

BEFORE THE
CALIFORNIA ENERGY COMMISSION

Draft 2013 Building Energy)
Efficiency Standards Revisions) Docket No. 10-BSTD-01
for Nonresidential Buildings)

CALIFORNIA ENERGY COMMISSION
HEARING ROOM A
1516 NINTH STREET
SACRAMENTO, CALIFORNIA

THURSDAY, OCTOBER 13, 2011
9:00 A.M.

Reported by:
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Commissioners Present:

Karen Douglas

Staff Present:

Mazier Shirakh

Martha Brook

Gary Flamm

Ron Yasny

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Tom Culp

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1 P R O C E E D I N G S

2 OCTOBER 13, 2011

9:04 A.M.

3 MR. SHIRAKH: This is Mazi Shirakh. We haven't
4 started yet, but for people who are on the phone, we're
5 getting a lot of background noise, static. If you can,
6 mute yourself or move the microphone because it's very
7 loud here in the Hearing Room.

8 MS. BROOK: Just for everybody on the phone and
9 those of you in the room, we are going to wait for our
10 Commissioner to arrive before we begin the meeting, but
11 since it's a committee workshop, she's going to be the
12 head of the day, so we're waiting for her.

13 Good morning. Just a few housekeeping items
14 before we begin. For those of you not familiar with this
15 building, the closest restrooms are located over there,
16 outside the room over there. There's a snack bar on the
17 second floor under the white awning. And in case of an
18 emergency, the building will be evacuated. Please follow
19 our employees to the appropriate exits, we'll reconvene
20 at Roosevelt Park which is across the corner there,
21 located diagonally across the street from the building.
22 Please proceed calmly and quickly. Again, follow the
23 employees with whom you are meeting to safely exit the
24 building. [Pause]

25 COMMISSIONER DOUGLAS: Good morning. I'd like to

1 welcome everybody to this workshop on the Draft 2013
2 Building Energy Efficiency Standards. We noticed this as
3 a committee workshop, but as some of you may know, we
4 have made some changes in the way that we operate, and so
5 this is now a Commissioner workshop. Commissioners are
6 being assigned different issue areas that they have
7 expertise and experience in and, so, this workshop is now
8 for my benefit to hear from stakeholders, and
9 stakeholders' opportunity to speak to the assigned
10 Commissioner about the Standards.

11 I will be very interested in what you have to say
12 and I'll be looking forward to potentially working with
13 stakeholders, and definitely working with staff on issues
14 that are raised today and, then, of course developing a
15 proposal that I would take and recommend to the full
16 Commission. So, welcome, in any case. My name is
17 Commissioner Karen Douglas. To my right is my Advisor,
18 Galen Lemei, to my left, my Advisor, David Hungerford.

19 With that, let me ask the staff to take this and
20 introduce yourselves and get started.

21 MS. BROOK: Great. I'm Martha Brook, I'm an
22 Engineer in the Building Standards Development Office,
23 and I'll be kind of MCing today's workshop. You
24 hopefully grabbed an agenda so you won't have to try to
25 squint and read what I just put up online. Just to

1 remind you, we are talking about nonresidential standards
2 updates today; tomorrow we'll be talking about
3 residential standards updates, as well as the
4 administrative sections. We're also talking about
5 Section 110 tomorrow, which covers both Res and Nonres.
6 I actually have one slide to follow today that will
7 introduce the beginning because I was sort of in this
8 Nonres mind bent, and so I went ahead and did a Nonres
9 slide for 110, so that might get covered on both days.

10 Anyway, this is an updated Rulemaking Calendar
11 for the upcoming proceeding. We updated it about just
12 probably a few days ago and reposted it. It reflects
13 more time to hear from you today and to respond to the
14 comments we hear in the next two weeks on the staff draft
15 proposed changes and that required kind of pushing things
16 back a little bit. So, instead of a March 7th adoption
17 date, which is what we previously had, that's now planned
18 to happen on April 4th. Everything else is pretty much
19 the same. Basically, all of that kind of slippage is in
20 this beginning period where we wanted to make sure we had
21 enough time to respond to your comments. So that is all
22 I have to say about the calendar.

23 And the other thing is, before we jump into the
24 updates, I wanted just to provide a little bit of
25 background. Most of you have been participating with us

1 over the last year or more on the staff development of
2 the updates. We've had 11 staff workshops starting in
3 April this year and going through August. Before that,
4 hopefully many of you participated in the stakeholder
5 meetings that the investor-owned utility consultants held
6 for the individual measure topics to flesh out issues and
7 resolve them early. The staff thinks that has been a
8 very successful process and are very happy to have the
9 collaboration of the Codes and Standards Program that's
10 publicly funded through the Investor-owned utilities.

11 The other thing I wanted to mention is that today
12 we are going through standards language changes, we're
13 not going to be talking about every change to the
14 referenced Appendices. Many of the changes in the
15 standards reference a change in the Appendices, but we're
16 not going to go through those in detail. The other thing
17 we're not going to be talking about in the next two days
18 is the ACM Approval Manual, that's not quite ready, it
19 will be complete within the next 10 days and posted. And
20 we can still accept comments on that within the same
21 period that we're taking comments for the staff draft
22 that we present in the next two days.

23 Are there any questions about what I just said?
24 Otherwise, I'll keep going. Oh, and maybe just process-
25 wise, what we expect is we do have planned breaks for

1 comment after each major section and we'll just ask you
2 to come up to the mic, you'll have to introduce yourself
3 so it can be recorded, your name and affiliation, and I
4 think that's all I have to say about process.

5 UNIDENTIFIED SPEAKER: When are comments due?

6 MR. SHIRAKH: Two weeks from tomorrow. It's, I
7 think, Friday the 28th of October, I believe.

8 MS. BROOK: Okay, so now we're going to jump in
9 and, again, this is just two items that are non-
10 residential building-related in Section 110, which is the
11 Mandatory Requirements for Space-Conditioning Equipment.
12 And the whole section on 110, again, will be covered
13 tomorrow; but just for consistency, because some of these
14 mandatory requirements are referenced later on in other
15 Code Sections, we've updated the Efficiency Tables for
16 Water Chilling Packages to match ASHRAE 90.1 and we've
17 included a non-standard equipment efficiency calculation
18 that again was developed in ASHRAE 90.1, and so we've
19 adopted that non-standard efficiency calculation process.

20 And then we've also added Closed Cooling Tower
21 Efficiency Requirements to the Heat Rejection Equipment
22 Table. And then the other thing that I think is worth
23 mentioning in this section is that we've got new
24 requirements for Evaporative or Open Cooling Towers, and
25 this is the big water saving measure that we're doing for

1 the 2013 Update. Basically it's installing controls that
2 maximize cycles of concentration and documenting the
3 maximum cycles of concentration using a Commission
4 provided calculator and new requirements for flow meters,
5 overflow alarms, and efficient drift eliminators for
6 these cooling towers. And statewide, the first year of
7 water savings for these measures is expected to be over
8 30 million gallons of water.

9 Okay, so now we're moving on to Section 120,
10 120.2 are the Required Controls for Space Conditioning
11 Systems. The first item (c) that was updated is
12 Operation and Control Requirements for Minimum Quantities
13 of Outdoor Air. We've added occupant sensor ventilation
14 control device as a type of control suitable for demand
15 control ventilation. And we've added new requirements
16 for the functionality and installation of occupant
17 sensors that are used for ventilation control devices.

18 Section (e) is Shut-off and Reset Controls for
19 Space-conditioning Systems. We added requirements to
20 setup and setback temperature set points and reset
21 ventilation rates in unoccupied classrooms, conference
22 rooms, and multipurpose rooms.

23 There's a new requirement for Economizer Fault
24 Detection and Diagnostics, and so all economizers for
25 air-cooled, unitary Direct Expansion (DX) units are

1 required to have a Fault Detection and Diagnostic (FDD)
2 system. And the system requirements for this FDD system
3 is specified in the Nonresidential Appendix 9.

4 §120.3 - maybe one thing I should mention
5 because I don't know if we've ever made an announcement
6 about this, but we are changing the numbering scheme for
7 the standards and, so, the numbers in parentheses there
8 are the old section numbers and the section number that
9 is listed up front is what we've changed to. And this
10 was required because the old numbering scheme was
11 constrained in being able to add subsections. So we've
12 gone to this decimal numbering scheme that allows, we
13 think, infinite, not that we want to develop infinitely
14 long standards, but we have more room now. So I
15 apologize for not saying that at the beginning.

16 So §120.3 are Requirements for Pipe Insulation
17 and we've updated insulation levels in Table 120.3-A to
18 match ASRAE 90.1.

19 §120.5 (125) are the Required Nonresidential
20 Mechanical System Acceptance Tests. And this section
21 basically introduces all of the Acceptance Tests that are
22 required and they are described in Nonresidential
23 Appendix 7. So we've eliminated the need to do
24 acceptance testing for factory installed economizers.
25 We've added acceptance tests for supply air temperature

1 reset and condenser water reset controls. And then we've
2 added text in there to explain that, if an Energy
3 Management Control System (EMCS) is installed to function
4 as a thermostat, then it must functionally meet the
5 thermostat requirements in Section 110.2.

6 §120.6 (126) is Mandatory Requirements for
7 Covered Processes. In the 2008 Standard, this section
8 was called Mandatory Requirements for Refrigerated
9 Warehouses. Now we've expanded this section to cover all
10 covered processes and reorganized it so that the first
11 element of this section is the refrigerated warehouse
12 section.

13 So, we've made some changes to the refrigerated
14 warehouses code, we've added definitions for freezers and
15 coolers, and replaced the references to frozen storage
16 and cold storage because they were misleading, and
17 freezers and coolers is the more industry accepted terms
18 and we've kind of clarified the Code in that way. We've
19 revised the space and surface insulation requirements,
20 clarified requirements for variable speed fan powered
21 evaporators.

22 We've increased the scope of design temperature
23 requirements for fan powered condensers to include water-
24 cooled condensers. We've added condensing temperature
25 reset controls, efficiency requirements for fan powered

1 condensers, and clarified the requirements for variable
2 speed screw compressors.

3 There's a new requirement for screw compressors
4 to vary the compressor volume in response to pressure,
5 there are requirements for freezer and cooler
6 infiltration barriers, and new acceptance tests for
7 electric resistance under slab heating systems,
8 evaporator fan motor controls, air-cooled condensers, and
9 variable speed compressors.

10 So the rest of this section is new for 2013.
11 There are other covered processes that we've brought into
12 the Code for the first time. The first of these is
13 Mandatory Requirements for Commercial Refrigeration. And
14 there is a definition in the proposed language for what
15 type of grocery stores, the scope of, the range of
16 supermarkets and grocery stores that are covered under
17 these requirements.

18 We have requirements for variable speed
19 condenser fans, condensing temperature reset controls,
20 minimum condensing temperature set points, efficiency
21 requirements for fan-powered condensers, compressor
22 suction temperature reset controls. We have liquid
23 subcooling requirements for low temperature, parallel
24 compressor systems, we have display case lighting
25 occupancy or time switch control requirements, upright

1 low-temperature display cases must have reach-in glass
2 doors, and heating and cooling systems must recover a
3 portion of the available heat from refrigeration systems
4 without significantly increasing the HFC refrigerant
5 charge.

6 So before I move on, I just wanted to mention
7 that we developed the commercial refrigeration proposed
8 standards in collaboration with the California Air
9 Resources Board, and they're very interested in
10 partnering with us to look at the combined benefit of
11 efficiency and reduction of greenhouse gas emissions. So
12 that last requirement was an example of where we had to
13 make sure that -- we wanted to improve the efficiency by
14 adding heat recovery, but we didn't want the systems to
15 increase their charge of refrigerant to accomplish that
16 because there's greenhouse gas emissions involved in that
17 trade-off.

18 The next section of §120.6 is Mandatory
19 Requirements for Enclosed Parking Garages. These
20 requirements apply to garages with design exhaust rates
21 greater than 10,000 cfm. They must automatically detect
22 contaminant levels and reduce fan airflow 50% or less
23 while maintaining these acceptable contaminant levels.
24 The fan motor demand needs to be less than or equal to 30
25 percent of the design wattage at 50 percent of airflow;

1 in other words, you can't just reduce the fan airflow and
2 not reduce the fan power, that needs to be a comparable
3 reduction in motor demand.

4 The Carbon Monoxide concentration must be kept
5 at less than 25 ppm at all times; the ventilation rate of
6 0.15 cfm/sff must be supplied for all scheduled occupied
7 periods of the garage.

8 Specifications for the CO sensor include how
9 many you need, the redundancy of the sensors, where they
10 must be located, how they need to be calibrated, and how
11 their performance needs to be monitored. And there is
12 also a ventilation system acceptance test included in the
13 non-residential appendix.

14 The other new Covered Process is Commercial and
15 Process Boilers. So, for new boilers larger than 2.5
16 MMBtu/hr, these boilers must have combustion air positive
17 shut-off devices. The combustion air, fan motors greater
18 than 10 hp need to be variable speed or have a way to
19 reduce the motor demand such that, again, the demand is
20 30 percent of the wattage at half of the airflow.

21 And then even larger boilers, larger than
22 5MMBtu/hr must maintain excess oxygen less than or equal
23 to five percent by volume. And process boilers, those
24 serving process loads greater than 10MMBtu/hr must
25 maintain excess oxygen at less than or equal to three

1 percent by volume.

2 We also have requirements for compressed air
3 systems. Compressed air systems greater than or equal to
4 25 hp -- and this is, you know, groups of compressed air
5 systems, it would be the whole group that would have to
6 be bigger than 25 hp for these requirements to apply.
7 There are requirements for trim compressors and primary
8 storage. The compressed air system controller --
9 actually, there needs to be a compressed air system
10 controller installed and there's compressed air system
11 acceptance testing requirements.

12 Okay, so now we're moving on to §120.7 and Mazi
13 is going to cover this one. We're going to go through
14 all of the §120 section and then stop for questions, so
15 if you can be patient, that would be great.

16 MR. SHIRAKH: So this is a new section. We've
17 never had for Nonresidential Buildings Mandatory
18 Requirements for Envelope, we've always had it for
19 Residential Buildings, so this is all new. And
20 typically, Mandatory Requirements are set at levels way
21 below the Prescriptive requirements, so this doesn't
22 impact the standard budget for the building by any means.
23 All it means is that, if you're doing tradeoffs, you
24 know, there's going to be some stops, there's only so
25 much trade-off you can do against building envelope.

1 Currently, it's possible to go to zero insulation, not
2 that anybody is doing it, but it is possible. So this
3 basically puts some stops at some levels, limiting trade-
4 off against building envelope, which we think is the best
5 defense for energy efficiency.

6 So there are requirements for roofs, walls, and
7 floors. For the roof insulation for metal buildings, the
8 average weighted U-factor must exceed 0.065. Again, for
9 roofs, wood framed weighted average U-factor must exceed
10 0.075.

11 For wall insulation, metal building's weighted
12 average U-factor cannot exceed 0.113.

13 The metal framed weighted factor cannot exceed
14 0.098.

15 For mass walls, the U-factor cannot exceed
16 0.44.

17 And for wood framed weighted average buildings,
18 U-factor cannot exceed 0.110.

19 And for floor insulation assembly, they cannot
20 exceed the U-factor of .071.

21 MS. BROOK: Okay, the next section is also new,
22 §120.8, it's sort of new, and I'll explain why. The
23 California Building Code actually includes building
24 commissioning requirements, they're currently in Title
25 24, Part 11. And that is our Green Building Standard,

1 but it is a requirement for all buildings greater than
2 10,000 square feet. And during the process of developing
3 additional commissioning requirements for Part 6, our
4 stakeholders encouraged us to combine all commissioning
5 requirements into one place and to place them in Part 6.

6 So what we've done in this section is copied
7 the Building Commissioning Code Requirements from the
8 2010 California Green Building Standards. We've removed
9 some of the redundant requirements in that section. And
10 we will be adding a clarification note in the 2013 Green
11 Building Standards stating that all energy system
12 commissioning requirements are now in Title 24, Part 6,
13 Section 120.8.

14 Then, the next thing we did is we added design
15 phase commissioning requirements to the set of Building
16 Commissioning requirements. And I'll explain that next.

17 So the Summary of Commissioning Requirements
18 looks like this. All of these except for 3 are already
19 in the Building Code. So they are 1) owner's and owner
20 representative's project requirements; 2) the basis of
21 design; 3) design phase design review, which we added; 4)
22 commissioning measures shown in the construction
23 documents; 5) commissioning plan; 6) a functional
24 performance testing requirement; 7) documentation and
25 training; and 8) a Commissioning Report.

1 The new parts of that, I will explain on this
2 slide. Design phase design review, basically tried to
3 add the part of commissioning that really helps a
4 building owner get what he expects to get out of the
5 building by making sure that the design intent is
6 captured in the construction documents and that all
7 available efficiency opportunities are discussed, and the
8 owner is aware of those opportunities. So that's the
9 intent of this Code language.

10 So we have design reviewer requirements that
11 vary by building size and system complexity. So, for the
12 very smallest and simplest buildings, the design team can
13 do their own design review for medium-sized buildings
14 with relatively simple HVAC system. There can be
15 somebody on the project team that does the commissioning,
16 but they can't be directly involved in the design of the
17 building. And then, for the most complex systems and
18 largest buildings, it needs to be an independent reviewer
19 that provides the design review.

20 The schematic design phase, there's a
21 requirement for a kick-off meeting with the owner, the
22 design team, and the design reviewer, and they complete a
23 design review checklist, which is now a compliance form
24 that they go through and basically look at best practices
25 that we've referenced in the compliance form, and just

1 check that they've talked about them and that they decide
2 whether they're applicable or not applicable to the
3 building.

4 And the two compliance forms that I'm talking
5 about now are posted for today's workshop in case anyone
6 is interested in what they look like, and I think there's
7 a folder we created yesterday called "Reference
8 Material," or something online that will have these
9 example forms.

10 And then the final stage of the design review
11 is, during the plans and specifications design phase,
12 there will be a design review where, again, there's a
13 compliance form with list items to check off so that the
14 commissioning measures and the efficiency measures are
15 actually identified on the plans and specs and there's
16 just a real simple form to complete to verify that.

17 So that is all we have for Section 120 and
18 we're encouraging anybody that wants to make a comment or
19 ask a question to come on up.

20 MR. GABLE: Good morning, Mike Gabel, Gabel
21 Associates. I think the idea of the design review
22 checklists are good, but I think what we're concerned
23 about is how this is going to integrate with the existing
24 forms and procedures, the Certificate of Compliance, the
25 Installation Certificate, the Acceptance Forms, and to

1 make sure there's a process in place from the beginning
2 to the end and is kind of coherent, and we know who the
3 players are and how they're supposed to interact.

4 MS. BROOK: Right.

5 MR. GABEL: So we're looking forward to the
6 opportunity to look at this more carefully and talk about
7 this --

8 MS. BROOK: Okay, yeah, so I would encourage
9 you to look at our administrative section because we did
10 include this in the Certificate of Compliance section, so
11 if there's any confusion there, that would be great to
12 find out.

13 MR. GABEL: Okay.

14 MS. BROOK: Thanks.

15 MR. CULP: Tom Culp, Birch Point Consulting.

16 As you know, later I'll be talking about day lighting,
17 but one other comment on the mandatory sections 110.6, I
18 think you're focusing more on the equipment, but when I
19 was reviewing the other documents, I saw an opportunity
20 for additional energy savings I think may have been
21 missed, particularly on nonresidential, and it had to do
22 with air leakage. And I don't know if that's going to be
23 discussed tomorrow. But just real quick, I just wanted
24 to point out that I think you have a mandatory
25 requirement for fenestration air leaks of .3 cfm per

1 square foot in this section 110 --

2 MS. BROOK: Uh huh.

3 MR. CULP: And that's reasonable for
4 residential, I don't recommend making any changes with
5 residential; but for nonresidential, the products are
6 doing far better than that. You know, we did a survey
7 when we were over at ASHRAE and IECC that, you know, like
8 95 percent of the products are below .2, current, while
9 storefront are below .06, and so both ASHRAE 90.1, as
10 well as IECC lowered those numbers for not residential,
11 but for commercial windows to .2 and storefront and
12 current wall down to .06.

13 MS. BROOK: Okay, great.

14 MR. CULP: So I just wanted to point out that
15 that might be another opportunity.

16 MS. BROOK: Great, thank you.

17 MR. SPLITT: Well, I couldn't not have more
18 people speaking, so this is Pat Splitt from ApTech. A
19 couple of comments, one just on the 120.8, and these
20 additional forms and checklists, it's not clear to me,
21 you know, once we get all this stuff that pertains to
22 something that happened before the plans were submitted
23 for a building permit, who is going to check it? What
24 authority do they have? Can a Building Department come
25 back and say, "Well, we don't think the building owner

1 considered everything they should," and you go back and
2 look at this, and look at this, and look at that?
3 Mechanically, have you worked out how it's actually going
4 to be implemented?

5 MS. BROOK: So, I mean, our assumption is that
6 the compliance forms have to be submitted with the
7 Certificate of Compliance and I think, just like any
8 other compliance process, that people learn as you go,
9 right? So maybe there are a couple of times when they
10 didn't do it, they didn't realize they had to do it, even
11 though it was in the standard documentation and was
12 called out as a requirement, and the Building Department
13 missed it, I mean, sees that it's not there when he does
14 the compliance check, and we have to do education and
15 training to make sure that people know that it's a
16 requirement. The plans and specs piece, it's really an
17 opportunity to make sure that the efficiency measures are
18 actually culled out and that they're going to be in the
19 installation and construction processes because they're
20 in the plans and specs. So it's a real reasonable
21 recommendation to make that check happen and any
22 recommendations that you would have to integrate it into
23 the compliance process, you know, we'd love to hear about
24 it. But we think we're kind of setting it up like all
25 the other compliance requirements.

1 MR. SPLITT: Well, I haven't seen the forms,
2 they just were posted. But it just seems like it could
3 be really intrusive and I could see a lot of building
4 designers and architects really objecting to you
5 interjecting yourself into their design process.

6 MS. BROOK: But it's part of their team, I
7 mean, that's the -- the requirement is that they have a
8 member of their team that does the review, except for the
9 very largest buildings where they have to find an
10 independent reviewer. But, by the way, they already have
11 commissioning requirements that they're at least expected
12 to meet and commissioning usually requires for the
13 largest buildings to also have a commissioning agent that
14 could also provide the design review.

15 MR. SPLITT: Yeah, I work with a lot of
16 industrial agricultural buildings that the building is
17 actually very large, but it's just a large shell, and I
18 could see some people objecting to having to bring in a
19 third party --

20 MS. BROOK: Well, that's actually a really good
21 comment and we should -- if there are exceptions that we
22 need to add, so if it's a huge simple building, that's a
23 good point and maybe we could do something about that.

24 MR. SPLITT: Okay. So it may work out, I just
25 see some problems that might be ironed out.

1 MS. BROOK: Okay.

2 MR. SPLITT: Another thing, just in general
3 about all the mandatory requirements is the last go round
4 had a little bit of success getting some installation
5 certificate requirements put in place and it worked out
6 better on the residential side where there's requirements
7 for the installer to actually check off that he actually
8 installed things correctly, and the form actually informs
9 them of what they are supposed to do to install things
10 correctly. But on the nonres side, the forms basically
11 are just blank. And unless somebody actually fills
12 something in, there's nothing there and, of course, the
13 installer isn't going to fill in more stuff for himself
14 to check, so I think there has to be a lot more work done
15 on the nonres side into developing installation
16 certificates that match up with all these mandatory
17 requirements so that you don't wait until all these
18 acceptance tests come along that you're implementing, to
19 have people come in and say you did things wrong. You
20 should put a little bit more effort into actually trying
21 to tell the installers how to do it right the first time.

22 MS. BROOK: Uh huh.

23 MR. SHIRAKH: So the forms are part of the
24 compliance manuals and, you know, we'll probably start
25 working on those in the March time frame, and after that

1 we'll be happy to work with you to get your comments.

2 MR. SPLITT: Okay.

3 MR. SHIRAKH: Thank you.

4 MR. EMBLEM: Good morning, Commissioner
5 Douglas, Martha, Mazi. I'm Erik Emblem. I'm with the
6 Joint Committee on Energy and Environmental Policy. This
7 is a committee that was put together by the Sheet Metal
8 Workers Local Unions in California and their contractors,
9 the Sheet Metal, Air-Conditioning Contractors. And, one,
10 I like the new format, I like the Commissioners being
11 involved and particularly you, I know that you're very
12 involved and care a lot about energy efficiency, so I
13 think this is very positive.

14 I work a lot on energy efficiency and
15 environmental policy, I also work a lot with contractors
16 and technicians and training in HVAC, in particular.
17 Just in general, we really support the idea and the
18 concepts that came out in the California long term plan.
19 And the key is that we can write standards all day long,
20 and we can write codes, but the truth is they're not
21 being enforced. You know, I mean, in general we could
22 say Codes aren't being enforced. And if these new
23 standards that we write aren't implemented and enforced,
24 then who loses? Well, actually, you know, the taxpayers,
25 the community, the person that writes the checks loses

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1 because we're going to determine or we're going to state
2 that we've determined that all of these standards are
3 cost--effective. In other words, when implemented
4 through the lifecycle costs of the systems we're
5 installing that the purchaser is going to reap the
6 rewards of a good efficient system, so it's very
7 incumbent on us to understand that from the beginning, to
8 begin with the end in mind that we want an efficient
9 performing system installed in buildings whether they're
10 residential or nonresidential in California.

11 So here are some thoughts, and I just received
12 this yesterday, so I haven't really internalized it, but
13 I know that the Commission through the California
14 Commissioning Collaborative had a study done on the
15 effectiveness of the acceptance forms, it was done by
16 PECI and it was issued September 2011. I think we have
17 to pay attention to this because, really, what that is,
18 what has happened on the installs out here since our last
19 code cycle, or during it, we're still right in the middle
20 of it, what they found were, 1) the forms are confusing,
21 right, 2) that Code officials were not clear on whether
22 they even needed to collect them, 3) mechanical
23 installation contractors are probably not the best suited
24 contractors to fill out the forms, 4) that probably TAB

1 Mechanical Contractors are. So let's pay attention to
2 what we've had here. The people that fill out those
3 forms and verify the data that is eventually uploaded to
4 the Energy Commission is crucial. In other words, you
5 can't design future Codes and Standards if that data is
6 faulty or non-existent. So the person that fills out
7 that form is key. And it gets back down to whether it's
8 the installing technician, the installing contractor, or
9 who should be filling out these forms. If Engineers --
10 it even says in here engineers have a hard time with the
11 forms, and that's understandable too. So when you look
12 at engineers wrote the forms, I'm going to say your high-
13 level contractors through your workshops have worked with
14 you on them and most of them have engineers on staff, are
15 saying these are good forms, but we are finding in
16 practical applications that these forms are hard to fill
17 out and hard to read and hard to understand. But we
18 found out that there's a sector of the industry, the
19 Mechanical TAB Contractors, that have a high level of
20 expertise, that understand the forms, and understand how
21 to fill them out. So what do we do with the information?
22 Do we do more of the same? I mean, do we just roll this
23 thing out and say let's wait until 2016 and let's get
24 some more forms in that may or may not have good
25 information on them? And then let's write the 2020 Code

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1 based on the information that came in the same way it
2 came in in 2012? I think we need to reevaluate how the
3 forms are constructed, number one, and I'll be happy to
4 work with you on that, but 2) who fills them out, who
5 fills those forms out. I think that relying on the
6 installing technician based on the information that we
7 have today, whether it's residential or nonresidential,
8 is faulty.

9 MS. BROOK: Okay, well, thanks Erik. And we
10 are taking the results of that CCC study and we have
11 already clarified and fixed several of the acceptance
12 tests based on that report, and there are also a large
13 number of recommendations that we'll be including when we
14 do our compliance manuals and forms design work. And we
15 have a meeting on our calendars next week to have a staff
16 discussion about the responsible party to talk about who
17 should be responsible for completing the forms, and we'll
18 definitely get back to you on our kind of internal
19 decision and talk with you about what you think about
20 that, and anybody else that is interested.

21 MR. EMBLEM: And I don't mean to be here to
22 criticize without a solution, so I'm putting this forth
23 as kind of a solution, how we could work with you to
24 cost-effectively, perhaps, put some requirements in there
25 to use these alternate people to do these certifications

1 and forms, people who are certified and trained to do the
2 work.

3 MR. SHIRAKH: Are you suggesting we should use
4 TAB Contractors to do the acceptance forms? Is that what
5 you are suggesting?

6 MR. EMBLEM: Nonresidential, in particular,
7 yes. And I'm going to go one step farther here in my
8 next little piece of this, and Mazi and I have talked a
9 little bit. I also serve on the Green Technical
10 Committee of the International Association of Plumbing
11 and Mechanical Officials, and at their last Green
12 Technical Meeting, they approved a requirement that all
13 ducts be tested. It doesn't matter what pressure class,
14 all ducts be tested. And that's based on the Berkeley
15 reports, on the cost-effectiveness of duct testing and
16 sealing.

17 Now, I noticed in this, and we've talked about
18 it, that we haven't done much, actually done anything in
19 this proposal as far as duct testing beyond small
20 commercial systems. And I'd like to challenge that the
21 duct testing that we're doing in the small commercial
22 systems under the current Code are ineffective and that
23 we need to step back and look at residential and
24 nonresidential HVAC systems with two different pairs of
25 glasses.

1 Commercial buildings are much more complicated,
2 have much more systems integrated into them, it's a whole
3 different animal. It doesn't matter if it's 5,000 square
4 feet, or if it's 10,000 square feet, if you have 50 units
5 serving a building that have 5,000 square foot zones,
6 that's a big building, yet you're saying that we can send
7 a HERS Rater in there to test the ducts in those systems,
8 and I just don't think that's right. They don't have the
9 training and the certifications weren't meant to do that.
10 So let's use the information that we have at hand, let's
11 go back to the reports, and say, "Do we have a method to
12 do it?" And the answer is yes.

13 If you go out into the industry and you see
14 what's happening in the industry and what I call the
15 medium to high level installations and performing
16 installations, you're going to find consistently --
17 consistently -- that design engineers specify that these
18 systems have to be installed to a standard and tested to
19 a standard, and most of the time they'll refer to the
20 procedural standards, the Associated Air Balance Council,
21 the National Environmental Balancing Council, or the
22 Testing and Adjusting Balancing Bureau, that's from the
23 GSA through all of the different military, that's
24 required. It's actually in Section 24 of Master Spec put
25 out by the AIA.

1 So let's not try to recreate the animal, let's
2 look at what they're doing day after day in California
3 today in those buildings, and let's see how we can
4 integrate that cost-effectively into our standard. And
5 I'd like to work with you on that, too. I think, again,
6 I don't want to come up and just attack, I want to come
7 with some solutions.

