be on them.

When we were in the 2005 standard process and we first talked about the test we spent a lot of time asking questions to staff and amongst ourselves and reaching out to the industry. Who is it that we want forming these tests? And as it stood in 2005 and my sense is it still stands the same way in this industry and that is the people that are qualified to do these tests come from a variety of backgrounds. They're not just test and balance contractors. They're not just commissioning agents. They're not engineers. They're individuals that have a very broad understanding – and I can only speak to the HVAC side. I'm not going to address anything on the electrical or lighting side. But there are people that have broad training, that understand the systems being tested. That understand the control systems and this is key for the acceptance test in California. They are almost all testing the control systems. So you need to understand how control systems work and you need to understand how to override control systems to do most of these tests.

But it's a small pool of people out there. We

are now seven years beyond 2005 and we still, even with all the activity at the testing and balancing agencies and ASHRAE and other organizations, there really are very few people that are competent in doing this sort of work. So I support some level of certification. I support some level of training and outreach to the building departments and I think, really, the problem is that they're just so strapped. They have the same funding problems everybody else has and they have the same training problems.

But I'd be willing to, on my nickel, to go out and talk to building department about these things and I'd be willing to work with agencies and organizations to come up with good criteria for certification for the California Title 24 Acceptance Test. Those tests are very different and are only a subset of the commissioning activities. I don't think a general commissioning certification is appropriate. The forms that we have in California are unlike any other forms. And we have some items in these acceptance tests, things that were custom built to get the biggest bang for the buck, built on pure research done by AEC and others to address problems that we've found in the field, particularly with economizers. And one of those items was that the air handling unit manufacturers that train carriers of the world could factory install and in the factory test and certify operational the economizers

and that would be sufficient. And we had discussions that included ACCA and others where everyone agreed that that probably would have taken care of it, Pete Jacobs from AEC, would have taken care of most of the problems we had seen in the field. John Proctor. That was another person we had reached out to.

So I think that when we think about what the solution is – I think we can all agree what the problems are but when we think about the solution we should do it in a collaborative method. It should be done in Workshops here at the CEC and not through a legislative action. And I am open to talking to all of you that are here about how to solve the problem but I don't think that it is one agency that should be doing this and I don't think it's one group of people. We need to think very specifically with how to tailor these certifications to the needs of the California acceptance tests and together with that we need outreach to the building departments.

So I'll conclude my comments with that.

COMMISSIONER DOUGLAS: I have a question for you, Mark. One of our questions is actually – has to do with should existing certification programs – should the Commission require certifications that pass our, you know, criteria to actually train specifically to the acceptance test?

MR. HYDEMAN: I think they should.

COMMISSIONER DOUGLAS: Okay.

MR. HYDEMAN: I think you really need to because, again, if you look at what all the commissioning activities are. If you read Guideline 0, Guideline 1. If you read, you know, any of the commissioning manuals that are out there. There's a lot of stuff that we don't include. We are focused on functional tests and calibration checks on key sensors. And that was done on purpose, you know, that was done because we were looking for those few areas where we could really focus in on and get a lot of bang for the buck. Because if we asked everybody to do all the commissioning it wouldn't get done.

MS. BROOK: Right. Thank you.

MR. HYDEMAN: That was a consensus.

COMMISSIONER DOUGLAS: And let me ask a couple of questions as well. I heard you say pretty clearly that your comments are on the HVAC mechanical side of this not the lighting side.

MR. HYDEMAN: Yes.

COMMISSIONER DOUGLAS: Is it your view that, you know, that possibly none of the certifications that we're looking at, whether it's TABB, AABC, NEBB, are appropriately focused right now on the California

acceptance test? I mean I'm trying to understand. Are you — do you think those three are under inclusive of the pool of qualified people or do you think we're better served with something different?

MR. HYDEMAN: Well, there are two issues here. One is that I didn't have the opportunity between when I learned about these proposals and being here today, so less than two weeks, to research what the intention was as Erik mentioned. But I did, in fact, read the papers that came along with it. There was a statement from Christine Kehoe and another one from Assemblyman Fuentes. And both of those clearly read not just certification by NEBB, AABC or TABB. It said TAB technicians who are certified to those things. So it was looking at a very limited pool as stated. Okay. So I assume that what was written by the State Senator and State Assemblyperson was language that was proposed directly to them. I don't have the paper trail so I can't tell you but if you were to use those words it would exclude commissioning agents, design professionals, operators of buildings. I mean there's a much wider pool of people that should be included and able to do these tests because there are people within all those other disciplines that are qualified to do this testing. So whatever we certify needs to be broad enough to include the big house because, again, when you look at

all of the professions in the building science of those maybe 10 percent or less are qualified to do these tests so we're getting subpool of a subpool.

COMMISSIONER DOUGLAS: You mentioned a UC Berkeley HVAC certification. What was that certification?

MR. HYDEMAN: It basically is a certification program for HVAC and control system design.

COMMISSIONER DOUGLAS: So it's a design —

MR. HYDEMAN: It is at the design level. We have not — we have elements in those classes on commissioning but it's not a commissioning certification.

COMMISSIONER DOUGLAS: Okay. All right. Well, you know, I'm definitely interested in your thoughts on whether there are other certifications that make sense for us to consider in addition to the ones that we're considering, whether, you know — and we'll be asking questions of the certification as we go forward. So how much of a hurdle would there be for a professional engineer who is imminently qualified in this field to obtain a certification? Is it a matter of showing your experience and, you know, education in this area? Or is it much more than that? So we'll ask those questions and we'll look forward to your written comments and your participation.

MR. HYDEMAN: And, as I said, I'd be happy to

work with any of these agencies. I mean, ASHRAE has got certifications. The TAB agencies have certifications. But to help them look at the subset of activities so that we can have a specific California type of certification.

The other thing is that we should make sure that it is something that is open to a wide variety of disciplines but also that it not too expensive.

COMMISSIONER DOUGLAS: Right.

MR. HYDEMAN: Because if there's a burden in terms of cost, then again, you may be excluding part of a poll.

COMMISSIONER DOUGLAS: Let me just ask one more question. I inferred from your comments that you're in agreement, essentially, on the problem statement. That, you know, we do have a problem of installation being suboptimal in HVAC systems and it's really kind of a matter of trying to understand what the right solution or set of solutions is?

MR. HYDEMAN: I agree with that.

COMMISSIONER DOUGLAS: Okay. All right. Thank you.

MR. HYDEMAN: And that's the whole reason the commissioning field came up.

COMMISSIONER DOUGLAS: Right.

MR. HYDEMAN: Is that hopefully, you know, in

the future people will actually design buildings and test them on their own but it's not happening.

COMMISSIONER DOUGLAS: Right. Well, thank you very much for being here.

MR. HYDEMAN: Thank you.

COMMISSIONER DOUGLAS: How about Thomas Enslow?

MR. ENSLOW: Good afternoon. My name is Tom Enslow. I'm with the law firms Adams, Broadwell Joseph & Cardozo. I'm actually speaking today on behalf of two different clients, I gave you two cards but I'll just speak on behalf of both of them now if that works for you.

COMMISSIONER DOUGLAS: Yeah. Please do.

MR. ENSLOW: First of all I'm here today on behalf of IAPMO which is the publisher of the Uniform Plumbing Code and Uniform Mechanical Code which are the model codes that serve as the basis for the California Mechanical Code and Plumbing Codes.

IAPMO has long recognized that quality control of installations is critical to ensuring that HVAC systems function as intended under the code. Study after study has shown that in some cases 85-90 percent of HVAC installations do not meet that building code specifications after installation. And, for that reason, IAPMO supports requiring acceptance testing to obtain acceptance testing certification from accredited agencies.

And it's certification that's specific to testing, adjusting and balancing training such as that offered by AABC, TABB or NEBB or some equivalent of that.

These certifications ensure that quality HVAC installations actually meet the intent under the code. The key, and as mentioned by Mark Hydeman, is not just in the training to the test but also understanding the balancing, the adjusting, understanding the system controls and being able to modify those and understanding how the whole system works. That is what is key for any certification that would work.

For this reason, IAPMO supports the adoption of such requirements to ensure compliance with their codes and they encourage California Energy Commission to adapt such requirements.

I'm also speaking on behalf of the United Association of Plumbers and Pipe Fitters. They also strongly support the proposal to require certification of HVAC acceptance testers to TABB, NEBB or AABC and also support the electrical system acceptance testing certification via CALCTP.

Strictly on the HVAC side, they don't see this as a radical proposal. Currently commercial buildings are already required to balance their HVAC systems in accordance with TABB, AABC or NEBB procedures under the

mandatory provisions of CALGreen as part of Title 11, Title 24 in Section 5.410.4.3. In addition, OSHPD also requires hospitals and healthcare facilities to balance their systems in accordance with TABB, AABC or NEBB. And, in fact, in the past in the 2001 California Energy Code that required balancing of systems in accordance with AABC and NEBB standards.

So currently most contractors who currently install, test and balance HVAC systems in commercial buildings should already either have their TABB, AABC or NEBB certification or be familiar enough with these procedures and experienced enough with these procedures that certification should not be that difficult.

Furthermore, our clients feel that it wouldn't be fair to create a new certification that's watered down to take the place of these TABB, NEBB, AABC certifications. Right now you've got these good adopters who are early adopters of these additional certifications, ensuring that they're putting these installations in correctly and ensuring the quality control that's necessary and to create some new certification requirement really disincentives industry from creating their own, self policing, creating their own programs like this and so it really punishes early adopters by going in a completely different direction.

Thank you.

COMMISSIONER DOUGLAS: Thank you.

MR. SHIRAKH: Can I —

MS. BROOK: Hold on.

COMMISSIONER DOUGLAS: Oh, I'm sorry. A couple of questions for you.

MS. BROOK: Just a couple of questions for you.

MR. SHIRAKH: I don't know if you're the right person to answer this but I'm going to put it out there sometime today. Hydeman mentioned that doing acceptance testing requires intimate knowledge of the control systems, the energy management control system, you simulate a certain condition, control system will respond, you monitor the response. My concern is the certification programs with actually getting into that level of detail when it comes to control systems and the algorithms if there's someone here that I can see —

MR. ENSLOW: That would be something that TABB, AABC and NEBB should address. Although that is my understanding that that is exactly what they teach their technicians is — because they're not just teaching testing they're teaching balancing and adjusting and in order to do that you need to know how these systems work. But they'd be more qualified to answer that.

MR. SHIRAKH: Okay.

MS. BROOK: I just wanted to clarify that California also — because California Mechanical Code is by and large the Uniform Mechanical Code. It also has requirements for tests and balancing.

We don't think our acceptance tests are tests and balance tests. We think that they're control system tests and clearly different than tests and balance requirements. And we're glad that they're in the Mechanical Code. That's really not what we're talking about here.

MR. ENSLOW: Right. My understanding is that they're — that it's all kind of a subset. A different side of the coin but again I think that TABB and NEBB and AABC can address why their certifications kind of encompass but you guys have to ask them.

MS. BROOK: Okay. Thank you.

COMMISSIONER DOUGLAS: All right. Thank you. Let's see here. How about Cesar Diaz, Legislative Director of the State Building Trades Council?

MR. DIAZ: Thank you, Commissioner Douglas. Cesar Diaz with the State Building and Construction Trades Council.

We are very supportive of the acceptance testing and certification proposals that are in front of you. Of course we understand that the improper installation

nullifies much of the investment that California is putting into energy efficiency.

Acceptance testing requirements augments standards for performance and basically maximizes the energy savings and reduces the costs, both to CALCTP and the proposals by the sheet metal workers can accomplish that. These programs and training programs are widespread throughout California and there are points in the investment that goes into training individuals that go through these programs goes into the millions. In fact jointly, if you look at statewide, apprenticeship system is over $100 million in investment to help get the next generation of construction workers trained in the new codes and so forth. So these programs are readily adapting to these things that can be readily accessible to actually address some of the concerns that were raised by staff here.

And I just wanted to point out that the UC Berkeley study pointed out a couple of different sections here that were relevant. It's the poor quality installation of energy efficient equipment that is undermining the achievement of energy efficiency goals and is directly linked to low wage labor markets which do not reward workers or businesses for investments in training.

Furthermore the study states that "California

has over 1,000 training programs in these occupations but the lack of widespread industry recognized certifications leads to confusion and lack of coordination in the workforce system."

So as far as preparing the training, what's out there and actually preparing the training curriculum towards that. They also recommend that full enforcement of codes with strong quality standards for contractors and setting high quality certification standards for installers and workers.

So we believe strongly that these proposals here achieve those goals and address those recommendations. Thank you.

COMMISSIONER DOUGLAS: Thank you. Dan Magyar. Magyar Electric.

MR. MAGYAR: Thank you. It's Magyar, actually.

COMMISSIONER DOUGLAS: Oh. Sorry about that. Thank you.

MR. MAGYAR: Dear Commissioners and interested public. I have — my name is Dan Magyar, owner of Magyar Electric. I've been in business as an electrical contractor for 8 years. I'm also currently 41 years in the electrical trade.

I wanted to support the value of the CALCTP proficiency. I'm currently an advanced lighting control

certified contractor. During my 40 some years in the electrical trade I've encountered very many different lighting control schemes. Of those many, these new advanced lighting controls are certainly the most sophisticated systems out there.

With the Commission adopting the proposed utilization of only certified CALCTP advanced lighting control individuals I feel confident that indeed these savings projected by the advanced lighting controls can be achieved.

Thank you very much for your time.

COMMISSIONER DOUGLAS: Thank you. Thanks for being here.

Let's see. Brian Jacoway, Valley Pacific Electric.

MR. JACOWAY: Madam Commissioner, afternoon. Ladies and gentlemen. I too would like to reiterate what Mr. Magyar said about the CALCTP Program. I'm currently five years in business as an electrical contractor here in California.

My experience in the trade goes just shy of 20 years. In my experience I've seen a lot of these installations of so-called advanced lighting controls not go so well because there hasn't been proper installation and there hasn't been proper acceptance of the installed

system.

Having gone through and been certified as an installing contractor I feel confident that anybody working has a certified technician could install the system properly. I also think that as far as a contractor is concerned the assurance of a properly installed system will mitigate his liability later on down the road when it is found out that the system was not properly installed.

So, therefore, I would like to speak in favor of recommendations.

COMMISSIONER DOUGLAS: Thank you. Thanks for being here.

MR. JACOWAY: Thank you.

COMMISSIONER DOUGLAS: Tom Meredith, IBEW Local 340.

MR. MEREDITH: Thank you, Commissioner. My name is Tom Meredith. I'm the President of IBEW Local 340, Sacramento, California. We represent 1,500 certified electricians in Northern California and I'm here to speak in favor of the CALCTP certification and also the making sure that you're having the same kind of qualifications to do the commissioning.

Again, you can have the best product in the world but if it's not installed and maintained properly you're not getting your money's worth out of it. And

we're seeking to see that California get their best bang for their buck.

Thank you very much.

COMMISSIONER DOUGLAS: Thank you.

Ron Mitchell, Bay Area SMACNA.

MR. MITCHELL: Afternoon. Ron Mitchell with Bay Area SMACNA.

So I'm speaking to a regulation providing the Title 24 acceptance, testing forms for commercial HVAC buildings be signed off by AABC, NEBB and TABB certified technicians.

Bay Area SMACNA objects to this restrictive policy because there are a number of other very qualified parties that should also be authorized by the regulation to sign off on these forms. Degreed engineers, professional engineers, project managers, commissioning agents and owners of mechanical contracting firms are all imminently qualified and should be included as the signees on these acceptance forms.

