

Workforce Education & Training Subcommittee Meeting Notes

January 17, 2012

Call to Order

Meeting was called to order at 2:03 p.m. PDT

Roll Call

Listed alpha by first name

Bill Parlapiano	PECI	Lance Clark	SMWIA Local 105
Bonnie Gustavson	WHPA Staff/BBI	Mark Lowry	RSES
Chris Compton	HVACRedu.net	Mark Ouellette	ICF International
Chris Ruch	Final Air Balance Co., Inc.	Pepper Hunziker	Percipio Consulting Group (on behalf of SCE)
Daniel Jones	Honeywell ECC	Rob Falke	National Comfort Institute (NCI)
Darrow Soares	Mt. San Antonio College	Robert Mowris	Verified
David Dias	SMW Local 104	Roger Mason	SMWIA Local 104
Don Tanaka	SoCal Pipe Trades District Council 16	Scott Johnson	National Comfort Institute (NCI)
Ean Jones	Verified	Sherard Jones	IAPMO
Ellen Avis	U.C. Berkeley Labor Center	Steven Allen	Green Mechanical Council
Erik Emblem	JCEEP	Susie Evans	IHACI
Gary Andis	NEMI (National Energy Management Institute)	Tiger Adolf	Building Performance Institute (BPI)
Gary Girardi	PG&E	Tom Morton	PIPE Trust Fund
Hugo Aguilar	IAPMO	Tom Tebbe	HVAC Excellence
James DeVoe	Delmar, Cengage Learning	Warren Lupson	AHRI
Jeff Henning	MSDC	Zachary Connolly	KEMA Services
Jill Marver	PG&E		

So as not to be repetitive, the organization names will not be repeated in the body of the notes. The individual names of meeting participants will be used.

Reports from Working Groups and Q&A on Working Group Reports

WE&T Codes and Standard Working Group, Hugo Aguilar, Chair:

We have identified the following gaps:

- The CEC does not have a curriculum that benefits both mechanical inspectors and contractors.**
With regard to the energy codes, we found that not enough education is being provided, and that could be resolved with collaboration between the CEC and IAPMO.
- Lack of code change education. Code change education for all parties, installers, inspectors, plan checkers, contractors is recommended:**
 - Courses for plan checkers and inspectors should be offered in a yearly basis.
 - Courses on filling out forms should be offered in a yearly basis.
- Building departments have opted to lay off mechanical and plumbing inspectors and utilize "building inspectors" to do the mechanical inspections (these are known as cross-discipline inspectors).**
 - Provide assistance to mechanical inspectors out in the field.
 - Certification.
 - Counties and cities to offer free permits for certain compliance.
- Contractors are not properly trained for implementation of the new and existing codes.**
The State Licensing Board should provide testing every three years.
- To certify California Energy Commission (CEC) to comply with Title 24.**
This will require audits or check-ups of building departments where you find areas which need improvement and notify appropriately. These audits used to be done but are no longer.
- City councils and elected officials are not well educated on the needs and importance of enforcement of codes.**
 - Auditing building departments is not effective if the data found is not shared correctly. Therefore, elected officials and city councils should be trained to know what to expect and what information is important.
 - Pass legislation that will provide enforcement of the CEC code.
 - Develop workshops.

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Questions, Comments, and Concerns:

Erik Emblem: When we're talking about CEC Title 24 classes being developed by the Energy Commission, do you see those classes as mandatory for inspectors, plan checkers, technicians, and contractors?

Hugo Aguilar: There was no discussion as to those classes being mandatory; however, in my opinion, I believe they should be. That would be the only way to verify that all the training is being provided to all the correct departments.

Erik Emblem: When you were talking about building department audits, was that with the CSLB, the Contractors State License Board?

Hugo Aguilar: The CSLB would be the department that would provide the retesting and certification for all the individuals not the building department audits.

Erik Emblem: The recommendation is for retest on codes.

Scott Johnson: As far as the CEC auditing and billing departments, it would be the same thing as was done in the early 1990s. Another issue that I've seen in the southern California chapters is that training was limited to only about 45 minutes, and that isn't enough time to get in comprehensive training. A note should go out to at least these chapters on this issue.

Hugo Aguilar: Time will be an issue that we can discuss when we generate the curriculum; but it's not something that can be done in a lunch-and-learn; it will require a lengthy seminar.

Erik Emblem: The IAPMO chapters try to get everything into a lunch period, but we need more comprehensive training.

ACTION: The need for more comprehensive training time should be entered into the report.

Scott Johnson: IHACI already has comprehensive training on Title 24.