8 But, in all, I think the staff was great, they
9 have an open line, they're very good at communicating
10 with me and I appreciate that, and if there's anything
11 that we can do as an industry to help out, we're here.
12 Thank you.

13 MS. BROOK: So just one question, Erik. It's
14 been at least my understanding based on the past work
15 I've done as managing PIER research with LBNL on
16 nonresidential duct leakage and duct sealing that we're
17 still waiting for that kind of holy grail of an
18 affordable test procedure for duct sealing in the large
19 systems, that we know that they're an issue, that those
20 systems need to be tested, but there's no comparable duct
21 blaster technology that is affordable for those
22 nonresidential systems. Am I incorrect there?

23 MR. EMBLEM: Well, I know that they're working
24 on a study right now, in fact, Craig Ray and his group
25 are working on one, I think that they're at the Cal EPA

1 building --

2 MS. BROOK: Right, that's the one that we were
3 doing years ago.

4 MR. EMBLEM: And they're looking at a total
5 system process of testing nonresidential systems, which
6 we support and, of course, SMACNA is a part of on the
7 ASHRAE Committees.

8 MS. BROOK: Okay.

9 MR. EMBLEM: We think that that is something
10 that is probably going to roll out and be available by
11 the 2016 Code cycle.

12 MS. BROOK: Okay, okay, great.

13 MR. EMBLEM: So what do we do in the interim?
14 Do we just turn a blind eye? Kind of residentially, you
15 looked at, 1) we know in our industry that on new systems
16 and on major remodels, on new duct, that the added cost
17 to test and seal the duct is about three percent of the
18 duct system on new installs. So if you were to start in
19 this Code cycle and say all new installs in major
20 remodels with duct over so many feet would have to be
21 duct tested, it adds about three percent to the cost of
22 the duct to seal it and test it. So that doesn't address
23 our issue, though, on existing buildings and going back
24 on retrofits, and I think that's where Craig Ray is going
25 with his, is how do we go back in these buildings where

1 we know it's leaking already and we look forward towards
2 building benchmarking and those systems? How do we
3 effectively and cost-effectively test those systems and
4 seal them? And I agree, I don't think that we have
5 something out there yet.

6 MS. BROOK: Okay, all right.

7 MR. EMBLEM: So I'm looking at new and
8 prospective.

9 MS. BROOK: Oh, okay, thank you.

10 MR. SHIRAKH: I have a question. Back to the
11 forms using TAB, you're just suggesting them for the
12 acceptance forms, the mechanical-related acceptance
13 forms, not for all acceptance forms? Does that include
14 like lighting?

15 MR. EMBLEM: I'm here speaking obviously
16 with the HVAC industry, but I do collaborate with my
17 friends in the electrical industry in their Advanced
18 Lighting Center, and I know that they have some
19 certification work that they're working on. I think
20 that, when you start looking at the integration of these
21 systems, and you start looking at the zero net energy,
22 that the integration of the electrical systems, the
23 lighting systems, the mechanical systems, and future and
24 today some renewables, those control systems are pretty
25 complex. And understanding how they interrelate is going

1 to have this cross-over effect. So when you start
2 looking at commissioning a system that is controlling
3 these in buildings, I don't think that just anybody can
4 do it, so I would think that the electrical people feel
5 the same way. When you look at the envelope issues, when
6 you look at the issues with infiltration and moisture and
7 all of that, I think you have similar issues. It's just
8 not a form filler that can go out there and check boxes,
9 somebody needs to collect data, and that data needs to be
10 reliable data so that the people who want to see the data
11 can evaluate, "Is this thing working the way we
12 anticipated it to work?" So in general, I would say it
13 needs to be an upper level type person that fills those
14 out, that has some good education on building and systems
15 and how they operate, and how to collect data and
16 understand instruments.

17 MR. SHIRAKH: And on the question of duct
18 sealing in nonresidential, I think when you and I talked,
19 you know, it is a good thing, but any major expansion of
20 the scope of this stage of this proceeding is going to be
21 a big challenge because of -- and I think you understood
22 that, you agreed that --

23 MR. EMBLEM: I understand that. I mean, I know
24 that these things don't just come out of a shoebox and we
25 do them, you have to really evaluate them. So what I'm

1 proposing, again, I want to have a solution instead of
2 just say that we're not addressing it, which we all know
3 that we're not, is there a solution moving forward? We
4 think there is, it may be too late in this cycle to
5 address it, but I can tell you from an International Code
6 authority that's looking at their Green Mechanical Code,
7 IAPMO, our committee -- there was one vote against in the
8 committee to test all ducts.

9 MS. BROOK: And you have a referenced standard
10 that you test to?

11 MR. EMBLEM: Yes. We're using the AABC Chapter
12 5, that's from the Associated Air Balance Council Chapter
13 5 Duct Leakage and Pressure Testing --

14 MS. BROOK: Okay.

15 MR. ELBLEM: -- which uses a percent of fan
16 flow.

17 MS. BROOK: Uh huh. All right, thank you.

18 MR. SHIRAKH: Thank you, Erik.

19 MR. EMBLEM: Thank you.

20 MR. STANONIK: Martha?

21 MS. BROOK: This is Martha. Who are we talking
22 with?

23 MR. STANONIK: This is Frank Stanonik at
24 AHRI.

25 MS. BROOK: Oh hi, Frank.

1 MR. STANONIK: Hi. I've got a basic let's call
2 it a format question that may have -- will have a lot of
3 relevance to what extent we provide some technical
4 comments. You went quickly through the sections and
5 120.6, okay, the major heading of that section is
6 Mandatory Requirements for Covered Processes, okay?

7 MS. BROOK: Uh huh.

8 MR. STANONIK: And then subparagraph (d) under
9 that major heading is Mandatory Requirements for
10 Commercial and Process Boilers.

11 MS. BROOK: That's right.

12 MR. STANONIK: I read that to say that those
13 requirements for commercial boilers only apply when those
14 boilers are being used for covered processes.

15 MS. BROOK: Okay, so that's actually a really
16 good point, Frank, and maybe what we need to do is leave
17 the process boiler requirements in that section and then
18 basically just copy them for commercial boilers and put
19 them in another section.

20 MR. STANONIK: All right, so the intent was
21 you're writing requirements for all commercial boilers?

22 MS. BROOK: Yeah, of those very large sizes,
23 yes.

24 MR. STANONIK: Okay, all right, then when we
25 get to talking about that further, we do have -- as I

1 mentioned in the email, we have some major concerns with
2 that.

3 MS. BROOK: Well, so actually, Frank, if you
4 were intending to make those comments today, now would be
5 the time because we don't have -- we're not going to
6 cover commercial boilers anywhere else today.

7 MR. STANONIK: Oh, okay. Well, unfortunately
8 at the moment because we're still pulling together some
9 of the information, they would be very general, but I
10 think we do have some -- in terms of the general issues,
11 we think that many of the assumptions that went into
12 justifying some of these things for process boilers do
13 not translate to commercial boilers that are used for
14 either space heating, or even hot water supply. And then
15 also, I think just some of the information, as an
16 example, implying that parallel positioning controls are
17 commonly used on low and ultra low NO_x commercial boilers,
18 we're going to try and pull together as an example the
19 commercial boiler listings from South Coast AQMD, and
20 identify exactly how many of those do employ parallel
21 positioning controls because I think the number is very
22 -- I just think that's some misinformation, but --

23 MS. BROOK: Okay, all right.

24 MR. STANONIK: At this point, all I can do is
25 point out where we're going to try and address some of

1 the issues, I don't have the data at the moment.

2 MS. BROOK: Okay, so is it clear -- what I'm
3 understanding and I just want to clarify, then, is your
4 industry's issues are with commercial boilers and you're
5 relatively okay with the process boiler requirements?

6 MR. STANONIK: Correct, yeah. I mean, this
7 started, well, you're certainly familiar with the
8 development process, this started out as the template for
9 process boilers and then, if you will, it kind of I'll
10 say bled over into commercial boilers, and that's where
11 we became much more concerned, yes.

12 MS. BROOK: Okay. And you and your industry do
13 have until October 28th to file comments, the earlier the
14 better, and we'll keep talking. Thank you.

15 MR. STANONIK: Okay, thanks.

16 MR. HEYDEMAN: Martha, it's Mark Heydeman.

17 MS. BROOK: Hi, Mark.

18 MR. HEYDEMAN: Hi. I just wanted to follow-up
19 on Erik's statements and we look forward to working with
20 Erik or continuing working with SMACNA on these issues. I
21 just want to point out that the research that you guys
22 were talking about from Lawrence Berkeley National Labs,
23 one of the surprising findings, everybody thought that
24 all the leakage was up at the high and medium pressure
25 ducts, but, in fact, 50 percent or greater of the

1 leakages that they found in the field was at the terminal
2 units and the low pressure ducts. And that's the problem
3 there is to try and detect where that leakage is and how
4 to address it, particularly with terminal units, there
5 are standards, ASHRAE standards, for leakage testing of
6 those units, but the manufacturers have pushed back about
7 having those standards adopted as Code, and to provide
8 that testing in the factories. And so I think when we
9 talk about duct work, and there is fan energy involved
10 there and there is loss of cooling and heating, we need
11 to talk about the entire system from one end to the
12 other, and there needs to be some research done before
13 that becomes codified.

14 MS. BROOK: Okay, thank you.

15 MR. HEYDEMAN: And work with the industry.

16 MR. SHIRAKH: Again, this sounds like a serious
17 topic for the next round of standards and we look forward
18 to working on this topic. There is someone in the room
19 that wants to make a comment.

20 MR. DIAZ: Good morning, everybody. I'm David
21 Diaz. I'm a Business Rep for Sheet Metal Workers Local
22 104. I'm going to talk about duct leak testing really
23 quick, too. With the SMACNA standards, if you build the
24 duct work and you seal it to SMACNA standards, honestly,
25 it should pass the test. The problem is -- I used to

1 work in the field and I'm a business rep now, so I don't
2 get my hands dirty much, but I used to work in the field
3 and I was a Foreman, and a lot of my projects that we
4 worked on had duct testing, okay, just because it was
5 part of the specs. The problem is I had guys,
6 apprentices that got lazy and they would seal the duct
7 work on the bottom so when the Inspector would walk by
8 and look, and go, "Wow, okay, cool," and test it and it
9 failed. Well, when you only seal two-thirds of the duct,
10 guess what? It leaks the other part. So you have to
11 test just because people cheat.

12 On acceptance forms, I've talked to some
13 technicians, union, non-union, on that installing on the
14 residential side and a lot of them tend to falsify the
15 reports because they know they're never going to get
16 caught.

17 MS. BROOK: Ah, uh huh.

18 MR. DIAZ: We can't have that. Now, if we want
19 to meet AB 32 requirements and all that other stuff, we
20 can't have that, so we have to have people that a) aren't
21 going to falsify, and some kind of teeth if they do, like
22 if they're certified, get their certification taken away,
23 whatever it is, but we have to have some kind of teeth
24 that way. And then I also, like Erik, I recommend TAB
25 people doing it because these guys know what they're

1 doing and they can't be dumbed-down forms, either. Or
2 put "N/A" on everything and, "Okay, here, the form is
3 done." You know, we can't have that, at least that's my
4 opinion anyhow.

5 MS. BROOK: Okay, thank you.

6 MR. SHIRAKH: I'm just going to briefly mention
7 something that's going to come up tomorrow, but that is
8 related to nonres, actually. We're going to recommend
9 changes that the nonres forms will also be required to be
10 registered and uploaded electronically to some databases,
11 so at least there will be some data to look at for the
12 next round of standards.

13 MS. BROOK: Do we have other comments online?

14 MR. YASNY: Yeah, what I'll do is I'll read some
15 comments from Jay Salazar. Let's see. "The standards
16 are enforced at the local level. The acceptance forms
17 are completely ineffective. Building officials are not
18 required to collect the forms." And then he said,
19 "Ninety percent of all permits are alterations, unitary
20 equipment. The podium is talking about less than 10
21 percent of the permits." And then he said, "The solution
22 to replacing acceptance forms for alterations is to have
23 Prescriptive details that can be easily inspected. New
24 buildings can still use acceptance forms." And then he
25 said, "Acceptance forms are not totally failed, but they

1 are not matched well to field practice for local
2 jurisdictions. In my jurisdiction, this boiler
3 requirement represents less than .1 percent of our
4 permits, so when we do get a set of plans, we won't
5 remember the requirements. I have no idea how we as
6 smaller jurisdictions would enforce this section.
7 Falsify reports? Really? Where is his data? An
8 anecdotal conversation is no way to make public policy."
9 And I think that covers Jay's concerns.

10 MS. BROOK: Okay, thank you.

11 MR. YASNY: And then we have some folks that
12 want to chat. Let's see, there is Casey and let me
13 unmute her.

14 MR. COLSON: Hi. This is Casey Colson.

15 MR. SHIRAKH: Yeah, we can hear you. Go ahead,
16 please.

17 MR. COLSON: Hi, can you hear me?

18 MS. BROOK: Yes, can you hear us?

19 MR. COLSON: Yes, I can. Great. Good morning,
20 everybody. Casey Colson from Target Corporation. We
21 have several comments under the brand new retail
22 refrigeration section. Do you want me to go through all
23 the comments at once? Or should I just do them one at a
24 time?

25 MS. BROOK: Actually, we probably -- we won't

1 be responding to them, we'll be accepting them at this
2 time because I know that you've been working with our
3 consultant on this and we know we have some outstanding
4 issues that we'll be working with you on, so go ahead and
5 state your concerns.

6 MR. COLSON: Okay. Under 120.6.d, we ask that
7 the exception based on square footage be defined in terms
8 of total refrigeration load or square footage of the
9 retail grocery area. It's possible that the retailer may
10 have a refrigeration system that has an equivalent load
11 of a small supermarket, or less, but have a sales floor
12 area of a big box store. The Supermarket Energy
13 Efficiency Report released in September did not take into
14 consideration the efficiencies and scalability of these
15 technologies for this particular situation. We believe
16 that for small refrigeration loads that utilize
17 distributed equipment to reduce the charge, energy
18 consumption will increase to some of these measures which
19 is counterproductive to the goals of Title 24.

20 MS. BROOK: Okay. You're kind of breaking up,
21 Casey.

22 MR. COLSON: Okay, sorry about that.

23 MS. BROOK: That's okay. We're still
24 listening.

25 MR. COLSON: Okay, under 120.6.d of 1 a through

1 c, item c states in response to ambient wet bulb
2 temperature, the intent of the language to require
3 condenser control based on single variable value, we ask
4 that the committee consider expanding the language to
5 include the options of controlling based on some
6 temperature dry bulb temperature head pressure. The use
7 of other devices will allow the same energy reduction and
8 reliability of control as a wet bulb temperature.

9 MS. BROOK: Okay. That sounds possible.

10 MR. COLSON: Okay. And then under 120.6.d.iv,
11 we have several comments related to refrigeration heat
12 recovery. We'll submit those comments via email, it's
13 quite lengthy, but the gist of it is, we believe with the
14 high efficiency refrigeration system, utilizing floating
15 condensing temperatures, that there's little available
16 usable heat at low ambient temperatures, and basically
17 that heat is not required in the system and it allows --
18 it decreases flexibility of design in the equipment and
19 for certain considerations, it might cause increased
20 energy demand.

21 MS. BROOK: Okay, and I know we do have a
22 statement that says the heat recovery, you know, based on
23 what's available as heat recovery, and so you seem to be
24 describing an instance where there would not be any heat
25 recoverable. But I would encourage you to send me your

1 comments and also put them into our docket, and we'll
2 work with you and our consultant on this and hopefully
3 get all your issues resolved.

4 MR. COLSON: Okay, thank you very much for your
5 time today.

6 MS. BROOK: Thank you.

7 MR. ROY: Good morning, Martha. This is
8 Aniruddh Roy with AHRI.

9 MS. BROOK: Yes, hello.

10 MR. ROY: Yes. I just have a quick question
11 with respect to your comments that are due. The notice
12 says that the comments are due on October 30th, which is
13 a Sunday, so would you consider pushing it to maybe
14 Monday October 31st? Or do you still want to keep the
15 deadline the 28th?

16 MS. BROOK: We'll definitely accept your
17 comments on the 31st, but don't tell anybody.

18 MR. ROY: Okay.

19 MS. BROOK: Okay?

20 MR. ROY: Thank you.

21 MR. SHIRAKH: We won't be here Sunday at
22 midnight anyway, so....

23 MR. YASNY: Okay, and then George Nesbitt has a
24 comment.

25 MS. BROOK: Okay, George, we're here. Are you

1 there? George?

2 MR. YASNY: My fault. Oh, here we go. Okay,
3 George.

4 MR. NESBITT: Can you hear me?

5 MS. BROOK: We can. Can you hear us?

6 MR. NESBITT: Yes. Okay, two things. I guess
7 I didn't realize there were not mandatory minimum
8 insulation levels for assemblies, so that's definitely a
9 good thing to add. And then the other thing is on pipe
10 insulation. You specify a U-Value per inch depending on
11 temperature range, and then a minimum thickness, yet some
12 insulation materials would exceed the minimum, but not
13 meet the thickness, so if I'm using a polystyrene or an
14 elastomeric three-quarter-inch wall pipe insulation and
15 it's got an R-4 or R-5 value, but it's not one-inch
16 thick, yet it would exceed the equivalent R-Value that
17 you would require. And so it seems, rather than
18 specifying thickness of insulation, it would be better to
19 specify the minimum R-Value.

20 MS. BROOK: Okay, if you could send me a few of
21 those examples and we could work through them with that
22 table and see, that would help us understand the issue
23 that you're raising.

24 MR. NESBITT: Yeah. Okay, great.

25 MS. BROOK: Thank you. Anybody else?

1 MR. YASNY: One more, Sandy.

2 MR. SAMILAN: Yeah, hi. My name is Sandy
3 Samilan and I just have a question and then a potential
4 comment. I have a question and concern with Appendix A-
5 5, the Reach Goals for Commercial Refrigeration. Is this
6 the appropriate time to comment on that? Or would you
7 prefer just to have a written comment?

8 MS. BROOK: Well, we want your written comment,
9 but we also are going to talk about that at the end of
10 the agenda, so --

11 MR. SAMILAN: Okay.

12 MS. BROOK: So you're definitely --

13 MR. SAMILAN: Do you want me to hold off, then?

14 MS. BROOK: Yeah, for now, hold off because
15 nobody will know what you're talking about and, then,
16 feel free to chime in when we get to that part of the
17 agenda. Right now it's scheduled for almost 4:00.

18 MR. SAMILAN: Three o'clock, okay.

19 MS. BROOK: Four, our time. But if you can't
20 for any reason attend later today, then please send your
21 written comments.

22 MR. SAMILAN: Okay, I'll do that. Thank you.

23 MR. SHIRAKH: Don't take these times too
24 literally because we always deviate from them.

25 MS. BROOK: If we're good, then we can move on

1 to Section 130, I think. And right now, just for the
2 record, we're on time.

3 MR. YASNY: Just one quick question. Someone
4 asked where 120.7 is, that it wasn't posted.

5 MS. BROOK: Oh, okay, well, you get to answer
6 that one, Ron.

7 MR. YASNY: Oops.

8 MR. SHIRAKH: Well, we'll post it.

9 MR. YASNY: Oh, that's right, yeah. I think
10 it's behind 120.6, it's just not labeled.

11 MR. SHIRAKH: Yeah, it is after the one --

12 MS. BROOK: In the same document as 120.6.

13 MR. SHIRAKH: The 20 series goes all the way up
14 to 120.8, so this should be in there.

15 MS. BROOK: Okay.

16 MR. FLAMM: Okay, my name is Gary Flamm. I'll
17 be presenting the Lighting issues. And I want to confirm
18 that our consultant, Jim Benya, is online. Are you
19 there, Jim?

20 MR. BENYA: Yes, I am. Good morning.

21 MR. FLAMM: Good morning. Okay, I'm going to
22 go through the 130 suite of documents, 130.0 through
23 130.5.

24 §130.0 (130) goes through the general lighting
25 requirements and how to determine Luminaire power, so

1 it's been edited for clarity. Basically, these are the
2 different classification of Luminaire, Incandescent,
3 Luminaires with Ballasts, Low-Voltage Luminaires, Track
4 Lighting, LED Luminaires, and miscellaneous. One of the
5 changes is, in the current standards for Incandescent
6 Recessed Luminaires, there is a table of different
7 minimum wattages that can be claimed on the label, and we
8 simplify that to just say the minimum that you can go to
9 for a recessed Luminaire is 50 watts per socket,
10 clarifying that there's no such thing as a permanent
11 adapter. We have that language in the manual already and
12 there still seems to be some misinformation. There is no
13 such thing as permanent.

14 We clarify also in the language that Lamps do
15 not change the classification of a luminaire type.
16 Luminaires are based on what the manufacturer created
17 them for, not based upon Lamps that are put in them.
18 And there is a general statement that lighting controls
19 shall comply with §110.9, which used to be §119, and be
20 installed in accordance with the manufacturer's
21 instructions. Now, that statement, that lighting
22 controls must comply with §110.9, was stated a number of
23 times, or is currently stated a number of times in §130.1
24 and, rather than stating it over and over and over again,
25 I just moved it here and said it once. And also, the

1 "installed in accordance with the Manufacturer's
2 instructions" is existing in §119 and it really belongs
3 in the application standard of controls, so it was just
4 moved here, so that language as existing is just moved.

5 So there is another document I want to point
6 out, it's called the "Nonresidential Appendix 8, which
7 are Default Luminaire Power Options." This is a document
8 that's been around for a long time, and it lists a
9 significant number of different Lamp Ballast type
10 combinations and it's a convenience where, if the
11 Designer doesn't know what the product, the ballast
12 system that's going to be installed, they can use this
13 number instead of manufacturer data or cut sheets. And
14 it's always conservative numbers that are on the high
15 end, and it's actually, if the designer wants to use
16 lower numbers, they can actually use the cut sheet.

17 A lot of the information in that document is
18 quite dated and a lot of the technologies in that
19 document are really not used very much at all. So the
20 document has been cut back significantly down to probably
21 25 percent of its current content, and basically it's
22 covering mostly modern technologies, electronic ballasts,
23 T8 systems, T5 systems, and it's not intended to use
24 every type of system that's available, which is confusing
25 right now because we get calls on, "Well, I don't have

1 this technology listed. What do I do?" And so it's a
2 voluntary option and it's been cut back significantly.

3 Moving to §130.1, which are controls that need
4 to be installed in each room. It's been edited and
5 rearranged for clarity. Subsection (a) are Area
6 Controls. That basically says you need a switch in every
7 room and that that has to be a manual on and off, and it
8 could be a dimmer as long as it has manual on and off.
9 And one of the clarifications is that, in every room, you
10 would need a Manual OFF/ON switch or you can have
11 something called an Annunciated Switch in another room,
12 and that's quite confusing currently and so we list
13 certain big box bases where you can have an annunciated
14 switch in another room. But for the most part, every
15 room has to have the switch in the room.

16 Now, this next section is another combination
17 that was just combined into one statement here instead of
18 put in many places in the standards. So basically we're
19 saying, or we're continuing to say, that all lighting
20 systems have to be separately controlled. The general
21 lighting has to be separately controlled from all other
22 lighting. Floor and wall display, floor display, case
23 display, ornamental and special effects, each has to be
24 separately controlled.

25 And the only new language is a clarification

1 that track lighting, if you're using track lighting, it
2 really has to be multi-circuited track if you're going to
3 put general, display, ornamental, special effects on a
4 track.

5 So Multi-Level Controls, this is probably one
6 of the most significant changes in the Lighting
7 Standards. Basically, what remains pretty much the same
8 is that, if general lighting in a room that is greater
9 than or equal to 100 square feet and has an installed
10 load greater than .5 watts per square foot, and it is
11 currently .8, must meet the requirements in Table 130.1-
12 A, and I'm going to go over that in a couple of slides
13 and I'll explain the difference. In addition to meeting
14 the multi-level switching, each luminaire has to be
15 controlled by one of the following methods: manual
16 dimming, lumen maintenance, which is basically to
17 maintain -- designers typically put in more lumens than
18 they need because they're designing for depreciation, so
19 you can maintain your lumens by tuning down the power and
20 actually initially get only as much light as you need;
21 tuning, which is very similar to lumen maintenance, an
22 automatic daylight control, or demand responsive control.

23 So the current multi-level control requirements
24 basically say that you need, in addition to 100 percent
25 and zero percent, you need something in the middle,

1 something around 30-70. And the reason we have that
2 broad range currently is because sometimes you have three
3 lamp luminaires, sometimes you have four lamps, you might
4 go checkerboard, you might go alternate rules, so there
5 are a number of ways. So we let that -- currently the
6 standards say that interim, that middle level, can be
7 somewhere between 30 and 70 percent. So here is the
8 table. So what the new table says is for multi-level, if
9 you have incandescent sockets that are for LED or GU-24
10 with LED, it has to be continuous dimming. So you need a
11 continuous dimming system that will take an incandescent
12 socket between 10-100 percent.

13 If you have GU-24 sockets for CFLs that are
14 greater than 20 Watts, or Pin-based CFLs greater than 20
15 Watts, you need continuous dimming between 20 to 100
16 percent.

17 The next classification is if you have GU-24
18 CFLs less than or equal to 20 Watts, Pin-based CFLs less
19 than or equal to 20 Watts, Linear fluorescent and U-bent
20 fluorescent less than 13 Watts, you need a minimum of one
21 step between 30 and 70 percent, that is the current
22 language, actually, and you need to be able to dim or
23 switch alternate lamps, or that can be done through
24 dimming or switching of alternate lamps.

25 The linear fluorescent or U-bent fluorescent

1 fluorescent lamps that are greater than 13 Watts, you
2 need a minimum step of all of the following: One step
3 between 20-40%, one step between 50-70%, one step between
4 80-85%, and one step at 100%, in addition to zero.

5 Subsection (a) basically says you have to be able to turn
6 your lights off. And that could be stepped dimming,
7 continuous dimming, or switching alternate lamps in a
8 luminaire provided that luminaire has at least four
9 lamps.

10 The next classification is Track Lighting, a
11 minimum of one step between 30-70%, and that can be step
12 dimming, continuous dimming, or separately switching
13 circuits with a minimum of two circuits.

14 And the last classification is High Intensity
15 Discharge (HID) Lamps, that means middle, high pressure
16 sodium, that are greater than 20 Watts, Induction Lamps
17 greater than 25 Watts, and all other light sources shall
18 have a minimum of one step between 50-70%, and it may be
19 stepped dimming, continuous dimming, or switching
20 alternate lamps in luminaires, provided they have at
21 least two lamps in luminaires.

22 (c) Shut-off Controls, we continue to have
23 shut-off controls, which it may be occupant sensing
24 devices, automatic time control, a signal from another
25 building system, or other device capable of automatically

1 shutting off the light. So, in addition to manual
2 controls, we require the ability to automatically shut
3 off lighting when the space is typically unoccupied.

4 We clarify that no countdown timer switches
5 shall be used to comply with the shut-off controls; that
6 has been the case for all of the cycles of the Standards,
7 however, there is some misinformation that countdown
8 switches, which are basically really cheap wall switches
9 -- most of them are -- that you can just spring wind, and
10 it makes no sense to allow a big space to put in a
11 several-dollar switch that can be easily removed. So
12 what we've added, though, is an exception, so this is
13 actually an inclusion of allowing countdown timer
14 switches which currently are not allowed, into bathrooms
15 and closets that are less than 40 square feet and which
16 have a maximum of five minutes.

17 So the new Shut-off requirements are a Partial
18 Off Occupant Sensor which is an addition to the Automatic
19 Shutoff, so for aisle ways and open areas in warehouses,
20 and in library book stack aisles and corridors and
21 stairwells, they need to basically be able to shut off --
22 I believe it's about half, I don't remember the
23 percentage -- of the lighting when nobody is present.

24 And then there is a new classification of
25 partial Occupant Sensor (OS) instead of shutoff. And

1 these are stairwells and common areas of high-rise res
2 and hotel/motels, have to be able to shut off the lights
3 half-way when nobody is around, and parking garages,
4 parking areas, and loading and unloading areas have to be
5 able to shut off the lights part way when nobody is
6 around.

7 Automatic Daylighting Controls, we continue to
8 have definitions for Skylit, Daylit Zones, Primary
9 Sidelit Daylit Zones, and Secondary Sidelit Daylit Zones.
10 They've been edited a little bit for clarity. There are
11 mandatory daylight controls currently. There are some
12 Offramps to the daylighting controls, and those Offramps
13 are gone now. If you have Luminaires in a daylight zone,
14 they have to be controlled now, so they are mandatory
15 requirements.

16 A requirement that all Skylit Daylit Zones and
17 all Primary Sidelit Daylit Zones have to be shown on the
18 plans. Luminaires in the Skylit and Primary Sidelit
19 Zones have to be separately switched. There are spelled
20 out requirements for the installation and operation of
21 these daylight controls, and there are new requirements
22 for parking garage daylighting.

23 There continues to be a requirement for Demand
24 Responsive Controls. That gives a buildings the ability
25 to be shed, the lighting when it's needed through an

1 emergency signal, or a price signal, the ability has to
2 be there. It's not required that the building be demand
3 response shed, but the controls have to be there. So
4 buildings that are greater than 10,000 square feet have
5 to have this control, and that is changed down from
6 50,000 square feet building.

7 And so, whenever §130.1(b) is required in those
8 same cases are when you're required to do Demand
9 Responsive Lighting Control. So the controls are one of
10 the two, either 15 % of full power for continuous dimming
11 systems, or, when you look at the table one level below
12 full ON in accordance with the Table 130.1-A for stepped
13 dimming or stepped switching.

14 §130.2 is Outdoor Lighting Controls. And so
15 there has been a clarification and a simplification of
16 outdoor incandescent luminaires that are greater than 100
17 Watts shall be controlled by a motion sensor. This has
18 been significantly simplified. There were lots of
19 exceptions, it talked about generic luminaires, but what
20 we're really talking about are incandescent luminaires.
21 And what this is saying is, if you need a bright lumen
22 package, it would be better to use a high efficacy
23 source, to use either HID, or fluorescent, or LED. So if
24 you're going to use a bright luminaire and you're going
25 to use a 100 watt rated luminaire, that it has to be

1 controlled by a motion sensor.

2 And there are luminaire cutoff requirements.
3 Currently we say luminaires that are greater than 175
4 Watts in specific areas have to be designated cutoff,
5 that is basically a shielding. We've reduced that from
6 175 Watts to 150, and there is a new metric that has just
7 come out called "BUG," which is a Backlight Uplight, or
8 Glare Rating. And so we added that as an option for
9 cutoff. So you either need to do the old cutoff
10 designation, or the new BUG rating.