COMMISSIONER DOUGLAS: Thank you. I just have one question, maybe. I think one of the issues that we're trying to grapple with here is that there probably are people coming in from a number of different perspectives that could be qualified to sign off on the acceptance forms but it would also be really beneficial if we could

identify a way of reducing the rate of improper installations by, you know, in short – I guess I'm asking when you talk about the different areas that people could come from, whether they're professional engineers or the commissioning background or so on, are you aware of certifications that we may want to look at? Or other ways to try and address the concern?

MR. MITCHELL: Well, other than their experiences as professional engineers and their experience, we're definitely in favor of education – and at this time I can't speak to anything about another certification.

COMMISSIONER DOUGLAS: All right. Well, thank you. I really appreciate you being here. I think Mazi has a question for you.

MR. SHIRAKH: So we heard for a professional engineer that's been practicing the only requirement is that they actually take the test that's less than a day. Do you think that's an unreasonable burden on an engineer to go through that process?

MR. MITCHELL: I'm sorry. I didn't understand what –

MR. SHIRAKH: Well, we heard that, from earlier testimony, if there a professional engineer who is out there performing his duties under this proposal all they

have to do is basically take a test to become certified. And this is a test that takes less than a day to complete. My question is is that an unreasonable requirement?

MR. MITCHELL: I think that for some firms that would be unreasonable. I can't speak to all the contractors that I represent but there would be, I'm sure, instances where it wouldn't be reasonable.

COMMISSIONER DOUGLAS: All right. Well, we appreciate you being here. Thank you.

Let's see. I'm just hesitating because sometimes I have trouble reading a name so sometimes I have to stare at it for a minute. Mark Paavola, Administrator, Northern California Valley, SMWTC. Did I get that – was I in the ballpark?

MR. PAAVOLA: You had some of the letters correct, yes.

[LAUGHTER.]

COMMISSIONER DOUGLAS: I'm glad to hear that.

MR. PAAVOLA: My name is Mark Paavola. I'm the Administrator for the Sheet Metal Workers Training Center here in Sacramento. Appreciate you taking the time out to listen to this.

I and my organization, we firmly believe that there should be some sort of certification and we believe that this is the correct matter to do that.

My background has been — I was a field service technician for 30-some odd years doing exactly what you're talking about. Where I worked, I've done a lot of the testing as it were, the start up as it were to the equipment to make it work as it was supposed to. And, ultimately, we know that throughout the course of history that it's very rare that it works as advertised and we run into that quite a bit.

Well, you're asking the question about whether a professional engineer or who else could do the testing. There needs to be some measure that you use to determine whether they're qualified or not. Do they have the field experience necessary? They may have the book experience necessary but do they have the field experience necessary?

We're discussing now using some of the various testing organizations – TABB, NEBB and AABC – as being qualified to do that. They have the training; they have the field experience necessary to do this type of work. In our training center our TAB technicians not only train on the TAB side but they also train the service side. So that encompasses all the areas that you need to know to be able to perform these start up and verification routines as needed. All of our TAB technicians give the education that they need.

I would like to address some of the questions

you've asked on your thing here, on your list here. For example, on 3 you want to know training and certification requirements for acceptance testing to help address the concerns.

We know that there's lack of enforcement right now. We've had classes at our training center with the building inspectors to try and get them up to speed on Title 24. They don't have the manpower to do that so they file the paperwork. They have no idea what the paperwork says. If we bring in some third-party organization that gives a level that that person is not only responsible to the company they're working for but they're responsible to that third-party organization to make sure that you fill out those reports correctly. They're not just doing it in the office. So that you have a third-party now that's watching out now for that individual that's doing that test. We know that the building department inspectors are overloaded right now so they can't do that type of work. So you get a lot of value from having that third-party organization overseeing these people who are doing the testing at that point.

I can't comment on a lot of these things because they're in regard to lighting and so forth and there's other people who can cover some of these other areas.

Number 8, for example, they want to know that –

how are they uniquely qualified for type of thing? Well, again, the training that they receive. Everybody talks about a TAB technician. They think they're just walking around with an airflow hood measuring things. That's not true because there was a question about the controls, having intimate knowledge of the controls. There's nobody that knows every control that they walk into because there's 20-30-40 different manufacturers of controls. But they are qualified to know how to use that control in the sense that they need to be able to start that equipment up. That's what the TAB technician has to know. Knowing that they can then start up that equipment. They can check the performance of that equipment. That's what we're discussing right now. They have the training and the education. Are they complete? They're the most complete out there. Let's put it that way. What you're dealing with right now.

You're alluding to how do we verify that the professional engineers and some of the superintendents, how do we qualify them? That's a tough one to do. That's where the certification comes into play. Where you have the certification. That they have to have that piece of paper that shows that they've at least got this qualification. Because how do you superintendent? You say all superintendents can do the testing. How do you

know that superintendent is qualified?

Those are issues that you're going to encounter. Specifically on 9, again, you're talking about if they're not certified how do you know that they have the skillset? What does it take to be an HVAC contractor in the State of California? Passing the contractor's exam. Does that qualify them do to this type of testing? Absolutely not. I received a contractor's license when I was about 30 years old. Could I have done this work? Absolutely not. I passed the test. That didn't qualify me to do this type of work.

Again, licensing a mechanical engineer. They designed the equipment. Do they have the field experience necessary to be able to go out and turn on that piece of equipment? Maybe. Maybe not. How do we verify that? That would be through this testing whether it's AABC, TABB or NEBB type of organization.

This is how we — we get the start in this because we know there's been a tremendous history in the State of California. That was mentioned earlier, about the economizers not working. Why don't we fix this? Let's start with a program that we start to fix this and build from there? We're not going to fix this issue in one meeting or one organization but let's start with a base that actually works and then we can build from there.

We can't get the whole state, make the whole state happy. That's not going to happen but if we start with one area, make it work, show that it works correctly and show that we can actually prove that it improved, that we got the efficiency that we got out of it, then we can build from there.

If we start small with what we're proposing today I think would be a benefit for everybody. I could go on and on but I don't want to take up your guys' time.

COMMISSIONER DOUGLAS: Well, thank you. I don't have any questions but —

MS. BROOK: I have a question.

MR. PAAVOLA: Yes.

MS. BROOK: Two things. One, do you know if the current TABB certifications actually train on our Title 24 Acceptance Test and the second question is do you think that they ought to?

MR. PAAVOLA: In our training center we do. I can't speak to all the training centers but in our training center we do. And I believe most of them do cover that. I know that in our training center we cover that with both our service and TAB testing. Our TAB training. Both of them cover Title 24.

MS. BROOK: So it's part of the certification.

MR. PAAVOLA: It's not part of the

certification. It's part of the training.

MS. BROOK: Okay.

MR. PAAVOLA: But as far as the certification there's other individuals here that can speak quite deeper into the certification question.

MS. BROOK: Okay. So actually I think that's a really important clarification and I think we need to understand that. That you're talking about training your professional groups —

MR. PAAVOLA: Right.

MS. BROOK: To specifically perform our — and that's what we want. I mean and I think that's what Mark was talking about —

MR. PAAVOLA: Absolutely.

MS. BROOK: Whether you're an engineer or a commissioning provider or a TAB technician, we want you to be trained on our test. How do we make that happen?

MR. PAAVOLA: Correct.

MS. BROOK: I think that —

MR. PAAVOLA: I would agree.

COMMISSIONER DOUGLAS: Actually, Martha, you — I think at this point it would be helpful — I'll call up the different certification agencies and we can ask some questions directly of them. I was going to do that at the beginning and then I thought well maybe I'll do that later

but I think now's the time. Anyway, thank you for your comments.

MR. PAAVOLA: You're welcome.

COMMISSIONER DOUGLAS: Let me ask Tom Meyer with NEBB, if you're here, and obviously if any of these people stepped out of the room we'll catch them later. But maybe you can help us and give us some background in the NEBB certification, the extent to which it teaches to Title 24, who tends to come into it, that sort of thing.

MR. MEYER: Okay. I'm Tom Meyer. I am the brand new, this is my first working day, and I'm serious, as the Technical Director. But it's not my first day in this industry and because I'm the new fish I should probably explain my credentials so you know where I'm coming from.

I'm the Secretary and in-coming Vice Chair of the Consultative Council under the National Institute of Building Sciences, also known as NIBS, who will provide reports and technical support to Capitol Hill and the White House. I am the Vice Chair of Guideline 0 which is the commissioning process for ASHRAE. I sit on ASHRAE 90.2. I have for three years. That is the residential building standard. My colleague was on 90.1 which is commercial. And that's significant. We'll get to that in a second.

I was six years as the ASHRAE liaison to USGVC so I kind of have the technical and lead mix and experience in that. I'm the Chair of Standard 134 and TC7.4, currently. I co-wrote the building code for Kuwait which was accepted into law in 2011. I co-wrote an 800 contact residential energy audit reports for the Department of the Interior. I wrote the sustainability policy for the Turkish Government. I'm on an ASHRAE panel writing the Best Practices for Commercial Buildings which includes energy auditing and testing. So, Level 1 and Level 2 and Level 3. I was on a panel put together by NREL for KSAs for commercial energy auditors. I am the current chair of the Educational sub-committee for WHPA. So that sort of lets you know that my backgrounds in this general direction even though this is my first day.

So, if I have to refer some questions to the experts over here — there's a fellow, a young fellow, with a laptop that's got a lot of the answers. He's, you know, the old story is — is that my brother and I know everything. Well, meet my brother.

NEBB is for this proposal because it makes sense. Why certify? And there's been some very good discussion over who's qualified, who isn't qualified, what's the track record been up to this point?

Madam Commissioner, I think what we're looking

for is the end result. We don't care how we get there we just want to get there and that's efficient buildings that run correctly and how do we get there? Well, that's what the question we're trying to answer is is maybe having people that do the testing would be useful. The question is why certify? It's not your knowledge. It's the consistency of the process. Okay. You can have experience skill and education but that doesn't guarantee consistent and desired results. People who learn, followed the son, the older guy, the younger guy, sometimes they form bad habits. Okay. Also, traditionalism isn't always the best way because anybody in our business knows you go to sleep one night and the next night everything's changed because we're moving at the speed of green right now, and it's 90 miles an hour with your hair on fire.

The next thing is that certification leads to accountability. NEBB has two different types of testing. We test and certify professionals and we test and certify technicians. So we make a distinction between them. The other point I want to make before I start answering specific questions is my credentials are both in commercial and residential. I said this would lead up to something. Both commercial and residential systems. Buildings are systems. We have to think of them in terms

of systems not just buildings. They're not components. They work together as a system. We have to have system specialists. Residential systems and commercial systems are completely different. ASHRAE recognizes that when they distinguish between 90.1 that my colleague sits on which is commercial buildings, 90.2 which I sit on which is residential. We recognize the complete disparity between skillsets and design technique. Now, there's some residences that we call mini-palaces that qualify as commercial buildings but those are the exception. Just as the fellow from Taylor Engineering has great credentials but he's an exception. We're talking about the bulk that's out there. How do we control the bulk? Not the exceptions.

And I believe that putting unqualified or underqualified people puts them in a horrible position. If they have minimalist training and they run into a system that they don't understand or they run into reports or findings that they don't understand they're in a horrible position. They either have to sign the building off and hope nobody catches them or they have to go to their boss and say we're not going to get paid. Or go to the building owner and say this building is not acceptable. Nobody wants to — in our industry we believe in killing the messenger. Trust me.

So if they “pencil whip it” we’re defeating the whole purpose that we’re here. So we need to have qualified people. We need to have the engineers and the technicians and everybody else prove that they understand the process and anybody that’s in the room that’s Lead AP qualified understands that the LEAD AP doesn’t mean that you know how to design green buildings. It means that you understand the process of designing green buildings. And that’s what I want us to focus on. Is we’re looking at the process to get to the end result which is a properly built and maintained building. I’m sorry, I didn’t mean to get off on my soapbox but I’m passionate about this as everybody else in the room is.

There were some questions that you had, ma’am. Specifically.

MS. BROOK: Well, we were interested to understand if your NEBB certification actually trains people on how to perform the Title 24 acceptance test?

MR. MEYER: Okay. NEBB is broken into 25 chapters and of course the California chapters would be the ones to adapt local conditions because every geographical area has its own needs and practices, okay. Now our standardized national test is not geographically oriented. Can we come up with one that would meet the Title 24 requirements and put for California use? Like we

used to see when we were kids on the cars, you know, stamped on the engine. Ford sale in California. Sure. We can do that. That's not a problem because you have certain needs. But I want to caution you that although California has Title 24 California has some very interesting geographic and climatic issues that doesn't really lend itself to, you know, simple answers. For example, microclimates. I teach a lot and microclimates — I use LA as an example and I'm not sure that we can really come up with a cookie cutter that can be perfect even if we address Title 24. Did that answer your question, ma'am?

COMMISSIONER DOUGLAS: I had a couple of questions —

MR. MEYER: Yes, ma'am.

COMMISSIONER DOUGLAS: For you or your brother with the laptop.

[LAUGHTER.]

MR. MEYER: Oh, by the way it's Chris that's over there with the laptop.

COMMISSIONER DOUGLAS: Hi Chris. Can you tell me who is eligible to get a certification from NEBB?

MR. RUCH: [Indiscernible]

COMMISSIONER DOUGLAS: If you could come to the microphone. To get a certification that would allow

somebody to do an acceptance test.

MR. RUCH: Thanks. Chris Ruch. I'm the Operations Manager with Final Air Balance.

I had been working on a matrix that shows all three organizations on the same page and going to each organization and talking to them. Pretty much specifically for this so that way after hearing the different organizations if you wanted to kind of hear them all at once and what the numbers are I could give them to you. So did you want to know specifically for NEBB the technician?

COMMISSIONER DOUGLAS: Yeah. That'd be great.

MR. RUCH: Okay. So for NEBB for the technician you have a couple of different options. You have 4 years of TAB fieldwork or 2 years of TAB fieldwork and a completion of a NEBB home study TAB technician course or completion of an equivalent TAB technician program.

For the supervisor you would be looking at an engineering degree and 2 years of supervisory experience in TAB or an associate degree in engineering technology and 4 years of supervisory experience in TAB or 4 years of experience in TAB and 4 years as supervisory.

COMMISSIONER DOUGLAS: When you say experience in TAB do you mean experience as a TAB-certified contractor or do you mean –

MR. RUCH: For me you'd really have to ask that directly to the agencies —

COMMISSIONER DOUGLAS: I'll ask that.

MR. RUCH: But from my own experience of working with engineering firms that I've worked for as an in-house balancer they were looking at it as 4 years directly working with the TAB technicians.

COMMISSIONER DOUGLAS: Okay. All right. Can you tell me how many times, just going back to NEBB, trainings are offered? I heard something about online but what locations, how hard or easy it is to get certified?

MR. RUCH: Yeah. I can speak directly to that. For NEBB specifically a test can be scheduled at any time. It is an online test so usually for my guys I send them to one office in the Bay Area. They'll go down there and sit with a proctor and take the test.

COMMISSIONER DOUGLAS: What does it cost to take a test?

MR. RUCH: Sure. For the NEBB test it has a $250 testing fee and then it should also be mentioned that there is an ongoing requirement which is important. It's $25 a year plus the chapter fee.

COMMISSIONER DOUGLAS: Okay. $25 a year is pretty reasonable. Is the chapter fee in that range of is the chapter fee —

MR. RUCH: I believe the chapter fee is more substantial so the chapter fee — you'd have to ask for specifics on that.

COMMISSIONER DOUGLAS: All right. How many NEBB trained people are there in California?

MR. RUCH: Sure. For number of certified technicians — do you want me to read them all out for all three certifications right here for these numbers? If that would be easier.

COMMISSIONER DOUGLAS: That would be great. That'd be easier.

MR. RUCH: Okay. For TABB, your TABB, you're looking at 705. For NEBB, you're looking at 80. And for AABC, 74.