ACTION: If anyone has comments to this report, Hugo would like them by email or by telephone.

WE&T Certification Working Group, Darrell Soares, Chair

Our group identified four gaps.

Gap #1: There does not appear to be an attainable certification to measure a technician's knowledge of energy efficiency. There are a lot of certificates out there, so the solution with was to identify, confirm, adopt, and groom the existing certificates. When we say "groom," we mean bring in standards to test energy efficiency, which will take creating another Working Group or panel with someone who is neutral who can moderate the process of confirming and adopting these existing certificates in the industry. Although we came up with only six certificates—based upon the number of people and the types of input our working sessions—there are probably other working certificates that can be listed. The basic solution is to develop and identify obtainable certifications.

Gap #2: We do not have a system in our industry to identify and manage the number of unduplicated HVAC technicians who hold competency-based certifications. The solution would be to police ourselves, self-identify, and not rely on the Employment Development Department or any other government organization to do that for us. "Self-identification" is explained in our Report. At this time, we find no one committed to holding and managing such a database because of funding. We suggested that IHACI might be a good neutral party for that effort.

Gap #3: There does not appear to be an immediate incentive to certify technicians. We suggest that the IOUs offer incentives to both homeowners and contractors.

Gap #4: The HVAC programs at existing educational organizations—like high schools and community colleges—cannot prepare future technicians for certification if the instructors themselves are not certified or if the programs are not accredited. There's discussion about at what level we would require certification, but there was not a conclusion reached. However, we did identify high school programs, proprietary schools, and community colleges that are turning out students with certifications where the schools are not accredited and the instructors are not certified.

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Questions, Comments, and Concerns:

Scott Johnson: National Comfort Institute and National Balancing Services should be included since this is a residential application. NCI is the only one that actually has a residential certification.

ACTION: Include National Comfort Institute and National Balancing Services

Darrow Soares: That should come out as we identify the existing certifications, confirm, adopt, and continually groom them to include energy efficiency. Anyone can come to the table, but it would be left to the group to actually formalize it.

Daniel Jones: When I discussed the WE&T Subcommittee's work with university, colleges, junior colleges, and state colleges, they appear to be "on board," so I think there will be receptive audiences with educational facilities as well as with the unions.

Darrow Soares: Are they ready to "jump" on accreditation and certifying their instructors?

Daniel Jones: Yes, and their students are also ready.

Erik Emblem: We will keep tapping your expertise in this area, Darrow, because it is a key component of the Long-Term Strategic Plan's Workforce Education and Training goals that leads towards certification. However, we must have this clearly defined.

WE&T Residential QI/QM Working Group, Roger Mason, Chair

- One of the major problems is that there is a lack of skilled workers performing the work in the industry.
- Chris Compton (HVACRedu.net) introduced statistics on testing, although the average tech scores come out pretty low.
- Local permitting offices need to have a standard for HVAC inspections.
- In order to meet Net Zero Energy by 2020, we need to make sure that HVAC systems are installed to design specifications and operating accordingly.
- Installers and technicians should understand and follow recommended service and installation instructions from manufacturers and from WHPA WE&T committee.
- We need to require training, mentoring, and technical support for HVAC installation and service work. We targeted some of the problem areas, and found a lot of the problems were in the residential sector from increased air flow on existing systems, especially on the return air side of the system during retrofits.
- We need to verify that the thermal expansion valves are installed correctly. We have a case report by Robert Mowris, Verified Inc. (see Working Group Report), shows that there's a need for diagnostic information for non-condensables in the system, and this comes up because some of the charging charts are in conflict with what we have with the CEC of not showing non-condensables in the system.
- We need to make sure that recovery and evacuation procedures are followed per the CEC Title 24. If they are, we need to document accordingly and that the work has been performed.
- There's a need to look at the accuracy of the thermometers and gauges that the techs are using out in the field. There appears to be a wide variety in the quality of measuring instruments.
- Increase the number of permits that are pulled on the HVAC systems being replaced. The retrofit and new construction areas seem to be a large problem: they are not doing duct testing and they are getting jobs confirmed without permits.
- Consumers and HVAC technicians need to know how to evaluate that the system has been properly installed and maintained. Because consumers don't know, we have to get information to those consumers on how to know if the system has been properly maintained and installed according to Title 24 codes.
- Require procedures for Quality Installation per ASHRAE/ACCA Standard 5 for all newly installed systems.
- Require procedures for Quality Maintenance per ASHRAE/ACCA Standard 4 for all tune-ups and service work.
- Require all C-20 contractors and/or their technicians to use CEC-approved refrigerant charge testing procedures any time refrigerant is tested.
- Require specific training for workers performing HVAC work. For example, state-approved apprenticeship programs, trade schools, community colleges, and on-line training should require 40%-50% lab training (either in the field or in the shop) and not just book training.
- Require all HVAC technicians to be licensed by the state of California and be able to pass an exam given by the state of California. The exam should be made up by WHPA, ACCA, ASHRAE, NATE, IHACI, Sheet Metal Workers ITI, SMACNA, CEC, etc. and it should be taken every 3-5 years. In addition, it would require that they attend an apprenticeship program, trade school, community college, or online training in order to have the license.