11 So the Controls for Outdoor Lighting are that
12 all outdoor lighting has to be controlled by a Photo
13 control or astronomical time control. Outdoor lighting
14 has to be controlled independently from other electrical
15 loads. If you have certain luminaires that are lower
16 than 24 feet, they have to be controlled with a motion
17 sensor to turn them half-off. And other spaces which are
18 sales frontage, sales lots, canopies, have to have either
19 a distributed part-night device, which can either be
20 motion sensor or time clock where the light, let's say,
21 you're open until 9:00 and you want the lights to stay on
22 the rest of the night, what you can do is at 9:00 program
23 the light to go down by 15 percent, so that's what a
24 distributed part-night device is for each luminaire, or a
25 motion sensor to do the same thing.

1 And for this other classification of building
2 spaces, a façade, Ornamental Hardscape, and Outdoor
3 Dining, you have three options, the distributed part-
4 night device, a motion sensor, or a centralized time
5 clock.

6 Section 130.3 are Lighting Controls for Sign
7 Lighting, and no substantive changes, just some edited
8 for clarity.

9 Section 130.4 are the Acceptance Requirements
10 for Lighting Controls. And so the actual testing
11 protocol are listed in Nonresidential Appendix 7 (NA-7)
12 and that's been edited to be consistent with the current
13 changes. This section has been edited for clarity. And
14 the lighting systems that need to be acceptance tested
15 are lighting control systems. Now, what I'm going to
16 bring up, and we're not addressing Section 119 until
17 tomorrow, is that lighting control devices are being
18 moved from Title 24 to Title 20, and lighting control
19 systems are being left in Title 24. And Lighting Control
20 Systems mean that you have one or more components to do
21 the functionality of a lighting control device. And so
22 lighting control systems will no longer have to be
23 certified to the Energy Commission, which is kind of
24 clumsy because manufacturers currently have to certify
25 all the components to make up a control system. And

1 we're saying, in lieu of doing certification to the
2 Energy Commission, that lighting control systems have to
3 be acceptance tested.

4 Also, Energy Management Control Systems have to
5 be certified acceptance tested that they meet all the
6 functionality of a control. If you have a Line-voltage
7 track lighting integral current limiter, that is a device
8 that we certify that is built into the track lighting
9 itself, or if you have a supplementary track lighting
10 overcurrent protection panel, in order to use that, you
11 have to have the acceptance test.

12 If you have lighting shutoff controls and
13 automatic daylight controls that comply with Section 131,
14 they have to be acceptance tested.

15 There is an option in Section 140.6 that allows
16 uncertain circumstances to have a redundant lighting
17 system as long as they're interlocked with a non-
18 programmable double-throw switch. And what we're saying
19 is that, if you're going to use that exception, it has to
20 be acceptance tested.

21 There are lighting controls that are voluntary
22 that allow you to earn a Power Adjustment Factor (PAF);
23 if you're going to earn those, you need to have those
24 acceptance tested. There is additional wattage that you
25 can earn for a videoconference studio and, in order to

1 earn that, part of it is an acceptance test, and outdoor
2 lighting controls have to be acceptance tested.

3 Section 130.5 is a new section. 130.5 is
4 Electrical Power Distribution Systems. The current
5 construct of Sections 130 through 130.4 all have to do
6 with lighting, and now we have some requirements that are
7 not specific lighting, and so we created a new subsection
8 to address these new issues that are not lighting only.

9 So there are requirements according to Table
10 130.5-A where some spaces have to have accessible
11 metering of total electrical use, so this is so the
12 consumer can see how their electricity is being used.
13 There are certain situations according to the table where
14 loads have to be disaggregated, so you need to have your
15 lighting load, your plug load, your mechanical loads, all
16 on separate circuits. There are minimum voltage drop
17 requirements, which I believe are identical to ASHRAE
18 90.1.

19 There is a new requirement for circuit controls
20 for 120-volt receptacles in private offices, open office
21 areas, receptions, lobbies, conference rooms, kitchens
22 and copy rooms. This requirement says that, for every
23 non-controlled receptacle, you have to have a controlled
24 receptacle -- I believe it is within six feet, with a few
25 exceptions -- and this in the CASE study talks about task

1 lighting controls, but we put it in this section because
2 the circuit doesn't know if it's going to have task
3 lights or something else. So this gives the occupants
4 the ability to plug-in their devices into either a
5 control circuit or an uncontrolled circuit.

6 There are specifications for what we mean by a
7 Demand Response Signal and this is where we parked those
8 specifications. And it also spells out when an Energy
9 Management Control System is used as a lighting control
10 system, or is used as a thermostat system, that it must
11 meet all the applicable functionality in all the
12 subsections of the standards to be able to be used. So
13 this was put in at the request of the EMCS industry,
14 where they have been denied the ability to use their
15 systems because it wasn't understood whether they could
16 comply with the standards or not.

17 And so those are the Lighting Control and
18 Building Power changes. And we're open to comments now.
19 Any -- Pat?

20 MR. SPLITT: This is Pat Splitt from ApTech.
21 Just a couple of comments. One, now is a requirement for
22 plans for some daylighting, but only if you think that
23 you're going to go over the requirement. But I'm
24 assuming now that the requirement for doing the
25 daylighting plan is general? Or is there some cut-off to

1 when you need it or when you don't?

2 MR. FLAMM: So -- I wasn't sure if it was on --
3 so the current requirement for daylighting controls
4 basically is, if you have above 250 square feet of
5 daylight footprint in a room, you have to have a manual
6 -- segregated manual switch.

7 MR. SPLITT: I'm talking about the plan, when
8 one has to submit a --

9 MR. FLAMM: I'm building a framework for that.
10 And it also says that, currently, at 2,500 square feet,
11 that manual control has to become an automatic control.
12 Now, it says that at 250 square feet of daylight, you
13 have to have the automatic control. So basically all
14 spaces have to have that -- if they have more than 250
15 square feet of daylight, they have to be shown on the
16 plans.

17 MR. SPLITT: But I'm talking about the daylit
18 area which is in a different -- it's sort of maybe in the
19 envelope, but the problem I have now is that, say we have
20 one of these large warehouses that is unconditioned,
21 12,000 square feet, right now, in general, people assume
22 that, well, that's unconditioned, so all we have to do is
23 lighting. So somebody will go off and have an electrical
24 contractor, electrical engineer, do the lighting, but
25 nobody has provided a daylit area plan, which would be

1 required in this large building because it's got
2 skylights, it has to have skylights, but it's not his
3 responsibility to decide what is the daylit area, it's
4 the function of the person who designed the building. So
5 you have to tie these together somehow so that somebody
6 knows that, even though theoretically you're only doing
7 lighting compliance, that in that building there's a
8 Certificate of Compliance for skylights, it's an envelope
9 requirement that is totally ignored. And if it's
10 ignored, then that's the end of it, you know, there's no
11 daylighting controls either. So I think the problem is
12 that, where there is a requirement that the daylit plan
13 be provided, you never state who has to provide it, and I
14 think it has to be provided by the architect or the
15 envelope designer. They're the ones that are actually
16 putting in the holes in the building; they need to know
17 that there are consequences of them doing it. If you
18 just say it's required, but you don't say who has got to
19 do it, they won't do it. The electrical engineer says,
20 "Well, that's not my job." So everybody thinks it's
21 somebody else's job and it will never get done, so you
22 actually have to call out who is going to do that and
23 then have, in your calculation requirements, have the
24 person who is doing the controls -- require that they
25 refer to that plan and make it clear that if they didn't

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1 get the plan, well, they have to ask for it. You know,
2 it's not up to them to come up with something because
3 what happens is it just gets sort of creatively created,
4 and if they do anything, they'll just put some numbers
5 but they never actually design the daylight area so you
6 know what fixture is actually in the daylight area, and
7 which fixtures aren't in the daylight area. You know, you
8 need a plan.

9 MR. FLAMM: I hear you, Pat. And perhaps we
10 could clarify that in the manual. What I'm concerned
11 with is that we, by specifying who can do this, we're
12 actually specifying who cannot do it. And we wanted to
13 let the market decide whether it was the envelope guy, or
14 the lighting controls guy, or the architect, or the
15 General Contractor. We were going to let them all decide
16 who was going to do it.

17 MR. SPLITT: They're going to decide it's the
18 other guy.

19 MR. FLAMM: Right, and I agree that's a
20 challenge and I don't know how we walk that fence between
21 being flexible and being overly Prescriptive.

22 MR. SPLITT: And the other thing you have to
23 somehow, for all this daylighting stuff, somewhere in one
24 document, in one place, so from beginning to end you can
25 just read through and figure out what the requirements

1 are, you don't have to hop. You know, right now, to --

2 MR. FLAMM: I agree with you.

3 MR. SPLITT: To do -- if I actually wanted, in
4 doing a performance program, to actually model that large
5 daylit area, even though I was theoretically just doing
6 electrical, not only do I have to go beyond the
7 electrical inputs to envelope, but to specify in
8 EnergyPro that that area requires daylighting, I have to
9 put it in the System section, the Mechanical section,
10 which makes absolutely no sense. Nobody would ever look
11 there and nobody ever does look there, so it just never
12 gets done.

13 MR. FLAMM: Okay, we'll work on that when we're
14 working on the manuals and the forms, etc.

15 MR. SPLITT: And then a similar light on the
16 outdoor lighting, we also should require a plan for
17 outdoor lighting, too, for the outdoor lighting areas
18 because, without that, you have a form with a bunch of
19 numbers that there's no way a plan checker can look at
20 those numbers and know what they're referred to. There's
21 no way to check it, it's just numbers and it just gets
22 approved because there's no way of knowing whether it's
23 right or wrong. So outdoor lighting also needs a
24 requirement for a plan.

25 Well, I've got to talk about BUG for a second.

1 I was sort of instrumental in getting the Building Code
2 Green Code change to put in some requirements for light
3 pollution reduction requirements, which basically refer
4 to this BUG system, and those are going to become
5 mandatory for all nonresidential buildings in July of
6 next year. So I'd like to see that we try to integrate
7 more the Energy Code with those requirements because,
8 right now, the Energy Code has similar reference to BUG,
9 but it's asking someone to look up Zonal Lumens, which I
10 think is a little more difficult to find and I might --
11 well, we can work on it later, but I think maybe if you
12 can just refer to the other Code, or move that language
13 into this Code so that it's the same language and we
14 don't have two different metrics trying to get to the
15 same place, would be better.

16 And then, lastly, just back to skylight daylight
17 areas, I think we need more work on how to define what
18 that area is and the shape because what's in there now
19 isn't clear. There's a lot of things that won't meet the
20 requirements right now, it's not .7, we take a
21 rectangular skylight and we say we're going to make a
22 rectangular shape, so where there would be curves, we're
23 filling in and saying, well, we can go a little bit
24 further, but then why not do the same for a circular
25 skylight, make that a square shape on the floor instead

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1 of a round because that would be a lot airier than for
2 the lighting designer to figure out what the area is and
3 how to know when he has something in the daylight area and
4 when he doesn't.

5 MR. FLAMM: We can discuss all this. Okay? I
6 thought I saw John McHugh stand up. He must have left.
7 Gene.

8 MR. THOMAS: Gene Thomas, Ecology Action. I
9 just wanted to get a clarification on 130.0 and the
10 permit adapters and changing lamp type doesn't change the
11 luminaire classification type. You're not intending to
12 say in a situation, well, here's a newly constructed
13 building, and there's an incandescent fixture, that you
14 won't be allowed to screw a CFL in there, or the Phillips
15 LED A Lamp that won the L prize or something? That's not
16 your intent, is it?

17 MR. FLAMM: That's not the intent. Title 24 is
18 a luminaire standard, it's not a lamp standard. And
19 occupants can put any lamp they want into a luminaire if
20 it fits and if it's within the ANSI Standards,
21 tolerances. But what this says is an incandescent light
22 is an incandescent light for compliance with Title 24,
23 Part 6. If the occupant wants to do beyond that, they
24 can, but when the designer or contractor is filling out
25 the paperwork, they have to claim that as an incandescent

1 luminaire because it's an incandescent luminaire, because
2 it can always revert back to an incandescent luminaire.
3 It's only something else as long as that lamp lasts. So
4 it's current that way, it's been that way all along. So
5 for the majority of the state, you know, keep in mind
6 that the Title 24 only affects a few percentages of the
7 new construction and additions. The majority of the
8 state, the changing of a light bulb is not even addressed
9 by Title 24, Part 6, it's something the consumers do. So
10 there's nothing in Title 24, Part 6 that is going to
11 prevent a consumer from screwing anything in that, you
12 know, they could screw a zip cord into it if they would
13 like, but according to the calculations, that's an
14 incandescent fixture.

15 MR. THOMAS: But in a retrofit situation, that
16 wouldn't then mean that the contractor that's putting
17 that LED screw in wouldn't be able to claim the energy
18 savings for that?

19 MR. FLAMM: Well, I don't know what you mean by
20 claim the energy savings. If it's non-Title 24 -- let's
21 say it's a utility program -- and the utilities are
22 paying to put in high efficacy lamps, no alteration to
23 the luminaire, that's under the radar of Title 24, Part
24 6. Utilities can still pay a rebate on it. You know,
25 they already buy down ahead stream CFLs so, when the

1 consumer puts that CFL, the utility claim credit for that
2 savings, but Title 24 still sees that as an incandescent
3 fixture. But if it's not a Title 24 project, it's
4 irrelevant, it's mute because you just screw a light bulb
5 into it.

6 MR. THOMAS: But aren't the -- the retrofit,
7 the changes to the alterations language, doesn't that
8 make it a Title 24 job at that point?

9 MR. FLAMM: Not if you're not changing the
10 socket, ballast, etc. If you're just putting in a light
11 bulb, that's still not a Title 24 project.

12 MR. THOMAS: So one other follow-up question
13 because it was one of the examples I saw in there, are
14 linear LEDs, okay? And we know they're far from ready
15 for prime time right now, but they might be a lot closer
16 to ready, or even ready by the time the Code hits. And
17 so, is the intent there to say that you can't take that
18 Linear Fluorescent Troffer and utilize that for linear
19 LEDs, that that would be contradicting or disallowed
20 under the Code. That's what I was seeming to get from
21 that.

22 MR. FLAMM: And I think we need to work on that
23 language. I agree a little bit --

24 MR. THOMAS: Because if you were, what that
25 would mean is, to contemplate that, they'd have to take

1 out that perfectly good box and everything that's there,
2 and put another one up, and that's going to add to the
3 cost of what's already an expensive upgrade. And once
4 again, I'm not recommending these linear LEDs at this
5 point, but it just points out we want to get more of that
6 cutting edge technology in there, they're always more
7 expensive, and if you can't utilize some of what's in
8 place -- another one was a socket adapter for LEDs and it
9 said, even if it is specified for that by the
10 manufacturer, it seems like you're saying you can't use
11 that.

12 MR. FLAMM: That is true and that's current --
13 there's no such thing as permanent, there's no ANSI
14 Standard of permanent, permanent is whatever the
15 manufacturer claims it is. And we don't recognize that
16 in Title 24 because, otherwise, you know, contractors
17 could put in an eight-dollar fixture and put in a dollar
18 adaptor and say, "Okay, let's call it a day." And it's
19 not permanent. You know, I go back from my experience
20 when I was at SMUD and some of these first permanent
21 adapters came out, the first generation were pretty good,
22 but within months the knock-offs were anything but
23 permanent. Because there is no standard of permanent, we
24 can't recognize anything as being a permanent adapter.
25 So, the manufacturer -- back to your linear fluorescent

1 -- the manufacturer of the luminaire can rate their
2 luminaire for LED lamps; at that point, it's an LED
3 Luminaire. It's the rating -- what was the manufacturer,
4 what was the luminaire manufactured for? What is the UL
5 label? What was it designed for? And that's what we
6 recognize, not light bulb changes. What was the fixture
7 designed for? And that's the way the Standards have
8 always been. And I edited that language about the linear
9 LEDs for clarity and I edited the language about there's
10 no such thing as a screw-based adapter because of
11 misinformation. Just because a manufacturer says his
12 product is permanent, there's no permanent standard,
13 that's in the eyes of the beholder.

14 MR. THOMAS: Is that something that could be
15 looked at for the next iteration --

16 MR. FLAMM: If there was a national standard of
17 permanent, then I think it was something we could look
18 at.

19 MR. THOMAS: Okay. All right, thanks.

20 MR. BENYA: Gary, can I add something?

21 MR. FLAMM: You may.

22 MR. BENYA: I just wanted to remind Gene that
23 what we're contemplating right now is a permanent
24 conversion --

25 MR. SHIRAKH: Jim, can you identify yourself,

1 please?

2 MR. BENYA: Oh, sorry, this is Jim Benya, Benya
3 Lighting Design, consultant through Architectural Energy
4 Corporation to the Commission. One of the things that we
5 talked about in this context was, of course, that when
6 someone changes a luminaire from one technology to the
7 other, it can be done with a complete conversion kit that
8 is UL listed to that purpose. And that kit could just as
9 easily be for linear fluorescent conversions from
10 fluorescent to solid state lighting, or anything else.
11 As a matter of fact, I think some of these products are
12 already on the market. But what differentiates them is
13 that it is a UL listed conversion for this explicit
14 purpose, and those would be acceptable.

15 MR. FLAMM: So, Jim, I want to clarify -- this
16 is Gary -- I want to clarify something. There's a
17 difference between alterations and new construction. And
18 new construction, the Section 130, does not recognize
19 kits, it's intended that in new construction you shall
20 use the rating, the manufacturer rating, of that
21 luminaire. However, when a retrofitter goes in and guts
22 a luminaire, that's a different issue. In those cases, I
23 think it is appropriate to look at some of these kits,
24 but not for new construction.

25 MR. BENYA: Well, I'm going to suggest that

1 there's a third condition in which someone is remodeling
2 a space and they have fluorescent luminaires that they
3 would want to convert to solid state lighting, for
4 example. And I think the way this is written, that if it
5 is a UL listed permanent conversion in the sense of you
6 have to do more than just take the bulbs out and put
7 bulbs in, it's going to have to be a UL listed conversion
8 and a luminaire, from one to the other. I think that
9 category sort of exists, Gary, and I think we definitely
10 should take a look at it, as Gene has pointed out because
11 I really do think that there is something there already,
12 but it's certainly not something as simple as putting an
13 LED tube in a fluorescent socket. That doesn't count and
14 that's, I think, what we're trying to get at.

15 MR. FLAMM: Okay, so then let's, Gene, Jim, and
16 whoever else, let's see what we need to do to the
17 language to make sure that it doesn't prohibit that.

18 MR. YASNY: Mudit has a comment.

19 MR. SAXENA: Yes, hi. Can you hear me?

20 MR. FLAMM: Yes.

21 MR. SAXENA: Yes. This is Mudit Saxena with
22 Heschong Mahone Group and the CASE Author for the
23 Daylighting Code from the IOU team. I just wanted to
24 note for the record that I wanted to provide a
25 clarification to the daylighting code as explained by

1 Gary. Gary explained that photo controls are now
2 required for 250 square feet of daylit area; instead,
3 what we are proposing is photo controls are required when
4 120 watts of installed lighting is within the primary
5 daylit zone or skylit zone. In fact, we are proposing
6 getting rid of the day lit area concept completely, which
7 addresses some of the concerns that Pat Splitt brought up
8 and, Pat, your comments that you brought up in the
9 daylighting meetings earlier have been incorporated in
10 what we are proposing here, so once you get a chance to
11 talk offline, I'll be able to explain to you how we have
12 addressed them. The concept of daylit zones gets rid of
13 the onerous part of calculating areas for daylit areas,
14 and so it makes the process of complying with the
15 daylighting code easier.

16 MR. SHIRAKH: Mudit, this is Mazi. I don't
17 understand. You say you want to get rid of the primary
18 and secondary daylit areas, but then you say it's 120
19 watts of lighting within the daylit zone.

20 MR. SAXENA: Uh huh.

21 MR. SHIRAKH: It seems like you have to define
22 that daylit zone again.

23 MR. SAXENA: Correct.

24 MR. SHIRAKH: Where is it 120 watts?

25 MR. SAXENA: The daylit zone, the only

1 difference between the daylight zone and a daylight area is
2 it's defined in a very similar manner, you don't have to
3 calculate the area for daylight zone, you draw it on plan
4 and you basically sum up the wattage of the installed
5 lighting that falls within the daylight zone, and you check
6 whether it's 120 watts or more, and if it is, then you're
7 required to have photo controls in the primary daylight
8 zone and skylight -- skylit zone.

9 MR. FLAMM: So, Mudit, this is Gary, I'm
10 reluctant to deconstruct and reconstruct, there's been a
11 lot of water under the bridge already this cycle, and
12 here we are at the 11th hour and you're proposing that we
13 completely change the metric, and I actually think it's
14 kind of late to do that.

15 MR. SAXENA: This is the same thing that we
16 have, this is what you have in your Code language, and
17 I'm not proposing anything new here. I'm just clarifying
18 it, I think you did not explain the Code correctly in
19 your explanation, you talked about 150 square feet of
20 daylight area; the code that you have in the document that
21 you put up, this is -- I'm not proposing anything new
22 here, this is all consistent with what we have discussed
23 -- 120 watts of installed lighting triggers the
24 requirement for photo controls.

25 MR. FLAMM: Okay, I stand corrected.

1 MR. SAXENA: Okay, thank you.

2 MS. BROOK: Okay, great. Thank you. I need
3 that little guide back again. Next, we're going to talk
4 about Section 140. And we'll be splitting this across
5 the lunch hour. We'll begin now, we'll get through the
6 mandatory -- the Prescriptive Requirements for Envelopes,
7 and then we'll break for lunch.

8 So first up is §140.1. And we've done
9 substantive edits to this section to clarify how the
10 performance compliance approach is implemented with
11 Compliance Software. And we also clarify that the
12 detailed methods assumptions and required inputs for the
13 Compliance Software is approved by the Commission and
14 documented in the Nonresidential ACM Reference Manual.
15 This is different than in past Code cycles where the ACM
16 Manual included both the process piece, which we're now
17 calling the ACM Approval Manual for how software gets
18 certified by the Commission, along with the very
19 technical detailed individual rules for how equipment and
20 systems get modeled in the Compliance Software. So now
21 we have separated those. The ACM Approval Manual will be
22 part of the rulemaking package and will be adopted by the
23 Commission. And then the ACM Reference Manual will be
24 developed once the Code is adopted, it's actually in the
25 process of development now, but it will be vetted

1 publicly after the adoption of the Standard update in the
2 spring of 2012. That's all I have to say about that --
3 oh, we do have the schedules posted for both the
4 residential and the nonresidential Compliance Software
5 certification process and the ACM Reference Manual is
6 posted online now, so you can go there to understand what
7 our process will be to complete those performance
8 standards compliance products. I think that Mazi is up,
9 but he's not here anymore, so... He probably thought I
10 was going to talk for hours and hours about performance
11 standards and I probably could if you want me to. Maybe
12 we could -- if there is anybody that has a question on
13 this topic, come on up and then we won't have to do it
14 later.

15 MR. GABEL: Mike Gabel, Gabel Associates. In
16 the section there in the introduction to the Performance
17 Method, you don't really refer back to the ACM Manual. Is
18 there a reason for that? I just thought it would be good
19 to tie the loop to --

20 MS. BROOK: It actually does include the ACM
21 Reference Manual. In the description of how the Energy
22 budget is calculated, it does bring up the ACM Reference
23 Manual.

24 MR. GABEL: Okay, so it's a definitional thing
25 between Energy Budget to ACM Manual to the methodology

1 used, that's how those things are connected?

2 MS. BROOK: Yeah, no, I suppose you're right,
3 though, there's no reason why we couldn't in the
4 introduction section, would you say, the approval manual.

5 MR. GABEL: Yeah, I think it would be helpful
6 to emphasize that the basis for the software that
7 performs these calculations is contained in these other
8 sections.

9 MS. BROOK: Okay, so that, I think we have
10 clearly introduced the Reference Manual, but I think it
11 would be a good idea to also introduce the approval
12 manual. Thank you.

13 MR. SPLITT: Pat Splitt from ApTech. Just a
14 couple of items on performance for nonres is that you're
15 proposing to start up a registry, at least some time,
16 that could take these inputs. Right now, the software,
17 there is a lot of inputs that the software doesn't fill
18 in, there are forms that it just generates with blank
19 pages that the only way, well, normally nobody ever fills
20 it in because this is just a certified program, if that
21 came out, is blank, then that's the official version of
22 that form is blank, so nobody does anything with it, but
23 they should have been filled out with many things like
24 controls that have to be tested. But right now, the
25 program doesn't do it, so even if somebody were to fill

1 those in on the plans that were submitted to the Building
2 Department, in your registry you'll never get any of that
3 information because that never got inputted into the
4 software. So I think you have to be sure that the new
5 software performance programs, wherever there's a place
6 where there should be an input, that either the program
7 automatically fills it in, or, if it's something that the
8 person doing the modeling has to input manually, he can
9 right there at that time input the data into the form so
10 it's now in the program, it's not something that you add
11 afterwards, and then, if you send something off to the
12 registry, all that data will be there. Or, if a year
13 from now somebody comes back and wants to make a change
14 and I call that program up again, that information is
15 there and it isn't lost because whatever page I scribbled
16 something on is long gone.

17 MS. BROOK: So are these forms within the scope
18 of the Performance Standard? Or are they more things
19 like Acceptance Test forms or installations --

20 MR. SPLITT: A lot of them, they're actually on
21 the Certificate of Compliance where you have to spell out
22 control requirements, that sort of stuff. They're just
23 blank right now.

24 MS. BROOK: Well, and so since I know you do
25 Code compliance perfectly, you fill it out, you fill

1 those pieces of paper out?

2 MR. SPLITT: No, I don't -- well, it depends on
3 what it is, if it's important, I do, but if it's not, I
4 don't because there's no way of tying that to the
5 calculations and to the performance. It doesn't affect
6 the performance at all any way, there's no check that
7 anybody ever put that in there.

8 MS. BROOK: Right, I understand that -- so the
9 misunderstanding between how we've implemented the
10 standards and how they're getting carried out in the
11 field is that there seems to be an understanding in the
12 field that every single form is going to be generated
13 through the performance software, the Compliance
14 Software, and our understanding is only the performance
15 standard related forms are generated in the Compliance
16 Software and the other required forms are done through a
17 manual process.

18 MR. SPLITT: Yeah, well, as an example I used
19 earlier, where you have this large area that has a skylit
20 daylight area over 8,000 square feet, now the program, if
21 it was set up to input the data properly, the software
22 could figure out how big the room is, what the size of
23 the skylights are, and what the ceiling height is, and it
24 would know whether or not you needed daylighting
25 controls, but the way it is now, it doesn't figure that

1 out, it's just a checkbox that somebody has to know to
2 check off on some obscure page, so if they don't check
3 that off, it doesn't happen. So this stuff doesn't show
4 up in the plans anywhere. Or if there are inputs in the
5 software now, for nonres, if I have a building that
6 doesn't comply, and I was somebody who didn't care about
7 whether I did it right or not, just that I can get the
8 building to comply because that's what I'm getting paid
9 for, I could model solar water heating, put in a net
10 solar fraction for that, space heating, and get credit
11 for it, the space heating, I meant, and it will never
12 show up in the forms because you're not supposed to take
13 credit for that.

14 MS. BROOK: Okay.

15 MR. SPLITT: So you can look at all the output
16 forms and you won't see that because it's an input that
17 shouldn't have been done. So, 1) everything should be
18 printed out that you input, or maybe beyond that you
19 might have to have a requirement in there that, if a plan
20 checker requires it, that it's mandatory that the person
21 who did the compliance documentation has to submit their
22 input file.

23 MS. BROOK: Uh huh, yeah, no, absolutely.

24 MR. SPLITT: Because that's the only way to
25 check it. These things don't all show up on the forms

1 right now.

2 MS. BROOK: Okay. Well, we are in our
3 compliance software development efforts, we are now
4 beginning to talk about the required reporting out of the
5 compliance software, so we'd like to talk with you and
6 Mike, if you're interested, to try to figure all of this
7 out.

8 MR. SPLITT: Okay and just one final thing, as
9 far as acceptance and approving these forms, or the
10 performance programs, there's never been public review,
11 there's never been a place where the program was
12 submitted to -- presented to people and we could ask
13 questions, and bang the wheels, and what about this, what
14 about that. So there should be -- well, not only should
15 there be, it's required by the Warren-Alquist Act, but
16 what does that mean?

17 MS. BROOK: It means everything.

18 MR. SPLITT: Okay, well, it's required. So it
19 would be nice for a change if we actually had the public
20 review so we could sort of, before it's too late, because
21 another thing we're always promised when we're at the
22 tight schedule is, "Well, we don't have time right now,
23 but after the dust settles and we get this thing
24 approved, we'll have a meeting and we'll review all this
25 stuff," and it never happens.

1 MS. BROOK: Okay --

2 MR. SPLITT: So we have to --

3 MS. BROOK: So what you're recommending is that
4 we have public review of the Compliance Software before
5 it gets certified by the Commission.

6 MR. SPLITT: Right.

7 MS. BROOK: Okay.

8 MR. GABEL: Mike Gabel. I want to distinguish
9 two things that Pat said that are really important, as
10 different. One is that the software have, the ACMs have
11 a certain amount of artificial intelligence looking at
12 the inputs that have been placed into the program for
13 that project, be able to deduce certain things that get
14 printed on the forms. The other issue, though, is there
15 are fields in the forms which the Energy Consultant, or
16 the person using the software really cannot sometimes
17 fill out at that time, but that in the Certificate of
18 Compliance requires somebody else to input later.

19 MS. BROOK: Uh huh.

20 MR. GABEL: The trouble with the registry is,
21 once you register the project, as Pat said, it's locked
22 up, no one can really access those fields and put them
23 in.

24 MS. BROOK: Oh, okay, so the solution
25 potentially is not in the Compliance Software, it's in

1 the access to the registry documents?

2 MR. GABEL: Well, I think the idea is to
3 construct forms bearing in mind carefully the process of
4 how this works because, if you don't do that, then there
5 are things that just won't work at all, so to be
6 discussed.

7 MS. BROOK: Okay. All right, since Mazi came
8 back, we can move on to Nonresidential Prescriptive
9 Envelope Requirements.

10 MR. SHIRAKH: Okay, so we're going to have two
11 lively subjects back to back here, the cool roofs and
12 nonresidential. This used to be Section 143, now it is
13 143.3.

14 So this Section 140.3(a)1 deals with Cool Roof
15 Requirements for the 2013 and there's two types of roofs
16 for non-residential and steep slope and low slope. The
17 requirement for the steep slope is really not that much
18 different than before. It used to be climate zones 2
19 through 16, now we're going through 1 through 16. The
20 only other change is the thermal emittance is being
21 changed from 0.75 to .85. There are Performance Software
22 that have always used the ACM Manual to specify .85 as
23 the emittance, I'm not sure why; prescriptive was
24 different, but we're making the two consistent this time.