And if we go to the Supervisor. For TABB, you're looking at 186. For NEBB, 84. And 24, TBE. I apologize for the blanket use of Supervisor. Each one has their own name for Supervisor.

And then as contractors. Number of certified contractors for TABB in California, 34. NEBB, 38. And AABC would be 11 companies but keep in mind that's also 15 offices. So.

COMMISSIONER DOUGLAS: Okay. So I guess I'd be interested in knowing that if I'm in Redding trying to build a building and, you know, can I find someone in the

Yellow Pages. Do I have to fly somebody in from the Bay Area? And can you give us a sense of how many locations in California would have access to people with these certifications?

MR. RUCH: I can speak to my own company —

COMMISSIONER DOUGLAS: Okay.

MR. RUCH: That I work for. We service anywhere in California. We just did a job at Sutter Coast, which is a 7 hour drive, Sutter Coast Hospital. Redding. Any remote area of California we go to frequently.

COMMISSIONER DOUGLAS: All right. I think those are my questions.

MR. MEYER: To just make it a little bit clearer the nature of the beast with this type of work is it's not unusual to have somebody come in from a fairly long commute.

Now I do need to make one point about NEBB specifically is that their pilot programs for online certification, online training, online continuing education and I'm the reason — that's the reason they hired me is that we're changing that and make that more available, more immediate and cheaper. And that actually is not a result of that hearing. It's because we know that's what's necessary in this industry. Do you have any questions, sir? No? Good.

COMMISSIONER DOUGLAS: Just one more question I guess. So somebody walks in with very good qualifications, say for the supervisor certification, what's involved for them to get certified? Just start to finish. Let's say they pick up the phone and, you know —

MR. MEYER: Okay. They have the experience and it's discoverable experience, then it would basically be the certification exam. See, as Chris pointed out it's a mixture of education down to experience. And as the education — we're looking for an optimum mix of the two. Okay. And the only way that we can — we have to prove the experience. We have to prove the basic education and then they have to prove that they understand the process and a certain technique in the process.

COMMISSIONER DOUGLAS: Go ahead.

MR. SHIRAKH: We've been focusing on engineers but what if there's a commissioning agent who's not a registered engineer but who has been doing this for the past 10 years or so. So what's the process for them to become —

MR. MEYER: The same.

MR. SHIRAKH: And same would be?

MR. MEYER: They would have to demonstrate their experience, any education. This would have to be discoverable and then they would have to sit for the exam.

MS. BROOK: But I heard that some of the requirements were actually connected to working under the TABB group and a commissioning agent wouldn't have the experience –

MR. MEYER: I believe that was a specific – wasn't that specifically for TABB, Chris?

MR. RUCH: [Indiscernible]

MR. MEYER: Right.

COMMISSIONER DOUGLAS: Okay. That needed to be on the record. For the record what was said is that's an option. There's three options for NEBB.

MR. MEYER: Yes. There's three options – there's three in-take options. It might make things easier, ma'am, if I ask Chris to email this to the Committee that can become part of the record and it'll also be easier for you to see it.

COMMISSIONER DOUGLAS: Sure.

MR. MEYER: I apologize. I had great intentions. I have it on a memory stick but that doesn't do us any good.

COMMISSIONER DOUGLAS: All right. Well, thank you. I guess I have maybe one more question –

MR. MEYER: Yes, ma'am.

COMMISSIONER DOUGLAS: And I see somebody else may be offering clarification on this. You know. Can you

help me understand, and I'll ask TABB and AABC this as well, but kind of how NEBB is different than TABB and AABC or not different as the case may be? Or am I really just treading in areas where I don't want to know?

[LAUGHTER.]

MR. MEYER: I think you may be better off asking Coke and Pepsi and Dr. Pepper —

COMMISSIONER DOUGLAS: All right. All right.

[LAUGHTER.]

COMMISSIONER DOUGLAS: So it is substantially the same service. It's just a matter of which one tastes better to you. Is that it? Okay. Thank you.

MR. MEYER: Put overly simplification, yes ma'am.

COMMISSIONER DOUGLAS: All right. Thanks. Go ahead.

MR. SHIRAKH: So just following through with what the Commissioner said, are the certification requirements essentially the same across the three or — and if there's a substantial difference we need to understand that.

MR. DE LEON: My name's Art De Leon. I'm the President of Final Air Balance Company and I am a NEBB certified company and Supervisor.

There's — in the scope of — I'm also certified

in TABB. So I'm NEBB certified and I'm TABB certified. My apprenticeship and my first 12 years before I started my company I was with an AABC firm. They're all the same in academics. What's different is they just have slightly different rules and with the AABC you have to be completely independent, you can't be associated with mechanical, manufacturer and what have you. With NEBB you — NEBB and TABB are the same where you can be a contractor and have a certification with the company as long as you have a supervisor and a technician. That's the core, really, on —

MR. SHIRAKH: So some of the details are different but the general requirements for education, experience and testing is essentially the same?

MR. DE LEON: They're really the same. Yeah. I could go take a test on each one of them and it would be identical. It's the same material, really. Practical and knowledge.

COMMISSIONER DOUGLAS: All right. That's really helpful. Thank you.

MR. DE LEON: You're welcome.

COMMISSIONER DOUGLAS: While you're here, if you want to make your public comment now you're welcome to since you're here.

MR. DE LEON: Okay. Thank you.

My public comment would be you're going to hear a lot of technical. The technicality of the TAB and the performance testing and documentation but I also wanted to hit on a point where, as an owner, I've been in this industry for 23 years, been an owner for 11 years up here. I started my career down in the LA area, moved up here in 2000, started my company and — so I've worked from San Diego to Yreka. I just did a job up there at Sutter Coast. I've worked at — I've done thousands of jobs. And one thing as an owner — we have insurance and the insurance really — we don't have a product that we sell. We just have a service. And our insurance, why do we have to have $1 million insurance, $2 million aggregate, minimum, on jobs. And it's not because of our product we're insuring. It's our men and how we do things out in the field.

I look at the training because I also went through the HERS training, by the way. I did all three of those. The training for my NEBB and my TABB was 8 years of experience and studying for a year solid, weekends, everything, to get my NEBB and TABB. With my HERS Rating I went in for three consecutive — I did the residential. The three of them and it took me 6 days to get those.

What I look at, as an owner, and like I was saying with the insurance — I'm getting nervous here —

it’s real simple to look at a book and like Mark was saying from Hydeman. It’s very difficult to this day when I send guys out on jobs when you look at a book and it tells you how to test the system. But when you actually go out to the job it’s very complex. And to this day when I send my guys out to the job who are certified, within my company I have 8 guys and I have over 75 years of experience with those 8 guys in testing, adjusting, balancing. It is still difficult — I’ll still get calls from guys with 28 years of experience, “Art, how do you want me to do this as a supervisor. I can do it this way, I can do it this way, I could do it this way but which way is going to be the most accurate that we’re going to be putting our name and our stamp on?” And we go into buildings where I’ve been working at Rockwell where they’re making the ships for the bombs and if you have to burp or belch in the room you have to go to the corner. The room is so clean.

Now I go to hospitals, they’re doing — am I taking too long?

Basically the point I’m trying to make is it’s not just about testing it’s experience that you’ve — that is accumulative since 1965 when the AABC started to right now, years and years of passing down an experience of jobs, when you go out to the job there’s a lot of dangers

that you can be effecting in the surrounding area. And not just the fan that we're testing. That's my biggest fear as a company owner and what my insurance is to cover is what am I going to do when my guys testing this fan but it could be affecting his area in the welding.

So it's —

MR. SHIRAKH: One quick question.

MR. DE LEON: Sure.

MR. SHIRAKH: You mentioned that you have certification from two of these organizations, NEBB and TABB, is there some advantage of having multiple certifications? Does that warrant some advantage?

MR. DE LEON: No. But some engineers on the specifications might say we want AABC only or we want NEBB only or we want TABB only or they want NEBB and AABC or they want NEBB and TABB. I'm doing the California Food and Ag Buildings. I do it every twice a year and their specs say NEBB and TABB. So that's the only reason. It's not specific. Believe me in knowledgebase they are all the same. You have to know the same amount.

COMMISSIONER DOUGLAS: That's really helpful. Thank you.

MR. DE LEON: You're welcome.

COMMISSIONER DOUGLAS: Thanks for coming up.

MR. BREHLER: If I could just add —

COMMISSIONER DOUGLAS: Oh, sorry.

MR. BREHLER: As a matter of housekeeping. Mr. Meyer, or anybody else in the room who hasn't submitted their written comments yet, the Public Notice has the instructions for submitting them to the docket. Thank you.

COMMISSIONER DOUGLAS: Thank you, Pippin.

All right. I'll ask for Gary Andis, the Director of TABB.

MR. ANDIS: Good afternoon. Give you a little bit of the history of what I've dealt with over the years. I've been in the business 39 years. Started back in the '70s. I was a factory rep out of Syracuse, New York in the late '80s, early '90s. Here in California in 1994 I came when Title 24 was kind of getting started. Our computers were operating on 9 megahertz for those of you who can remember those days. And in the Title 24 we were doing Title 24s for California. I have to give credit for one plan inspector in Morgan Hill, California. I despised it. Because he came right here in this room. Every time we had a CEC meeting he showed up. When we came down to do the Title 24, in residential if I put shade co efficiency in for drapes he would mark on it for the building inspector and when the building inspector got to the job I had to have drapes in the residential house for

him to sign off on.

That is the kind of inspectors that I would like to see throughout California. Those were special. But those definitely come around. And California has got some of those but unfortunately I don't think there's enough of them.

As far as TABB, I've got to say that I'm certified in TABB, have been for years. I also hold a certification from AEE, Associated Energy Engineers. The engineers firm knew that they had everyone educated to what needed to be done but they also knew that a lot of their engineers didn't have the hands on to execute the validation within the field. So AEE started a certification under TABB. Unfortunately, most engineers said, "All I want is the report. I don't want to have to go into the field and do it. I went to school I don't want to do that." So AEE has just dropped their CTAB certification so it no longer exists.

Our TABB certification is really unique within itself because when you ask me about the certification I'm going to be able to address it. When you ask me about the training I'm going to have to refer to the gentleman on my right because TABB is unique because its ISO 17024 which is an international standard and is policed by ANSI. So we can only do certification. We do not do training. We

create the job task analysis and we create the knowledgebase. Now the job task analysis and the knowledgebase is what you're going to see pretty much across the board with all three certifications. Then the training is based on those job task analysis and knowledgebase.

There was a question, "Do you train specifically to the forms of Title 24?" And I would have to say we do not across the nation. As it's already been proven here locally that training is done but that's done on a training process. I will tell you that our knowledgebase covers every aspect that it would take to fill out the forms on a technical aspect but to lay the form down it does not. In other words I can't tell you what Line 15 is but the technical knowledgebase is within every one of our knowledgebases that we produce.

TABB has actually a certification for the contractor. It has a certification for the supervisor and the technician. To be a contractor you must employ supervisors and technicians in order to be a certified contractor. So those give you kind of a unique set up. The supervisor has a criteria that they can be. It's one of four. They can have college degrees and have experience in the field or they can be certified within the tech part and they can come in and take the exam. Our

technician exam is primarily based on a written exam and a performance exam so they not only have to show that they have the education but they have the quality to perform everything with their hands. Some other certifications are NATE and — so I'm on the service side as well. So in saying that when you get into the technician certification you have to have the hands on. You have to understand in the NATE certification that I hold, and there's 6 or 7 of them, it's pretty simple. They'll tell you across the board, "Add up the air that's in the grills and that's what goes through the system." Commercial systems don't operate that way. You have diversity and sometimes it can be as much as 35-40 percent and that's way out there. You've got VAV systems. There's very few certifications that ask questions within built-up systems. Most of these built systems are either split systems or packaged units. You have the dry side or you have the wet side. These three certifications along with TABB are the only ones that bring the dry and the wet together for one certification.

We have prepared answers to all these questions. If you want me to I can read through them all but some of them's been covered. It's entirely up to you. If you'd like to ask questions I can answer them.

COMMISSIONER DOUGLAS: Thank you. If you've

prepared answers to all the questions, I really appreciate it. We'll look forward to getting them in writing. Martha, Mazi – do you have any questions.

MS. BROOK: [Indiscernible] Oh, sorry. We would like to see the responses to those questions. If you can provide them that will be very helpful.

MR. ANDIS: Okay. We will definitely clean these up. They went through counsel this morning and just got here and I've only got them on the iPad. I didn't even get them printed off.

MS. BROOK: We'll take the iPad. That works.

[LAUGHTER.]

MR. ANDIS: You're going to have to talk to this guy over here on that. But we can definitely clean them up and if there's any questions that anyone has on the certifications, be more than happy to answer any of them.

MR. SHIRAKH: [Indiscernible]

MR. ANDIS: We do.

COMMISSIONER DOUGLAS: All right. Well, appreciate you being here. Thank you very much. We'll look forward to getting the written answers to the questions.

And let me ask Jim Taylor from AABC to come up.

MR. TAYLOR: Hello. I actually came here just to represent the AABC and answer any questions you had

about the certification.

I'm not here to provide a presentation about why we think we should be here. I've been a TAB contractor since 1992 with the same company and then all of my work in Northern California so, by default, we've been filling in a lot of the MEC sheets since about 2005.

Really, you know, aside we've always been the most qualified left on the job to fill out the form. That's why we've done it and the reason I kind of go with experience is the basis of all of our technicians and the basic of AABC certification. Now Art had mentioned AABC and I think we had also talked about the size of AABC. We are the smallest. We are the oldest though. We were established in 1964 by mechanical engineers that were designing systems and weren't getting the performance out of them when all was said and done. So they came up with a set of standards and the AABC was born.

So in the bylaws they realized it took a lot of experience to understand the systems and put them together and get them operating at the end. So AABC, I can speak only mostly for the AABC, although we are by choice union contractors. We're not required by AABC to be union contractors. We choose that and most of my technicians that I manage get the benefit of getting TABB education. And the AABC provides — basically I manage the training

for our technicians as well as the field experience and AABC wants 8 years of experience and what they dictate as experience is either field experience or accredited engineering school. So if you're a four year accredited engineer you only need 4 years of experience to become a test and balance engineer. I went the long way. I had a business degree so I had 8 years of experience before I could apply and take the test and balance engineer test so very proud of that. I've earned that from the school of hard knocks in just doing very diverse application projects and I think that's a very representative sample of how the AABC functions.

So do you have any direct questions about the AABC and our certification?

COMMISSIONER DOUGLAS: Are you planning on submitting anything in writing responding to these questions or should we just ask some of them now?

MR. TAYLOR: Ask them now. I really just came here as a courtesy.

COMMISSIONER DOUGLAS: All right. All right. So let me just ask how — so how does somebody become certified under the AABC?

MR. TAYLOR: Okay. The current requirements are — is that you seek employment with an AABC company. Our membership is also that we have to be, since we're union

affiliated, we have to get them into the apprenticeship program. In our instance there's two levels. That's not required though. And there is the experience gained through four years of field experience working on diverse systems and working for a diverse group of engineers as well as the home study test and at the end of that process you get – it's an 8 hour test or a technician level certification. And that continues on 4 more years to get the test and balance engineer to be able to apply to take the test for test and balance engineers' certification.

COMMISSIONER DOUGLAS: Okay. Great. And what's the number and, if you can say location or rough location, of people who meet the certification requirements of AABC in California or nationwide?

MR. TAYLOR: Actually, the gentlemen – Chris –

COMMISSIONER DOUGLAS: Oh. You've got that –

MR. TAYLOR: He threw that data out there.

COMMISSIONER DOUGLAS: Oh. That's fine.

MR. TAYLOR: I believe he's accurate. There's 74 certified technicians.

COMMISSIONER DOUGLAS: Okay. Great.