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- We came close to saying that C-20 license holders should be tested every 3-5 years, but we felt that should be decided by the main committee. However, if the C-20 license holder is listed as “sole owner” and is also the technician performing the work, they should be required to re-test every 3-5 years just like the technician.
- The C-20 exam should include questions on proper installation and maintenance procedures and we should have a continuing education requirement for the license holder.
- We discussed air flow, expansion valves, and proper maintenance of vacuum pumps—a problem that showed up in the report from Robert Mowris.
- With regard to statewide policy or guidelines for HVAC systems’ inspections, codes could be understood differently in other cities and counties in California. Since may have local codes that more or less stringent than the Uniform Mechanical Code, training should be provided to building inspectors on appropriate standards.

Questions, Comments, and Concerns:

Scott Johnson: It would be interesting to get another Working Group concentrating on fluid dynamics and psychometrics. I would love to be part of that if that goes forward.

Erik Emblem: There seems to be a bit of overlap among the Certification, Codes and Standards, and your Residential QI/QM Working Groups. Roger, the Certification Report mentioned not requiring what you call a state license for technicians. They were calling for more of a clearing house of information that would maintain various certifications. Is that true, Darrow? I see this link between key findings in QI/QM Residential and Certification.

Darrow Soares: We identified that there is no accurate way to determine how many technicians are certified because many of them carry multiple certifications but with unduplicated numbers, and we don’t have access to them. Whatever the certification is, we as an industry in California would have to manage that. We can’t leave that up to anyone else, especially a state or federal organization because they have their own standards. We’re mostly interested in meeting Net Zero Energy by a particular time. In order to do that, certification seems to be one of the prime factors in that, so we need to know how many of what certifications we have.

Erik Emblem: There’s a cross-intention between the recommendation of the Residential QI/QM and that and they’re suggesting a state license.

Darrow Soares: I think where the overlap is and where we have to collaborate is our Gap #1—the attainable certification measuring a technician’s knowledge of energy efficiency. All we identified is, “One does not exist,” and what Residential QI/QM is saying is, “What is it?” So, if someone identifies it for us, we can manage it.

Gary Andis: Roger, on our Certification report we had different people with different certifications. We had some with NATE certification with air distribution, oil, gas furnaces, and air conditioning. Our problem was making sure we didn’t have someone with oil and air distribution certification installing heat pumps and making sure the certification was actually in the type of work they were doing. Roger, you’re talking about licensing and an exam, but you also have a lot of mandated training with that. Would your licensing exam cover all aspects of HVAC (they’d have to know air distribution and heat pumps and gas furnaces) or would it be a specialized license for each category?

Roger Mason: The point was that there had to be certification. Yes, there is a broad spectrum with different types of work that they would be working on, but we felt that the different organizations that do training now need to sit down together and come up with an actual certification. You’re right that it would have to be specific to what the people are working on.

Scott Johnson: Why don’t we identify what a system’s performance really means and all the related disciplines?

Darrow Soares: That’s sort of the direction that we were going, but we didn’t want to “reinvent the wheel.” It was Chris Compton and Pepper Hunziker’s solution to Gap #1: “To convene a panel of knowledgeable and experienced individuals from each of the certification agencies.” From that group, confirm that they all meet the same competencies, adopt them as recognizable, and then groom them into an existing certificate that covers energy efficiency.

Susie Evans: That was my interpretation. We did not want to reinvent the wheel.

Tom Tebbe: I would like to go back and address tracking or developing a database for certifications. The Working Group and the different certifying bodies are certainly willing to address the issue of someone having similar certifications from NATE, from HVAC Excellence, and from other certifying bodies. If I understood correctly, we need to have a tracking system that if my agency went to certify someone by the name of Joe Blow and NATE certifies Joe Blow and another

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certifying body certifies Joe Blow, it actually only shows up as one individual being certified in California rather than three separate certifications. Am I correct in assuming that what we want is the actual number of certifications held by technicians?