25 The nonresidential Low-slope, that is where is

1 seems some of the discussion is going to revolve around,
2 and we're changing the climate zones from where it used
3 to be 2 through 15, we're going 1 through 16, capturing
4 the cooler climate zones in the state, that would be like
5 High Sierras and up in Humboldt County, North Coast,
6 Climate Zone 1. And the bigger difference is the
7 reflectance and we are proposing to go up from .55 to .67
8 for new construction or, pardon me, newly constructed
9 buildings. And, again, the emittance, we're making it
10 consistent with the ACM requirements, .85. And the
11 alternative compliance approach is using the SRI
12 approach, which does trade-offs with being reflectance
13 and emittance, as long as the SRI is .80, then the
14 product will comply.

15 High-rise Residential, pretty much the same
16 requirements, little difference in the climate zones,
17 same requirement for the Low-sloped, .67 reflectance
18 instead of .55, making thermal emittance consistent
19 across the board between different approaches. SRI is
20 still .80 for the steep slope, same as before. Climate
21 zone here is 2 through 15 and that, again, includes the
22 coldest climate zones, it wasn't cost-effective there.
23 And thermal emittance, the reflectance is .20 which is
24 the existing requirement, it hasn't changed, emittance at
25 .85 and SRI of 16. So basically that captures the major

1 Code changes for the cool roofs.

2 The other major difference or update to the
3 Code is the Side Fenestration windows for Nonresidential
4 Buildings. In the past, there was basically, you know,
5 we only had an SHGC and a U-Factor requirement, we never
6 had a VT or Visual Transmittance requirement. And then
7 we also had, as a compliance option, or a credit, we had
8 a methodology called the Effective Aperture.

9 So the proposal for this round of Standards is
10 actually to tighten down on the SHGC and the U-Factor,
11 but also introduce VT as a third criteria for
12 prescriptive requirements. And there is the difference
13 glass combinations, a fixed operable, and there are
14 different sort of casing and stuff, there's a lot of
15 listings, so I only actually highlighted here the most
16 common type of glass that's being used. For the full
17 list, you need to go to that section which is posted, but
18 the concept is the same.

19 So for nonresidential buildings, Area-Weighted
20 average U-factor for fixed windows is proposed to be .36,
21 and the relative solar heat gain coefficient, again, for
22 fixed windows, is 0.25.

23 And the VT, the Visual Transmittance, this is
24 the total fenestration value of 0.42 for fixed glass.

25 And the same type of approach for Skylights for

1 Nonresidential Buildings. Again, these are all Area-
2 Weighted average, and what we mean by the Area-Weighted
3 is that you can actually deviate from these values so
4 long as the overall weighted value of the U-Factor is .5,
5 in this case, or lower, you comply, which means in the
6 case of VT, you can have darker glass near the bottom and
7 lighter glass closer to the ceiling as long as the
8 weighted area U-factor is better than what we're
9 specifying here, your design will comply which is an
10 important consideration.

11 For nonresidential buildings, again, the U-
12 Factor for skylights that are mounted on curbs is .58.
13 The relative solar heat gain coefficient is .25. And the
14 VT is .49. And this is not as controversial as the side
15 lighting requirements.

16 Other new requirements for this round of
17 requirements is the Air Barrier for Nonresidential
18 Buildings, so a continuous air barrier shall be installed
19 in the building envelope in Climate Zones 10-16, except
20 in relocatable classrooms.

21 And the infamous Overall Envelope Approach,
22 which has been debated at length in every cycle of
23 standards, and we never seem to be able to come up to the
24 same conclusion on it, you know, we are actually
25 proposing to get rid of it this time and use a simplified

1 performance approach to replace it. We've gone back and
2 forth on this in 2005, there were problems with the
3 equations that didn't quite work out, then, in 2008, we
4 came up with this fancy spreadsheet with about 900
5 coefficients in it, and nobody knew how to use it, and we
6 spent months this time to try to come up with another
7 approach that works, you know, it was like trying to put
8 a round peg in a square hole.

9 So we've always talked about coming up with an
10 interface for the compliance software which will allow
11 both in Res and Nonres buildings, we've enabled the user
12 to basically check off what features they want to use in
13 the performance software, and if they're just doing
14 envelope trade-offs, then that's what they'll specify,
15 and they use the compliance software to do it. I think
16 I've finally convinced Martha that this is a good idea
17 and she's going to pursue it. So that's our proposal for
18 now, is get rid of the overall TDV, hasta la vista, and
19 use this simplified method instead, and hopefully that
20 will solve some of these problems.

21 The compliance software, the simplified
22 software, will actually allow like, you know, trade-offs
23 between cool roofs, insulation levels, side fenestration,
24 you know, whatever the overall TDV used to do, you can do
25 it here -- much easier.

1 This is §140.3(c). These are some of the
2 changes to the skylight requirement, you know, the Area
3 Threshold used to be 8,000 square feet, we're proposing
4 to drop it to 5,000. The skylit area required used to be
5 50 percent, now we're increasing that to 75% of the
6 space, it should be within the skylit area as is defined
7 in this bullet. And the minimum skylight area Effective
8 Aperture is no longer needed and we're not proposing to
9 keep that.

10 So here comes the good part.

11 MR. GABEL: Mike Gabel. So I have several
12 comments on Table 143.3(a). You don't have that up on
13 the screen, you just summarized those results, I think?

14 MR. SHIRAKH: Right.

15 MR. GABEL: So I'll give some of this offline,
16 but basically there's a fixed inoperable category and, if
17 you go to NFRC website, you look at fixed or operable
18 windows, especially operable, there's operable operable
19 and operable fixed. So the problem is I think you need
20 to define these with a footnote that correlates them with
21 NFRC descriptors. Personally, I think if something is
22 operable and fixed, it's more like an operable window and
23 it should follow these requirements. But this is the
24 first time the Standards will use these differentiations
25 as defining what the standard is for a window, so you

1 have to be really careful with those definitions and get
2 them right.

3 Also, under that same table, you list windows.
4 You probably want to say vertical fenestration or
5 fenestration in walls, or something like that, because
6 you're including, obviously, other things, so just a
7 stylistic thing.

8 Substantively, I did a search of windows that
9 would meet these requirements for nonres and high-rise
10 residential buildings, kind of interesting, I looked at
11 major manufacturers who have thermally broken aluminum
12 windows and, just as an example, for example, *Milgard*
13 listed out 1,600 products in that category of which seven
14 percent meet the nonres requirements, less than three
15 percent meet the high-rise residential requirements. I
16 couldn't find any to meet the fixed, and I couldn't find
17 sliding glass doors at all to meet sliding glass door
18 requirements. Plenty of French doors did, a huge
19 percentage of French doors did, don't ask me why. There
20 is also the issue of using CMAST because, well, first of
21 all, let me say that you're taking away the center of
22 glass calculation algorithm, COG algorithm, and I think
23 you might want to keep that in there as a fail-safe;
24 instead of 10,000 square feet, you might want to keep it
25 in there as less than 1,000 square feet. We don't know

1 the impact of having people use CMAST calculations, how
2 that's going to really work.

3 If you go on the NFRC website, you can't have
4 access to a CMAST database of curtain wall storefront
5 windows. I called Mudit yesterday and it turns out NFRC
6 charges you \$400 a year to even view the library of CMAST
7 values that people have entered. I'm thinking you need
8 to contact NFRC and tell them they need to release a
9 viewing-only version of their program that's free, that
10 lets you look at the shared database so that people who
11 want to specify general values for a project can say,
12 "Oh, okay, well tell your client...", if I have an
13 architectural client, "...here, look at all these products
14 that need prescriptive values, you should be able to find
15 something that works." So I think you guys need to lean
16 on NFRC and I guess Nelson is on the Board of Directors,
17 I think I might talk to him about that.

18 Let's see, and so in summary I think we need to
19 look at sort of all these issues around CMAST, center
20 glass values, implementation, amount of product, and we
21 need the next couple of months before this thing gets
22 locked and fixed in concrete, to make sure that these
23 values work.

24 One other final suggestion is the U-Factors
25 between Table 1, excuse me, 3(a) and 3(b), are so close I

1 think you might as well make the high-rise residential --
2 they're only .01 and .02 different -- make them the same
3 as the non-res, .47 and .41, etc., just to keep it
4 simpler and make it sort of clear to the industry what
5 these rules are for those kinds of glass. Thanks.

6 MR. SHIRAKH: Thank you, Mike. Are you going
7 to give us written comments on these or -- okay, thanks.
8 Tom.

9 MR. CULP: Tom Culp, Birch Point Consulting.
10 We've already, for Ms. Douglas' benefit, we've already
11 had a lot of discussion about the daylighting and that's
12 been very useful. But for your benefit, just so you know
13 who I am, I've worked in the glazing industry for 13
14 years. I've worked with the Glass Association of North
15 America who has all the major glass manufacturers,
16 fabricators, glazing contractors, as well as the Lumen
17 Exteriors Council that does the framing that goes on
18 these products. I'm also on the Board of Directors for
19 NFRC along with your own Nelson Peña, so I'll take back
20 some of those comments, but good comments. I'm not
21 representing any of those organizations here today. I've
22 been involved here because I have some of the concerns
23 about how we do the daylighting and so we've had some of
24 these discussions, but I wanted to highlight again some
25 of these things plus some new information that we found.

1 Before we get into that, first I want to
2 reiterate that we tend to focus on the differences, but
3 there are a number of issues where we agree and there's a
4 lot of good stuff in this standard, it's just this one
5 area of side lighting, daylighting that we still have
6 some very serious concerns. And there have been some
7 changes, but we have real concerns about how daylighting
8 is being implemented, and are we going to achieve the
9 claimed energy savings in real life. I'll be submitting
10 written comments, but I wanted to highlight some of the
11 concepts and concerns.

12 As we've discussed, daylighting is complex. It
13 depends on the space, the orientation, the use of the
14 space, the geometry, the glazing, the controls,
15 everything. But if you try and boil it down to what are
16 the important factors, 1) controls, 2) distribution,
17 spreading the glass, making it up high to get the light
18 into the space, and then third are the window properties
19 for that specific application. So looking at what the
20 standard is being proposed here, controls, check, you've
21 got that, and very good. That's something I really
22 applaud, that we have a strong controls section. But
23 when you look at the other two aspects, we're missing the
24 mark by focusing on VT alone, while ignoring distribution
25 and doing nothing to encourage good daylit zones and the

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1 spread of light. We've modeled -- the CASE reports model
2 the one-story building with equally distributed glazing
3 and then we're assuming that those energy savings can be
4 extrapolated to all buildings in California -- 20-story
5 offices, schools, banks, restaurants, hotels. But
6 without the language about the glazing distribution in
7 the Standard, we're not going to get that good
8 daylighting or realize those energy savings in real life.
9 And the Green Codes, the International Green Construction
10 Code, ASHRAE 189, address these. The other places,
11 you've done a very good job in top lighting; top lighting
12 addresses this where you look at distributions of the
13 skylights. But for some reason here on the sidelit,
14 we're focusing on the wrong thing, the VT only. I was
15 speaking with Jack Bailey, who is with One Lux Studio in
16 New York, he plays a key role on the Sustainability
17 Committee for the International Association of Lighting
18 Designers, and his comment was that, looking at VT alone
19 is not a good substitute for daylighting. The point is
20 that there is not a correct VT number. It depends
21 balancing the light for the specific application. And
22 the optimum VT depends on that specific application --
23 sometimes higher, sometimes lower. But there's not one
24 number. And we've discussed a lot of this and I think
25 we're making progress.

1 Yesterday, I did try and sit down, now that we
2 have language to respond to, I did sit down and try and
3 come up with some revisions on my own. I just did this
4 yesterday, so it's still kind of rough and I'll include
5 it in our written comments, but I do have some copies
6 here now if you want at least a first glance. There
7 might be, in my view, a better way to address daylighting
8 and achieve the energy savings that we really want, but
9 also make corrections for whether there are problems. And
10 there are a couple of aspects and I'm not going to go
11 through the detailed language, but I want to try and
12 highlight what I feel is important to do. Number one is
13 we have to account for glazing distribution, getting the
14 light in the right place. And I've suggested some
15 language adapted from the International Green
16 Construction Code that was promoted by the International
17 Association of Lighting Designers and the New Buildings
18 Institute and AIA, and I've adapted that to Title 24 type
19 language, and that is suggested here basically saying
20 that a certain amount of your floor area needs to be in
21 daylit zones; that does two things, it spreads out the
22 glazing, it also encourages people to raise their glazing
23 so that you get more penetration and you're covering more
24 floor area. And there's a couple of other suggestions,
25 we can talk about the specific language and exceptions.

1 I took some of the exceptions from the skylighting
2 section that I think makes sense on how you spread the
3 light. The second part is really having to do with the
4 VT. Now, where do we want VT? We want VT -- high VT
5 makes sense when it's up high. And I know there was some
6 language in there about sill heights and so forth, but
7 really when you read it, all it said was, if you have two
8 VTs, don't put the dark glass above the light glass, but
9 that really does nothing, that's common sense. And it's
10 really not getting to the point, so I had some other
11 suggested language about windows located above six-feet
12 high, trying to address the idea of clerestory windows;
13 that's where you want high VT.

14 I've also put in an option, not replacing the
15 VT, but an option for Effective Aperture, Primary Sidelit
16 Effective Aperture. And I know we've discussed this and
17 there have been some claims that Effective Aperture has
18 an energy penalty to it. And I wanted to address that
19 because it's not true. The arguments were claiming that,
20 well, a designer will want to use a lower VT, so they're
21 going to put in more glass area, or put it down on the
22 floor to do so. But that's completely backwards, that's
23 not how the design process works. A designer does not
24 pick a VT and then fit the window around it, they design
25 the window space for the building, the function of the

1 space, and so forth, and then, once they do that, then
2 you use the Effective Aperture to determine how much VT,
3 how much light is appropriate for that space, so it was
4 backwards. The other thing is that this is a
5 prescriptive path, less than 40 percent window to wall
6 ratio. So people are not going to be using the
7 prescriptive path to put glass on the floor, otherwise
8 you've got glass bounded from the top of the windows to
9 about at your chin, so it's really -- there's not a
10 penalty there. And, as we've mentioned before, Effective
11 Aperture is the metric used by the International Green
12 Construction Code in ASHRAE 189.

13 Finally, I made some suggested corrections to
14 the default VT calculation and we can talk about that
15 offline, but it's more of a technical correction.

16 But I think the other important point is that,
17 similar to what Mike was saying about the Table B and
18 Table A, maybe just match up the U-Factors, we need to do
19 that on the VTs, as well. I just didn't realize until I
20 read through it that we had different VTs for the high-
21 rise apartment hotel and motel, that some of the changes
22 that were made for nonresidential were not made there,
23 even though there's many of the same issues that we've
24 already discussed, plus in those spaces, because whether
25 the Commission sticks with the 250 square foot limit, or

1 the 120 watt limit, not all those spaces are going to
2 have controls and, when you look at apartments and
3 hotels, for example, if we go to 120 watts, you know,
4 that's the equivalent of nine 60 watt equivalency FLs.
5 Not every room is going to have that much in there, so
6 the energy savings are not from daylighting,
7 unfortunately are not as much in some of those spaces.
8 So there's less justification for having a different VT
9 there, so I think those need to be matched up. So,
10 again, I'll be submitting written comments on this
11 proposal and addressing some of the other issues, a few
12 other things I found in the analysis that may require
13 some tweaking of the numbers, and again, I agree -- I
14 want to stress that we've been debating this VT issue,
15 but I agree on many other issues, I think the staff and
16 the consultants have done a great job on controls and on
17 top lighting, the top lighting does account for
18 distribution and controls, and it's doing a good job, and
19 just from a broader perspective, because I work
20 nationally, I don't work just in California, but
21 California set the path for those two examples --
22 controls and top lighting. You guys did it first, then
23 look who picked it up -- ASHRAE 90.1, ASHRAE 189.1, IECC,
24 IGCC. California has really led the way with those.
25 It's here that we differ and for some reason I feel that

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1 the IGCC and ASHRAE 189 are leading the way instead of
2 California in terms of daylighting when you look at what
3 the lighting designers and AIA and so forth, what are
4 being proposed there. So I think we just need to keep
5 working on this and continue the dialogue.

6 MR. SHIRAKH: Thank you, Tom. So I've actually
7 been kind of thinking about this idea that you brought up
8 about having the Effective Aperture as a prescriptive
9 alternative. I'd like to talk to you about that. We can
10 put some limitations on some of the parameters that go
11 into the equation, I could talk to you about that. But
12 essentially, the issue boils down to this, whether the VT
13 that the CASE team is recommending, .42, if that causes
14 glare in the space, that's one of the issues, but I think
15 it's the main issue. Would you agree to that, Tom?

16 MR. CULP: That's one issue, but I think where
17 you haven't addressed --

18 MR. SHIRAKH: You can sit at the table there if
19 you wish.

20 MR. CULP: Glare is certainly one issue that
21 we've raised, one concern. Are people going to close the
22 blinds, turn on the lights, and then, equally, when the
23 glare condition is over, are they going to re-open the
24 blinds so that the lights turn back off? That's one
25 issue. But I think there are other issues like this

1 distribution where we're not, you know, we're missing a
2 big important part of daylighting design, which is the
3 glazing distribution.

4 MR. SHIRAKH: So why wouldn't the Weighted Area
5 average address -- you know, you just mentioned that one
6 of the approaches you are promoting is having darker
7 glass at probably head height and clear glass up near the
8 top. I mean, that's what the weighted area average VT
9 would --

10 MR. CULP: Yeah, and I think we all absolutely
11 agree that that's really one of the best daylighting
12 designs for side lighting because then you could have a
13 moderate VT to help manage glare next to the work space,
14 but you have your high clearer glass up top to bring that
15 light into the space without causing that glare.

16 MR. SHIRAKH: In fact, that's the kind of
17 system we have here at the Commission, so again, we
18 provide --

19 MR. CULP: No, the problem is that that's not
20 what the language says to do. By adding the words "area
21 weighted average," it allows that, but it's not promoting
22 that, it's not requiring that. And to be honest, are
23 people going to do it? Probably not. They should, but
24 they're not. So we need stronger language about --

25 MR. SHIRAKH: The Code language doesn't really

1 promote anything, it's the Code language, you know, we
2 have our compliance manuals where we can have examples,
3 pictures, actual design, you know, that's where we
4 address the promotion issue, but the Code language
5 basically says you have two choices, you can either
6 prescriptively have VT of .42, you're good, or you can do
7 the weighted area average, and if it's .42, you're good
8 again, you know, we don't really promote anything within
9 the Code language. So, again, my question is, if that's
10 available and you can do it, you know, I hear that you're
11 saying it's a good practice, you know --

12 MR. CULP: But then we need to say to do that
13 because most people won't do it and the reason it's a
14 little different from other Code requirements, because by
15 not doing it, they may be causing another problem which
16 is, by having this incorrect VT --

17 MR. SHIRAKH: Well, are you suggesting that the
18 daylighting designers, architects, will not understand
19 our Code and just --

20 MR. CULP: Daylighting designers and architects
21 will, but not everyone users a daylight designer,
22 unfortunately.

23 MR. SHIRAKH: And the other thing that we
24 brought up here was this idea of the simplified
25 performance approach, which makes it hopefully very

1 convenient, and that's the other option, we can actually
2 have more trade-offs available to you if you wish. And,
3 again, is that something that would be helpful?

4 MR. CULP: Absolutely. And Jon McHugh and I
5 discussed that some and I was pleased to hear that the
6 performance path is used a lot more here in California
7 than in other states. I wish other states would go that
8 way because it leads to better integrated design. But,
9 on the other hand, that doesn't excuse us from getting
10 the prescriptive path correct for those people that do
11 use prescriptive path for replacement products and
12 establishing the correct baseline for the performance
13 path, so I don't think -- that certainly helps, but I
14 don't think we can use the performance path as an excuse
15 for issues and prescription.

16 MR. SHIRAKH: It's not actually just an option.
17 Again, I think within the prescriptive, there is
18 flexibility. You know, you're concerned that people just
19 use the VT and they'll just go that route and they don't
20 use the weighted area average, I mean, that's probably
21 something we can address through our training efforts,
22 through the compliance manuals. And then the question of
23 glare is, you know, that's what I am actually trying to
24 get a handle on, like whether this is a problem or not.
25 A couple of buildings were mentioned, the New York Times

1 Building, the Cal EPA, and when I look at -- I actually
2 don't have much data about the Cal EPA Building, but I
3 thank you for sending me those reports, it kept me busy
4 for a while, not very long, but you know, the type of
5 windows, the VT, the window ratio, the SHGC are really
6 quite different than much higher, almost like 140 percent
7 more light goes into the New York Times Building, yet
8 they seem to manage the glare. You know, is glare still
9 a problem in the New York Times Building?

10 MR. CULP: That was the key aspect of this
11 study with Lawrence Berkeley National Lab was how to
12 manage that and, in trying these automated exterior
13 shading devices, and so forth, and so they do manage it
14 that way; unfortunately, it's expensive and nothing that
15 we can require in the Standard, but the point there is
16 that, to look at how they took this daylighting issue and
17 handled it, and the example I gave is do the keyword
18 search on this 240-page report from Lawrence Berkeley
19 National Lab, VT was mentioned twice, glare and
20 discomfort was mentioned 395 times, or something like
21 that. And it shows the relative factors, you know,
22 daylighting and VT are not the same. VT is one factor,
23 but it's how you integrate it in the design, the
24 distribution, accounting for glare, and so forth. So, I
25 mean, yeah, in that particular building, the window to

1 wall ratio was over 40 percent --

2 MR. SHIRAKH: I think that was about almost 80
3 percent --

4 MR. CULP: Yeah, but it's more to look at the
5 concept, and you know, in my previous comments a couple
6 of photos we submitted were for buildings that would be
7 the 40 percent window to wall ratio, at least one of them
8 was, and I can submit some more, too. But it's the same
9 issue where you see the blinds being pulled because of
10 the glare issue. But, again, glare is one aspect I think
11 that is of concern. As I looked into this, I realized
12 we're assuming equally distributed glazing when we're
13 calculating the energy savings, but that's not going to
14 happen unless we address it in the Standards. So we also
15 need to address the distribution.

16 MR. SHIRAKH: Okay, again, I would like to work
17 with you maybe on the Effective Aperture. If the
18 approach results in the same energy savings, I think
19 we're okay with it, we just need to talk to you and make
20 sure we agree on the basic assumptions that go in it.

21 MR. CULP: Okay, thank you.

22 MR. SHIRAKH: Thank you.

23 MR. MCHUGH: Mazi, can I add something?

24 MR. SHIRAKH: Sure. Is that Jim?

25 MR. BENYA: Jim Benya of Benya Lighting Design,

1 consultants for AEC to the Commission. I just wanted to
2 point out that there's been -- there was quite a bit of
3 work done by several teams during the development of the
4 Standard. I'd just like to slightly step back for a
5 second though and point out the leap. One of the things
6 I recommend that we try and do is recognize that there is
7 utilizing the 80:20 principles. Eighty percent of the
8 projects are pretty ordinary and 80 percent of the
9 projects can be, in my opinion, benefit from a simple set
10 of codes and standards that every day contractors, every
11 day architects doing every day buildings will use
12 effectively. I think you're absolutely right talking
13 about the complexity of daylight, even some of your -- I
14 don't disagree with any of the specific technical points
15 that you've made, as a matter of fact, they were made
16 very very well. The problem is that we've tried in the
17 past, I think, in the Standard to be that explicit and to
18 be that careful, to preserve all of the options. And
19 historically we have created Codes that have been hard to
20 follow, hard to manage, and therefore hard to enforce.
21 And we didn't get as good of results as we'd like to. So
22 the idea is to take the designers, the design teams that
23 wanted to do simple every day buildings and give them
24 simple every day rules. So the reason for making the
25 prescriptive measures simpler is exactly that. If you

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1 have a building that is doing frankly better at
2 daylighting which most buildings need, then you should
3 leap into the performance section and make your case in a
4 more complete manner.

5 So the points you're making are positively
6 totally agreed upon, but put it in the context of what
7 you are ordinarily going to run into; as a building
8 official who has got to approve every day buildings
9 coming across his desk every day, and you'll see why
10 there was a real effort on the part of the Commission and
11 all their advisors to try and find simpler ways to write
12 it.

13 MR. SHIRAKH: So, then, what is your
14 conclusion. Are you, Jim, supportive of the prescriptive
15 proposal by the CASE team? And you're saying that can be
16 used in the majority of cases and, where there's
17 problems, people should use performance? Is that what
18 you're --

19 MR. BENYA: Yes, in general that's what I
20 believe, that the CASE teams really worked on this a lot
21 to try and -- you know, there were some knock down drag
22 out disagreements, let me tell you, because everybody
23 knows daylighting is harder than a few simple numbers.
24 ASHRAE has been through this problem from Standard 189,
25 Standard 90, IDCC, IGCC have been through this very same

1 problem, LEAD goes through this problem all the time
2 because good daylighting is not that simple, but simple
3 buildings can follow some simple rules. So I think it's
4 perfectly great, Mazi, if we undertake to review this one
5 more time, but I want everybody to know that it wasn't
6 like, you know, these things weren't thought of before.

7 MR. SHIRAKH: Thank you, Jim. Hopefully you
8 can help us resolve some of these issues. Any other --
9 Mr. McHugh?

10 MR. MCHUGH: Hi, Jon McHugh with McHugh Energy.
11 What Jim was just talking about, the 80/20 rule, what's
12 kind of interesting is that it almost turns out that it's
13 actually the 20/80 rule that we're talking about because
14 I was actually kind of interested in this whole issue,
15 you know, what fraction of buildings are using the
16 performance approach vs. the prescriptive approach, and I
17 contacted Martin Dodd and he does regular trainings on
18 Title 24, and one of the trainings was to a number of
19 building officials. And of course, this is sort of a
20 convenience sample, but he asked the building officials
21 what fraction of new commercial buildings used the
22 prescriptive approach vs. the performance approach. And
23 the response that he got back from the building officials
24 was it's on the order of 70 percent of new buildings are
25 using the performance approach. So, to some extent, you

1 know, some of this may be a *Tempest in the Teapot*.

2 Now, Tom has mentioned that he's been in the
3 glazing industry for 20 years, I started my daylighting
4 career 20 years ago, have my Masters Degree specifically
5 on this particular subject, wrote ASHRAE, a Journal
6 article back in 1996 on the energy impact of daylighting
7 and, in addition, worked on the California Title 24
8 Daylighting Proposals and led the charge for ASHRAE 90.1,
9 the ASHRAE 90.1 Daylighting Proposals, as well as I'm on
10 the ASHRAE 189.1 Committee and led the development of
11 Addendum A which updated the Daylighting in ASHRAE 189.
12 And it's absolutely true that there's been a lot of
13 activity over the last, well, decade, really on
14 daylighting, starting with Title 24 and, actually, Title
15 24 and ASHRAE 90.1 have been essentially leapfrogging
16 each other recently, the standards in the 2010 Standard
17 for ASHRAE are more stringent than the current standards
18 that we have in Title 24. And with the adoption of the
19 proposals, again, Title 24, I think, will pretty much,
20 pretty dramatically leap past where ASHRAE 90.1 2010 is.

21 Now, what's different between ASHRAE 90.1 and
22 ASHRAE 189, is that the focus on daylighting has been on
23 the various easiest places to daylight, and so the
24 current requirements are focused around the primary
25 daylit zone, which is one window head height from the

1 window. The proposal for this round of Title 24
2 standards includes mandatory requirements for that
3 primary zone because it is the area where the largest
4 savings is, but in addition, we're prescriptively
5 expanding the requirements for the secondary zone. So
6 the need is for more light to actually realize the
7 savings in that secondary zone.

8 Some of the earlier discussions have been
9 around trying to just make sure that you illuminate the
10 primary zone. Now, in ASHRAE 90.1, there's only
11 requirements for the primary zone and you can get a
12 control credit for the secondary zone. To get the
13 controls credit for that secondary zone, you have to have
14 an effective aperture of 30 percent and it's almost
15 impossible to get an effective aperture of 30 percent
16 with anything less than 40 percent visible transmittance
17 to the glass. So I think that what's actually proposed
18 is actually reasonable; we're looking for more light
19 because we're looking for illuminating that secondary
20 zone. It is simple and, as I think was brought up
21 earlier, people can put a higher transmittance glass like
22 60 percent transmittance glass up in the clear story
23 window and then put lower transmittance glass in the view
24 window, and that's perfectly reasonable.

25 In terms of glare, the fact of the matter is

1 that reducing the transmittance of the glass in general
2 is not going to provide sufficient glare control for
3 those situations where there is direct beam sunlight.
4 You're still going to need some kind of control, whether
5 it's blinds, or shades, or something like that.

6 So I think that the current proposal is well
7 thought out, you know, we are taking advantage of, I
8 think, some fantastic new technology that has been
9 provided by the fenestration industry. So we're looking
10 at effectively decoupling the solar heat gain and visible
11 light transmittance and we're making use of that new
12 technology which, you know, multiple manufacturers have
13 patents on and, so, I would actually suggest that we're
14 actually in the right place. I would be happy to answer
15 any other questions that might --

16 MR. SHIRAKH: Yeah, I have two questions. Mike
17 Gabel, who has just been addressed just said the product
18 availability is an issue and I want to get a reaction
19 from you or the CASE team about whether that is actually
20 a problem, because if it is, then it is a problem.

21 MR. MCHUGH: My understanding is that the glass
22 that we're looking at is a relatively new product and,
23 so, if the issue is around those particular issues,
24 that's one thing, but I think the bigger issue for Mike,
25 and you can correct me if I'm wrong, is potentially the

1 issue of U-Factor and frame issues for glass and that's
2 completely different -- I mean, that's a U-Factor issue,
3 what I'm talking about right now is just the BT and SHGC
4 issues. But you certainly want to make sure that,
5 especially for retrofits, that there is the appropriate
6 relaxation potential of U-Factor so that, you know, glass
7 is available to be used in retrofits.

8 MR. SHIRAKH: And the second issue that he
9 brought up and you actually mentioned it is, yeah, we
10 want -- because, you know, we're including the secondary
11 daylight zone as part of the requirements for controls,
12 then we need to have more daylight to penetrate that.
13 What they're arguing is this is going to basically cause
14 glare for the guy who is sitting next to the window and
15 it could be just too much light coming in, and they're
16 arguing that, to get around it, they're going to defeat
17 it by putting in blinds that will stay closed, and
18 especially you are defeating the entire purpose because
19 those blinds will stay closed and you never get the
20 savings that you wanted from those fancy controls that we
21 put up there in the first place. So what is the response
22 to that?