MR. TAYLOR: So we're a very small agency.

COMMISSIONER DOUGLAS: Okay. Good. Mazi or Martha, any other questions?

MS. BROOK: When you provide training in

California do you train them on our acceptance test?

MR. TAYLOR: We do not. AABC is a national — actually international association and so it's very specific to the TAB contractors in California to take on that.

MS. BROOK: Okay.

MR. TAYLOR: And I've never actually, to be honest with you, most of our technicians that have the aptitude to do our trade are very good on picking up on those forms. They're very versed in the usage of that equipment. Since commissioning is such a hot topic in the industry now. Commissioning assistants as a TAB contractor as well as doing their own commissioning is very similar.

MS. BROOK: Okay.

MR. TAYLOR: So the MEC sheets are, in my opinion, a functional performance test.

MS. BROOK: All right. Thank you.

MR. SHIRAKH: And specifically you teach your students how to do test related to control systems?

MR. TAYLOR: Yes.

MR. SHIRAKH: Energy management systems?

MR. TAYLOR: Yes. To be successful as a TABB contractor we get a very diverse — we see all types of control sequences as well as software so we get a very

diverse – I don't know of anybody else in the industry that really sees that diverse of an application of HVAC systems. AABC, I think, the only thing I'd like to comment also is that we are independent and that we're not affiliated with any design engineers, installing contractors and so that was one of the cornerstones and that's one of the biggest differences between AABC and the other certifications in this room.

MR. SHIRAKH: Just following up –

MR. TAYLOR: Is that you cannot be an –

MR. SHIRAKH: Just following up on Martha's thing. Your organization is a national one. It's not focused on California.

MR. TAYLOR: Yes.

MR. SHIRAKH: Were you suggesting that we should incorporate California acceptance testing requirements in there somehow otherwise why – it's not clear what the benefit to us is if it's not focused on our acceptance testing.

MR. TAYLOR: I think the current TABB certifications are showing experience. And I think that's, from listening to everything that's been going on and the discussions that I've had with my peers. It really – I mean we get frustrated often with them as TABB contractors by commissioning agents that are just filling

in check sheets and don't have field experience on the diversity of a system. We have to not only educate them on our trade we have to show them TAB verification that the system is working correctly. Well, heck, we're doing all of the work then so I think the key that I see there is experience. Someway of documenting experience and not getting, as Art said, a HERS Rating in 6 days. We do duct testing and we've been doing duct testing on hundreds and hundreds of projects, in very high tech, in very sensitive areas. Usually that's what dictates duct testing.

COMMISSIONER DOUGLAS: All right. Thank you.

MR. TAYLOR: Is that it?

COMMISSIONER DOUGLAS: Yeah. That's it. Thanks for being here.

Let's go to Bernie Kotlier, the Co-Chair of California Advanced Lighting Controls Training Program.

UNKNOWN SPEAKER: [Indiscernible]

COMMISSIONER DOUGLAS: Absolutely.

Michael Siminovitch coming forward with CLTC.

MR. SIMINOVITCH: Thank you, Commissioner. Just a few words. I wanted to speak to this concept at a relatively high level.

In terms of lighting the kinds of things we're going to be seeing in the next 5 years are going to really add to the level of complexity in the design and operation

of our buildings at such a level it's going to require very significant level of training and understanding in order to have the kinds of technologies and kind of efficiency that we're really looking for.

So I break this into sort of three areas. One is what are the strategic objectives? What's the process? And what's the level of agreement? So I really think we should be pushing very hard on the educational elements on this and I think if there's fairly broad agreement from the industry in support of this.

We work with the contractors, the utilities to test and develop some very early types of training and educational processes that Bernie was very helpful on with the CALCTP with the controls training. It was adopted. It was very — we got tremendous input from the Energy Commission, from the utilities and, more importantly, I think we got very strong interest from the industry in order to get these new technologies and put them into place.

So I think you're going to find fairly broad agreement on this from the industry and from the contractors. I think the devil's going to be in the details here as far as what are the processes that can be brought to bear in order to achieve this. And what I think we're going to need is a certain level of uniformity

between all the different types of organizations that do offer training. I think all the organizations are very supportive of training but I think the central threadedness is going to be how do you get all of these organizations to agree on some level of commonality. I mean, if somebody's got a certain kind of training program, how acceptable is it to the Commission and how do those training programs compare to all the other kinds of training programs that you might have.

So I think the critical question here is not so much the agreement on the product. It is going to be on the agreement on the process in terms of how do we get all these organizations working together.

So I'm going to leave it at that. If you have specific questions?

MS. BROOK: So when you're suggesting a process step, are you suggesting that the Energy Commission develop a set of criteria that all approved certifications must meet or some just collaborative work amongst the industry to align training programs?

MR. SIMINOVITCH: Well, I think you're going to have to – I think there's going to have to be some kind of agreement. Some kind of commonality whether it's the Energy Commission or some other public entity that comes together and says, "Of the following 5 entities that are

offering training what minimum level of standard is acceptable to us that will make sure that the goals of your standards and programs are realized?" I mean I think that everybody agrees that the lighting controls is the right thing to do. It's going to be where the bulk of your savings is going to be achieved. If we don't have the people trained right we're not going to get it.

And I think you heard broadly from the industry that everybody is pretty much supportive but we need to get all these different organizations talking to each other so there's some level of agreement so, "Yes. Our training program has some minimal acceptance."

So I think you hit the nail on the head here. We need to either have you folks or some other entity say, "Yes. The following entities have the bare minimum that it takes to say, 'This person's okay to come in and do acceptance training.'" That's the concentrated point here. The rest of this, in my opinion, is noise. We really need to focus in on how do you get this process going because everybody is gung ho on the product. The product is a great idea. You desperately need to have this product. If you don't have it you're not going to get your savings that you've lined up for Title 24. You're just not going to get it.

In lighting and not HVAC, but lighting, most of

our savings is going to be coming from advanced controls. That's just the reality of it. So it's invest now in a product that unifies us as a group.

Either you guys do it or you ask somebody else to do it. One of the two. So I wanted to make sure that you addressed that question because it was a key question that you had.

COMMISSIONER DOUGLAS: What does it take to get the CLTC training? Is it a, you know, what does it cost, how long does it take?

MR. SIMINOVITCH: It's not CLTC training. We were one of the early – there was a group of folks. The utilities, the contractors, the contractor's association. We got together and said, "Look. We're not going to obtain California's goals here unless we start training people." So we were the little university at the table that was helping out on this process. By and large it's a body of information. It's distilled into a series of courses. Bernie can speak to the logistics of it. It's now offered broadly. There's now many people being trained.

But I think the concept here is that it's not the only program. I mean I think that CALCTP is wide open to have lots of other folks do the same or similar things. But what the essence is that we determined what the bare minimum of information that was needed there so that any

other organization that wants to go through the same process they need to do the same exercise just like the HVAC folks do but if somebody wants to offer lighting controls training, they need to do what we do. We said this is what you need to know, it's a moving target, these are daylighting controls, these are all the different technologies you need to really understand.

So I'll let Bernie talk to sort of the mechanics of this and there's lots of contractors being trained in this state. There's not a really big problem on throughput in terms of actually getting these people out there. I think it's just the cross-communication that needs leadership from you folks.

COMMISSIONER DOUGLAS: Okay. Thank you.

MR. SIMINOVITCH: Thank you.

COMMISSIONER DOUGLAS: I assume that since you're talking about a process you're not prepared to tell us what the bare minimum ought to be or —

MR. SIMINOVITCH: No.

COMMISSIONER DOUGLAS: Are you?

MR. SIMINOVITCH: Well we do. We know what the bare minimum is for lighting controls and I could spend the next three hours going through sort of a cross section of what our course might be. I'm sure you don't want that. But we have something that we can hand to you and

say, “This is the bare minimum that needs to be done in order to get a contractor up to speed to be able to do the very commissioning you need to see.” That’s, I don’t think, is a problem. I think the problem is then to get the 5-10 other organizations all to say, “Yes. Yes. Those are the 10 things we need to know.” So someone in a position of trust, you folks or whoever else you deem, needs to say, “Here’s the straw man that says this is the bare minimum of what we need.” And I think every other, you know, the HVAC guys need to do this but in lighting I can give you the 10 broad course elements. We already have it. The homework’s done. We just need to hand it to somebody.

COMMISSIONER DOUGLAS: All right. Good. Well, we’ll look forward to getting it. Thank you, Michael.

Bernie, do you have anything to add? If you do, this would be a good time.

MR. KOTLIER: Thank you, Madam Commissioner, for this opportunity to speak to you today and I’d also like to thank the California Energy Commission for its support of CALCTP, a long-term support and funding of this program.

I’m one of two co-chairs of CALCTP and I’d like to recognize the considerable contributions of my co-chair Mr. Doug Avery of Southern California Edison. He could

not be with us today but, as I said, his contributions have been significant and appreciated.

CALCTP is a non-profit lighting controls industrywide collaborative. Stakeholders include all three investor-owned utilities, the Sacramento Municipality Utility District, the California Community Colleges, 14 advanced lighting control manufacturers, the University of California, electrical contractors, electricians, the National Electrical Manufacturers Association (NEMA) and, of course, the California Energy Commission.

CALCTP was formed because utility representatives stated to stakeholders that many lighting control systems have not functioned to their specified efficiency or did not work at all. And those utility representatives identified poor installation, poor commissioning, poor maintenance as primary reasons for these deficiencies.

CALCTP was initially funded by a contribution of $450,000 from Southern California Edison with supplementary funding from the electrical industry as well as PG&E and SDG&E. Later, CALCTP received $5 million from the U.S. Department of Labor and more than $500,000 from the State of California. This funding has allowed CALCTP to develop curriculum, training and certification that is

comprehensive, effective and state of the art training that requires a 100 percent pass rate on the hands on lab portion of that training.

CALCTP is an open industrywide program. It is eligible to any and all state certified general electricians in California. It is offered across the state at community colleges and at electrical training centers. To date, 1,450 electricians have been trained and certified all around California.

At the current rate of training, by January 2014, the time when the 2013 update will be instituted there will be at least 3,000, and likely 3,500-4,000 CALCTP electricians in California. Some may question why CALCTP electricians are well suited to perform acceptance testing.

I firmly believe that the CALCTP electricians who install these advanced, sophisticated devices know them best. They know the system specs, performance, the requirements, the programming, the calibration and the maintenance of these systems.

The question of who or what other association or credentials should be included in acceptance testing for lighting controls is an important one. According to lighting industry experts, many professionals, often called specifiers, who include lighting designers,

engineers, architects, etc. are not up to speed and necessarily expert on the design or operation of advanced lighting control systems.

In fact, a group of lighting industry stakeholders is coming together from all over California and those stakeholders include the three investor-owned utilities and are convening a meeting next month to begin discussing a training and certification program for those specifiers.

One final point. When I've asked lighting industry professionals for other credentials that we could add now for acceptance testing that represent wide levels of expertise and competence in every meeting and every discussion, none have been offered.

While there are members of other certifications and other associations and other groups who are competent no industry professional has been able to say that any group has wide participation and high levels of competence to the degree that that group should be eligible for this acceptance testing. And I would submit with the exceptance of CALCTP and its broad and comprehensive training.

COMMISSIONER DOUGLAS: Thank you. Thanks for being here.

MS. BROOK: Yeah. Bernie. Can a commissioning

provider take your training?

MR. SIMINOVITCH: Excuse me?

MS. BROOK: Can a commissioning provider who isn't an electrician or an electrical contractor of any kind take the CALCTP training?

MR. SIMINOVITCH: A commissioning provider who is not an electrician, not a state-certified electrician, they could audit a class but they could not be certified.

MS. BROOK: Oh. Okay.

COMMISSIONER DOUGLAS: Anything else? It doesn't look like it. Okay. Thanks.

MR. SIMINOVITCH: But I would just add to that we understand acceptance testing can be different than commissioning, and isn't necessarily applied the same way.

MS. BROOK: Mm-hmm.

MR. SIMINOVITCH: Any other questions?

COMMISSIONER DOUGLAS: No, thank you.

All right. Let's see here. Ellen Avis, UC Berkeley something Unemployment in the Green Economy.

MS. AVIS: Hi. I'm Ellen Avis with the UC Berkeley Labor Center and the Donald Vial Center on Employment in the Green Economy.

I was one of the lead authors of the statewide workforce education and training needs assessment for energy efficiency, demand response and distributed

generation that was, as many of you know, commissioned by the Public Utilities Commission as part of the implementation of the Energy Efficiency Strategic Plan.

I just wanted to share some ways in which the findings of that need assessment show the importance of enforcement of code and raising standards for workers involved in those industries. In particular in this case, obviously, setting that bar high for assessment and testing.

So basically I have three points. Strong enforcement of code is obviously critical. It's what we're talking about here and without enforcement and testing that keeps up with the advancing technology requirements it just seems like updating the code is a pretty futile exercise as the needs assessment and other studies have shown where worker and contractor standards are low and enforcement is weak that there really are huge problems with the quality of installation of energy efficiency equipment. So even when the equipment is code compliant the installation is poor and there's a huge loss of savings which, you know, as many people have mentioned today there's that now classic sort of example in residential HVAC where 85-90 percent of installations are not done to code and we're losing energy savings everyday basically because of that.

So, as I said, it's really important to set a high bar for acceptance testing and enforcement and we need the most skilled people to be doing those jobs not, you know, someone to just sign a form.

So this is particularly true in the commercial sector. Compliance is higher in the commercial sector but the systems are more complicated and are getting more complicated all the time. So we have a base to start with in terms of compliance but we need to make sure that the bar is set high so that continues as the technology advances.

And then I wanted to speak to CALCTP in particular for the needs assessment we did an inventory of training programs throughout the state which was very extensive and, in the course of that inventory, CALCTP really stood out as the model and single best example of a training program that really looked at the needs of the industry and the demands of an advancing technology, saw a real gap and filled that gap. So it's really the only program training for this particular skillset at this time. And it's especially important because it's taking already highly skilled workers and bringing them up to the cutting edge of technology which is what I mean by setting the bar high. In order to get real energy savings we really need people who are trained specifically in the

technologies that they're assessing and not just someone to sign a form.

So advancing the Title 24 standards is about raising the bar so we want this to be effective. We want to raise the bar for the workers involved in verification as well.

Thank you.

COMMISSIONER DOUGLAS: Thank you.

So next we'll have Josh Allen with Allen Electrical Contracting.

MR. ALLEN: Thank you, Madam Chair. I'm Josh Allen. I'm with Allen Electrical Contracting. I'm out at Chico. I've been through the business development on the CALCTP and the installer side of it. I'm here to support it. It's a very comprehensive program. It's very detailed.

And I've been in business for 5 years for myself. I've been an electrician for 14 years.

I've installed lots of systems prior to going through the class and unfortunately I've found that I've installed them improperly myself. And so it's very detailed, it's comprehensive and so I think that it's a good program to push the standards that you guys are trying to accomplish.

MS. BROOK: One question I have. I guess it

seems to me that there's real value in CALCTP not only from the verification perspective but also the installation perspective. You're actually getting trained on how to install it right.

MR. ALLEN: Yes.

MS. BROOK: I guess the only thing that concerns me is that there doesn't seem to be a path for people who do verification as a profession, like a commissioning provider, to get that same kind of certification and that — because, again, because we're not requiring the installing contractor to verify in every case it's great. If that works and they're qualified to do that but that's not the only path the industry is taking to do verification of the functional performance of these systems.

So I know you're not CALCTP. You're just — I just wanted to mention that.

COMMISSIONER DOUGLAS: Thank you.

Dave Dias, Sheet Metal Worker 104.

MR. DIAS: Thank you, Madam Chair. As you can probably guess I'm here to support this with the Sheet Metal Workers 104. Our territory right now consists of going from Monterrey to the Oregon border.