Darrow Soares: That's my impression too that we want to count individual technicians and their certifications rather than saying how many technicians are certified through NATE, HVAC Excellence, NCI, etc.

Erik Emblem: This emphasizes how important this whole group is, how much work has already gone in, and how much more work needs to be done. We will let the Executive Committee know and recommend to them that there is still work to be done. We could convene this same group, maybe add to it, and continue the work. You've done a terrific job of identifying areas of need; we can see elements of significant agreement among the disciplines; now we need to bring it all together to transform the industry in quality installation and quality maintenance?

WE&T Commercial QI/QM Working Group, Tom Morton, Chair

Where are we today?

1. Contractors and technicians are working in the industry with a very broad spectrum of skills, only a few are highly skilled and qualified to perform quality performance work.
2. There is a lack of continuity and coordination in building design, construction, installation, maintenance, and service. Often the service techs are being asked to "fix" a system that was never installed or maintained properly.
3. Most buildings don't have a baseline measurement of current performance to compare to when improvements are done.

Where do we need to be?

1. All workers need to understand quality workmanship in building performance.
2. All buildings need to be evaluated for their energy performance levels and upgraded by design in order to achieve Quality Installation Net Zero Energy.
3. Buildings must be maintained and serviced according to best practices for quality maintenance to maintain building peak performance.
4. Buildings will need to be measured using standardized criteria throughout the service and maintenance cycle.
5. Quality diagnostic tools must be used properly in order to gather accurate measurement data.
6. The building performance program needs to have some "teeth in it" to drive building owners to get the needed work done and to force workers to perform quality work—which means educating the customers.

What are the Gaps?

- There are sufficient education and training programs available for installers and technicians, but they do not avail themselves to learn what they need in order to do quality workmanship. They're "skirting the system" because they just don't feel it's necessary.

How do we fill the gaps?

- Focus on workforce education and training about building performance strategies and requirements from the engineering design phase through the construction, installation, inspection, maintenance, and service levels of the workforce so everybody is addressing the same set of guidelines in a cohesive manner.
- Establish design teams to get the contractor and the equipment operating personnel involved at the front end, getting the people who will be maintaining the equipment involved in the beginning of the process. Get away from the cycle of whose-fault-is-it and get to the cycle of let's-get-the-design-correct-up-front with the help of those who know what they're doing.
- In order to provide a real picture of energy savings, we need to know how the measurement of current performance assessment is performed and how the resulting energy improvements will be measured after work is done. It's not a one-time deal where one person goes out, does the work, and that's it; we want to go back every 3 months, 6 months, or 9 months to stay on top of the issues and evaluate them.
- When a new building is commissioned, there needs to be a start-up test assessment. If it doesn't meet Net Zero at start-up or commissioning, the design/construction contractors need to fix it. There are so many buildings that were designed a certain way but never built that way.
- We want to make sure that customers are educated enough so they know how to ask for technicians who have certifications—which means customer education.
- Leverage for quality workmanship and technician certifications needs to be established:
 - Utility companies could require technician/contractor certifications.
 - Customers could demand them.
 - Mandate that the building owner will make sure that the contractors doing the work are qualified and in compliance.
 - The state could require licensing.

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- Equipment manufacturers could require certifications for installation and warranty work.
- Like the electrician requirement in California, have HVAC workers licensed. This has been discussed at least for 12 years. There are the key certifications already discussed in the Certification Report. As far as the utilities go, we went with the certifications listed in the Certifications Report.

WE&T Sales Force Training Working Group, Daniel Jones, Chair

Erik Emblem: We have one more Working Group that's ready to engage. Daniel Jones has volunteered to head up the Sales Force Training Working Group.

Daniel Jones: I am interested in having those of you from the other Working Groups come on board to talk about Sales Force side of things. I will be launching in February.

ACTION: If you would like to join this Working Group, please contact Daniel Jones or Erik Emblem.

Erik Emblem: Another important component of QI and QM is the sales force. We're not interested in over-selling or under-selling energy efficiency, but we need to deliver a quality job to the actual building owner—the person writing the check.

Final Combined WE&T Report

Erik Emblem: There's cross-footing among the various reports and it will come together in one report. The Working Groups' reports will need to be pulled together into one readable report. Once the report is completed, you will have an opportunity to provide feedback. As that develops, I will keep everyone informed.

Next Meeting

The next WE&T Core Meeting will be on Tuesday, March 13, 2012, at 2:00-3:00 p.m. PST.

Meeting was adjourned at 3:02 p.m. PST.