23 MR. MCHUGH: So if you, just as an example, I
24 was recently at the New York Times Building and the
25 situation there, as you found out, is that it has lots of

1 glazing area, actually very high transmittance glazing
2 area. That system actually has automated blinds, but the
3 main thing for that building is that, if there is no
4 direct beam sunlight on the windows, the blinds are up.
5 And you know, the issue is that, in general, especially
6 for California with our clear skies, we really don't have
7 a glare issue when we don't have direct beam
8 illumination. So the illumination that's from clear sky
9 tends not to be a glare problem. You know, there could
10 be some examples where you have a bright white building
11 and it's a sunny day, and it's getting a glary -- but
12 you'd still have a glare issue whether or not you had
13 very high transmittance windows or you had lower
14 transmittance windows. So, I mean, you're still going to
15 -- when there is direct beam sunlight, you're still going
16 to need to use blinds; when there's no direct beam
17 sunlight, essentially --

18 MR. SHIRAKH: In the New York Times Building,
19 you said they use automatic blinds? Or is it manual?

20 MR. MCHUGH: So the New York Times Building has
21 automatic blinds, but certainly the vast majority of
22 daylit buildings do not have -- you know, that was sort
23 of a one-off type project. The vast majority of
24 buildings have manual blinds. And --

25 MR. BENYA: Jon, I'd just like to -- this is

1 Jim Benya again -- I'd like to add that many of the
2 floors have had to move the workers' work stations 10
3 feet back from the windows, that even with the blinds --
4 even on a cloudy day with the blinds up, there's too much
5 brightness to work on your computer very near the
6 windows. This is not a good building and it's not a good
7 example, but it does bring up the fact that, in leading
8 edge designs and well financed designs, that the blinds
9 can be used as the means of controlling cool air and, to
10 a certain extent, solar gain. In this particular
11 building CASE, those blinds are two percent transmitted
12 because the glare on the east and west sides of the
13 building is so severe so much of the year. And as a
14 result, when the blinds are pulled, the light has got to
15 be on. I mean, there's no kind of in between on that
16 building. I think there could be better models for us to
17 talk about, but you know, Jon's overall point is really
18 good, there are solutions in more advanced buildings and
19 with as many people trying to design more advanced
20 buildings as there are today, I think that we will see
21 automated blinds and other controls stepping in and
22 making these buildings work, you know, somewhat
23 regardless. But let's just say that a building with 80-
24 90 percent window wall ratio, on four sides, in most
25 North American apartments, isn't a real good idea to

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1 begin with, and I don't think this building would pass
2 Title 24 simply because the envelope is so crummy.

3 MR. MCHUGH: So I just want to make one last
4 comment about glare, which is the computer models that
5 were used to develop the CASE standard made use of the
6 daylighting glare index calculation that is inside of --
7 I think they're using Energy Plus, but both DOE2 and
8 Energy Plus both have a daylighting glare index
9 calculation procedure, and so what that does is it does
10 look at glare, and when it calculates the glares above a
11 certain level, it does pull the blinds. So the energy
12 analysis included glare. So, I think we're covering our
13 bases there.

14 MR. SHIRAKH: One other comment. Does this
15 idea of having darker glass at head height and clear
16 stories up high, you know, it's allowed under our
17 prescriptive proposal. Is there some way we can, as Tom
18 was suggesting, we can highlight that? I mean, I
19 mentioned the compliance manuals, but is it something we
20 can do that people become more aware that that option is
21 available?

22 MR. MCHUGH: I think the manual is the
23 appropriate place to describe those features. We have a
24 whole slew of things, not just around fenestration, but
25 around mechanical systems, etc., which are exceeding the

1 standard and good design, whereas the codes are the
2 definition of, well, I would say outstanding design vs.
3 the Code is now becoming good design in terms of its
4 requirements. You know, there's always a trade-off
5 between simplicity and trying to write a design manual,
6 and I think that right now what is proposed is, I think,
7 fairly short and sweet in terms of capturing the big
8 issues. And you know, being involved in the sky lighting
9 proposal, you know, the original one back in 2005, the
10 difference between side lighting and top lighting is
11 that, in general, people put windows in their buildings,
12 so it's an amenity that people already ask for.
13 Typically, windows are fairly, I mean, you can go around
14 -- windows are typically fairly evenly distributed around
15 the building, so you know, trying to do some of these
16 other things might be just sort of over-specifying the
17 problem whereas, with top lighting, there were people
18 definitely doing it, you know, a number of companies had
19 been doing this for a while, but it was not a typical
20 design approach and was not an amenity that people were
21 demanding originally whereas windows certainly have been.

22 MR. SAXENA: Mazi, this is Mudit Saxena. Can I
23 get a chance to comment here at this point?

24 MR. SHIRAKH: Just one second. I know there
25 are people here that want to talk about cool roofs. Reed

1 is waiting patiently. We'll get to you, Reed, I promise.

2 Go ahead, Mudit.

3 MR. SAXENA: Thank you, Mazi. So I'm Mudit
4 Saxena with Heschong Mahone Group. We have a long and
5 wide experience with working with daylight buildings. I
6 agree with comments from both John McHugh, as well as Jim
7 Benya, and especially Jim's comment about the New York
8 Times Building as being a pretty one-off building, which
9 isn't very comparable, and he mentioned that if we had
10 examples of other buildings, that would be good. We've
11 studied a lot of side lit buildings, we did a study about
12 five years ago on 123 daylight spaces in the Pacific
13 Northwest, including California. And more recently, we
14 studied 61 spaces across the United States for the
15 Daylight Metrics Project. One of the things that I
16 wanted to add about the glare discussion here, glare is a
17 dynamic problem. It's a problem that comes and goes
18 because the sun moves around and glints from other
19 spaces, other windows that may be in your view, or it may
20 be just a car that is parked right outside and it's
21 causing a glint and it causes glare to you. It's
22 unpredictable to a large extent and it needs to have the
23 occupant in control to be able to take care of. If we
24 try to solve the glare problem using a static metric,
25 that of VT, I think we'll end up with a very wrong

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1 answer, and the answer will always be "extremely dark
2 windows" because the right answer would be extremely dark
3 windows, that way you solve the glare problem.

4 I think we will do ourselves a big disservice
5 if we start thinking of solving a dynamic problem of
6 glare through static solutions. The solution for glare
7 has existed for a very long time and is ubiquitous, and
8 that is blinds and shades, manual blinds and shades. In
9 our study of the daylight spaces that I talked about, these
10 are average every day spaces, these are not high end
11 spaces. Ninety-three percent of the spaces we studied
12 had either blinds or shades. So people have figured out
13 how to solve the glare problem through the use of manual
14 blinds and shades. I think the solution for glare
15 exists, we need to understand it. We need better studies
16 to understand how people are using blinds and shades, but
17 that shouldn't stop us from proposing Code that
18 encourages better daylighting design. And having VT --
19 and I completely support Jon's argument about Effective
20 Aperture of at least 30 percent to get daylighting into
21 the secondary daylight zone, which gives you about a .4 VT.
22 So we've done a lot of thinking about this with Eric
23 Shadd, he's the CASE author for the fenestration portion,
24 and we have talked about glare issues, we've come a full
25 circle on this, and we've all put our heads together and

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1 I think we're in a very good place. I'll take myself
2 off, then. Thanks.

3 MR. SHIRAKH: Thank you, Mudit.

4 MR. DEVITO: Thank you. My name is Eric
5 Devito, I'm here for Cardinal Glass Industries, it's a
6 large glass manufacturer, all aspects, coatings,
7 insulating glass units, float glass, you name it, across
8 the country. We have two facilities right here in
9 California, as well, that make the product. First, thank
10 you to the gentleman from the roofing industry who agreed
11 to sort of let us finish this topic a little bit before
12 they launch into some of their issues, so I guess a thank
13 you and apologies to the rest of you that have to hear
14 more about windows. But thank you, Commissioner, for
15 hearing all of our public comments today and taking time
16 to delve into these issues. Thank you to Martha and Mazi
17 and Eric, we've had loads of discussions, particularly on
18 the VT issue offline, you know, both in the workshops and
19 outside of them, trying to get it right.

20 Before I get into that, though, I want to first
21 put on record, we definitely support the path that you're
22 heading, the new prescriptive values that are being
23 proposed, both for U-Factor, SHGC, and VT. It's the
24 right move, it puts California where it's supposed to be,
25 the numbers are achievable, the numbers will keep pushing

1 the market transformation that you've already experienced
2 here in the state, it will push it to that next level
3 where it's a reasonable place to go and where I think you
4 need to go, and I know a lot of folks that do. It's a
5 simplification, even more than you already -- you know,
6 you had your prescriptive path was always pretty decent
7 at simplification as it was, it's even better now, you
8 know, it's material neutral, it's eliminating all the
9 different climate zones, it's focusing those targets to
10 get you to that market transformation, which helps with
11 the enforcement issue that someone raised. You know, if
12 you can get your enforcement because the products leaving
13 the factory already meet your Code, it solves a lot of
14 your enforcement issues, so we think your values and the
15 way you're headed is going down that right path. We
16 think Area-Weighted Averaging makes sense, that was a
17 relatively new addition and it adds flexibility, it adds
18 for some design flexibility, and some product flexibility
19 for certain types and certain aspects of the buildings,
20 so we agree with that.

21 We do -- one sort of item of question which we
22 have raised, but we're not going to push it at this
23 stage, we know that's probably for future Standards
24 updates, is this RSHG, Relative Solar Heat Gain. We
25 think just specifying an NFRC rated SHGC makes the most

1 sense, it's easiest, there are other aspects into the
2 RSHGC calculation which go away from simplification, but
3 we understand that's where you are now and that would be
4 more of a step than you're willing to take at this point,
5 so I just reserve sort of the opportunity to come back in
6 future standards updates well down the road to maybe
7 revisit that RSHGC issue.

8 As far as the VT, you know, I do have a lot of
9 comments on the VT, I don't think this is the best forum
10 to get into all of the technical details, so I'll let
11 that go. Like I said, we've addressed a lot of them
12 offline, but it is cost-effective; one of the most
13 important things I think we can leave here with is this
14 is a simplified prescriptive path to set your energy
15 budget. All of the various issues we're talking about on
16 shading and other controls, that can be done in the
17 performance pastel, the area weighted averaging provides
18 lots of options. There is plenty of flexibility that was
19 there before, but even more so now as a result of all
20 these stakeholder discussions, more flexibility has been
21 added. Personally, I supported the higher VT numbers
22 that were out in the original proposal. They've actually
23 come down considerably from what we were originally --
24 but I understand the need for that, I understand the need
25 for compromise, I understand the need for flexibility, so

1 I think that this blazes an excellent trail on the VT
2 issue that other Codes have not done yet.

3 I heard Mr. Culp mention that, you know, ASHRAE
4 is the leader and other Codes are the leader, I disagree;
5 they may have led in introducing the VT topic for
6 daylighting, they do it differently, they do it through
7 ratios and effective aperture. You're getting to the
8 same place much simpler here by setting a point for a VT.
9 I mean, the 1.0 SHGC, the VT ratio that's being used in
10 other Codes is, you know, when you take your .25 SHGC
11 value that you have, I mean, that's a .25 VT. Twenty
12 percent of the visible light, that really isn't a very
13 strong visible light standard. What California is
14 proposing is a much stronger and a much better standard,
15 and obviously justified and cost-effective.

16 I also have a comment to make about Mr. Culp
17 said, "Well, the controls are the most important thing,"
18 well, if you don't let the light in in the first place,
19 you have nothing to control. So building it right,
20 getting appropriate daylighting from the start, and
21 setting the budget, more importantly, through that
22 prescriptive path, is saying these are the type of energy
23 usage and savings and what we'd like to achieve through
24 daylighting, you set that through the prescriptive path,
25 then if you want to vary it and go do your trade-offs

1 through the performance approach, that's the right way to
2 do it, but that's the way you're doing it.

3 There were some comments about product
4 availability and I understand what Mr. Gabel was saying,
5 I don't disagree, I've done the same type of analysis
6 myself, I've pulled up the various manufacturers. 1) On
7 the glass manufacturing side, the glass can beat it. You
8 put in almost any frame, you take the right extra low
9 solar gain low e glass, you put it in almost any frame,
10 it's going to meet your standard. The issue I think he
11 is encountering is a lot of the products that may be out
12 there right now are still under the moderate low solar
13 gain type of product and all this really is is a
14 different type of coating, it's built the same, it's made
15 the same from the window manufacturer's side, it's just
16 using a different coating, which they do use now, but
17 there's been no real impetus to spec that product. I
18 think there is -- I think you're going to see a lot more
19 of it -- the Federal Tax Credit on the residential side
20 really pushed a lot of this glass, so you saw a lot more
21 penetration. I think if you look today vs. 2009, you'll
22 see much more penetration of this type of product from
23 the window side. That's one aspect. Two, you know, the
24 seven percent only available, I think if you look at a
25 manufacturer's product distribution, I can see how that

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1 would happen, but that doesn't necessarily mean how many
2 they make, that's of all the various products that they
3 make across their whole line. The most important thing
4 is that they offer a product that meets it, they can
5 always ramp up, ramp down, to meet the standard.
6 California is a big enough market, it's happened before,
7 believe me, manufacturers will meet that standard,
8 they're capable of meeting it now, it's just a matter of,
9 again, picking a high solar gain or -- excuse me, a low
10 solar gain, extra low solar gain, low e coating, vs.
11 maybe the moderate one that they're using now. And it's
12 really no additional cost at all, it's just using a
13 different type of coating.

14 On that note, I do agree with Mr. McHugh's
15 comments. I do agree with the VT Standards and all the
16 other Standards that you promoted here today. I look
17 forward to continuing to work with staff to getting these
18 new proposed Standards off the ground. And I thank you.

19 MR. SHIRAKH: Thank you, Eric. Any other
20 comments on fenestration?

21 MR. ZAREMBA: Tom Zaremba and I represent
22 Pilkington North America and AGC Flat Glass North
23 America, Inc. And I appreciate the opportunity to talk.
24 I'm going to really try to make it as brief as absolutely
25 possible given the length of time and the number of

1 people who are interested in these subjects. I want to
2 thank the staff for working with us so well. We asked
3 for underlying analyses documents and we just got them a
4 day and a half ago. Unfortunately, it took me about 17
5 hours to download and it was my computer was too small,
6 so I haven't yet had an opportunity to review those. So
7 we'll set all that aside for the moment because that will
8 give me an opportunity to do so between now and the
9 written comment period.

10 One of the things, though, that I do want to
11 point out, and I have just a document here that may help
12 illustrate this, is this issue of the products that are
13 currently in the marketplace and what the impact of the
14 standard might be. What I've done is I've taken a graph
15 that appears in the CASE Report, it's at the very end, I
16 believe, it's in the Appendix, and basically what it does
17 is to block in the upper left-hand quadrant, of the
18 products that are available in the marketplace, those
19 that would comply. And the CASE Report indicates that
20 basically this is a spread of the major six
21 manufacturers' products, inventories. So everything
22 outside that box, that upper left-hand quadrant, from a
23 prescriptive path requirement side, is not going to
24 comply with what is being proposed here. And I find
25 myself asking, so, okay, how did this happen? I mean,

1 it's really limited. Well, I look again to the CASE
2 Report and it basically says that all of the proposed
3 changes that are being made here, virtually all of those,
4 are being driven by the availability of triple silver
5 product, triple silver coated low e glass, that's it. So
6 essentially the standard is being written around a
7 specific type of glass and that's why all of the other
8 glass types are being omitted. Now, of course, the
9 standard itself can drive demand, there's no doubt about
10 it. If these are the permissible products in the
11 prescriptive path, it will in fact drive additional
12 demand. The Standard can't really do much about supply,
13 so, as a result, you know, simple law of economics
14 indicates that, if the Standard goes through, you're very
15 likely to experience -- if it goes through all in one
16 shot, right now, "We're going to enforce this right now,
17 going forward" -- you're very likely to experience a very
18 significant rise in price. And, of course, that's going
19 to have a significant impact on the analysis of cost--
20 effectiveness and other things. So I simply point out
21 that this will drive a tremendous segment of the market,
22 I mean, look at the number of products that all of these
23 manufacturers have available in their inventories that
24 will be excluded, and you know that there's going to be
25 some serious repercussions in the marketplace relative to

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1 demand for a specific single product available by three
2 of the manufacturers.

3 Having said that, the other thing I want to say
4 is that the end all of the game is to save energy. That
5 means you have to reduce the electrical loads through the
6 VT. I understand the drive for simplicity, there's no
7 doubt but that the folks that have testified, Mazier, and
8 all the other people that are involved in this effort,
9 are looking carefully at how do you do this, but make it
10 simple. My experience, as limited as it may be, I've
11 been involved in the ASHRAE development, the 189, and
12 IGCC development, and involved in the daylighting
13 provisions of those, my experience says that daylighting
14 is one of those issues where, if you really want
15 simplicity, then you leave it to the performance path,
16 you leave it out of the prescriptive. And the reason is
17 that, if the end game is to save energy, the real
18 question is "how often are those blinds going to be drawn
19 to avoid too much sunlight coming into the building?"

20 Now, there are ways through configuration, and
21 you heard Tom Culp, I'm not going to repeat all that
22 stuff, but there are ways to ensure that the daylighting
23 reaches the locations where it is, where it's intended to
24 be, without having glare issues. For example, even the
25 CASE report suggests that, for example, unless you have a

1 minimum sill height, you're going to be dropping daylight
2 on the floor, it's not going to be effective. So there
3 are all sorts of considerations to go on, and I agree
4 that the performance path is the appropriate path for
5 designers to take on that requirement. Putting it in the
6 prescriptive path, by VT alone, even one of the comments
7 that Mudit said is that people will control it by the use
8 of the blinds. The real question is, will they reopen
9 those blinds in order to allow the lighting controls to
10 activate? And there's no answer to that.

11 The comparable area that I'm familiar with
12 would be, for example, in the Fire Codes, I have a fire
13 door and it's open to a hallway, open, separating two
14 components or corridors, part of the building. If that
15 fire door is propped open and not attached to an
16 automatic closing device so that when the fire alarm goes
17 off, that door closes, it doesn't count from a fire
18 protection standpoint because, if the door is open, it's
19 going to let the fire go through. So the only things
20 that count in respect to certainty relative to energy
21 savings are, for example, like what happened in the New
22 York Times Building where they tried to control glare
23 with automatic devices that acted as shading. And as
24 Mudit pointed out, about 97 percent of the buildings are
25 going to have those, or at least of those that he

1 studied, they're going to have shading. But the real
2 question is, if those shades are closed, and left closed,
3 you're not going to enjoy the energy savings that this is
4 intending to accomplish.

5 So I would encourage you to simply think about
6 this during the time between now and the time that this
7 goes into effect, I simply wanted to raise some of the
8 questions that I have as to what will happen to price and
9 are we really going to enjoy the energy savings as
10 intended, because enjoying that is clearly a great
11 objective, one that I would like to see happen. So,
12 thank you.

13 MR. SHIRAKH: Just a couple of comments. In
14 relation to this graph, I understand a lot of products
15 don't meet because of the original proposal by the CASE
16 team was based on triple-coated silver -- but my
17 understanding is they have actually modified the CASE
18 proposals, the VTs, SHGCs, that now it encompasses a lot
19 more products, you can actually have double-coated
20 products, you can have -- I mean, there's a whole list in
21 the latest CASE reports. So is it not true that they
22 have changed their VT and SHGC and more and more products
23 can meet the requirements?

24 MR. ZAREMBA: Not if you keep all three of the
25 factors together and, again, I'm looking at, for example,

1 page 12 of the September CASE report where it says triple
2 silver-coated glazing forms the basis for most of the
3 updates to the standard. So, if you take one or another,
4 yes, or if you use trade-offs, or if you use Area-
5 Weighted. If you don't, then the answer is no, you're
6 not going to meet it with any other product but that.

7 MR. SHIRAKH: Is that your understanding? My
8 understanding was that those products that you listed in
9 the CASE report actually met all three requirements at
10 the same time basically with the prescriptive.

11 MR. SHADD: This is Eric Shadd. I did the
12 analysis for the CASE report. What you're saying is
13 true, Mazi, there are many other products besides triple
14 silver which can meet the standard without overhangs or
15 fins or any other such thing, and they run the range from
16 triple silver to double silver, to single silver, they
17 even include products that Pilkington and AGC make, which
18 are pyrolytic and they even include single silver, they
19 even include products that Pilkington and AGC make, which
20 are pyrolytic and we're talking sort of room side low e
21 coatings, tinted glass, etc. I think it goes on. The
22 list of products that can meet the standard I think
23 lasted about four pages long. The list of products that
24 can meet the standard without any sort of Area-Weighting,
25 or overhangs, etc., was about a page long. I believe

1 there are 26 different products that can do it that way.

2 MR. ZAREMBA: The numbers that were picked for
3 the red lines on this graph, there's some slight
4 variation, we're talking first of all center of glass,
5 but we're looking from 2.7 to 2.9 HGC and 4.8 to 5.2 on
6 VT side. So regardless of the number of the types of
7 products, you're looking at a very small segment of the
8 available product in the marketplace.

9 MR. SHIRAKH: And my other question, you
10 mentioned the performance is actually the way to do
11 proper daylighting, which we have the performance back
12 here, but the way it works in California, our performance
13 budget is based on our prescriptive. You have to have
14 some prescriptive equivalent in order to have it in our
15 performance, otherwise what is the performance based on?
16 So, you know, I agree with you that the performance is
17 the way to go for these more complicated situations in
18 buildings, but we need a prescriptive baseline that can
19 set the standard budget for the performance. That's why
20 we need to have something in the prescriptive.

21 MR. ZAREMBA: And I'm not suggesting that you
22 shouldn't. What I'm suggesting, though is, again, in a
23 very non-complicated way, I think some of the other
24 Codes, even the IECC for its 2012 edition, has taken into
25 account some of these factors, like configuration of the

1 glass in addition to VT. So there's a relationship
2 there, I think, that the current codes outside of Title
3 24 have recognized, that plugging a VT in a loan isn't
4 the way to go, you have to have some additional factors
5 which address it. And I think, you know, Tom has
6 suggested EA and there are other ways to do that. I'm
7 not suggesting that the prescriptive path just simply
8 ignore this, I think it is inevitable and an appropriate
9 thing that it does address these things. The real
10 question is whether it's done in such a way that it is
11 really too simple, and will it yield the energy savings,
12 and if it doesn't, if we can't expect it to yield those
13 energy savings in those circumstances where the drapes
14 simply get closed and never reopened again, or remain
15 closed for a very long period of time, therefore
16 increasing the electrical loads, then the question is,
17 well, how do we address that and how do we try to remedy
18 it. And that's what we're working with you to try to
19 accomplish.

20 MR. SHIRAKH: As I suggested earlier, I'm
21 personally open to an EA approach as a prescriptive
22 alternative to VT, having both in there, but the devil is
23 in the details.

24 MR. ZAREMBA: It is.

25 MR. SHIRAKH: So we may agree or we may not.

1 But, you know, I would be willing to --

2 MR. ZAREMBA: Of course, it's my understanding
3 that current Title 24 has daylighting requirements in the
4 performance path without a prescriptive baseline, so it
5 can be done both ways, I think.

6 MR. SHIRAKH: Okay. Any other questions or
7 comments on daylighting? Eric, yeah.

8 MR. SHADD: Well, if there are more
9 stakeholders out there who want to make statements, I'd
10 rather follow-up and listen to what they have to say
11 first before I respond.

12 MR. SHIRAKH: Is there anyone online that wants
13 to talk about daylighting?

14 MR. YASNY: I think George Nesbitt has
15 something to say.

16 MR. NESBITT: Yes, can you hear me?

17 MR. YASNY: Yes.

18 MR. NESBITT: Yeah, George Nesbitt. I guess I
19 just wanted to actually go back to what Pat Splitt had
20 said about software and being able to take credit for
21 solar space heating, that does not come up anywhere on
22 the Perf 1. CFR 1 does come up as a --

23 MR. SHIRAKH: George, we're talking about
24 daylighting requirement.

25 MR. NESBITT: Yes.

1 MR. SHIRAKH: Is this related to this?

2 MR. NESBITT: Well, no, not to daylighting.

3 MR. SHIRAKH: Can we shelf that for a while? I
4 want to bring this to a conclusion. Is there any other
5 comments related to daylighting, the topic we were just
6 talking? Pat Splitt.

7 MR. SPLITT: Pat Splitt from ApTech, just real
8 quick. Just one comment, there was a suggestion made to
9 maybe change prescriptive a little bit to try to say that
10 the lower glass would be a higher -- or lower visible
11 light transmittance to high glass clear -- just imagine
12 that wall where, if there was a four-foot band of dark
13 glass and then clear glass above, your eyes are going to
14 go berserk looking at that. Normal daylighting, if this
15 was a normal daylit situation where there was clear glass
16 above and the lower glass is either tinted, or there is
17 shade, so the occupants can handle the glass that they
18 can view through, the light that's coming above from the
19 clear glass normally is somehow redirected either through
20 light shelves or louvers or something, so that light
21 doesn't directly come into the space and doesn't create
22 glare no matter what. You can't simply just say you're
23 going to have clear glass above, it's more complicated
24 than that and it's too complicated to put into
25 prescriptive, so I think we just shouldn't go there.

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1 And then the other comment is, just getting
2 back to what I said --

3 MR. SHIRAKH: You know, the current proposal
4 says Area-Weighted average; actually, this was a recent
5 addition to the Code language because of comments that
6 Tom made and, you know, I agree, you can't really
7 describe, you know, this kind of stuff in the Code
8 language, that's what the Compliance Manuals are for, so,
9 you know, my suggestion is, if you're going to keep this,
10 then we defer that until we develop questions and answers
11 and examples in the manuals.

12 MR. SPLITT: Okay. Along that line, then, what
13 I spoke about before about trying to combine the
14 electrical lighting controls section and the envelope
15 sections and skylight, well glass perimeter sections,
16 those have to be brought together and treated as one so
17 everybody can look at everything together because I don't
18 think, without looking at it together, I don't think
19 everybody is thinking about how it affects what the other
20 guy is doing enough and the place for that really to
21 happen is probably a special section in the manual.
22 However, the problem that happens -- been around this
23 many many cycles -- and what happens, you adopt
24 regulations, and after the regulations are adopted, you
25 say, "Well, now let's do the manual and figure out how

1 we're going to do this." And sometimes you find out,
2 well, you can't do it. So I have this novel suggestion
3 that, at least for this daylighting thing, because it's
4 so complicated, actually try to write up the procedures
5 and have some sort of a workshop before you adopt the
6 stuff so we can figure out whether it's really going to
7 work or not, and if there's a problem, we have a chance
8 to change it.

9 MR. SHIRAKH: Okay. Thank you, Pat. Always
10 good suggestions. Any other daylighting related -- do
11 you have something to say, or are you good?

12 MR. SHADD: Yeah, if everyone is through, I can
13 go. So once again, I'm Eric Shadd and I did the analysis
14 for the fenestration update. And I think, first off, I'm
15 actually feeling sort of cautiously optimistic. I think
16 Tom has sort of scooted away from the arguments around
17 glare as much, I know we've talked a lot about it here,
18 but from what I understood from his presentation, he's
19 thinking more about distribution of glazing and that's
20 sort of a new thing for us to think about in the
21 standards, so I don't have too much more to say about
22 that. Maybe in terms of the glare issue, I just want to
23 add that, you know, we're talking about a glare, we're
24 talking about a visible transmittance of 4.2, which means
25 that basically 42 percent of the light that's coming from

1 outside will make it into the space. I think we have yet
2 to see any evidence that that is a "bright" window. To
3 me, that sort of qualifies as more of darker, moderate
4 window. When you look at daylighting manuals and such,
5 they usually recommend visible transmittance as higher
6 than 50 percent and consider between .35 and .50 to be
7 useful, but not ideal. So I think, in the end, we kind
8 of have to remember that what we have to show is that,
9 you know, what would need to be shown is that .42 is a
10 bright glass, that it would cause sufficient glare that
11 would cause people to close the blinds, and when those
12 blinds were shut, that you would still not get enough
13 light into the space to have effective daylighting, and
14 that people would do that enough of the time to where
15 that would be an energy penalty. Now, there hasn't been
16 any study presented to us that shows that that would be
17 the case, there's been some anecdotal evidence, but you
18 know, we sort of -- there's a long list of arguments in
19 the report, and I believe we've answered all of the
20 specific technical issues to the satisfaction of our CASE
21 team, you know, myself and the fenestration, as well as
22 the daylighting folks, we've satisfied our responses, the
23 IOUs seem satisfied with our responses or rebuttals to
24 their arguments, daylighting experts also outside of the
25 project team have backed us up, and we have some written

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1 letters to the CEC, I believe, to say that industry
2 representatives such as Eric Devito and another industry
3 representative, Serious Energy, formerly Serious Glass,
4 also backs us up. And also, I believe, the CEC staff are
5 satisfied with our arguments against glare and how we've
6 accommodated it in the standard. I won't get into all
7 the technical details, there are a lot there, it's pretty
8 much all in the report. I guess the one last thing I
9 will say is, you know, if you want dark windows, you go
10 with the dark view window with the clear story up top,
11 and so we've allowed for that.

12 Let's see, the next thing I would talk about is
13 I think Tom talked about improving the clear story
14 definition and possibly encouraging that somehow more in
15 the Code. I think we could look more into that, I'm not
16 exactly sure how we would do that right now, and maybe he
17 has some ideas. I have some ideas, too, but we could
18 come into more discussions about that. And then, to move
19 on to -- I'm just going to pick and choose here. There
20 is, as you can imagine, we've been talking about this for
21 a while, so I'm going to pick and choose --

22 COMMISSIONER DOUGLAS: Why don't you just hit
23 the high points because we're behind on the agenda and
24 we've got people who have been standing for a good 45
25 minutes?

1 MR. SHADD: Definitely, I just had one more I
2 wanted to do.

3 COMMISSIONER DOUGLAS: Thank you.

4 MR. SHADD: Which was to talk about the
5 availability and we've already sort of discussed that a
6 little bit and just wanted to reiterate that, in the
7 report, we have pages and pages and pages of products
8 that are not triple silver, we have all of the six major
9 manufacturers are represented in there. In terms of Mr.
10 Gabel's concerns, that seems, you know, I would like to
11 look into that a little more, too, because that is a
12 question of visibility, can people find -- can people
13 just look something up and say, "Okay, this window will
14 qualify." Maybe we need to talk to the NFRC about having
15 that be more transparent and, like you said, having some
16 kind of review, or something like that. So that's it.

17 MR. SHIRAKH: Thank you, Eric. So what I would
18 suggest is, not long after these workshops, we get
19 together again with Tom and Tom and maybe we can clarify
20 some language, or maybe we can come up with some
21 alternatives. The key is to maintain the energy savings
22 and not sacrifice that, but within that framework, if we
23 can come up with some flexibility, you know, we are open
24 to that. And now I think we need to move on to Cool
25 Roofs. Thank you for being patient.