I guess it's question 17 that Martha brought up about if we have the man power to do it statewide. In our

local, yes. Pretty much, we do. We have people — I just actually called a couple of business reps for the North Bay and we have people in Eureka doing commissioning right now as we speak. So we cover the entire state.

Randy Young over here from our sister Local 162 in Sacramento. I think Robbie attested they'd cover the rest of at least Northern California part. So we really don't have any issues that way. We can cover the whole state.

There's a couple of other things. I'm also a trustee on our training trust and you brought up a question about acceptance testing. Are we trained to? Yes, we are in the process of changing our curriculum on the TAB side to do that because we know it's critical to that state.

MS. BROOK: Okay. That's great.

MR. DIAS: We are going after that. And see what else —

Oh. I just wanted to say. I know there are some engineers and stuff that talked about design of buildings. A building can be designed to the best LEED standard or whatever but if it's not installed and checked and tested correctly it doesn't matter and that's really what I wanted to say. I've seen a lot of that. I've been in the trade for 28 years now so it's been awhile. I sit

on a lot of – I sit on IAPMO, International Green Mechanical Code, the UMC which is the California mechanical code based off that directly and I see all – I deal with the inspectors. We train the inspectors in our training centers and I understand, we all understand, in our whole entire trade how it can effect if things aren't put in correctly, tested to make sure they're running correctly.

That's pretty much all I have to say unless you have any questions.

COMMISSIONER DOUGLAS: I do not. Thanks for being here. Thanks for being here to speak.

James Page, ITI. International Training Institute.

MR. PAGE: Good afternoon, Madam Inspector, Commissioners. Thank you very much.

My name is Jim Page. I work for the International Training Institute. We're the educational branch arm for Sheet Metal Workers International and I am the regional coordinator here on the west coast.

As Gary had earlier pointed out and you've had a couple of coordiners, school coordinators, here. Up here already. Gary pointed out earlier that his program he manages is for the certification. The program that I work on, and I'm one of 5 in the United States, we basically

work with the schools, making sure that their curriculum is in line with the state standards and the joint apprenticeship training requirements.

We also do journeyman upgrade training. Now where's that come to in TABB. My background, 35 years — close to 35 years here in the trade, I'm a TABB specialist for the industry. I manage training schools for TABB, the certified labs we have across the United States and the TABB training that goes on on a national level. I have been involved with the AABC prior to taking on this task with the national level. I was with the AABC. We were also a NEBB firm in the early going and we were a TABB firm.

So working with all 3 of the agencies, and it's been spoken and stated before, in a general platform everybody's got a knowledgebase. Everybody has done a job task analysis as to what has to be done. And it's all really based around following the same protocols. The testing that's done is the industry standard testing procedures. The training that goes on is about proper usage of the instrumentation and there's been some conversation over the forms that are filled out.

There's even training specifically on forms. How do you fill out a report? And it's very much emphasized amongst all 3 of the bureaus that integrity is

the most important thing. I mean these bureaus all sell basically paperwork. They're not installing. They're validating. That's their job. So that's what they specialize in and you have to have an understanding of systems. You have to have a workforce out there of trained technicians but you also have to have a level of supervision which is why when you listen to the bureaus talk and you look at the matrix that you were sent, or will be sent, you'll see the structure breakdown.

We have the contractors, we have a supervisor and we have the technicians in the field. So there's top down management that's going on here. And that's what's very, very important, especially when it comes to the MEC forms and I work the MEC forms — by the way, Gary's commitment here to California. He's a past California resident but he hails out of Virginia but he's got a long commitment here to Local 104. I'm a California resident. I hail out of Long Beach, California and I have a very much commitment to the State of California and Los Angeles. So we're very passionate about what we do in our industry and about the work that's performed out there. And yes, it's very true that on a national level people will look at what's going on here. And I've had to speak in a lot of other states around the country about what their energy programs are and how they're going about it.

Those MEC forms are a general standardized form that in the early goings when they came out there was a lot of discussion in the field about responsibility on the form. Who bore the responsibility? We're the technicians in the field validating, doing the check offs but there was a responsibility box. And there always was a discussion going on about whether it was the design engineer, the general contractor, what we going on. So clarity has come over the years to some of this and we have some new forms. The latest version that's out there. Again, it's about the integrity of the person that's out there doing the work. The fact that they've gone through a certification, a structured certification, program and they've proven proficiency in that industry and now they're out here doing the work.

So it's a big investment here in California. Really this investment here is for the future of California's sustainability, you know, and these JATCs, these schools, these bureaus have all spent a lot of money training their people specifically to be out there doing this, as some people would say, easy type of work. But I have a real pushback to those that say we can do this in 6 hours because I can tell you the hours and the commitment of the individuals that do TAB are very extensive. It's very hard. And I applaud anybody that goes through it,

you know. It's not that you can't do it. It's just how much commitment did you have in learning it. We're not saying we're engineers. Really we are the communicators. We are the liaisons to that engineer, to the general contractor on the job and that engineer that designed it and we're out there validating performance and documentation and we're going to turn that in and we're going to be having a discussion if there's one to be had for why something may or may not be working. You know.

It's an important job and it's a stressful job, and I'm open to any questions you may have.

COMMISSIONER DOUGLAS: Questions? I don't think so right now. Thanks for being here.

MR. DIAS: Okay.

COMMISSIONER DOUGLAS: All right. Robert Helbing.

MR. HELBING: Good afternoon, Commissioner and members of the public. My name is Bob Helbing. I am the owner and president of Air Tro Heating and Air Conditioning. I am a fourth generation contractor. Last year Air Tro was recognized as contractor — or commercial contractor of the year by the Air Conditioning Contractors of America. I've been on the board of the Institute of Heating and Air Conditioning Industries for the past 7 years. Excuse me. I am a fourth generation contractor.

I am also a mechanical engineer. I'm a registered mechanical engineer in the State of California and a member of ASHRAE.

We've talked a lot today about TABB, NEBB and AABC and I've had the pleasure of working with Erik Emblem to promote those organizations in, for example, utility programs. As a commercial contractor I work with them on a regular basis. I know the quality of the work and the commitment that we've heard about today.

But the utility programs that I was working with Erik on were voluntary programs. Okay. They were smaller in scope. They were easily modified or cancelled if they were not working properly. We're talking about something different today. We're talking about putting something into regulatory language that once it's there turns out that there's flaws or problems; it will take years to get it straightened out.

I think we have had problems in the past with Title 24 with some of the language that was written and it's been a struggle to get it to straighten up and fly right. I don't want to see a similar mistake made in this case. We talked about compliance. The lady from UC Berkeley mentioned that commercial compliance is higher than residential compliance. Honestly as a commercial contractor I've seen exactly the opposite. I can go into

building departments in Los Angeles County and I can request the MEC forms and they don't know what I'm talking about. If I take the time to download the MEC forms and fill them out and bring them in they don't know how to handle them. It's my experience that compliance on the commercial side, at least in the retrofit market, has been in the low single digits. We've heard numbers like 85-90 percent of systems installed are not working to spec. My guess is most of those systems were done without permits and without performing compliance.

Now my concern here with this proposed regulation is we're talking about making compliance for commercial contractors an even greater challenge than what it already is. We've heard some figures today. We've heard about how many qualified technicians there are in the State of California who would be able to do this work. I think the number came in at something under 1,000 technicians. My guess is that not all of those are working fulltime in the field. Some are probably instructors. Some are probably also doing part time business. They're not fully available to do this work.

I don't know if anybody has numbers on the amount of commercial equipment sold in California but my guess is we're talking over 100,000 systems a year and the total HVAC system sales in California about 1 million so

it's safe to guess that at least 10 percent of that is commercial. We're talking about 1,000 technicians for 100,000 systems installed. It seems like a lot of work for these guys.

We'd heard about how it takes 2 years of field experience before you can become a certified technician and it seems to me that if we do find we have a bottleneck here — somebody mentioned this is a good base. I think it's a bottleneck. If it turns out we have a bottleneck there's no quick and easy way to fix it. We can't bring in other people because they don't meet the specifications for these organizations. These are national organizations. They are not going to throw out their charters for the convenience of California. They're going to insist that their standards be met, which I respect them for that, but it does mean that if we run into a problem here there's no simple fix.

There are other groups out there that do training in the HVAC industry. As a board member of the Institute of Heating and Air Conditioning Industries I understand that we've trained about 15,000 people in the past 2 years. Now that has not been in testing and commissioning. It's been throughout the HVAC industry but it is a resource available if we do need more commissioned professionals there are other agencies out there that can

provide this work in addition to these groups. North American Technician Excellence is another organization, does a lot of HVAC training nationwide. Now, again, they are not testing and commissioning specialists. We've heard that the specialists here also do not train to the California standards. They will have to modify their training programs in order to do this work. I would think that other organizations that specialize in HVAC training could do similar things.

So these are my reasons for being concerned about this proposal. I think it was brought in rather hastily and hasn't been fully thought through and I don't see any reason why it has to be incorporated in the 2013 Title 24 revision.

COMMISSIONER DOUGLAS: Thank you. Any questions? I don't think so. All right. Thanks for being here.

MR. HELBING: Thank you.

COMMISSIONER DOUGLAS: Mark Ouellette, Senior Project Manager, ICF International.

MR. OUELLETTE: Good afternoon, Madam Chairman, staff and citizens. I've attached my full written testimony but I'm going to cut those short and highlight just some of the key points.

My name is Mark Ouellette and I am with ICF

International. Thank you for this opportunity to testify on the proposal for using California Advanced Lighting Controls Training Program, or CALCTP, certified electricians as acceptance field testing technicians.

As you know, CALCTP was established back in 2008 by a broad partnership of stakeholders including the California Lighting Technology Center, the major IOUs across the state, SMUD, the California College Chancellor's Office of Advanced Transportation Technology Energy Campuses, the LMCC as well as workforce investment boards across the state.

To date CALCTP has had a broad number of funders including the U.S. Department Employment Training Administration which you've heard before, the State of California Employment Training Panel was a clean energy workforce training program, investor owned utilities, the TomKat Charitable Trust Foundation as well as the California State Labor Management Cooperation Committee.

CALCTP Board was established and ICF was hired back in 2008 by the Board to act as an independent third-party administrator of the program. My comments today will reflect our role as Administrator of the program.

As was previously mentioned, CALCTP is now fully implemented across 28 training sites in the state including 6 community colleges, the Energy Training Center

at Southern California Edison and 21 electrical training centers. The course includes a 15 hour online prerequisite course which was developed by lighting manufacturers from across the country to be completed prior to taking the CALCTP certified technical instruction course. The course is also heavily based on hands-on labs. The course is 50 hours long with 10 hours of lecture and 40 hours of hands-on installation in a lab environment.

The ratios are very low, 1:10 for the lecture portion, 1:1 for the lab portion. Students must show competency in 1 lab before they can move on to the next. So it requires a 100 percent pass rate in the lab portion of the test. Also there is a final exam. The final exam was developed by experts in the field. It was then — data from the first 500 participants was calculated and it was validated by psychometricians for efficiency.

The California — the CALCTP team has developed a criteria for updating the lab boards based upon in the lab curriculum based upon market share, competitiveness and future use in the marketplace. Each training site gets visited several times a year by myself and my staff to ensure that the integrity and the fidelity of the model is being met. To date over 1,650 state certified general electricians have received the CALCTP training and over

1,450 are certified. It has an 87 percent pass rate.

Based upon our training for the past 2 quarters we believe conservatively by the end of the calendar year CALCTP will have train 2,795 electricians and many more electricians will be trained and certified by January 2, 2014 which should provide more than adequate numbers to conduct lighting controls acceptance testing for the state.

There are several instances in pilot studies where CALCTP certified electricians were hired to install and commission a lighting project. Most notably was the attached in my written testimony. The case study of the Brookfield Properties which witnessed a 75 percent drop in the lighting energy use after the installation was complete.

So, in conclusion, we have seen impressive results from electricians that have been CALCTP certified including practical use of the course and results in the fields. For these reasons we recommend the California Energy Commission require the use of CALCTP certified electricians as acceptance testing Field Technicians for the 2013 update of the Title 24 code. Thank you for this opportunity to testify. I'm available for any questions you may have.

COMMISSIONER DOUGLAS: Thank you. Thanks for

being here. Any questions?

MS. BROOK: Has your organization thought about providing any kind of certification for third-party verification professionals like commissioning providers?

MR. OUELLETTE: Yeah. If others are qualified and there's a course or some kind of certificate that they have completed that we could say, "Okay." It's hard to just pick somebody and say, "You meet the criteria. You meet the criteria." If there's some class which they've completed which we can't verify, you know. What we did for CALCTP was we looked at what are the core competencies that are needed to be an expert in installation. We then went back —

MS. BROOK: But I'm trying to clarify that we're not talking about installation. We're talking about verification.

MR. OUELLETTE: But the same process with verification. Were there was a class or way to certify that we developed knowledge skills and abilities that were needed, went back, developed the curriculum that was identified by experts, went back and said, "Okay. How do we test to make sure that the people that have this skill are competent in that skill and the certification means something to be more than welcome to do that," and so far we've asked, we've asked specifiers, the California

Commissioning Collaborative, “Do you have such a class that we can verify?” And the answer was, “At the moment, no. We need to develop it.”

MS. BROOK: Well the commissioning collaborative doesn’t do certification but –

MR. OUELLETTE: Okay.

MS. BROOK: They are national building, like the National Building Commissioning Association, is a certifying body for commissioning providers.

MR. OUELLETTE: Yep.

MS. BROOK: So I would think that there would be some potential there.

MR. OUELLETTE: Yeah. I mean –

MS. BROOK: So that’s what I wanted to know. Thank you very much.

MR. OUELLETTE: If there is something that we can – yes. We’d be more than willing.

MS. BROOK: Okay. Great. Thank you.

COMMISSIONER DOUGLAS: Thank you. Thanks for being here.

Dale Gustavson, President of Better Buildings, Inc.

MR. GUSTAVSON: Thank you, Commissioner. Dale Gustavson, Better Buildings, Inc. I am not here to speak on behalf of the Western HVAC Performance Alliance but my

company is responsible for managing that and has been involved with that since its birth in 2009.

I'm not going to say much about the proposal because as you might guess as being an alliance of organizations that include from soup to nuts almost everyone involved in the discussion. We have members on both sides. But we also have members that include the California Public Utilities Commission, the California Energy Commission, the IOUs, SMUD and others.

So I just – 2 things really. One, I think in thinking back to the strategic planning process including what was known as the HVAC Conveners Report which also became this Commission's report to the legislature on HVAC. That there was an emphasis and an intent throughout that entire process for the State of California to embrace existing industry certifications and help the public become more aware of them. And that's where it has been continued throughout the development of the strategic plan and from that implementation of programs in the utilities.

And we in the Performance Alliance have been wrestling with those questions, how in fact do we help the public become more familiar with these hard to earn, prestigious certification. And that's really all I want to say about that. I think if we go in the direction of coming up with our own anything we're undoing what has

taken us 5-6 years to correct the direction of.

COMMISSIONER DOUGLAS: Mm-hmm. Mm-hmm.

MR. GUSTAVSON: In terms of knowledgebases, you've all of the organizations talk about knowledgebases and what I think we've seen in the Performance Alliance is we've wrestled with should certain certifications be acknowledged within the utility programs is that it's probably more important for the State of California whether it be the CEC, the IOUs, anyone working with industry, to work with and begin to understand the knowledgebases and how to have an impact on them. Then – it – over time, and I don't think it would be much time, we've already seen the evidence in 2 ½ years of the knowledgebases changing slightly as a result of just interacting with us tree huggers out here. So food for thought if we want classes taught or certification to reflect our values and our priorities in California one way to do that is certainly just to work with those groups and that's why they're here I think. I'm going to leave it at that. Thank you very much.