1 COMMISSIONER DOUGLAS: Let's do this now, but
2 let me request that you not be repetitive, that people
3 come up, definitely identify yourselves, definitely say
4 something where you have a unique perspective or
5 something hasn't been said yet, please say it, but feel
6 free to say, "And I agree with everything the person
7 before me said" because that will get us through this a
8 lot faster and it always means something when you see a
9 lot of people show up, but they don't actually all have
10 to say the same thing for it to count.

11 MR. HITCHCOCK: I agree with everything the
12 window guys said. My name is Reed Hitchcock, I'm with
13 the Asphalt Roofing Manufacturers Association, ARMA. I
14 do want to just quickly thank Mazi, Payam, Bill, and the
15 Commission for the opportunity to comment and participate
16 in the process. We have had a good dialogue with the CEC
17 staff so far this time around, but I do want to draw
18 attention to a letter that was sent to the CEC by a
19 Coalition of 14 Associations involved in the roofing and
20 insulation industries, it was sent yesterday morning.
21 The Coalition is made up of manufacturers, contractors,
22 labor unions, and it focused on four key areas related to
23 the proposal. And it was cost justification, jobs and
24 economy, trade-off options, and consistency in the Code
25 language.

1 The letter was submitted for the record for
2 this workshop, so I won't re-read it here, but what I
3 want to do is call attention to what we consider the
4 underlying -- fundamental underlying issues that we have.
5 Foremost of concern to ARMA and I think the other members
6 of the coalition, is the flawed cost justifications,
7 going back to the 2002 Lawrence Berkeley National Lab
8 Report upon which the 2005 standards were based and,
9 again, the increases that were made in 2008. We've
10 discussed issues with these baseline numbers literally
11 for years and, while I appreciate the CEC's position of
12 not wanting to go backwards on the standards, we've come
13 to the stage now where the arbitrary sort of trial
14 balloon requirements that have been proposed and floated
15 by industry will do a disservice to the California
16 consumes, the building owners, but not only promising
17 cost-effective energy savings that will not likely be
18 realized, but also by effectively removing quality
19 performing, durable and proven roofing materials from the
20 market in the State of California. Many of these
21 materials that are produced in California will have a
22 direct impact not only on manufacturing jobs in
23 California, but on the application side of things,
24 particularly for skilled laborers.

25 Manufacturers have also invested very heavily

1 in their facilities in California to enable them to
2 produce materials that qualify for the 2008 requirements.
3 Some of these facilities produce the very products that
4 will be effectively removed from the market on the basis
5 of the proposed increases in reflectance and emittance,
6 increases based on little more at this point than a
7 mandate, real or perceived, to deliver a more stringent
8 requirement, regardless of the direct impact on the
9 economy, jobs and ability of consumers, designers and
10 building owners to select the roofing materials that will
11 best serve their needs beyond the color of the surface.

12 Just a couple issues that I do just want to put
13 on the record, that need to be really looked into,
14 lifecycle by product type, maintenance and repair costs,
15 real world install costs for materials, and real world
16 premiums for cool products, tradeoffs that go down to the
17 baseline numbers, which are currently proposed at .08 for
18 steep slope roofing and .1 for low slope roofing in the
19 Code, and consistency between the requirements between
20 new roofs and re-roofing.

21 I do appreciate Mazi's initial response to the
22 Coalition letter regarding undertaking a new analysis,
23 but speaking on behalf of ARMA and not the whole
24 coalition, it's critical from our standpoint that the
25 roofing industry be at the table for development of the

1 methodology for the analysis due to the many complexities
2 of roofing systems that go well beyond the surface. I'm
3 sorry, I can't read what I wrote. Oh, I would recommend
4 a CEC and industry working group, working together to
5 develop the methodology, but obviously that will take
6 time. In the mean time, it remains ARMA's position that
7 it would be irresponsible and misleading to change the
8 present requirements, the proscriptive requirements,
9 before a complete re-analysis can be done. That's all I
10 have.

11 MR. SHIRAKH: So one of the points that Reed
12 was making related to the 2005 Standards, that the cost
13 basis was flawed. In an email to you yesterday, I
14 suggested maybe, you know, we should reset our costs and
15 savings and go back to 2002 for both and rerun. We're
16 okay with doing that, I don't know what your position is?

17 MR. HITCHCOCK: Well, again, I think if we're
18 going to do that, it can't be sort of going back up on
19 the mountain and coming down with two new -- with new
20 proposals, without that interaction and that
21 participation. I think there's a lot of complexities
22 that we've talked about over the years.

23 MR. SHIRAKH: And that was my attempt to try to
24 address your concern. Typically, you know, when we do
25 our analysis, you know, we use the existing Standards as

1 the basis and, so, when we move from 2008 to 2013, that
2 the difference between the costs and the savings will
3 become the basis for the lifecycle costing analysis. But
4 they're saying that what we did in 2005 that brought us
5 to the .55 was flawed. So an alternative would be to
6 actually start over from dark roofs to .67 and looking at
7 the cost and the energy savings. And if you guys are
8 okay with that, we're okay with that, so we need some
9 response from you on that proposal.

10 The other one is under a question of jobs and
11 economy, we're not really saying you can't have roofs,
12 we're just saying you have a roof of a different coating.
13 So how would that impact jobs and --

14 MR. HITCHCOCK: Well, and understand, and I
15 know there's some people that will address the specifics
16 related to the products they manufacture, but understand
17 that based on the prescriptive requirements, particularly
18 the .67 that's on the table right now, there are product
19 categories and specific products that are eliminated. As
20 we mentioned at the last public workshop, there are, I
21 think it was -- the number is near 15, asphalt roofing
22 plants in the state. Built up roofing is largely taken
23 off the table as a compliance option for a start.

24 MR. SHIRAKH: Okay, so if I may respond to
25 that?

1 MR. HITCHCOCK: Sure.

2 MR. SHIRAKH: Your Coalition asked us to come
3 up with prescriptive alternatives just to address that
4 issue and we have, and that's why we have the insulation
5 tradeoff in the prescriptive path for both newly
6 constructed buildings and alternations.

7 So, again, these are prescriptive requirements,
8 you know, it's not performance, we're not banning any
9 product from the State. And even within the prescriptive
10 path, you know, we have alternatives for products that
11 have lower reflectants, you know, in exchange for some
12 additional R value.

13 MR. HITCHCOCK: And the current --

14 MR. SHIRAKH: Why is that not --

15 MR. HITCHCOCK: Well, the current state of the
16 table, as I understand it, is you've taken it down to a
17 .25; right?

18 MR. SHIRAKH: Taken to .25 through
19 prescriptive. Through performance it can go down to zero
20 if you want.

21 MR. HITCHCOCK: Right. Again, we're focused on
22 the prescriptive as the baseline and we feel pretty
23 strongly that that compliance option should -- if you're
24 going to have that, it needs to go down to the baseline,
25 number one.

1 MR. SHIRAKH: Well, these are for low slope, I
2 think all of the discussion is about low slope.

3 MR. HITCHCOCK: Yeah, so take that table down
4 to .1, but make sure that what the -- that the tradeoffs
5 do make sense. You know, at a certain point you get to a
6 point on insulation where, you know, as you know, there's
7 no need for a certain color roof. You know, a lot of
8 products are not light colored.

9 MR. SHIRAKH: But you agree that the
10 prescriptive off-ramp that we've provided is useful, you
11 just don't think it goes down far enough?

12 MR. HITCHCOCK: Right. Yeah, that's where I
13 was going. Yeah, I think conceptually we agree with it.

14 MR. SHIRAKH: Okay. And, again, on the costs,
15 you know, we'd like to hear from you guys. If you want
16 us to reset the baseline, we'd be happy to do that.

17 MR. HITCHCOCK: Well, I think that's definitely
18 a conversation we need to have. The Coalition asked for
19 that so I think, you know, getting together and having
20 that conversation --

21 MR. SHIRAKH: I think that would be a fair
22 approach.

23 MR. HITCHCOCK: But I think right now what I'm
24 hearing, if that's the approach we're going to take then
25 there's a huge question mark around the numbers that were

1 put on the screen today.

2 We have no idea if those are even in the same
3 ball park as where that would take us.

4 MR. SHIRAKH: So, you know, we'll look at the
5 cost and we'll look at the energy savings and let it run,
6 and wherever the chips may fall.

7 MR. HITCHCOCK: As long as we're working
8 together.

9 MR. SHIRAKH: Okay.

10 MR. HITCHCOCK: All right, anything else for
11 me?

12 MR. SHIRAKH: I think that's it.

13 MR. HITCHCOCK: Okay, thank you. Thank you.

14 MR. SHIRAKH: And, you know, one more thing I
15 may want to mention is that they asked us to -- they
16 disagree with, not strongly, but somewhat concerned about
17 the cost basis that we had in the CASE report, so we were
18 supposed to get some bids for actual costs. It's been a
19 challenge, as you can imagine, you know, we're asking
20 people who are busy and have other businesses, you know,
21 to spend time.

22 We've only got two bids, we're working on
23 getting more, but the two bids that we've got so far is
24 basically the same ball park as what we're estimating.
25 So, hopefully, we'll have more data and if you can help

1 us get more --

2 MR. HITCHCOCK: We're trying. As I mentioned
3 on our call the other day that's a challenge that we ran
4 into as an industry, you know, I'm hopeful that some of
5 the contracting organizations could be of use to you
6 getting those numbers.

7 MR. SHIRAKH: Would appreciate it, thank you.

8 MR. HITCHCOCK: Thank you.

9 MR. HEINJE: My name's Steve Heinje, I am the
10 Technical Service Manager for United Coatings. We've
11 been in the business for about 40 years, I've got my card
12 here.

13 We probably don't have time or blood sugar for
14 my -- I actually have a presentation around here. I
15 would love to show you my tour of Home Depot and Lowe's,
16 which I would entitle "Be Careful What you Ask For, You
17 May Get It."

18 In my brief, my brief survey of the retail
19 market and I'm a commercial -- we are a commercial
20 company, our emphasis is in commercial low-slope roofing.
21 But, you know, I see high-reflectivity products that are
22 advertising their coverage rates at 325 square feet per
23 gallon. This is not good roofing practice.

24 I brought this up at my comments at the last
25 workshop, where the way the Department of Energy's, I

1 believe they did some of your preliminary analysis, they
2 looked at the Cool Roof Rating Council as a database, and
3 parsed it, came up with a number, and here we're talking
4 now about the .67. It that right, it's .67, yeah.

5 MR. SHIRAKH: That's if I --

6 MR. HEINJE: And that's for new construction.

7 MR. SHIRAKH: That's for new construction.

8 MR. HEINJE: Yes, I understand. And I
9 understand the insulation tradeoff, by the way, and
10 that's appreciated. My company often goes over
11 polyurethane foam so that is helpful, that's relevant.

12 Although even though that's true, I think you
13 have to consider that your goal is to retrofit -- I'm
14 wearing a white shirt, okay, I'm a white coatings guy.
15 Our goal, if we're going to use a cool roof, let's say in
16 a market like San Diego, or Orange County, is to get as
17 many of those roofs retrofitted as possible, so even
18 though the insulation tradeoff is helpful, that does put
19 a penalty on the building owner.

20 So the reality is from a cost perspective he's
21 going to go shopping for a bright white coating, probably
22 that's cheap, he's going to comply. That's the nature
23 of -- unfortunately, the nature of regulations is to
24 flatten the marketplace.

25 So, I did a little look at our company's data

1 and I'm going to give it to you here. I probably
2 wouldn't want it to be a matter of public record, but
3 I -- give me a second here, I've got to get the one I
4 marked up. Should I give it to you, sir?

5 MR. SHIRAKH: Sure. Distribute.

6 MR. HEINJE: I just have one copy. I have one
7 so I can remember what I'm going to say, okay.

8 But I took a look at this and I didn't actually
9 know about the .67, I knew about the .63. I was a little
10 surprised at the .67.

11 So, looking at my company's database and I have
12 access to all the data, I know how long the products
13 last, I know their Code approvals, that's what I do, what
14 I discovered is if I make a line at .67, and this is just
15 with respect to my company's products, although we are
16 the only company in North America that makes polyureas,
17 silicones, SCBS, acrylics, fluoropolymer. We used to
18 make hypol and we've made them all. We even make -- we
19 even make a wood stain for shingles, okay.

20 So, we are committed to the roof coating
21 industry and we're committed to making quality products.
22 But when I look at my data, looking at my total solar
23 reflective -- oh, boy, total solar reflectivity at three
24 years, at the .67 line I'm marginal on my core product,
25 the product that actually was the first acrylic product

1 to be tested by UL for fire, and probably could comply
2 with that or adjust it with time, but I'm not certain
3 that we would comply.

4 But a very important category of product is the
5 silicone category. And silicones have a tendency to hold
6 dirt. That's not a good thing from a global warming,
7 urban heat island, or an air conditioning perspective,
8 but they're very fine coatings. In fact, probably the
9 most long-lived chemistry on the market is the silicone
10 coatings.

11 We call them ASTM D 6694s. They have age
12 reflectivities of .64, so that product category is gone
13 at least until we solve this problem, but silicones have
14 been in the marketplace for 25 and they're still getting
15 dirty today, so that's a long intractable problem.

16 On the other side I see I have some low-cost
17 systems that have high reflectivity, that are not Code
18 approved. We can sell them because there's no Code
19 enforcement.

20 But and the market seems to -- and they work,
21 we call them discretionary products. These aren't bad
22 products, they might meet Table 118(b), but I have no
23 data to --

24 MR. SHIRAKH: What is the reflection --

25 MR. HEINJE: Well, I have one here that's .72,

1 that's a high one. I have a -- the table's there. I'd
2 actually have more luck with this with my lows' tour,
3 because there's plenty of them there.

4 But I'm just looking at my data, I see a
5 product category that's negatively affected, called
6 silicones, and that's really for the .67, looking at my
7 company's interests and what I think is a technological
8 argument about the .67 creating some unintended
9 consequences, that's the strongest thing I come up with.

10 There was another comment made at the last
11 workshop that apparently the findings of the researcher
12 was that high reflectivity products tended to cost less.

13 But looking at my product line, I don't find
14 that to be the case, I see an increasing cost.

15 Now, I know why this is, we do not take resin
16 out when we add TI02, okay, so that's why that is.

17 MR. SHIRAKH: Yeah, I don't think we are
18 relying on that information anymore.

19 MR. HEINJE: Okay, okay. And then I found a
20 similar thing, by the way, in my little tour of the Home
21 Depot stores. Similarly, I do not see -- by the way I
22 don't mind if you spend the money in coatings.

23 MR. SHIRAKH: Which Home Depot do you go to, I
24 think I --

25 MR. HEINJE: I went to Home Depot and the

1 Lowe's. One's actually -- the Lowe's is actually quite
2 close, perhaps two, three miles away.

3 MR. SHIRAKH: Because that's what I did.

4 MR. HEINJE: Anyway, so I did -- and I was
5 making a comment to the process and if you're not relying
6 on that anymore, fine, we'll move on.

7 MR. SHIRAKH: The information that you gave me,
8 that I handed to the Commission, is that cost data, the
9 one that you just handed to me and I gave it to the
10 Commission?

11 MR. HEINJE: Yeah, well, I blocked out my -- I
12 gave you costs as a percentage of my max, I blinded it.
13 I have a very expensive fluoropolymer product so that
14 becomes a hundred percent and everything else becomes
15 like 25 percent of that, so it kind of was easy for me to
16 do that.

17 I actually have the hard cost data, of course,
18 but I wasn't going to present that. So that's how I got
19 around revealing my prices and, yet, speaking to the
20 matter, I just scaled the data.

21 Similarly, but back to this Lowe's and Home
22 Depot tour, I went and I found seven products on the
23 shelves, one of which had Code approval and appeared to
24 be a fairly high-quality product. And another one,
25 curiously -- excuse me, three -- three of which had Code

1 approval. One of them was an acrylic, the other three
2 acrylics were -- had no Code approvals that I could tell.
3 They were rated by the Cool Roof Rating Council, but they
4 weren't -- so, I guess what I'm trying, and then --

5 MR. SHIRAKH: What were the reflectants, do you
6 remember?

7 MR. HEINJE: I've got them right here.

8 MR. SHIRAKH: And if you can say for the
9 record?

10 MR. HEINJE: Yeah, I'll say for the record.
11 There's a product called -- this is an interesting --
12 this is a good case, let's just pick this one up. What
13 I'm trying to say is there's a law of diminishing
14 returns. If you're raising the bar, I can respect your
15 interest in that, but there are tradeoffs.

16 I mentioned the silicone category tradeoff, I'm
17 about to get to aluminized roof coatings, which I don't
18 even make or care about, but you are going to lose those,
19 too.

20 But even looking at the acrylic technology,
21 which is my life and blood, so I see a product here
22 called "Roof Guard 700" with an initial reflectivity of
23 85 and it looks like it's got a three-year of 65, so it
24 looks like that might be cut. I've got -- I wasn't quite
25 sure about some of these ratings.

1 And that product has got -- it's called, "a
2 seven-year product."

3 So, looking at initial reflectivity, it looks
4 like I've got this high-quality product, but this is a
5 seven-year product. Now, I don't know about you, I don't
6 want a seven-year roof.

7 And then I find a -- I find another one with an
8 88, but it doesn't have an aged, yet.

9 So, what I'm trying to say is that you can't
10 look at that cool roof database, Cool Roof Rating Council
11 Database and assume that all those products meet the rest
12 of the Code, because they don't.

13 And you can't pretend that adding white pigment
14 makes better roofs.

15 And I'm really trying to get to a third point,
16 as you raise reflectivity what the inclination of the
17 user is, is to put less coating on, because you now have
18 a higher coverage rate. Just it's the physics of it.
19 You take your concentration of TI02 from 10 to 15 percent
20 and your reflectivities go up, but now you have more
21 pigmentations. Guess what, it will spread 50 percent
22 further.

23 So, now you have roofs with less coating on and
24 that becomes a problem of roofing practice. And I am
25 worried about that, I think that I might have troubles

1 with this, that I might find products put down in the
2 marketplace at 10 or 12 Mills Dry Film thickness.

3 In fact, back to Lowe's, I calculated that two
4 of these fine products would get on the roof at about 8
5 dry Mills.

6 Now, I figure the erosion rate of an acrylic is
7 roughly a half-a-mil a year, perhaps 3. You know, and
8 this product at that application thickness is not going
9 to service well.

10 So, I think the .67 layer will somewhat favor
11 some of the inferior products, that's my basic gripe.

12 MR. SHIRAKH: Do you have a recommendation
13 besides putting it at --

14 MR. HEINJE: You know, it's not what you want
15 to hear, but I look at the database and I see .3 or
16 .64 -- .63 or .64. I like your .63 number just fine.

17 And that's what I came up with. I looked at
18 technologies, you know, I looked at silicone, I looked at
19 urethane, I looked at my acrylics and I realize that
20 doesn't put me in that bind where I have a tendency to
21 just make what I'm going to call the white roof paint.
22 That's what I'm trying to avoid.

23 I did -- I would have mentioned, also, that the
24 category -- even though I don't make, nor particularly
25 care about their fate, the aluminized roof coatings do

1 have a valid -- and I am an RCMAY Board member, so I'm
2 doing this for the RCMAY brotherhood that makes
3 aluminized coatings, okay.

4 Their product has merit in your marketplace,
5 though, because you have some fairly wet, nasty climates
6 up in the northern, at least in the northern coast, and
7 then you have the mountains, the Sierras.

8 And if you're coating a roof in the winter, you
9 know, to be honest with you the white acrylic's
10 problematic, it can be. Certainly, if you have a repair
11 or there's some reason why you're re-roofing because
12 you've got a building, maybe it's a grand opening at
13 Christmas, that's happened before, and you're putting a
14 coating on it, the aluminized coatings have a place. But
15 they have a low emissivity and not a very high
16 reflectivity, so they're out, too.

17 That's a product category that if left alone I
18 think most people in hot climates, honestly, would not be
19 using the aluminized product, but I think in those wet or
20 cold climates they would and I think they should.

21 MR. SHIRAKH: And what is their reflectivity,
22 do you have any --

23 MR. HEINJE: I think Mrs. Helene Pierce is far
24 ahead of me in this matter. Are you going to speak to
25 that, aluminized or not?

1 MS. PIERCE: I'd love to.

2 MR. HEINJE: Okay, good. Yeah, that's just not
3 my bag. I just know that they look good in wet climates,
4 I've seen the roofs and I think the technology has merit
5 from a regional perspective. End of comments.

6 MR. SHIRAKH: Thank you, sir.

7 MR. OGG: My name's Chris Ogg, I'm the District
8 Manager for [inaudible], we're a thermoplastic member and
9 manufacturer.

10 Thank you for the opportunity to speak about
11 cool roofs here real quick. I'm going to make it short
12 because my colleagues kind of hit on a number of points
13 ahead of me.

14 We appreciate the fact that the CEC has
15 modified their original proposal, which feels a step in
16 the right direction.

17 It is still unclear to us why there's a two-
18 tier approach that is being proposed in regards to
19 reflectivity in the solar reflective index. This will no
20 doubt lead to, we feel, some significant confusion in the
21 marketplace.

22 MR. SHIRAKH: What do you mean by the two-
23 tiered approach; can you please clarify?

24 MR. OGG: Well, based on what we've read here
25 you're asking for two different items where before you

1 had one, and that's why we're trying to understand why
2 the --

3 MR. SHIRAKH: And that's one for newly
4 constructed, then there's one for existing.

5 MR. OGG: Okay. With regards to the insulation
6 tradeoff for the roofs not meeting the minimum values, we
7 would proposed that this prescriptive approach be
8 permitted in new construction and alternations, as well.

9 MR. SHIRAKH: We have actually done that.

10 MR. OGG: You've done that already, okay. Even
11 with the simploid tradeoff calculators developed by the
12 CEC, the tradeoff approach should be allowed for
13 prescriptive option in new construction. It is simple
14 and transparent that would, without doubt, be a
15 preference to designers, contractors and building owners.

16 I'm going to keep this short because these guys
17 have already hit on a number of things. But it also
18 should be noted that however these suggestions are
19 implemented, the CEC has not addressed the fundamental
20 concern that we and many others have expressed, that the
21 CEC has not presented the concrete evidence that the
22 proposed changes will have a significant impact on energy
23 savings.

24 Although these benefits of implementing the
25 proposed changes are clearly debatable, the ramifications

1 will be significant and including disruption to the
2 market and elimination of certain products from the
3 market, as well, with long-term performance already in
4 the market.

5 And also we feel that there's some likely job
6 loss in manufacturing, sales and marketing due to the
7 segment of the industry.

8 Additionally, trying to implement these changes
9 in the 2013 Code will woefully inadequately -- I'm going
10 too fast -- will be woefully inadequate notice for the
11 manufacturer of products in a sufficient time for the
12 proper development and field trials.

13 You know, honestly, we're trying to -- you
14 know, to come up with a product that fast, what you're
15 looking for to meet what you're trying to do, it's
16 definitely going to take a number of products off of the
17 market as well as increase the prices of others to get
18 into the market.

19 And again, we feel it's kind of a poor
20 tradeoff, particularly when one considers, you know,
21 there's a proven economic justification for the changes.

22 And let's see, and finally the proposed changes
23 could not come -- it is our opinion it come not come at a
24 worse time. The overall economic climate nationally and,
25 more importantly, here in the State of California, in the

1 supply issues with titanium and dioxide, the most
2 important component to reflectivity is in most -- in most
3 roofing technologies a far ideal, such drastic changes to
4 the Energy Code.

5 We urge the CEC to take a step back and put off
6 the changes to the Energy Code for 2013 to a subsequent
7 Code cycle. The CEC should work with all the
8 stakeholders and map out a comprehensive road map for the
9 future and meet the State's goals in setting reasonable,
10 aggressive targets defining time frames and would allow
11 appropriate product development cycle to ensure that the
12 end-all user's needs and expectations for their roofing
13 systems, most notably durability, are met.

14 So, basically what we're trying to say is, you
15 know, we need a little more time to come up with the
16 proper products, otherwise you're going to come out with
17 products that don't have the same lifecycle that we're
18 expecting now because, again, it's too fast, and it's one
19 of those type of things, if that makes sense.

20 MR. SHIRAKH: Just one comment I have is you
21 mentioned we don't have -- demonstrated, we haven't
22 demonstrated the savings. You know, I admit sometimes we
23 have problems nailing down costs, but I think we're
24 actually pretty good at nailing down savings. By we, I
25 mean our consultants.

1 MR. OGG: Well, based upon the last -- the
2 workshop, I mean based upon the calculations from Dr.
3 Hoff's calculations on his written submissions, it had
4 shown that it's just a fraction of a penny per square
5 foot is possible with the current proposal, when compared
6 to the original baseline, so that's kind of what we're
7 looking at.

8 MR. SHIRAKH: So, I know, and again we've
9 proposed to look at the cost basis for the standards.

10 MR. OGG: All right. Well, that's all I have,
11 thank you.

12 COMMISSIONER DOUGLAS: Thank you.

13 MR. SHIRAKH: And I think what we've agreed,
14 actually, to do with ARMA is take a look the recurring
15 cost, the maintenance cost of the roofing system, that's
16 another thing we're incorporating into our lifecycle cost
17 analysis.

18 Go ahead, please.

19 MR. CALLAHAN: Okay, thank you. My name is
20 Bill Callahan, I'm Executive Director of Associated
21 Roofing Contractors of the Bay Area. We are an
22 association of unionized roofing contractors. We do big,
23 difficult work that often involves satisfying a customer
24 and a Code at the same time. And it's important for us
25 to have options, which I mentioned last time I was here.

1 And that's why I'm really concerned, on a
2 couple of levels, about this proposed deletion of
3 140.3(b). And this is referenced in existing Section
4 141, and it's really important to us.

5 I can understand intuitively what you said
6 about --

7 MR. SHIRAKH: And can you explain what that is,
8 the audience knows what that is.

9 MR. CALLAHAN: It allows a roofing contractor
10 to use a non-compliant product and do a manual
11 calculation based on the total energy, okay. So, we can
12 do an insulation tradeoff, importantly, that goes below
13 the deck, not just above the deck.

14 And part of the problem I have with consultants
15 and staff people, who never talk to contractors, is
16 simple solutions are simple for you, but not necessarily
17 easy in the field and an option you think is available --

18 MR. SHIRAKH: Can you recite that section
19 again? What was that, 141?

20 MR. CALLAHAN: 141, it's Exception 2, Section
21 141(b)((1)(b) and it allows -- it references the overall
22 envelope energy approach of Section 140.3(b) may be used
23 and the standard building shall be based on the higher
24 roof/ceiling insulation of blah, blah, blah. And it then
25 allows you to go into the reference appendices and look

1 at what type of framing you're looking at in the ceiling
2 and you have an opportunity to put insulation below the
3 deck in situations where you don't have an opportunity to
4 put it above the deck and that can help you satisfy a
5 customer.

6 So, I'm worried about seeing this disappear and
7 I'm worried about it becoming simplified because you
8 simplified something else in another section of the Code,
9 that I'll talk about in the afternoon when you deal with
10 that where, well, we'll add continuous insulation.

11 But again, continuous insulation is above the
12 deck and I'm worried that this is going to eliminate
13 other options.

14 MR. SHIRAKH: Well, if I can respond to that,
15 you're talking about the overall envelope that when I
16 earlier said, you know, we're eliminating, we're
17 replacing it with the simplified performance compliance.

18 MR. CALLAHAN: Right.

19 MR. SHIRAKH: But in the place of -- that's the
20 overall envelope is in 143(b). We are actually going to
21 keep an option there. What we're getting rid of is the
22 formula for now, that we could never get it to work. But
23 we are going to have some form of tradeoff.

24 MR. CALLAHAN: Well, if I may make one comment,
25 I do think it's kind of funny, Mazi, that the CEC changes

1 the reflectivity and the emissivity requirements of the
2 products and so the market will adjust and manufacturers
3 can change their plans. And you've had this formula
4 sitting here for years and none of these bright computer
5 scientists, guys out there in the market have come up
6 with a program that would do this, and that ought to be
7 instructive about how it's not always as easy for the
8 market to follow the regulations as sometimes thought.

9 MR. SHIRAKH: Well, actually, we got it right
10 in 2008, but I think the 2008 approach just is too
11 complicated, people can't use it because of all the
12 coefficients and embedded assumptions, so nobody could
13 use it.

14 And our choice was to keep that or go back to
15 2005 and neither one was very palatable.

16 MR. CALLAHAN: As long as we get something we
17 can use. And, you know, Reed mentioned it in terms of
18 the cost analysis and Pat mentioned it earlier with the
19 computer software that you were concerned about seeing
20 before it became part of a regulation.

21 I'm concerned about that, too. There seems to
22 be a history here of something gets proposed without
23 really soliciting advance input from the industry. We
24 respond to it in some kind of way and then you go back
25 home and you put all this stuff in a black box and you

1 give us something else, but we don't get to see what's in
2 the black box.

3 Now, Reed wants to see, you know, what's the
4 formula? What is the calculation that is made to
5 determine the cost and related to the energy savings
6 because we suspect, I think, that some of the assumptions
7 may be wrong or they may be over-simplified.

8 The same thing here and my only concern in this
9 is that if you're going to come up with something simple
10 involve us in doing that, so that the end-user, the poor
11 guy who has to go out there in the field and try and
12 satisfy a customer, you know, had a part in putting it
13 together and understands it.

14 Again, what you may think is simple isn't
15 simple for the end-user, you know, or for the Building
16 Department for that matter.

17 And I'll talk about some other problems with
18 Section 141 later, when we get to it, but you've made a
19 simplified -- you added something to make it simpler that
20 I think is going to make it a lot more complicated, but
21 that's another section.

22 MR. SHIRAKH: Okay.

23 MR. CALLAHAN: So, again, it would be nice if
24 you let us into the black box and I think you'd find a
25 lot more cooperation and support if people were engaged

1 in the actual process, not simply always presented with
2 the result, well, here's what our calculations show.
3 Well, what's the formula. Trust me.

4 MR. SHIRAKH: No, he's not done.

5 MR. CALLAHAN: I'm done.

6 MR. SHIRAKH: Oh, you wanted to respond to one
7 of his points?

8 MR. ARENTZ: Yeah, this is John Arentz, AEC, I
9 worked in part on the cool roof proposal.

10 MR. CALLAHAN: Yeah, we talked.

11 MR. ARENTZ: So, with regards to this overall
12 envelope tradeoff I may be partially to blame. I
13 developed a spread sheet tool that implements all the
14 formulas that are in the current 2008 standards that is
15 that overall TDE tradeoff, but it's been considered
16 difficult enough to use and it didn't have -- it was a
17 pretty simplistic Excel interface with macros, and so it
18 wasn't very sophisticated at all, but it implemented the
19 formulas, hopefully, correctly. But I think it was
20 deemed that that was too difficult to use, that very few
21 people were actually using it, and so that was one of the
22 reasons for not wanting to update it.

23 With regards to the question of the insulation
24 and options for doing this tradeoff, I think one thing we
25 discussed that we may do, as opposed to just having a

1 requirement for a continuous insulation is maybe having
2 an equivalent U factor for the assembly, so it would give
3 you the choice to do -- basically, put the insulation
4 where it's needed to achieve the same energy performance.

5 MR. CALLAHAN: Right, which is in part of
6 Section 141 now, but not in the newer section, which
7 creates a problem.

8 You know, and I understand what you said about
9 your spread sheet being complicated, there are a lot of
10 components to a building.

11 But when you're doing a reroof there's really
12 only two, the insulation and the membrane.

13 MR. ARANTZ: That's right.

14 MR. CALLAHAN: So it's not a very difficult
15 calculation for us and probably a really simple spread
16 sheet to put together, too. I'd just like to see that
17 remain so that we have that option.

18 MR. ARANTZ: Okay. Well, I mean the --

19 COMMISSIONER DOUGLAS: Let me ask the
20 discussion about the spread sheet move into offline
21 communications or informal communications.

22 MR. ARANTZ: Absolutely.

23 MR. CALLAHAN: Sure, sure.

24 COMMISSIONER DOUGLAS: We've had a fair amount
25 of discussion about it and I appreciate you bringing it

1 up.

2 MR. CALLAHAN: That's fine. We can talk again
3 and you know my number.

4 COMMISSIONER DOUGLAS: All right, great. Thank
5 you.

6 Who would like to come up next?

7 MS. PIERCE: When a few of you stand between a
8 room of people and their lunch, I promise I'll be short.

9 My name's Helene Hardy Pierce and I'm Vice-
10 President of Technical Services at GIF, we're a roofing
11 materials manufacturer, who my friend from the coating
12 side of the business referred and said that I'd address
13 something about aluminum.

14 But I attended the June hearing and provided
15 comments at that time and, subsequently, have provided
16 written comments to CEC staff and I will not repeat that.

17 For your benefit, though, we are a California
18 manufacturer with multiple facilities in the State of
19 California. We've also invested millions of dollars to
20 be able to produce products that are currently Title 24
21 compliant.

22 The changes proposed will have adverse effects
23 and most -- not surprising, because we saw it a short
24 time ago, but everybody keeps talking about reflectivity,
25 but for those of you who aren't picking up on this, the

1 shift from 75% emissivity to 85% emissivity removes 60%
2 of the products that actually even meet the 67%
3 reflectivity. And I actually think that -- and that's on
4 product availability using the CEC database which, as has
5 been pointed out in the past both in writing and in
6 verbal comments, is a leap of faith in what's actually
7 available in the market at best.

8 There also may be somewhat of a dearth of
9 comments today because the cost analysis remains
10 incomplete. You know, a couple of data points from
11 actual roofing contractors I don't think is enough to
12 base anything upon. There still was showing a 10% cost
13 premium on the cool side.

14 And one other point I would like to make is to
15 point out a caution to the entire State of California,
16 you are on a collision course with everything else that's
17 being done in green, and sustainable, and roofing. And
18 the collision course is this, highly reflective materials
19 for the roofing market are very likely to be unable to
20 meet indigenous material requirements of other types of
21 Codes that are barreling down a path, and the high
22 probability of the State of California adopting the IGCC
23 at about the same time that you're trying to adopt this
24 Code.

25 And when you start talking about reroofing and

1 50 percent of the materials having to be indigenous that
2 really is setting up a problem, I think, for the State.

3 So, all of that being said it is only right to
4 acknowledge the efforts of Mazi, and Priam, and staff to
5 maintain an open dialogue with the roofing industry.

6 Thank you.

7 COMMISSIONER DOUGLAS: Thank you for your
8 comments. Where do you do your manufacturing?

9 MS. PIERCE: What do we manufacture?

10 COMMISSIONER DOUGLAS: Where do you do your
11 manufacturing, just curious?

12 MS. PIERCE: We have plants in Fontana, in
13 Stockton. Help me, Ilene. Shafter. So, yes, and we
14 have about 30 plants nationwide but, obviously, several
15 in the State of California.

16 COMMISSIONER DOUGLAS: All right, thank you.

17 MR. SHIRAKH: Thank you.

18 COMMISSIONER DOUGLAS: All right, other
19 comments?

20 MR. DESJARLAIS: Hi, I'm Andre Desjarlais, I'm
21 with the Oak Ridge National Laboratory. I lead building
22 envelope research at ORNL.

23 First, I want to thank Mazi for putting back
24 the prescriptive table requirement. However, I'd like to
25 suggest two conditions to that table. One, that it be

1 extended to the black roof baseline, which I think
2 somebody else has also mentioned.

3 But I think more importantly the emittance
4 requirement is not able to be traded off with that table
5 and I would suggest that you add or replace the
6 reflectance value with an SRI value, so that you can also
7 trade off products like bare metals and the aluminum
8 coatings that we were talking about earlier today. Those
9 products effectively cannot be traded off based on the
10 table that you have today.

11 And my second --

12 MR. SHIRAKH: Just so I understand, the current
13 equivalency is based on reflectants, you want us to make
14 it based on SRI.

15 MR. DESJARLAIS: Or both. Yeah, either.

16 MR. SHIRAKH: SRI is basically --

17 MR. DESJARLAIS: But if you have SRI there now
18 I can -- I can trade off either emittance or reflectants
19 and that would include -- that would add these products
20 back into the mix.

21 MR. SHIRAKH: Okay.

22 MR. DESJARLAIS: And my second recommendation
23 is, again, I think I commend you for being willing to
24 kind of revisit the cost effectiveness issue.

25 And while you're doing that I would suggest

1 that one of the biggest problems I see in your cost
2 effectiveness model is that you assume all building
3 envelopes last the same length of time. You know, and I
4 think no roofs last the length of time that you're using
5 in your analysis, so I think you need to revisit the
6 issue of service life of roofs and address the fact that
7 a roof coating is not going to last as long as a four-ply
8 asphalt roof. And each one of these product categories
9 should have a service life that's more typical of what we
10 actually see in the field and I think that will improve
11 your quality of your calculation appreciably.

12 MR. SHIRAKH: Yeah, the last discussion we had
13 with ARMA and the other hearing, where we agreed to do
14 that and I think, John, you're doing it, aren't you,
15 looking at the --

16 MR. ARENTZ: Yeah, well that's in progress. I
17 am looking at maintenance issues and looking at for cool
18 roofs relative to non-cool roof, which is what I was
19 recently asked to look at, what are the additional costs
20 to do recoating. And we're taking update costs that
21 we've gotten from, like was mentioned, the limited set of
22 stakeholders for built-up roofs to look at the lifecycle
23 costs.

24 Now, as far as the issue of the expected
25 lifespan of roofs, now, for the current analysis we

1 assume a 15-year lifecycle for the lifecycle costs. And
2 I don't -- to date I haven't had good data on what
3 expected actual costs are for different roofing systems
4 to look at. So, if industry and others have some actual
5 data on that, you know, that's beyond some anecdotal
6 stories, I'd be happy to look at that.

7 MR. DESJARLAIS: No, I appreciate the
8 difficulty of the task you have, but I think we all agree
9 that roof coatings don't cost a nickel a square foot,
10 which is what the basis of the 2002 report was.

11 MR. ARENTZ: Okay, well, yeah, just to be clear
12 pretty quickly, I know everybody's getting hungry. So,
13 we're not using the assumptions that were done in the
14 2002 costs. What I have from right now is about \$1.50
15 per square foot for a recoating cost and that's the cost
16 that I'm going to be using in this updated analysis,
17 yeah.

18 MR. DESJARLAIS: Yeah, that's -- but, you know,
19 at the last meeting what we were referring to is not
20 doing a cost analysis, we were going to just assume that
21 the 2008 cost analysis was valid and look at the cost
22 difference. And since I think we all feel the 2008
23 analysis, which is really the 2002 report, was flawed,
24 that your basis was flawed. And I think the fact that
25 you're redoing it and using new prices is the right way

1 to go.

2 MR. ARENTZ: Yeah, I mean it's difficult
3 because, obviously, any costs we get now are based on
4 what we're getting for current costs from contractors, as
5 opposed to back when that study was done so --

6 MR. DESJARLAIS: Well, I don't think even the
7 cheapest paint at Sears cost five cents a square foot
8 installed, back in 2002, either. So, let's go eat.

9 COMMISSIONER DOUGLAS: Thank you. Other
10 comments?

11 MR. HUTCHINSON: Good afternoon, Tom Hutchinson
12 and I represent the UPM Roofing Association,
13 Commissioner, Mazi, Martha, thank you for the opportunity
14 to speak to you this afternoon, now.

15 We are also signatory to the Coalition letter
16 and agree with the points brought in there. I would also
17 emphasize that the difference between new construction
18 and reroofing at .67 to .63, we'd like to see that
19 leveled off at .63 as well.

20 But one point I'd like to make to you is the
21 exception for ballast. You currently have it in there at
22 25 pounds per square foot, which is prohibitively
23 difficult when the -- from what I understand, the
24 California Code requires for dead loads for roofs to be
25 25 pounds.

1 So, for any type of consideration the
2 structural engineer would have to make substantial
3 modifications.

4 The EPM Roofing Association undertook an
5 analysis, based on using software programs recommended by
6 the CEC and we've submitted that for review, which would
7 show substantial reductions and that will result in
8 energy savings.

9 And that's the key here is that years ago SPRY
10 and Oak Ridge performed a study and they came up with the
11 conclusion that ballasted roof systems are actually more
12 energy efficient than cool roof systems. So, this should
13 be a system that should certainly be looked into.

14 ASHRAE, as well as the City of Chicago have
15 exceptions at substantially lower cover rates than the 25
16 pounds per square foot.

17 MR. SHIRAKH: What is ASHRAE's?

18 MR. HUTCHINSON: Seventeen currently and
19 Chicago's at 15.

20 One of the benefits, perhaps, of ballast it
21 does maintain its reflectivity over time, but it also
22 adds a level of fire protection that's an added benefit.

23 The one thing that I hadn't seen or thought
24 given consideration was the F-16 climate zones and
25 perhaps that needs to be created over the various climate

1 zones as well.

2 And, additionally, it does give designers an
3 option. Do you really want white roofs everywhere? Is
4 it appropriate everywhere?

5 I heard some discussion about glare. Boy, no
6 one's talking about the glare off of a white roof coming
7 into this curtain wall systems, that's a whole different
8 issue.

9 But given that we have some energy savings with
10 ballasted, it's given designers various options, and it
11 offers fire protection. I just ask and request that you
12 take a closer look at that tradeoff for there, for
13 ballast there. So, thank you.

14 COMMISSIONER DOUGLAS: Thank you for being
15 here.

16 More comments?

17 MR. FISCHER: Hi, I'm Mike Fischer with Kellen
18 Company and I'm here representing an unholy alliance of
19 various interests who, through Reed's efforts, are
20 holding hands. I'm here representing John Ferraro today,
21 on behalf of the Extruded Polystyrene Association. I'm
22 here representing Jared Blum, from the Polyiso
23 Manufacturers Association, and I'm also representing the
24 Roof Coating Manufacturers Association President, who's
25 Joe Malad, and you've got some of the members, obviously,

1 here participating.

2 But I will speak about glare off of reflective
3 roofs. We have an office in Atlanta it's, I think, a
4 three-story building and outside there's a covered
5 walkway area. And it's the south, and one of the staff
6 accountants for our company, his second-story window
7 faces directly opposite that roof system, and while that
8 roof is reflective not for energy reasons, but for
9 comfort of those standing underneath it, it is disruptive
10 to his work because the light comes in directly off that
11 into his office. So, he's getting sunlight from the sun
12 and he's also getting that bounce off that roof system.

13 So, what this brings me back to is the law of
14 unintended consequences and I certainly appreciate the
15 difficulty that the staff have to try to come up with a
16 way to demonstrate energy savings increases as we move
17 forward. But we have to look at this from the big
18 picture stand point which means you have to look at
19 durability.

20 As a trade association representative, we can't
21 talk about warranties, we have to look at costs. As a
22 trade association representative, we can't talk about
23 prices, so you have to find another path through the
24 contractors or through other sources to try to identify
25 those costs.

1 But what we can do is we can talk and work with
2 you on looking at the methodology. As we speak, the U.S.
3 Department of Energy has issued a call for public
4 comments on their methodology they're using for energy
5 savings analysis, so they've actually formalized the
6 process of developing the methodology.

7 I'm not suggesting that we want to go to that
8 level at this point in the process on Title 24 updates,
9 but I think it speaks to the idea that industry can bring
10 what we can bring to the table to work with staff on
11 looking at all these things from the big picture.

12 So as I stand here to represent the insulation
13 interests and the cool roof interests, looking at what's
14 reasonable and what's right, making sure that options are
15 there so the contractors are happy, the building owners
16 and designers are happy.

17 But in the end, if we're able to consider all
18 these variables, how much energy's being saved, what's
19 the impact on sustainability, what's the impact on cost,
20 durability, I think you'll end up with a better product.

21 And so I understand we're going to be talking
22 about the methodology as we move forward, but I think we
23 need to be clear that it's more than just that, it's also
24 about what's the energy savings, what's the cost value,
25 limiting the tradeoffs. You know, there are times when

1 caps on tradeoffs make sense. You don't send a kid to
2 school in Minnesota with just wearing really good boots
3 because -- and then wearing a t-shirt and shorts the rest
4 of the time in the winter because on area weighted
5 average they're warm.

6 And the same thing would be true in Florida or
7 San Diego about just putting really good SPF 50 on one
8 part of your body and so on.

9 So, the unintended consequences tell me that in
10 the interest of lunchtime we should bring an end to this.
11 I would, obviously, like to offer to bring our groups in,
12 along with our coalition that Reed's put together, which
13 I think for the first time we've got an entire group
14 working together to support the efforts of the CEC.

15 So, I wish you sympathies, but good luck at the
16 same time. Thank you.

17 MR. SHIRAKH: Thanks.

18 COMMISSIONER DOUGLAS: Thank you, thanks for
19 being here.

20 Other comments. All right, well it's time for
21 lunch then.

22 MR. SHIRAKH: No, I think there is one coming
23 up.

24 COMMISSIONER DOUGLAS: Oh, I'm sorry. One
25 more, come on up.

1 MR. VARVAIS: Yeah, my name's Dan Varvais with
2 the Spray Foam Alliance and Environmental Materials
3 Science, and my comments are real brief.

4 One, we support the -- I went blank -- the air
5 ceiling in 140. And there seems to be a misplaced note
6 on Table 140.3 (a)(b) and (c), where you're requiring QII
7 for the application of close-up polyurethane foam in
8 these buildings, and you're excluding all other
9 insulation materials. I'm just pointing it out, so I
10 think maybe that's a misplaced note.

11 MR. SHIRAKH: I need to look at it.

12 MR. VARVAIS: Okay.

13 MR. SHIRAKH: Ron's here, if he can respond,
14 but we'll look at it.

15 MR. VARVAIS: Thank you.

16 MR. FLAMM: Could I interject something,
17 please, this is Gary Flamm. I know, I've watched the
18 court reporter's over time that they always get a
19 business card and, Dan Varvais, I would not know how to
20 spell your name if I didn't see it.

21 So, I would recommend that everybody that has
22 spoken thus far would drop a business card in the lap of
23 our court reporter, so that he can spell your names.
24 Thank you.

25 COMMISSIONER DOUGLAS: Thank you, Gary. With

1 that, it's 1:20, we'll give you an hour for lunch because
2 sometimes it isn't easy to find lunch in less than an
3 hour.

4 If you want to get lunch quickly, you can get
5 it on the second floor here, in the Energy Commission,
6 and they have sandwiches, but they probably don't have
7 enough sandwiches for everyone here.

8 So, we'll see you at 2:20 and we will start at
9 2:20, thank you.

10 (Off the record for the lunch recess
11 at 1:22 p.m.)

12 (Reconvened at 2:21 p.m.)

13 MS. BROOK: Good afternoon, this is Martha
14 Brook, we're going to continue the 2013 Nonresidential
15 Standards Workshop.

16 The next section we're going to cover is
17 Section 140. And I think we might have a couple breaks
18 in here -- oh, what happened here? Did I do that? Okay,
19 good.

20 All right, so we're going to cover Section
21 140.4, Prescriptive Requirements for Space Conditioning
22 Systems.

23 And we'll start through this and the first item
24 that is an update is Item (c), power consumption of fans.
25 We removed a requirement for VAV fans that are greater

1 than 10 horsepower to be variable speed. So, it looks
2 like a deletion in the Standard, it's actually getting
3 replaced with new text that I'll cover when we get to
4 Item (m).

5 And then we've also added efficiency
6 requirements for HVAC pump and fan motors, 1/12
7 horsepower to one horsepower.

8 And in space conditioning zone controls we've
9 reduced the degree to which primary air is reheated, so
10 trying to reduce reheat in space conditioning systems.

11 Item (e), in the economizers, direct expansion
12 systems with economizers must cycle compressors off when
13 economizers provide partial cooling. Effective January
14 2015 direct expansion systems must be able to stage or
15 modulate capacity.

16 The reason for this staged date of
17 implementation is just to make sure that there is more
18 products now that can meet this requirement. There are
19 products now that can meet it and it's cost effective,
20 but we think if we, you know, notice people by our Code
21 adoption, manufacturers, that this is a requirement that
22 there will be even more products and the cost will come
23 down.

24 So, we still use current costs for our cost
25 effectiveness, but we just want to give the industry a

1 little bit more time to respond.

2 Economizers and return air dampers on
3 individual cooling fan systems have requirements for lots
4 of things, warranties, drive mechanisms, reliability,
5 leakage, adjustable set points, damper control, sensor
6 location specifications, sensor accuracy, sensor
7 calibration data, prevention of sensor false readings and
8 relief air systems are all prescriptively required in the
9 Code now.

10 There's a Table 140(e)-A, Economizer Tradeoff
11 Tables. They're not currently updated, but they will be.
12 So this is a table that lets you not install an
13 economizer if you have an increased efficiency of your
14 equipment, and we're going to be updating those
15 efficiencies to take advantage of some national --
16 national code analysis that's been done.

17 And then we've also updated Table 140(e)-C,
18 which is the Air Economizer High Limit Shutoff Control
19 requirements.

20 Item (i) in the 140.4 is minimum chiller
21 efficiency and we're -- we're using the chiller
22 efficiency tables from ASHRAE 90.1 in our Section 110,
23 but we're saying in this Code requirement that chillers
24 must meet or exceed Path B efficiencies listed in that
25 table. So, there's Path A and Path B efficiencies listed

1 in that table, but our requirements for our standard is
2 that chillers meet or exceed Path B, which is more
3 stringent.

4 Limitation of air-cooled chillers, chilled
5 water plants can provide up to 300 tons with air-cooled
6 chillers, but no more.

7 This is the new fan control section, Item (m),
8 multiple- and single-zone systems must vary the air flow
9 rate as a function of actual load, either two-speed or
10 variable speed with fan motor demand limitations for
11 single-zone systems that demand limitation that's less
12 than or equal to 50 percent design wattage at 66% of
13 design fan speed and for multi-zone systems that's less
14 than or equal to 30% design wattage at half of the design
15 air volume.

16 And this replaces existing variable air volume
17 control for single-zone system code and the previous code
18 I mentioned, power consumption of fans for VAV fans
19 greater than 10 horsepower.

20 Does anybody want to talk about that Section
21 140.4?

22 I'll probably just keep going and if you think
23 of anything that you want to talk about, we can bring it
24 up in the next break in the presentation.

25 And there's nobody online. Ron, is that

1 correct? I don't know what's going on here.

2 MR. DESJARLAIS: This is Andre Desjarlais with
3 AHRI.

4 MS. BROOK: Yes.

5 MR. DESJARLAIS: Martha, can you hear me?

6 MS. BROOK: I can.

7 MR. DESJARLAIS: Okay. Yeah, I think we have
8 submitted comments, you know, on the light commercial
9 HVAC equipment earlier and I think, you know, with
10 respect to some of these Code changes our members do have
11 some concerns.

12 I just want to let you know that we are putting
13 together some data and that will be submitted in our
14 comments by the 31st. So, you know, just wanted to let
15 CEC know that you can be expecting that data shortly from
16 us.

17 MS. BROOK: Oh, okay. All right and I'll go
18 back and look at your previous comments and make sure
19 that we respond to those as quickly as possible.

20 MR. DESJARLAIS: Right, I see we had copied
21 Jeff Stein as well, from Taylor Engineering. We did
22 receive a response, a letter from him as well. So, you
23 know, we haven't really responded to that letter. We're
24 still working on the data and the analysis.

25 MS. BROOK: Oh, okay. Okay.

1 MR. DESJARLAIS: As soon as we get that in
2 we'll share that with CEC.

3 MS. BROOK: Okay, great, thank you.

4 Yeah, Pat, I knew if I gave you a minute I knew
5 you'd --

6 MR. SPLITT: I had to think for a second, but I
7 came up with something. Pat Splitt from APTEC. I'm not
8 going to be here tomorrow for the residential so this
9 comment sort of deals with both of them.

10 MS. BROOK: Okay.

11 MR. SPLITT: By I do a lot of hydronic system
12 designs and now for homes going to zero net energy, or
13 commercial buildings, you need basically all-electric
14 systems, so I've been trying to use air/water heat pumps.

15 And I can do that but I've been having problems
16 fitting it into the compliance software because it
17 doesn't really handle it very well and I just want to
18 make sure that there's going to be some way for the new
19 software to handle it. And also, maybe a methodology for
20 getting things listed in the appliance directory where
21 nationally there isn't really a test procedure, yet.

22 Like for the air/water heat pumps there's a lot
23 of variable flow systems that people keep going back and
24 forth and nobody can make up their mind.

25 But these are all systems that have been sold

1 and installed in California for years and years, and it
2 would be nice to be able to do it officially.

3 It's not as much of a problem on the non-res,
4 commercial side because if you go prescriptive for
5 mechanical it's very simple and you can actually model
6 these things with minimum efficiencies and still pass.

7 But on the residential side I'm killed if I
8 model an air-to-water heat pump water heater as a .97
9 energy factor.

10 MS. BROOK: Oh, okay. Okay.

11 MR. SPLITT: So, it's the same problem, but
12 it's more of a problem on residential.

13 MS. BROOK: Okay.

14 MR. SPLITT: But for both sides there's a lot
15 of equipment that's out there that doesn't quite fit into
16 any bin, and people want to use it and there's going to
17 be a lot more of it as you go to zero net energy, and
18 want to do electric, and make sure that there's some easy
19 way of doing it. Or if somebody comes up with some new
20 piece of equipment that they're just developing and they
21 want to try it out that, you know, there should be some
22 trial method or something like that.

23 MS. BROOK: Well, what we talked about on the
24 non-res side and we haven't formalized this, but what
25 we've been talking about is for those either exceptional

1 designs or unique operating schedules, things that are
2 outside of the bounds of the compliance software that we
3 could allow those things to be modeled, but there's a
4 little flag that gets checked that says there needs to be
5 some sort of review --

6 MR. SPLITT: Uh-hum, yeah.

7 MS. BROOK: -- by a certified or some authority
8 group that is, you know, deemed acceptable to review
9 compliance.

10 MR. SPLITT: Yeah, there should be something
11 between doing nothing and what we have to do now is,
12 basically, if you want an exceptional design that you
13 have to create a whole new program. You know, it's
14 just --

15 MS. BROOK: Right, right, right, okay.

16 MR. SPLITT: -- it's just prohibitive, you
17 know, and some people just give up.

18 MS. BROOK: I agree. Uh-hum, I agree. Okay
19 thank you.

20 All right, we'll keep going. This is not me,
21 this is Gary.

22 MR. FLAMM: Good afternoon. So, the next three
23 sections I'm going to cover are all nonresidential
24 prescriptive lighting standards. So the first section,
25 .6, is non-res indoor, .7 is outdoor, and .8 is sign

1 lighting.

2 So, the non-res indoor has been edited for
3 clarity. The default wattage exclusion for portable
4 lighting, the issue is that portable lighting is usually
5 installed after the building inspector has left, so we
6 have assumed that the typical office puts in at least .2
7 as a default.

8 And if the -- at the time of design if it's
9 known that more than .2 is put in, then they're supposed
10 to claim that on the compliance form.

11 And we're changing that to .3 with a
12 corresponding reduction in the general lighting in the
13 ceiling of .1.

14 So this is just a default number. Because no
15 people have no way of knowing the portable lighting load
16 at this point, they claim the default number.

17 There's also an option that in certain spaces,
18 big spaces, where they need a redundant lighting system,
19 where they're only going to use one for one type of
20 application and the other for the other application,
21 that's been edited for clarity but, also, it's going to
22 require acceptance testing in order to be able to claim
23 that you're putting in that redundant lighting system.

24 There are also a number of power adjustment
25 factors, that's where the actual connected load gets to

1 be reduced by a percentage depending on special controls
2 that are above the controls that are required. And so
3 that whole section has been edited for clarity and there
4 have been a number of changes. The daylighting power
5 adjustment factors have gone away because now daylighting
6 is mandatory, and so that whole section has been changed.

7 And there's a new power adjustment factor for
8 occupant sensors in open offices. So if there's an open
9 office for which there will be office furniture, and
10 somebody puts in ceiling-mounted occupant sensors,
11 depending on whether they're controlling 125 feet or two
12 something, there's three different tiers, they get to get
13 additional credit, which means that they get to -- they
14 don't have to claim as many watts as they actually
15 installed in that space.

16 The lighting wattage excluded, there's a whole
17 list of applications that don't have to comply with
18 Section 140.6 and one of those exceptions was video
19 conferencing studio lighting, which said that you didn't
20 have to put in -- you didn't have to claim two and a half
21 watts, that's what the current standards say, for video
22 conferencing studio.

23 And the problem with that is it's very clumsy
24 in compliance forms how to do that. We basically do that
25 on the back of a napkin right now, when somebody is

1 accounting for the connected load.

2 So that has been removed from the excluded
3 wattage table list and it's been put into the area
4 category table, along with what we call a use-it-or-lose-
5 it adder, so we just moved that to make the compliance
6 forms more elegant.

7 And there's a new ASHRAE, IES just came up with
8 a new elevator standard and we add it to that list of
9 excluded applications, more for clarity. It's been
10 unclear in the standards whether elevator lighting was or
11 was not part of the building load.

12 The tailored method, the narrative for how to
13 comply with the tailored method of compliance has been
14 expanded significantly and gone through step by step on
15 how to comply with the tailored method.

16 The Illuminating Engineering Society comes out
17 with a new handbook every ten years and they just came up
18 with the tenth edition this year. In the previous two
19 cycles we referenced the ninth edition.

20 And there were some significant changes in the
21 tenth edition. Part of the tailored method of compliance
22 is to identify an illuminance category, which was listed
23 as A through G.

24 And as a way to map the tailored method to the
25 new tenth edition handbook we changed those A through G

1 designations to lux values. And so wherever the 2008
2 standards talked about A through G, we talk about lux
3 values, which is a metric version of foot candles.

4 These are the tables that are at the end of
5 Section 140.6. 146.(a) are lighting power adjustment
6 factors. These are the credits. This is the table that
7 the narrative refers to.

8 Table 146.(b) are the complete building method
9 lighting power density values, how many watts you can put
10 in if you're using the complete building method, which
11 means that you're looking at the square footage of the
12 entire building and you're multiplying that times your
13 allowed wattage for lighting.

14 There were edits -- and there's some of those
15 applications went down, some of the allowed lighting
16 power densities in the complete building method have been
17 reduced and all of that information is online.

18 Table 156(c), the area category method, that's
19 where you're looking at basically room by room. Some of
20 those lighting power densities went down.

21 Also, I'm going to talk about the tailored
22 method, Table 146 -- 140.6(d). A lot of the function
23 areas that were in the tailored method have been moved to
24 the area category method table, so the tailored method
25 table has been significantly reduced.

1 And a lot of the use-it-or-lose-it allowances
2 are as footnotes in the area category table.

3 Now, the difference in the area category table,
4 as you look at room by room with the tailored method, you
5 not only look at the room, how many watts you get for
6 general lighting, there's also an allowance for wall
7 display if you need it. There's an allowance for floor
8 display lighting if you need it, and for very valuable
9 merchandise and ornamental lighting. And each of those
10 layers are use-it-or-lose-it.

11 Table (e), mounting height adjustments has been
12 adjusted in accordance with the CASE Report.

13 There's a new table, 140.6(f), room cavity
14 ratio equations. Those ratios -- those equations have
15 existed mixed within the narrative portion of the
16 standards and they disrupted the flow of the narrative,
17 so I just put them into a table.

18 And in the narrative I now, instead of -- you
19 know, you have to go a half a page to pick the narrative
20 up again, the narrative continues and the calculations
21 have just been moved to a table.

22 And Table (g) was categories A through G,
23 illuminous categories, and that has been changed to lux
24 values and a lot more rows in it than there were in the
25 previous table.

1 From there we're going to go to the outdoor
2 lighting, the changes in the outdoor lighting power
3 section. It has been edited for clarity.

4 Some of the lighting power densities have been
5 reduced and there were -- the way the outdoor lighting
6 standards work is it's called a layered method, is what
7 we call it, where one layer of wattage is available for
8 the hardscape. You get another layer, it might be for
9 the same area, let's say it's a sales lot, and then you
10 get another layer for sales frontage.

11 And the total allowed lighting power for the
12 site is made up of all these layers of all the different
13 function areas.

14 There was one additional function area that was
15 for local ordinances and it has been determined that that
16 is no longer needed, so that allowance has been removed.

17 And the last section is Section 140.8 and
18 that's for the sign lighting power, and that has only
19 been edited for clarity and there have been no
20 substantive changes to that section.

21 And any comments on that -- those sections?

22 MR. SHIRAKH: So, any comments on lighting
23 sections online?

24 MR. YASNY: Gary, you know, we missed somebody
25 on the last section and he made a comment that I can

1 probably just read, and then he's going to follow up on
2 in writing.

3 And this had to do with economizers and two-
4 speed fans. "We have conducted studies that are not yet
5 complete" -- oh, this is Richard Lord.

6 "We have conducted studies that are not yet
7 complete, but Jeff Stein used an arbitrary D rate of the
8 economizer by 25% to justify his change, which he based
9 on monitoring of one unit in the field. What he's doing
10 is de-rating some conditions where just the economizer is
11 being used, so the savings are significantly over-stated.
12 He also has defined requirements that products are not
13 available for and only likely will not be available in
14 volume at the implementation date. We will file formal
15 comments, along with the technical analysis."