COMMISSIONER DOUGLAS: Thanks for your comments.

Christopher Ruch, Final Air Balance. Oh. You've already been up, haven't you?

MR. RUCH: [Indiscernible]

[LAUGHTER.]

COMMISSIONER DOUGLAS: All right. Go ahead.

MR. RUCH: My name is Chris Ruch. I'm the Operations Manager for Final Air Balance. I did put together that matrix purely to try so that way it'd be easier for everyone here to look at and determine how many numbers are with everything on one page.

First off, I really do appreciate being here, Commissioner. Thank you very much. I thank everyone in this room for having such care with what's going on in this industry. For myself I've had the opportunity to work in both independent balance companies. That's balance companies that are purely – that's all they do is balance. I've also had the opportunity of most of my career to work for large mechanical companies running what would be called an in-house TAB department where we work within the mechanical company.

Because of that that's given me a definite benefit to see the Title 24 forms, the compliance forms and how they interact. A lot of mechanical specs purely call out for that the mechanical company is responsible for these compliance forms. So I got to see how this happens inside mechanical firms. What I came up with is a certified TAB technician is the best choice and I will explain why.

I tried various different combinations of

different technicians. Mind you I came from companies with the top control guys, top mechanical start-up technicians and I tried different combinations to get them to do it because I was the only TAB guy at the time. What I found though is that TAB technicians really were the best ones to do it and the reason why is that they're trained to test the entire system, 1. It's not, even though we use the term air balancer, air is just a small sliver of what we do. So it's everything involved in the system that we're testing. On top of that we have a very clear understanding of protocols and method of procedures of doing different kinds of testing.

In regards to controls, which I've heard a lot about, every in here has to understand that a good TAB technician in order to really do your job has to be able to override the system to perform the test. That means that we have extensive knowledge of not just one kind of controls like many of the control technicians that I work with but every kind of controls. We also have an extensive knowledge of the user interface. Meaning that I know my guys are specifically trained to be able to do quick manipulations and overrides on the units.

The other thing would be is that TAB technicians are the ones that are accurately and honestly reporting findings on the jobs. What I'm getting to with that is

that they are the only ones on the jobs that's, generally, not building anything. There's no product that you can look at afterwards so what that means is that the TAB technicians that are out there are the ones that everyone from the engineer to the general contractor to the inspector are depending on to be accurate and honest with their readings.

This is backed up because they have a certification that can be lost. I can go through the different certifications but what you'll see when you look at them is that the people that do this put an extensive amount of time into it. If you are known or get caught lying you will be dropped out of your certification and you will lose it. And that's everything to these guys. So that's the main reason that I found that they are the best ones. Because they tend to be the ones that are very honest with what they're putting their name to.

Another thing is that they, of course, own and know how to use all the equipment needed. Not just one piece of equipment for one kind of test but generally in their truck or in their storage area they'll have a piece of equipment that can test any kind of scenario given that if it's a windy day or what's going on.

The other thing that should lastly be mentioned with that is that TAB technicians inherently have the

ability to pick up these skills. However, we shouldn't just depend on that. We should also look at these TAB organizations, all 3 of them. I'm a member of 2 myself. Have the ability to very quickly ramp up their training programs to meet any need. I know that as operations manager that when I've contacted the schools or NEBB or TABB, who I am a part of, they've been able to quickly respond with documents or training materials for my technicians. So these are organizations that have built up something to be able to respond to any kind of specific training necessary.

The other reason that I chose TAB certified technicians at a mechanical firm was the I was also trying to protect the engineers. The in-house engineers that did this. With the change from 2005 – 2008 it changed from all a sudden an engineer was signing on, or a licensed person, any architect, contractor, somebody that had something very significant to lose was signing on that the technician who did that did it correctly under penalty of perjury. It's important to understand that very rarely is the licensed person there the one that's actually out there performing the test. Generally it's a technician. And for the protection of the engineers that I was working with we made sure that the people that were doing those tests were definitely qualified. This also falls into the

protection for the inspector.

My original push for this because I'm very concerned about energy looking at this and I was very concerned with what I've seen out in the field of how much is not working out there. And my initial push for this was not necessarily to have TAB technicians do it. My initial push was for increased enforcement. Now after talking in front of IAPMO or talking with various inspectors, it became apparently that they just didn't have the funding to really thoroughly dig into this in the way it really needed to be done.

So the main thing would be having some kind of major certification behind this with strict guidelines would give those inspectors the knowledge that when they get report and it's signed off by a technician that has that much to lose and an engineer that tested that technician enough that they can feel confident that it was done correctly.

If you have any questions I'd be more than happy to answer them. As far as the matrix, if you would like it sent to you if you don't have it already I can be sure and get that to anyone.

COMMISSIONER DOUGLAS: Thank you. Thanks for being here.

MR. RUCH: Absolutely.

COMMISSIONER DOUGLAS: And we'll be sure to docket the matrix so that everybody will be able to get it.

Thomas Enslow, United Association of Plumbers and Pipe Fitters.

MR. ENSLOW: I already spoke.

COMMISSIONER DOUGLAS: Oh. You already spoke. Great. I don't know how I put the card in the wrong pile.

Chris Walker, California Association of Sheet Metal and Air Conditioning Contractors.

MR. WALKER: Chris Walker on behalf of the California Association of Sheet Metal and Air Conditioning Contractors. We appreciate the opportunity to be here, Commissioner Douglas and staff and other Commissioners.

Could I start with – I have comments but I have one quick question about process because I noticed on Friday, the 45-Day comment went out on the regulation itself and today we have a workshop on a proposal that would at some point be brought into that language. So I'm just kind of curious how that process will play out.

COMMISSIONER DOUGLAS: So maybe I'll ask staff to talk about that. We've opened this up as a separate rulemaking. Go ahead, Martha.

MS. BROOK: Yeah. So on our last slide which we'll get to as soon as we're done with the comments in a

few more hours, depending on what we hear today and what the Lead Commissioner – you know, with our discussions decides to do what we've planned is that we could open a parallel rulemaking. And that's, you know, our legal counsel has confirmed that that's absolutely a fine thing to do so that our current 2013 update which we've released 45-Day language on Friday would continue on all the way through adoption and approval by the Building Standards Commission. And we would do this new proceeding in parallel and have a whole separate 45 day language. It would only be limited to the scope. We wouldn't make any other changes. It would just be the scope of certification for nonresidential acceptance test. It would have its own 45-Day, 15-Day language. Its own adoption date at the Commission and then we'd – it would sort of catch up with the other proceeding.

MR. WALKER: But it would never be merged?

MS. BROOK: It would be merged at the time it's approved by the Building Standards Commission as part of the overall Title 24 California Building Code Update.

MR. WALKER: Great. Thank you. I apologize for the question but we were kind of concerned about process and didn't understand how it played out.

CAL SMACNA represents close to 600 contractors statewide and in good years employs up to 22,000 men and

women performing sheet metal work and HVAC work throughout the state.

We hope that today, and I'm told that it is, the beginning of the discussion and it's going to be an interactive process and we appreciate that opportunity. We did have contractors that wanted to be here today to relay their positions very clearly and on the technical aspects. I am not a mechanical engineer. I'm not a mechanical contractor so I'm not going to be any help when it comes to the technical issues but as this moves forward we would like to absolutely be included in that process so we can bring the expertise to the table.

Briefly, we would, as an organization, do not support of the proposal to only allow AABC, NEBB and TABB certified technicians or firms to perform the acceptance testing and documentation. We believe that mechanical contractors and mechanical engineers have a valid role and a valid role to play in that process and they'd like to continue to play in that process.

We believe that Title 24 forms require a complex mix of skills and certifications to complete. We do not believe that this is something that can be taught in a 6 day or even a 20 day course. This needs to be done by highly trained, highly qualified personnel that have extensive experience in this industry.

We believe that AABC, NEBB and TABB certified techs and firms have the requisite skills and knowledge to complete some of the forms and provide some of the testing but not all. For example some of these require a PE stamp, etc. and we think that it really is a collaborative process not to be done by a single person but a mix of people all highly qualified and certified. We even support additional certification and / or training, well thought out training or certification, should that be needed. But we do not want to limit it at this time to only those certified bodies.

We are working on a matrix because we understand that you are probably curious what our position is on various roles and what portions of the forms those roles should be responsible for. We're working on that matrix and should have it completed in the next couple weeks. Apologize I don't have it today. This workshop was kind of quick. We're scrambling to get all of our ducks in a row but we will have that to you in the next 2 weeks.

Finally, we do believe very strongly that the forms should have a spot for the responsible party to be signing off on. We think that's a critical piece to ensure accountability going forward. And we support — we're talking about what kind of certifications exist. It's kind of the supply side of it. We're not talking —

we've heard comments earlier about the demand which are the local building officials and others. We need to be addressing the demand that this be done properly on the front end at the same time and as aggressively.

Finally, one little housekeeping item, this is a small item. But on the Commission's website under the docs, the documents and reports for review, under this workshop there is a letter that comes to you from the Joint Committee on Energy and Environmental Policy. And the file name includes SMACNA in that file name. CAL SMACNA is not part of JCEEP. We have not been involved with JCEEP since December 31, 2010. Our positions on Title 24 are completely independent form JCEEP and we'd like to have that corrected.

Thank you.

MR. SHIRAKH: Actually, I have a question. So CAL SMACNA doesn't support this proposal but SMACNA the national organization does. I mean, what is this? I'm really confused here.

MR. WALKER: I cannot speak for national SMACNA but I don't believe they support this. I don't think I've heard them say they support this.

MR. SHIRAKH: Well then —

COMMISSIONER DOUGLAS: Is anyone from national SMACNA here that —

MR. WALKER: CAL SMACNA is the California Chapter.

COMMISSIONER DOUGLAS: Right.

MR. WALKER: We do not support it.

MR. SHIRAKH: Which part of SMACNA supports it? We have letters from SMACNA that definitely — I'm a little bit confused here now.

COMMISSIONER DOUGLAS: I think you can please clarify but on the microphone. I mean we have Erik who might —

MR. HYDEMAN: I apologize. I've been corresponding with Eli Howard on this issue because I had been directed and in fact SMACNA did comment on this and that's why you found out that document had SMACNA in there.

Eli said that the national SMACNA has no comment on this. They're not for or against it. They're not taking a stance on it.

MR. WALKER: And if I may, the letter in question that I'm speaking to that's in the Energy Commission file is not signed by SMACNA. It's signed by others who are members of the Joint Committee on Energy and Environmental Policy. However, how it's saved as a PDF document and how it's referred to it says SMACNA in the referenced piece of it. I just wanted to make sure

that the contents of the letter are not confused to be endorsed or supported by SMACNA or CAL SMACNA.

COMMISSIONER DOUGLAS: Okay. And that's probably my misunderstanding. And I don't even know if I was the one that saved that file but I think that's a staff misunderstanding and I appreciate you clarifying it.

MR. SHIRAKH: That's exactly my source of confusion. So I still don't know who's supporting this.

COMMISSIONER DOUGLAS: Erik? All right. So we'll look forward to that matrix.

MR. WALKER: Thank you.

COMMISSIONER DOUGLAS: Erik, is there anything?

MR. EMBLEM: Yes, Commissioner. Erik Emblem again with Western States Council and the Joint Committee on Energy and Environmental Policy.

You have several letters already on the docket from SMACNA contractors supporting this proposal. And I'm prepared today before I leave to give you 25 more of SMACNA contractors who have written and want to be docketed supporting the proposal.

As an organization on the national level I think that is true that they have not taken a position. But as an organization national SMACNA is a cosponsor of TABB who is proposing a written response to all of the questions and that their representatives voted on it actually

Sunday. They worked on it. I got slapped on the back of my hand because I had to work Sunday. And they're sending out a proposal of support from TABB's perspective.

COMMISSIONER DOUGLAS: Thank you. Go ahead.

MR. TAYLOR: Madam Chair, since there's been a representation that SMACNA contractors support it. There may be some individual letters out there. I know that there was a grass roots call that was put out to them and they may have unwittingly signed on to some letters but I want to let you know that the California Association does not support it. That the Bay Area SMACNA does not support it and I have 25 letters from contractors written Friday afternoon that do not support the proposal.

COMMISSIONER DOUGLAS: Well thank you. And thanks for the letter. And I realize that with the timing of the workshop there were challenges for parties in terms of reaching out to their members and getting input into us so of course we do have a couple of weeks after the workshop for you to get us more information and we'll look forward to getting it.

Let me know call on Bob Wiseman, President, Institute of Heating & Air Conditioning –

MR. WISEMAN: Yes.

COMMISSIONER DOUGLAS: Ah. You're here.

MR. WISEMAN: I am.

COMMISSIONER DOUGLAS: As I stared at the card you made it up here.

MR. WISEMAN: Thank you, Commissioner Douglas. Hi. My name is Bob Wiseman. I'm the President of the Institute of Heating & Air Conditioning Industries. We are a California, primarily California, HVAC trade association. We have over 700 members, primarily non-union. As I am a HVAC contractor, I do commercial work myself and I do residential work. My mix is basically 50/50.

One of the things, as I look at this, I kind of look at this from a little bit different perspective than many. Title 24 has been a difficult process and our goal, our hope as a trade association, as everybody in this rooms, I believe, wants is to make this process as clean and as simple as possible. To make it even and fair for everybody. To be honest we found out about this process just a couple weeks ago. We have not had a chance to review this.

This is something that is much too rushed in our opinion to be included in the 2013 standards. This is something that we need to think about. We don't want to make another mess such as what's happened and I think we can all agree with that. With the proper care I think we can get there. I know the motivation of everybody is

right. That people want to do the right thing, to get involved, but we can't rush into that process. I think we will all suffer because of that.

I've heard a couple comments throughout this afternoon that I wanted to address. I often hear the concept that commercial work has a higher compliance rate than residential work. I have to — I do not see this. I don't see this at all. In fact I've heard from utility companies they consider their compliance rates for commercial permits 0 percent plus or minus 2. It's bad. And of course it depends on what market we're talking about. The commercial market is huge, going anywhere from 5 tons to, you know, as far — as high as we want to go. So this is a big industry that we have to look at and make sure that we take of it, you know, properly. There are different market segments here that have to be dealt with independently. There is a huge difference between new construction and engineered projects and add-on retrofit. The requirements are different. The expectations of building owners are different. The people who will do the testing is different. These things need to be looked at.

With such low compliance asking people to fill out these forms, you know, and setting standards for these forms at this point is much putting the cart before the horse. We have a structural problem in the state with

compliance and we can address these issues and we can deal with these issues. And then we're going to be able to deal with who is going to do this work. And when we do that have an inclusive policy to include all the organizations who can do this without gatekeepers there to stop everybody from being able to participate in the process.

I just think that at this point it's something that we need to seriously consider slowing down on, looking at and fully vetting the process.

COMMISSIONER DOUGLAS: Can I just ask? Are your concerns addressed kind of equally to both the lighting and the —

MR. WISEMAN: Primarily HVAC.

COMMISSIONER DOUGLAS: Primarily HVAC.

MR. WISEMAN: Yeah. That is my experience.

COMMISSIONER DOUGLAS: Okay. Thank you.

MR. WISEMAN: Sure.

COMMISSIONER DOUGLAS: How about Mike Outerbridge? Outerbridge Electric.

MR. OUTERBRIDGE: Good afternoon. I'm Mike Outerbridge with Outerbridge Electric. I'm a local electrical contractor. I've been in business for 23 years. And I just wanted to support, excuse me, the CALCTP program.

The lighting industry right now, everything is going really high-speed and it's very complex and it's very expensive. To get what you guys want out of it, the results, which is the bottom line saving energy you have to have qualified people. Not only installing it but commissioning it or inspecting it. Making sure it's completely dialed in and getting the results that you're trying to receive.

Any kind of further education that we can provide to my workers in the field is welcome. I'll sign up tomorrow. And that's pretty much where I stand.

COMMISSIONER DOUGLAS: Great.

MR. OUTERBRIDGE: Any questions?

COMMISSIONER DOUGLAS: No. Thank you. Thanks for being here.

Keith Dias, Training Coordinator, Sheet Metal Workers Training Centers.

MR. DIAS: Good afternoon, Commissioners. I'm Keith Dias. I represent the Local 104 — Sheet Metal Workers Local 104 Bay Area Training.

I'm here with — just in support of the proposal. Talk a little bit about what we provide. We do provide training to our apprentices and our journeyman. A lot of people haven't — they've talked about training. We train in the TABB industries. We train in the servicing of HVAC

equipment and also design, fabrication and installing of HVAC systems.

A lot of people have talked about the training but one of the things I just want to reiterate. We provide on the job training also, with our qualified contractors. We have two TAB training sites in the Bay Area. We're going to build a third one year here in the next year or so. They're extensively for TABB. The next one we're going to build is going to be approximately 2,700 square foot TABB facility.

So, I'm just here to provide the counsel and the Commissioners with information that the training is out there and we do provide. And if you guys have any questions for me —

COMMISSIONER DOUGLAS: I do not. I don't see any. Thank you. Thanks for being here.

Just so people know I have 9 cards left. How many people do we have WebEx wanting to speak? Oh, I'm sorry. I've got 11 cards. All right.

Randy Young, Sheet Metal Workers, 162. Randy Young.

MR. YOUNG: Good afternoon. Thank you for allowing me to give just my recommendation or my support for the proposal that was brought forward to the Board and the body.

Just a little piece of information. There was somebody earlier that talked about 1 million pieces of equipment set. If you do the math, 10 percent of commercial that makes about 100,000. If you divide that by 12, 12 months in a year, that leaves you with 8,300 pieces of unit or equipment, I should say. And if you divide that by the 1,000 TAB techs we currently have that's about 8.3 pieces of equipment per month per TAB tech so that's doable with TAB sheet metal workers.

And also Local 162 covers Fresno up to the Oregon border from Local 104 over to the east all the way to the Nevada border. We've got shops in Fresno, Modesto, Stocking, Redding, Sacramento, Shingle Springs, Eldorado, Coalinga. Basically darn near every city up and down the valley we have contractors who can do this work.

And I would support this initiative. Thank you.

COMMISSIONER DOUGLAS: Thank you.

MS. BROOK: Karen, I'm just going to interrupt for one second because there's a couple times when we talked about a two week period for comments. We actually only have a one week period because March 5 is our deadline. So those of you developing information we do have a deadline of — and I wanted to notice you now in case you had to leave early that March 5 is our comment period deadline.

COMMISSIONER DOUGLAS: Thank you. That's a really important notification. I noticed that one of the people who said two weeks did leave so I think we was a representative of CAL SMACNA so you can get back to him. There's nobody else that I noticed who said two weeks and left but that doesn't mean that didn't happen.

All right. So California Director, Blue Green Alliance.

MS. HOYOS: Good afternoon, Madam Chair. I'm from the Blue Green Alliance and for those don't know we're an organization of 8 big national labor unions and 4 national environmental organizations and we're here to speak in strong support of the Sheet Metal UA and IBEW proposal that would require acceptance testing performed and verified by TAB contractors with AABC, NEBB or TABB certification and to require that the electrical system acceptance testing be performed by electrical contractors with CALCTP certification.

At the end of the day our organization exists to grow jobs in the clean energy economy and we think it's critically important in an economic time like this for those jobs to be quality jobs. We think it's important to support industry, excuse me, training operations and apprenticeship program that graduate people who are able to execute this certification at a very, very high level.

Scott Wetch mentioned earlier that this is not just a union versus a non-union, clearly there are both involved in all these three certification, four certification, programs. But having said that we think as was — I think really well articulated by Ellen from the UC Berkeley Don Vial Center that at the end of the day if the equipment is not working properly we're not getting the gains we need. We are prepared to be full tilt boogie in support of passing strong, aggressive, green building code standards for 2013. That's how we're positioned to be and as part of that we want to make absolutely sure that we have certifications being executed by people who are fully qualified to do so.

And there's — most of the preponderance of the day we've been hearing people speak in support and there's been a few people that have raised questions about capacity. Are there enough people who can do the training and having had the opportunity to work with people like Erik Emblem and work with people like Bernie Kotlier they can spend 5 or 6 amounts of time that we've spent in this hearing telling you exactly how they could make this work swimmingly. So I'm sure they'll talk to you afterhours as much as anyone, any staff person could possibly want.

But I just wanted to thank you for your time and underscore our support. And we really look forward to

this being incorporated into the standards to that we can move forward and be what California can be. Thank you.

COMMISSIONER DOUGLAS: Thank you. And could you say your name for the record just so that we have it. You didn't put it on the card.

MS. HOYOS: Lisa Hoyos.

COMMISSIONER DOUGLAS: Ah. Lisa Hoyos.

All right. Charles Knuffke, WattStopper.

MR. KNUFFKE: Thank you, Madam Chair. Charles Knuffke with the WattStopper. And I'm just here to speak in support of the training that's done in CALCTP. I just wanted to let you know that I'm not saying that that should necessarily be the only path to certification however if we were designing the program to try to do what Dr. Siminovitch was talking about and trying to ensure that there's a level of understanding of basic control requirements, of the technologies involved, making sure that the right products are put in the right place that program would actually look exactly like the CALCTP Program.

I just want to say that I've been involved with some of the people that have been through the program and it is refreshing to see people who actually understand how to fill out the acceptance testing forms that are required and understand the use of the products. So I think that

it has done exactly what it is touted to do which is raise the level of understanding and to ensure that the lighting controls of the future, which are definitely going to be much more advanced than they are right now, are being treated properly and understood by the people doing the installations. So I understand you've got quite a bit on your plate to make sure that everybody has access to that sort of a training program but, as I said before, the training program that is there is exactly the type of training program that's needed for the industry.

COMMISSIONER DOUGLAS: Great. Thank you.

MR. KNUFFKE: Thank you.

COMMISSIONER DOUGLAS: Let's see. Darlene Besst, NECA.

MS. BESST: Thank you, Madam Commissioner. I'm Darlene Besst with the National Contractors Association. I'll make this very brief otherwise I'm repeating what others have said.

But I would like to add that as contractors association we have worked very hard to get our electricians trained and certified. A few years ago participation was a challenge but as electricians have gone through the program and as they recognize the complexities of the systems they seen this training as valuable and it had enabled them to do an effective and

professional job with installations.

In speaking to our contractors they are convinced that electricians trained and certified to install these energy saving systems are the best qualified to do the acceptance testing.

And then I would like to make one comment concerning a question raised about commissioning agents. While there are certainly individuals who can commission there is not a whole class, we wanted to point out, there is not a whole class that has been trained and certified and there is no standard or credentialing program for all commissioning agents.

Thank you.

COMMISSIONER DOUGLAS: Thank you. I've got another card from NECA as well. Eddie Bernacchi.

MR. BERNACCHI: Good afternoon, Commissioner Douglas, CEC staff. Thank you for putting this workshop on today. I know this is how we get ideas out there and vetted and this has been very educational. I think I've even learned having to find myself in a clean room where to belch today so.

[LAUGHTER.]

So it's been very educational. My name is Eddie Bernacchi and I'm here on behalf of the California Chapters of the National Electrical Contractors

Association. We represent over 800 of the contractors here in the state who perform work on many non-residential lighting efficiency projects.

As Bernie Kotlier mentioned earlier the quality and openness of the CALCTP program is very apparent and that is why our NECA contractors adamantly support the adoption of the acceptance testing by CALCTP trained contractors and electricians.

Advanced lighting control systems. These are not plug and play systems. We're not discussing here today the replacement of CFL light bulbs. These are very sophisticated lighting control systems that if not installed correctly will not perform up the energy efficiency standards they're designed to. If the goal of this Commission is truly to promote energy conservation or energy efficiency then the Commission must support acceptance testing of these energy efficiency systems by qualified contractors to ensure that the systems perform properly to achieve that goal.

So if — we strongly believe that a minimum standard of certification is essential and for these reasons our NECA contractor support the CALCTP acceptance training proposal.

I also have with me 30 some odd letters from contractors, our contractors, from throughout the state

who support this proposal that we'd also like to submit to the record formally.

Thank you, and thank you again for putting on the workshop.

COMMISSIONER DOUGLAS: Thank you. Thanks for being here.

Richard Garbrick with Schetter Electric?

MR. MARKUSON: Is it Markuson?

COMMISSIONER DOUGLAS: No. Richard Garbrick. If you like, I'll go with Richard Markuson next.

MR. GARBRICK: Is Schetter Electric. S-C-H-E-T-T-E-R. Schetter.

Yeah. I'm Richard Garbrick with Schetter Electric and just real brief. I have gone through the CALCTP management program and we've heard a lot of the qualifications to get into the CALCTP program, we've heard about the, you know, as far as the advanced lighting controls and where the technology is going to. And I think I want to address some of my comments to the public good and as far as with the advanced technologies, I know it's not too far, we can all remember when the VHS came out and a lot of us bought them and they sat there with the 12:00 blinking at us because we couldn't program them. Well a lot of these advanced controls can be a similar way when they're installed improperly. They're not getting

the best use. And when we don't install these things appropriately they're not getting the use that they need as far as the energy savings and they're not doing the full effect that they have the ability to do. And I know that, you know, Schetter Electric has been around for 50 years and they have some of the finest qualified and the trained electricians that we have out in the field. There's a huge difference when the standard is set, the training is done and we're fully supportive of that. And I know that when the consumers out there, when they go through the expense and the time to put some of these products in their building, they deserve to have them installed right and they get the maximum use out of their energy efficiency. And that's what I want to say.

COMMISSIONER DOUGLAS: Great. Thank you.

Okay. Richard Markuson.

MR. MARKUSON: Thank you, Commissioners. I'm here representing the Western Electrical Contractors Association; Plumbing, Heating and Cooling Contractors of California and the Air Conditioning Trade Association. And I'll divide my comments into 2 since they're on 2 separate components.

WECA is strongly in favor of training and qualifications for both electricians and contractors in California; however, I would say that we are adamantly

opposed to the proposal forwarded by IBEW to create a state monopoly. And this is not a criticism of CALCTP it's probably an excellent program but for the state to consider creating a monopoly that only 1 organization may certify and qualify acceptance technicians and contractors for the entire state of California — a lots been talked about. How many current technicians there are available but according to their own website there's only 50 contractors who are currently certified in order to perform these to employ these certified technicians. That's inadequate.

Furthermore, I'm very concerned about only having a one week period of time to provide written comments. We only learned about this on the 22nd. We don't understand the race to create a state monopoly for doing the lighting certification.

We have similar concerns — I also represent PHCC and ACTA on the other components for the air conditioning HVAC certification. Again, you're being asked to adopt a regulation monopoly programs for the three existing certification entities. We are opposed to that. It is incumbent upon the state of California to establish strong standards for energy, in both lighting and the HVAC. However, we don't think it's appropriate for the state to be adopting or sanctioning monopoly organizations, private

organizations, to verify these installations.

For that reason we are strongly opposed to the provisions.

COMMISSIONER DOUGLAS: Can I ask one question? You know you talk about monopoly, and I tend to agree with you, when you're saying one organization is the only that can do it and I think even Dr. Siminovitch made similar comments on that. But do you object to the concept of having a certification requirement? Let's say there were 2 or 3 organizations or let's say it was open ended as to how many organizations?

MR. MARKUSON: Absolutely. And, in fact, I was a little bit confused by what I found to be somewhat conflicting testimony from the 2 CALCTP representatives. The Dr. suggested that CALCTP was really designed to be a forum for establishing minimum certification, minimum training standards and things like that but then the other representative said that CALCTP was the only entity was qualified in order to do that.

I think WECA contractors would strongly support some minimum standards. WECA operates a state approved apprenticeship program that's approved by both the State of California and the Department of Labor. So I think we would be strongly in support of some minimum standards but mandating that only those graduates of the CALCTP program

are qualified I think we would strongly object to that. And similarly for the HVAC programs, although there are, at least in that program, 3 options available for the contractors and the technicians quite frankly my numbers are primarily from a non-union background. I've been told anecdotally, and I think one of the witnesses here today said one of the programs is exclusively union. We've heard anecdotally that at least 2 of the programs have a heavy union emphasis. We just don't think that it's appropriate for the State of California to be making those qualitative decision about which programs work and which don't.

COMMISSIONER DOUGLAS: Okay. Other questions? I don't see any. Thank you.

MR. MARKUSON: I think the questions that were posed and were put upon the board really did — I think your staff did a great job of kind of analyzing some of the challenges, particularly in this short time frame, to get responses from the industry. I did not see those questions on your website. Maybe you can direct me to where they are because we would like to provide some written testimony as well.

MS. BROOK: They're an attachment to the notice so they're in the same document as the notice.

MR. MARKUSON: Wonderful. We didn't see it as

an attachment.

MS. BROOK: Okay.

MR. MARKUSON: But thank you very much.

MS. BROOK: All right.

COMMISSIONER DOUGLAS: Great. Thank you. Thanks for being here.

Dennis Morrin, Sacramento Electric JATC. Training Center. By the time I get through the card you'll be there ready to speak.

[LAUGHTER.]

COMMISSIONER DOUGLAS: Go ahead.

MR. MORRIN: As soon as I heard the first name I got started. I'm Dennis Morrin. I'm the Director of the Sacramento Electrical Training Center. We also run an apprenticeship program which is the JATC acronym.

I come here speaking in favor of the CALCTP program, the California Advanced Lighting Controls Training Program. We've been delivering this training program now for a couple of years. We have nearly 200 local electricians that have gone through it and they're all state certified electricians. It is definitely a benchmark model program for training the workforce and to ensure that when people go out and do the work they can actually do it. And I have to go back to Mr. Ouellette's comment when he talked about the 87 percent passing rate.

If you inverse that and say that's 13 percent failure rate. Yes, some people are failing. Not everybody can do the complexity of this work. And those that can't are not certified so that, in fact, only the people that are going to get the results from the energy savings and the complex controls are the ones that are going to be out there doing the work. It's state of the art training on a specialty skill and we're very much in favor of this program. Thank you.

COMMISSIONER DOUGLAS: Thank you. Thanks for being here.

Andrew Meredith. Andrew Meredith? Did we — we might have lost somebody. I'll call him up again.

Victoria Rome, NRDC.

MS. ROME: Good afternoon. I'm Victoria Rome with NRDC, the Natural Resources Defense Council. I just have a few general comments today.

We think acceptance testing is important. When designed right it serves as an important tool to increase compliance and make sure that we get the savings that are promoted on paper in terms of energy and cost savings.

Now is a good time for the Energy Commission to review and update requirements for who does the acceptance testing. And we would think that — we would urge you to establish specific requirements regarding qualification,

certification for acceptance testers. Specifically we think, unless it's impractical, acceptance testing should be done by an independent party so in other words not the person who did the installation design or manufacturer of the system. In extreme circumstances we understand there may need to be flexibility on that point.

And regarding the specific proposals before you today we think those are a good starting point. We're supportive of those proposals as a starting point and would be happy to provide additional input as you move forward.

Thank you.

COMMISSIONER DOUGLAS: Thank you. Thanks for being here.

Patrick Splitt, App-Tech Inc.

MR. SPLITT: Good afternoon, Commissioner. I'm Pat Splitt from App-Tech. I'm an Energy Consultant from Santa Cruz. I've been one for 30 years and have been to a lot of these workshops.

I thought from the description of this being a workshop that this would be a little different so I didn't have a prepared statement but since I've been sitting here for a long time I've had a long time to write stuff down.

[LAUGHTER.]

So anyway on my blue card I said I opposed this

proposal but basically I'm opposing the timing. I think it's a good idea that people be trained better and get a lot more knowledge but I just don't think we have the time now to get into this. Especially when I review the document that was the basis of this and look at the findings and I see all these problems with the requirements are confusing, not easy to understand, our contractors are unfamiliar with the forms, incorrect forms are commonly used. Just a lot of problems with the process we have now. I think what we're doing is we're putting the cart before the horse. That actually one of the problems we have with the nonres compliance is that this equipment isn't getting installed correctly.

And we're not – I don't see that the Commission is doing much to try to get the equipment installed correctly. We're off talking about, "Well, we've got to check this stuff afterwards." I think it'd be a lot nicer and more efficient if it was installed correctly the first time. And there actually already is a document that has been approved, it's in the standards now, they're called, Installation Certificates. On the residential side they got formatted fairly well and for whatever the contractor is doing these forms sort of spell out what they're supposed to do and which regulations actually comply to what they're doing and it's on the form that the licensed

contractor has to sign and state that he actually installed these things correctly. This is then required to be given to the building owner so they have a record later on if something isn't right who's responsible. In the nonres side those forms sort of exist but they're essentially blank pages. Very little on there. A lot of space where a contractor could fill in things and put requirements onto his systems if he wanted to but why would he do that?

So I think that really, one of the things that needs to happen is we should actually try to implement those forms better and actually try first before we build up a whole new system of certification to test this equipment. What I think first we have to do is actually for mechanical compliance, electrical compliance, whatever. Set up some flow charts. Start with the planning part of the phase, permitting, construction, verification, move-in by the owner and maybe follow up test. Set up this flow chart and at each stage list what the requirements are, who is supposed to do it, what forms are supposed to be filled out and by who and lay that all out and see if you can get — at least most people would agree that the flow chart is right. Because I think right now everybody has something else in their mind about how this is supposed to work. And I think first you have to

lay this out and once you lay it out you can see well a lot of this stuff we're talking about, actually stuff the installers should know how to do, I mean, he doesn't just install stuff and walk away and never turn it on. I mean it should be working when they leave. We're just trying to verify with these acceptance tests so he has to know that somebody's going to come in and this is what they're going to be looking for. And if all that was on the form that he had to sign and give to the building official and to the owner, well his license is on the line. We already have a document to try to get this to work. It's just not implemented very well. So I think that has to be improved. There is a lot of other problems with the forms. People are having problems. There's problems with the compliance software. That you can't actually – even if there's a form where there's a place where I'd like to input something I can't do it. The program just doesn't let me type in anything in that spot. So there's just a lot of things that need to be clean up before we start doing new things. We ought to try to get things that are on the books now working better.

So, now let me just see what I forgot to tell you from my list. So anyway one thing is the responsibility has to be defined in the standards. Right now there's a problem where there's a form where you're

supposed to put who's responsible for doing these tests but nowhere does it say who decides who puts a name in there. So everybody thinks somebody else is going to do it so the place usually gets blank.

MS. BROOK: We've done quite a bit of work on our 45-Day language in that regard and would love to have you review and we can talk about that later.

MR. SPLITT: Okay. Again, who's the responsible party? Everybody thinks it's someone else. I know —

MR. SHIRAKH: We're actually doing a lot of review of the documentation out there of the responsible party, who's signing and all that, run that by you but, you know, we have —

MR. SPLITT: Well, actually, let me switch hats for a second. I'm also Vice-Chair of CABEC and CABEC is very interested as an organization of getting involved in trying to fix those forms.

MR. SHIRAKH: I agree. Forms are part of the manuals. We'll work with you guys as we did in 2008. I think what we'd like to concentrate on now is this proposal in hand. If you have any comments related to this acceptance testing and procedures. We can talk to you about the forms a little bit later.

MR. SPLITT: Well, there are certain things that sort of are involved at, like in the lighting side for the

acceptance test. They're supposed to have somebody done a daylit plan and there should also be a plan for the outdoor lighting. Well, those aren't done and they sort of should be done by the person, for the daylighting plan, by the architect or by the lighting design for outdoor. By the time the acceptance guys get onboard whoever should have done that is long gone and they're sort of having to imagine what a lot of this stuff is. So that's a problem that sort of crosses over from one side to the other.

One thing I noticed is that many people, just a comment here; they mentioned they were members of more than one organization of these TABB groups. So when you get your total of all the people you have to realize that many of them belong to two or more of those organizations and it may not be as many as it looks.

Also, there are some companies, I think more on the electrical side, that specializes in just particular types of equipment. So they have certain brands they install. They have certain controls that they use. And they use these same controls over and over again so they're very, very familiar, factory trained with stuff. So they're actually very good at installing this equipment and operating it and setting it up but they may not have a broad controls background. So there's a lot of people I think that can actually do their job and shouldn't be sort

of pushed out of being able to do their work just because they don't know a lot of stuff that is useless to them.

I guess that's enough. I've got more. You know me so. The main thing is I think we should try to fix what we have on the books right now and put this off until later until we see — it may not be needed. Once we get the installation certificates going and get the installers to actually know what they're supposed to be doing. We may not have all these problems.

MS. BROOK: Okay. Thank you, Pat.

MR. SHIRAKH: Thanks, Pat. You have my number.

COMMISSIONER DOUGLAS: All right. Appreciate your patience in waiting to make the comments. Very helpful.

Johnnie Smith, Hangtown Electric, Inc.

Looks like Johnnie Smith has stepped out of the room or has run out of patience. I'll go on to —

I'm now on cards that I'm either repeating or came up in the last 10 minutes or so. Jon McHugh, McHugh Energy.

MR. MCHUGH: Good afternoon. I'm Jon McHugh and I'm representing myself today. One of the things that I thought I'd first talk about — I know that there's part of this has to do with concern for jobs and I was doing a bit of hand-calc earlier with some help from my friends that,

you know, for the new nonresidential standards we're really, I'd say, replacing electrons with neurons. That there's more effort and more thought and more design into new California buildings that would qualify under these new standards. And so the nonresidential portion of the standards my calculation is is that there's around 740 fulltime jobs per year that are created by the new standards to satisfy the needs of the requirements. For our friends in IBEW the lighting retrofit portion, a fairly substantive change to the standards, which would require when more than 10 percent of lighting is upgraded that the new lighting system has to meet the control requirements and the lighting power density requirements. My estimate is that there's an additional 140 jobs per year that is created by that change in the standards. So, you know, this new standard is a job creator and a kind of similar kind of order of magnitude of, you know, somewhere around 700 additional jobs associated with the residential standards.

So I just wanted to first start out there that to some extent that standards are actually helping all ships rise in terms of construction jobs. And related to the conversation about the standards I'd like to kind of recognize someone who's actually no longer with us. Jeffrey Johnson was a member of the California Energy

Commission staff, then when he worked on this he was with the New Buildings Institute. And the idea of acceptance testing is what I call commissioning light. Its intent was not to be commissioning. It was not be a full blown very sophisticated approach. It was actually based on some fairly detailed research, much of it sponsored by PIER that looked at what are the issues. The sort of the 80/20 rule which is if I take 20 percent of the effort can I uncover about 80 percent of the failures that we see and so based on that kind of research it looked at some fairly simple approaches with some fairly simple tests that would uncover whether or not various failure modes of this installed equipment. So the intent was to not only fix problem systems because you couldn't pass a test if it had this fault because you would fail and so, no, you don't turn into the inspector, "Here's my form that says that it failed." No, I've got to now go back and fix a piece of equipment. Some of these tests were intended to be conducted by the actual installing contractor so the idea is that there would be direct feedback and we would be improving the quality of the installation so that, I think as Pat had mentioned earlier, that people are starting to do it right the first rather than saying, "We're bringing in this third-party. We don't really trust the person who's installing it." We actually believe that when

people don't install equipment incorrectly it's not because they're trying to rip off the consumer. Sometimes it's just a mistake and so what happens is that by applying these simple tests, these simple tests identify some fairly major issues. And so it would be somewhat problematic – it would be changing the scope. I mean, it would be changing the scope from something that is ultimately something that's a self-certification to something that's a third-party certification and that's really sort of the question that's in front of the Commission around this proposal. Because this proposal would say that many of the folks that do install equipment would not be allowed to perform these acceptance tests. Myself and my colleague Matt Tyler over here, after the 2005 standards we actually tested the test with contractors and looked at some of the issues. And Matt, since then has actually done further investigation later on. One of the things in terms of doing the test is that even though TAB contractors and various contractors may be very knowledgeable about controls, the fact of the matter is that these controls can get pretty darn complex, pretty darn quickly. So an acceptance test that would actually disallow the controls contractor from performing the test, I think, potentially would actually increase the cost of the test, make it a lot longer to perform. So I'm not

sure that's really what the intent was. Certainly when we did our cost effectiveness of the test I don't think we were presuming that people are going to be doing these tests were actually going to have to spend quite a bit of time getting up to speed on that particular control system. So the intent is to really encourage folks to actually get it right the first time, the second time, right? After they've conducted the test a couple of times, didn't pass, now I know how to actually make this — install this so the system works.

And this is not just for mechanical but this is also for electrical systems too. And as we heard from Dr. Siminovitch control systems are getting more and more complex. And, you know, CALCTP, which I think is a great program. I think we should be encouraging that but at the same time my understanding is that, for instance, low voltage electricians would not be able to apply, those with the C7 license would not be allowed to have certification nor folks that are controls contractors. Again, kind of keeping out some of the very skilled professions that you'd want to include.

So I guess the end is that I think there's a lot of good in the proposal that people brought forward that we would like to see more training for folks but I also don't think that we want to narrow the scope.

Any questions? Okay. Thank you.

COMMISSIONER DOUGLAS: No. Thank you. Thanks for coming up.

Patrick Pico, Vice President of Advantage Construction Services Division.

MR. PICO: Thank you, Commissioners. Patrick Pico. I'm a TAB technician, supervisor. I've been in the industry professionally for 25 years but pretty much all of my life being a second generation HVAC. You know my dad was in this industry for my entire life and was a contractor in the state. And I've been involved from the training side through the fabrication, the install side, eventually leading me to the testing and balancing side of it.

And listening to everybody speak today, we see the complexities of the issues out there. We're all trying to clear up the complexities and make the system work more efficient. Make all the equipment out there be much more productive and work more energy efficiently.

From my experience what I've seen is that the TAB, and I'm not saying that TABB is T-A-B-B, any of the certifying agencies, those professionals, the technicians, the firms, the supervisors. Those are the people that I see that have been given the proper skillsets to go out and perform these mechanical acceptance tests. That's

what I've seen in my professional career when I've worked full-service mechanicals, the TAB personnel for those firms are the ones that were dedicated to go out and perform these tests. They were the ones with the knowledge of the controls, being able to manipulate and put these sophisticated pieces of equipment into those modes that are required to come up with this data.

So, I was listening when Martha was bringing up our people being taught to fill out this form and we've heard from some of the training centers specifically that they are going specifically after these forms. But I've looked back at what I've seen is yes. They've been giving that, not maybe specifically to that form, but in a much broader sense. All their training on airflow, all their training on instrumentation and which one to use in the proper application. I can teach somebody a procedure but if I give them 3 pieces of equipment that are supposed to do the same thing how do they know which one to use at the proper time. So those are the things that I see any of the certifying agencies that we have out there currently, they've tested people to this level of knowledge. These people have proven proficiency to this level of knowledge and of everybody out there they're the most complete group to be able to fulfill these forms and ensure that equipment that's installed out there is operating to its

most efficient applications.

Thank you very much.

COMMISSIONER DOUGLAS: Thank you.

Andrew Meredith? Andrew Meredith? Going once, going twice.

Matthew Tyler, PECI.

MR. TYLER: Good afternoon, Commissioner and Energy Commission staff. My name is Matt Tyler and I work as a Mechanical Engineer for PECI. I am the principle investigator of the recent PIER project that led to publishing the report on behalf of the CEC that eventually led to opening this can of worms.

So I'm available to answer any questions and provide any clarifications that you might need based on the report content.

In addition I'd like to provide a clarification. Perhaps 10 or 15 minutes ago a speaker mentioned that there are no certifications programs for commissioning providers and that's incorrect. There's actually at least 4 and that includes programs that are administered by AEE, ASHRAE, ECA and University of Wisconsin at Madison.

COMMISSIONER DOUGLAS: Thank you. Mazi, Martha, any questions? Okay. I don't think so. Appreciate you being here.

Johnnie Smith, Hangtown Electric? Or Andrew

Meredith? Looks like we wore both of them out.

How about the phones and WebEx?

MR. WARE: We have a question from George Nesbitt.

COMMISSIONER DOUGLAS: Go ahead, George.

MR. WARE: George, are you there?

MR. NESBITT: Yeah. George Nesbitt. Environmental Design Build HERS Rater.

I think in the residential end we have to remember that we have a certified HERS Rater but the installers have to test 100 percent of their own work but they're not required to have any specific certification.

So I think on the commercial end it's important if we're not requiring a third-party who is certified that we do require the contractor or whoever is doing the acceptance testing to have some sort of certification or qualification.

I'd also say that I think it's probably important that we have flexibility for engineers, contractors, trades people to be able to have that if they have the qualifications and not necessarily say, "You have to have electrical contractors license" or whatever as to be the only one.

I think that would be my – and I definitely also want to echo as a HERS Rater I've worked – I've actually

had almost – I've had no call for nonresidential duct testing and I think a lot of that has to do with the PERF-1 not making HERS verification requirements clear in bold letters. And that, in general, the quality of construction in high-rise residential and other nonres – you know, they're not installing installation right and all the various other things. You do not have credit for doing those right under the Energy Code. That's something I keep hammering on and I'll keep trying, even if it's 2017.

COMMISSIONER DOUGLAS: Thank you, George. Other people online or on the phone?

Looks like most of you – oh. Oh. Is that somebody?

MR. WARE: I had to mute George.

COMMISSIONER DOUGLAS: All right. Well, if there's nobody else online or on the phone it looks like most people made the effort to come here in person. Is there somebody else on the phone who'd like to speak? It doesn't sound like it.

So with that let me turn this back to Martha and Mazi to talk about next steps.

MS. BROOK: So I think we've mentioned this already but just as a follow up we do need to have your written comments placed in our docket by March 5 and we

would very much encourage you to attempt to respond to the questions that are attached as an attachment to the Workshop Notice and if you have any problems finding it let us know and we'll be happy to send it to you.

And then we also talked about the Energy Commission may initiate a parallel rulemaking proceeding to consider adoption of certification requirements or training or criteria for qualifications for these acceptance tests for the nonresidential standards for inclusion in the 2013 standards update.

And that's all we have.

COMMISSIONER DOUGLAS: All right. So with that I'd like to thank everybody for being here and for providing your ideas and information and expertise and lending it to us today. We'll look forward to next steps on this and, again, really appreciate you being here. So, with that, we're adjourned.

(Whereupon, at 4:43 p.m., the workshop was adjourned.)

REPORTER'S CERTIFICATE

I do hereby certify that the testimony in the foregoing hearing was taken at the time and place therein stated; that the testimony of said witnesses were reported by me, a certified electronic court reporter and a disinterested person, and was under my supervision thereafter transcribed into typewriting.

And I further certify that I am not of counsel or attorney for either or any of the parties to said hearing nor in any way interested in the outcome of the cause named in said caption.

IN WITNESS WHEREOF,

I have hereunto set my hand this 21st day of March, 2012.

Peter Petty

PETER PETTY
CER**D-493
Notary Public