16 Hold on. "Along with the technical analysis
17 period."

18 MR. SHIRAKH: Is that it?

19 MR. YASNY: That's it.

20 MS. BROOK: Okay. Okay, thank you, Dick, and
21 we will look forward to seeing the data and your comments
22 in writing.

23 MR. JOHNSON: This is Karl Johnson. I had one
24 question, the elevator requirements what -- could you
25 specify what those are?

1 MR. FLAMM: I don't know the -- all I know is
2 that ASHRAE came out recently with some elevator
3 requirements and I don't have them memorized. I can get
4 at -- you know, I have them. I think it's just a
5 lighting power density, I don't believe it's by level.

6 But there is an assumption that elevator
7 lighting is exempt from Title 24 and a lot of -- even
8 though the standards are silent on that, that's always
9 been assumed.

10 And not only that elevators are really an
11 appliance because they're assembled offsite and they're
12 brought and put into the building.

13 So just for clarity, because ASHRAE just did
14 something, I just said, well, let the standards say
15 something to go along with what everybody assumes they
16 say anyway, which is that elevators are not covered by
17 Title 24.

18 MR. JOHNSON: I had a follow-up question. I've
19 been doing audits with the universities on their places,
20 and elevators still seem to have T-12 lamps in them and
21 so does modular furniture underneath. It seems like we
22 don't have a Code to cover those things, so they're still
23 using T-12 magnetic ballast kind of technology in those
24 spaces.

25 MR. FLAMM: Well, there's two issues there,

1 Karl. First is I would love somebody to propose an
2 elevator Title 20 standard.

3 MR. JOHNSON: Yeah.

4 MR. FLAMM: Because I think it's appropriate.

5 And I believe that the lights can be put to sleep because
6 they already have the digital control on them.

7 MR. JOHNSON: Yeah.

8 MR. FLAMM: And the second thing is we -- Title
9 24 cannot regulate furniture because it's not there when
10 the building inspector inspects the building. So it's
11 really not a Title 24 issue.

12 MR. JOHNSON: But could Title 20 address that,
13 as well?

14 MR. FLAMM: I think there's some Federal
15 preemption, but outside of that I -- there is a Title 20
16 regulation for T-8 lamps, for under-cabinet furniture
17 light that is a T-8 lamp is regulated by Title 20, but
18 there are some Federal preemption issues that we're
19 pushing against.

20 MR. JOHNSON: Well, with the CEC research that
21 might be morphing towards LEDs as a standard.

22 MR. FLAMM: Correct.

23 MR. JOHNSON: So, you should look at those.

24 MR. FLAMM: Okay.

25 MR. GABEL: Mike Gabel. This is really not so

1 much about prescriptive lighting, but the way it sets the
2 baseline for performance. And when it comes to secondary
3 side-lit day-lit zones the concern is when you get to the
4 ACMs that unless you put all kinds of notices all over
5 the forms that someone has not modeled the space,
6 standard design will set a budget without those controls.

7 So, I'm just sort of giving you the warning
8 when you get to the performance method it's probably
9 going to take people a year or two, for building
10 departments to even realize people have to put that into
11 the performance method. Because if it's mandatory --
12 excuse me, if it's prescriptive and you don't model it,
13 it will just disappear and the energy budget will be one
14 percent higher or something like that. So, I'm just
15 going to put a little placeholder for that.

16 MS. BROOK: Are we good, we're ready to move
17 on.

18 MR. FLAMM: Thank you.

19 MS. BROOK: Okay, 140.9 is a new section. Was
20 there a -- did there used to be a 140.9 Section?

21 MR. SHIRAKH: Yes, there was a 149, which was
22 additions and alterations for nonresidential buildings.
23 That is now called 141. So, 140.9 is this covered
24 processes.

25 MS. BROOK: New, okay.

1 Okay, so these are prescriptive requirements
2 for covered processes. We have three items under this
3 section, they're all new.

4 The first is prescriptive requirements for
5 computer rooms or data centers. The first is an
6 integrated economizer requirement for each cooling fan
7 system to meet a hundred percent of the expected load.
8 And the calculation method for estimating that expected
9 load will be approved by the Commission.

10 Controls that prevent reheating, recooling or
11 simultaneous heating and cooling, non-adiabatic
12 humidification will be prohibited.

13 Limitation on fan power, two-speed or variable
14 speed control on fans with motor demand limitations and
15 then air barriers for containment to prevent discharge
16 air from recirculating.

17 The next item is prescriptive requirements for
18 commercial kitchens. The first requirement is to reduce
19 short circuiting of kitchen exhaust hoods, so the
20 replacement air is limited to 10% of the hood exhaust air
21 flow rate.

22 There are maximum exhaust flow rate
23 requirements in Table 140.4(b). And that's a mistake, it
24 should say 140.9(b).

25 Limitations on heated or cooled makeup air for

1 spaces with exhaust hoods, transfer air is more or equal
2 to 50% of the replacement air. The demand ventilation
3 controls need to be on 75% or more of the exhaust air
4 system.

5 Energy recovery devices with recovery
6 effectiveness greater than 40 percent on half of the
7 total exhaust air flow, 75% or more of the makeup air
8 volume needs to be unheated or uncooled. And there will
9 be kitchen exhaust system acceptance testing requirements
10 delineated in the nonresidential Appendix 7.

11 The last item under this prescriptive section
12 for covered processes is prescriptive requirements for
13 laboratory exhaust systems. And there's a single item
14 here, zone exhaust and makeup air flow rates shall be
15 capable of reducing to regulated minimum circulation
16 rates or a rate necessary to maintain pressurization,
17 whichever is larger.

18 And I think that's the end of this section.
19 Does anybody want to make comments on covered processes?

20 MR. SPLITT: I gave you a bye in the last one.
21 Pat Splitt from APTEC, just one question on -- you had a
22 note there on kitchen exhaust hoods that only 10% of the,
23 what was that, makeup air can be provided or what was
24 that?

25 MS. BROOK: I'm getting there.

1 MR. SPLITT: Yeah, replacement air limit to 10%
2 of hood exhaust air flow rate. So, if you have a
3 manufactured exhaust hood that brings in its own makeup
4 air, you say that amount of air can only be 10% of the
5 exhaust and the other 90 percent has to be --

6 MS. BROOK: Yeah, so basically you can't
7 short -- you can't install short circuit hoods in
8 California anymore, basically, right? I mean the idea is
9 that they -- they waste so much energy because once you
10 start doing that short circuiting then the containment of
11 the fumes you're trying to exhaust drops way down, and so
12 you have to beef up the exhaust rate to get the
13 containment and, you know, the stuff you're trying to
14 exhaust up through the hood. And so that's the reason
15 for that requirement.

16 MR. SPLITT: But this is just talking about
17 replacement air in the hood, itself, or just replacement
18 air anywhere in the kitchen, you know?

19 MS. BROOK: Oh, I think it's for the hood
20 because it's really focusing on limiting short circuiting
21 of the hood.

22 MR. SPLITT: In other words if you didn't
23 provide it in the kitchen, then that air has to be --
24 it's going to be sucked out of, say, the restaurant area. I
25 mean all that area has to be made up and be cool.

1 MS. BROOK: And that's where these other
2 transfer air requirements come in because the transfer
3 air is where it would come from, the serving room or the
4 eating room, and so that -- so that's basically what
5 they're saying.

6 MR. STEIN: Martha, this is Jeff, maybe I could
7 provide --

8 MS. BROOK: That's fine.

9 MR. STEIN: Yeah, this is Jeff Stein, I was one
10 of the authors of this proposal and I can give a little
11 more clarification on it.

12 MS. BROOK: That's great. And Jeff, could you
13 just speak up a little bit, please?

14 MR. STEIN: Sure. So the 10% limitation there
15 is basically, as Martha said, we're pretty much outlining
16 a very specific and very rare type of hood in California,
17 which is a short circuit hood. And the idea with the
18 short circuit hood in theory was that if you provide the
19 makeup air directly inside the hood, then you won't have
20 to condition that makeup air and you'll save on
21 conditioning makeup air to the space.

22 The problem was there was some research done
23 that showed that they don't work. And as Martha
24 described, what ends up happening is you have to increase
25 the makeup to the room to get adequate capturing

1 containment.

2 So, there are no limitations on bringing makeup
3 air into the room, itself. Or, actually, there are
4 separate sections that describe that. But this
5 particular one, the first one here is basically saying
6 you can't inject more than 10% of the makeup air directly
7 into the hood, the rest of the makeup air has to be
8 provided into the room, itself, because that's the only
9 way to actually get the hood to capture and contain.

10 And there are a number of products -- less than
11 one percent of hoods sold in California are actually
12 short circuit hoods, so this is not going to make very
13 much difference on the marketplace today.

14 MR. SPLITT: Okay, so this is then we're
15 talking about only where that air is injected directly
16 into the hood. So we could have --

17 MR. STEIN: Right, you can't inject more than
18 10% of the air directly into the hood.

19 MR. SPLITT: So there could be a system that
20 actually is providing makeup air but it's just letting it
21 into the room, as long as it doesn't put it into the
22 hood, itself.

23 MS. BROOK: That's right. That's right.

24 MR. STEIN: Yeah, and there are a number of
25 designs that do that, that integrate makeup through the

1 hood, but the makeup is then delivered to the room before
2 it goes back into the hood, and so that is not being
3 affected by this requirement.

4 MR. SPLITT: Okay, I understand. You might
5 want to put a picture or two in the manual.

6 MS. BROOK: Oh, no, there's some really good
7 pictures in the CASE Report, so we'll definitely do that.

8 MR. STEIN: Martha, if I could, I wanted to
9 clarify a little bit, too, about some of the other bullet
10 points on your slides. Those -- most of those are
11 actually from a menu of options and they're not all
12 required. You don't have to do demand control
13 ventilation, and energy recovery, and the 75% percent
14 unheated/uncooled.

15 MS. BROOK: Oh, I --

16 MR. STEIN: Those are all options and you only
17 have to do one of those and it's only for large kitchens,
18 so it's not quite as drastic as it might look on this
19 slide.

20 MS. BROOK: Okay. Well, appreciate you
21 clarifying that and I apologize for misrepresenting the
22 proposal.

23 So which of those, again, are choices, demand
24 ventilation, energy recovery or --

25 MR. STEIN: Well, probably the bullet that says

1 limitations on heated or cooled makeup air --

2 MS. BROOK: Uh-hum.

3 MR. STEIN: -- the four bullets below those
4 should be indented again, so there are four options that
5 are available.

6 MS. BROOK: Okay.

7 MR. STEIN: If transfer air is available, then
8 you don't have to do any of the other options.

9 MS. BROOK: Okay.

10 MR. STEIN: If transfer air is not available,
11 then you have to choose from one of the three other
12 options, the DCV, energy recovery, or partial
13 conditioning of makeup air.

14 MS. BROOK: Okay, so we'll make the
15 clarification, we'll fix it on the slide because it will
16 be -- it is posted and we'll repost it. And then,
17 obviously, it's correct in the -- well, I'll make sure
18 it's correct in the standard update as well.

19 MR. STEIN: And it does -- it does only apply
20 to large commercial kitchens over 5,000 CFM.

21 MS. BROOK: Okay, great. Thank you.

22 Any other questions, or comments, or
23 clarifications on covered processes? All right, we're on
24 to --

25 MR. STEIN: Martha, I think --

1 MS. BROOK: Go ahead.

2 MR. STEIN: -- if you don't mind, Mark Heydeman
3 had a comment, he's trying to unmute himself as we speak.

4 MS. BROOK: Oh, and we're going to talk about
5 data centers now?

6 MR. HEYDEMAN: Oh, no, no, I wanted to talk
7 about covered processes.

8 MS. BROOK: Okay.

9 MR. HEYDEMAN: Sorry about that. I had unmuted
10 myself on the WebEx, but not on my phone.

11 MS. BROOK: Okay.

12 MR. HEYDEMAN: So just one item that came up,
13 we had envisioned all of these things living in Section
14 144 and now you have all of the processes, lab exhaust,
15 and kitchen exhaust, and data centers in a separate
16 section, which I think is fine.

17 But we want to make sure that we don't lose all
18 of the mandatory and other prescriptive measures. In the
19 case of the data centers, the economizer requirements are
20 in lieu of the 144 Section economizer requirements, but
21 all of the equipment efficiencies and most of the
22 controls we want to have applied to these cover processes
23 as well.

24 And we can work with you offline to work on the
25 structure of the language. But by putting these things

1 off in a separate section, we need to make it very clear
2 that all of the other requirements of the standard also
3 apply to these facilities.

4 MS. BROOK: Okay, yeah, we think we've -- well,
5 we tried to do that and maybe we didn't do it the way
6 that you would recommend and we definitely should be
7 talking about that, and we can do that.

8 MR. SHIRAKH: And usually what we do within the
9 prescriptive section, we refer back to the mandatory so
10 people can see there are mandatory requirements.

11 MS. BROOK: Okay, okay.

12 MR. SHIRAKH: That's what we do like in Section
13 152 for nonres -- I mean res, we refer back to 150.

14 MR. HEYDEMAN: Yeah, I just wanted to make
15 sure, Mazi and Martha, that everyone that's listening
16 understands what the intent is and it's clear in the CASE
17 Reports. But because of the way this is structured I
18 think it could be viewed that these are not -- these are
19 in lieu of the other requirements and I just want to make
20 sure that that's not the case.

21 MS. BROOK: Okay. Yeah, we'll definitely work
22 with you on that. Thank you, it's a very good point.

23 MR. YASNY: And perhaps Robert Nakamura wants
24 to say something. Robert? Never mind.

25 MS. BROOK: Okay. I think we're on to Mazi,

1 now. Oh, no, this is Gary and --

2 MR. SHIRAKH: Right, this is going to be Gary
3 and Mazi show.

4 MS. BROOK: Yeah.

5 MR. FLAMM: Okay, this next section that we're
6 going over is formerly Section 149. We're calling it
7 140.1. This is one of those results of we were running
8 out of numbers and this is one of the reasons, we have a
9 new Section 140.9.

10 So, this is 141 and it's nonresidential
11 additions, alterations and repairs. So, of course, it's
12 been edited for clarity. There are added exceptions for
13 solar-ready requirements when there are additions and
14 alterations that do not have a solar zone.

15 So we didn't go over the solar --

16 MS. BROOK: We're doing that tomorrow.

17 MR. FLAMM: We're doing that tomorrow. Okay,
18 so this is an exception that you don't have to do that if
19 you don't have the solar zone in additions and
20 alterations.

21 When a space conditioned system is altered the
22 unitary system with an economizer shall have control
23 systems that cycle the compressors off when economizers
24 can provide partial cooling.

25 So my mechanical whiz, you want to say

1 something about that, Mazi?

2 MR. SHIRAKH: It is just what it says.

3 MR. FLAMM: Okay, we shall move on and this is
4 Mazi.

5 MR. SHIRAKH: So back to our favorite topic,
6 different context, this one is within alterations. So
7 the requirements are slightly different. This section
8 specifies the reflectants requirements for lowest load
9 proofs in alterations is .63.

10 If you recall from this morning, the
11 recommendation for newly constructed buildings the
12 reflectants was .67. So this is different in recognition
13 of the existing market and alterations are different, and
14 many products that would be available in new construction
15 would not be available in existing homes.

16 So, this .63 reflectants is required in all 16
17 climate zones. Again, the maintenance of .85 and if you
18 want to comply with SRI, that would be an SRI of 75.

19 As in the newly constructed buildings we are
20 providing continuous insulation as a prescriptive
21 alternative to cool roof requirements in lowest load
22 applications. And the reflectants go down to .45. I
23 think we provide prescriptive alternatives and I think
24 the range actually goes down lower than .45, it goes down
25 to .25 right now for continuous insulation tradeoffs.

1 For the steep slope roofs the requirement is
2 pretty much the same as this morning, reflectants of .20
3 and a thermal maintenance of .85, and an SRI of 16.

4 So this is the performance approach, the
5 baseline for additions and alterations. And,
6 essentially, when altered components are -- a specific
7 feature in the building is altered that's considered an
8 altered component, and there are rules for how it's
9 treated within the performance software.

10 And so we're -- set the rules and this is
11 continuation of previous rules changed slightly, that
12 when you alter components, it's called, considered an
13 altered component, it must meet the mandatory
14 requirements. In general that's the logic. It must meet
15 the mandatory requirements for that altered component.

16 So, like if you touch a wall or a window, it
17 should meet mandatory requirements for that altered
18 component.

19 So, if you just meet the mandatory requirements
20 there is no penalty or credit. If you do an alteration
21 and it exceeds the mandatory requirement for that altered
22 component, but does not actually meet the prescriptive
23 requirement for that altered component you get partial
24 credit relative to the actual value and the mandatory
25 requirement for that altered component. So, there's

1 partial credit.

2 And, now, if you alter that component and bring
3 it up all the way to the prescriptive requirements, then
4 there's actually a big credit which is relative to the
5 existing condition prior to alteration and the
6 prescriptive requirement.

7 So, the whole intent here is that if you touch
8 something, you're trying to make an alteration, bring it
9 up to the prescriptive requirement, get the full credit.
10 But at least if you bring it up to more than mandatory
11 requirements, you get a partial credit.

12 So, I'm going to be working on this with Mike
13 Gabel. And the residential is pretty much the same and
14 you'll see that tomorrow. And Jon McHugh, I know there's
15 some issues still related to this and we can work on it a
16 little bit later.

17 We're back to Gary Flamm.

18 MR. FLAMM: This next section is going to be
19 about lighting alterations. The current standards,
20 basically, if you replace more than 50% of the
21 illuminaires in a room, you have to bring that room up to
22 the current requirements, power requirements.

23 And if you touch the wiring, you have to bring
24 the lighting controls up.

25 And if you subdivide a room, each room has to

1 have the manual switches to be able to turn it on and
2 off.

3 That's where we are, now. So, now I can
4 explain where we've gone to. We've defined three
5 different types of alterations, we actually have
6 definitions here. Illuminare alteration, illuminare
7 modifications in place, and lighting wiring alterations.

8 Illuminare alterations are basically if you add
9 illuminare, if you disconnect illuminare from the service
10 and put it back, or if you do a gut rehab and put in new
11 illuminaires, those are all illuminare modifications.

12 Illuminare modification in place means you basically
13 leave the illuminare housing in place and you gut the
14 inside of it and you put new guts in it. And in doing so
15 you change the technology, you change the number of
16 lamps, the type of controls, some major modification to
17 that illuminare.

18 Now, the current standards say that replacement
19 of lamps, ballasts, lenses, lamp holders is not an
20 alteration covered by Title 24, but that is changing.

21 So, ASHRAE 90.1, where we've had 50% threshold,
22 recently went to 10%. So, if you go into a room and you
23 change 10% of the illuminaires, you have to bring them up
24 to the current power requirements.

25 So, we're following ASHRAE 90.1 and so we've

1 got that same threshold, and it's always per room. The
2 reason we do that is if you change a bunch of illuminaires
3 on the floor, you shouldn't have to -- well, let's say
4 you change all the illuminaires on one floor, but you
5 don't touch the second, third, fourth and fifth floor,
6 you should only have to bring up to date the floor that
7 you touched or the room that you touched.

8 So that's why we've always looked at the
9 alteration per room because you could go into a room and
10 do a very minor modification and that could be a repair.

11 Now, one of the things we're introducing this
12 time in illuminare modifications in place, what was
13 proposed by the CASE team was bringing ballast
14 replacements as a compliance requirement. And this is
15 where we ended up morphing into illuminare modifications
16 in place.

17 And so the number was bantered around and we
18 ended up at 40 in what is considered a building space.
19 And a building space is defined as a single floor in a
20 multi-floor, a single tenant lease space, and there's a
21 couple definitions of what's a building space.

22 So, there's two thresholds. We didn't want to
23 have routine ballast change outs, maintenance, repairs to
24 be considered an alteration that's regulated by Title 24,
25 so we came up with this two-level requirement.

1 So, first of all you have the 10% threshold in
2 a room, which is similar to what we've always had and a
3 minimum of 40 illuminare modifications in place in what's
4 called a building space which is, again, the total lease
5 space, the total single floor.

6 And so there's two levels and I think it's
7 confusing a little bit to see those two levels. And what
8 we're trying to capture is to not -- to note make routine
9 ballast change outs to be regulated by Title 24.

10 And so to capture all of this we put this in a
11 table format. Jim Benya had actually promoted this very
12 strongly and it seemed to be well received. So instead
13 of a narrative we have all of this construct, except for
14 wiring alterations, in a table format.

15 So, what we say for illuminare alterations,
16 each room that has greater than 10%, if you have less
17 than or equal to 40 building luminate alterations of the
18 general lighting, and you put in 85 percent of the
19 allowed lighting power density you don't have to put in
20 as many controls as if you put in 100% of the allowed
21 lighting power density. This is why we had to put this
22 on a table.

23 So, the stakeholders said, you know, I can save
24 just as much energy with installing less power than I can
25 with multi-level lighting.

1 So, the requirement we have in Section 131 for
2 the multi-level lighting, which requires basically a
3 four-step ballast, we were trying to address that issue
4 here. So those who are in the alteration business, if
5 they only put in 85% of the power, they don't have to put
6 as many controls in, they only have to put one step in
7 between zero and a hundred.

8 If they put in a hundred percent of the
9 lighting power density, then they basically have to put
10 the four-step ballast.

11 So those are the two alterations are very
12 similar, whether you install 85% of your allowance or
13 100% allowance for either illuminare alteration or
14 illuminare modification in place determines how many
15 controls you have to put in for the multi-level control.

16 So, sorry for the expanded definition, but I
17 felt like I needed to do that. Comments?

18 MR. CALLAHAN: Good afternoon, Bill Callahan,
19 Associated Roofing Contractors.

20 In the earlier session there were a number of
21 comments made about the new Table 141.0(a), which is a
22 tradeoff table for insulation. I like it conceptually,
23 it saves you a step, instead of doing a manual
24 calculation, it's very easy to see.

25 Should it go down to .00? Perhaps. I would

1 support that, as other commenters have mentioned.

2 Does it need more information because of
3 emissivity tradeoffs? Possibly.

4 My concern, though, is a simpler one. This
5 table's in the wrong place in the regulation. It doesn't
6 belong here, it belongs right in front of Exception 2 to
7 141.0(b)(1).

8 You have eliminated the existing Exception
9 1, which had to do with taking off the gravel in a roof
10 and removing it to a certain level and putting it back.
11 It should really go there.

12 And the reason is this is an option and it's in
13 between two prescriptive requirements and it's going to
14 confuse people.

15 What's going to happen is that a contractor or
16 building official is going to look at this and say, okay,
17 you've put in a roof membrane of .5, instead of -- and
18 because of that you get to put in 6-R, to trade off for
19 that because you're putting in R-6 on the roof deck.

20 Then you get to the next requirement, which is
21 the minimum insulation requirement for reroofing, that 6
22 should not count against the minimum 8 or 14, but that's
23 exactly how they're going to look at it because one
24 follows the other.

25 MS. BROOK: Okay.

1 MR. CALLAHAN: And you should move this after
2 the minimum insulation so everybody knows, first, it's R-
3 8 or R-14, and then after you've done that you have the
4 opportunity to do other tradeoffs for the reflectivity.

5 MR. SHIRAKH: Thank you.

6 MR. CALLAHAN: Otherwise, you know, you're
7 going to have compliance problem and a lot of confusion,
8 and that's my comment.

9 MR. SHIRAKH: Thank you, it's a good point.

10 MR. CALLAHAN: Thanks.

11 MR. SHIRAKH: Did you take note?

12 MR. HITCHCOCK: Reed Hitchcock, Asphalt Roofing
13 Manufacturers Association. It probably goes without
14 saying, but I just wanted to make sure that, you know,
15 when people look at the transcripts that we point them
16 back to the right discussions. And I just want to
17 reiterate earlier concerns raised about cost
18 justification, some of the interaction we've had with CEC
19 and direction forward at least at this time on
20 reevaluating the baseline cost justifications. That's
21 all I had, thank you.

22 MR. SHIRAKH: Thank you, Reed.

23 MR. THOMAS: Gene Thomas, College Action. And,
24 Gary, I got a handout for you, an extra one that was
25 going to go to Jim.

1 I had emailed you previously the wrong version,
2 this is the one that had my comments in it. And first of
3 all I want to say it's been really good working with
4 everybody on the CASE Team, Gary, and Jim, and John, and
5 Mudit (phonetic), and Owen, and everyone else and
6 appreciate the opportunity to give input.

7 At the last conference call that we had on this
8 issue, on the table, and specifically I'm talking about
9 from the stand point of lighting, alterations and
10 retrofits. I thought we were really close to having a
11 consensus, you know, a fairly decent consensus from the
12 stakeholders that were in on the call. There seemed to
13 be some buy-in on a higher number of ballasts than 40,
14 but we appreciated the table and we kind of liked where
15 things were sitting at that point.

16 When I saw this posted it -- there were some --
17 a couple good additions to it, but there's a couple
18 things that seemed like a big step backward from our
19 stand point.

20 And the first one of it, in both tables, C and
21 D, is the room-by-room requirement, which the way it
22 looks to us is that that would be a real significant cost
23 adder compared to the building space definition that you
24 have here in 149(d). We think that's great, that
25 clarifies things a lot and it makes sense to us to have

1 that in Table C, as well.

2 I mean in the context of the retrofit industry
3 you've got, and you've described it briefly, but you've
4 got a situation where now the threshold is 50%, that's
5 being brought down to 10%, that's huge.

6 Then you have the -- right now the basic
7 exemption for lamp ballast retrofits, which comprises a
8 huge proportion of the energy savings that the retrofit
9 industry and programs, like ours, deliver.

10 And we had in the last iteration, you know,
11 talked about 40. We weren't terrifically comfortable
12 with that but -- but it was if you have 40 or less, you
13 can meet the existing controls requirements, and
14 switching requirements, and dimming, multi-level
15 requirements, but you don't have to meet a lower LPD
16 threshold.

17 That's more stringent in this and we don't --
18 we don't think that makes sense. We think it makes sense
19 to have the 40 fixture cutoff point apply to both the
20 alterations and the alterations in place. For those
21 small, hard-to-reach customers, that we don't think that
22 40 covers nearly all of them, but it does cover a lot of
23 them. And for us it makes a lot of sense to have that.

24 And this is also another differentiation that
25 wasn't in the previous versions, separating out the

1 alterations in place from alterations, because they were
2 both treated the same except that the lamp ballast are
3 completely exempt at this point.

4 So we think that it's important to have those
5 apply to both of these tables and we think if they -- if
6 that small customer makes that -- you know, has 40 or
7 fewer than a hundred percent of the allowable LPD should
8 be sufficient.

9 Because the one thing that we all have to keep
10 in mind with this is the customer can say no, and they
11 say no quite a few times now, even the way things are.
12 But if you're imposing these significantly higher costs
13 on a room-by-room basis, that can considerably add to the
14 overall cost of the job, they either won't do it in that
15 room and proceed with the rest, and then you have a lot
16 of differentiation of lamp types, and you're stranding
17 that older technology, or they'll just say no to the
18 entire retrofit and then you don't get any savings at
19 all.

20 And like the gentleman earlier today referred
21 to, when you -- if you don't -- the controls being at the
22 top of the loading order, if you don't get light into the
23 room there's nothing to control.

24 It's kind of that same way, if the person
25 doesn't say yes to your retrofit proposal, you get zero

1 savings. And if he says yes to part of it because of
2 some of this granularity of the space requirements, then
3 you're stranding partial savings and making it harder to
4 go in and get it subsequently.

5 So, what I've proposed and what I've handed out
6 here basically says that -- gives that 40 number of
7 fixtures, illuminaires, or 10% applies to both tables, and
8 in each table it has the space definition because in
9 practical terms that's pretty much how it plays out for
10 retrofits.

11 I mean we typically, most of the time we'll be
12 doing number three, retrofitting the entire space in a
13 building or a single tenant, under a single lease. And
14 that's a good, common sense way of doing it.

15 In the previous version, in the last conference
16 call, you had a .7 LPD that would apply to basically that
17 kind of space definition.

18 And so I -- .7 watts per square foot. And now
19 you've changed it to a more granular approach, where
20 you've got to have a multiplicity of different LPDs based
21 on the area category method.

22 We can support that, but we think it makes
23 sense to have two tiers, an 85% and a 70%. So in other
24 words, if a retrofit comes in 30% below the allowable
25 LPD, then existing controls should be good. That's darn

1 good for a retrofit and we think it's going to leave out
2 comparatively few people that would then say no.

3 If it's -- excuse me, if it's under 40 they can
4 keep 100%. If it's 40 or more they can -- but they come
5 in at 70% of the LPD, then they can have existing
6 controls. If they come in at 85%, then it's exactly the
7 way you had it before, they have the additional switching
8 requirements and they have two-level lighting control.

9 We think that's a great, the two-level thing
10 has really helped get this traction in the market.

11 And then if it's more than 85% and I just
12 changed it from 100% to more than 85%, because that's
13 really where the cutoff is, then everything applies in
14 the Code, it's like new construction and we can support
15 that.

16 And we can support everything else that's in
17 there, but we feel pretty strong about the floor by -- or
18 the room-by-room being kind of a deal killer and we think
19 it makes some good sense to have one other tier that's
20 going to help encourage people, encourage that lease
21 holder in that space, yeah, I'll go ahead and have this
22 lower lighting level because then -- because those are
23 comparatively cost effective, those will pay for
24 themselves within an acceptable pay back for that
25 business owner.

1 When you layer on all of the other requirements
2 then it's a lot more costly, you're going to get more
3 no's, you're going to strand more savings.

4 And once again, this has the greatest impact on
5 the smaller, harder-to-reach customers that make up most
6 of the number of jobs, but you're still going to achieve
7 your desire savings with larger customers that are going
8 to have -- that are going to be more accepting of the
9 higher requirements as you get up to those higher LPD
10 levels.

11 MR. FLAMM: Okay, two things. I think it would
12 be useful to have a conference with you, and Jon McHugh,
13 and Owen, and Jim, and myself, and Mazi and to go over
14 these numbers. I think that would be the next logical
15 step to go through.

16 The second thing is I'm -- there's some logic
17 I'm not following. I'm wondering if you're thinking the
18 glass is half empty and I'm thinking it's half full.

19 The whole issue about rooms, if you have a
20 tenant lease space and let's say it's got six rooms, and
21 you only do three of those rooms, you don't touch the
22 other three, even though there's 40 you don't have to
23 touch those other three because you didn't get into them.

24 Or here's another example, you have a core
25 space with a bunch of perimeter offices and all you're

1 doing is the core space, even though you do 40, you
2 shouldn't have to do all of the little offices because
3 you didn't touch them.

4 So, the 10% per room brings that room into
5 play. By not having 10% in that room, that room is not
6 in play. So, I'm not following your logic because I
7 think the intent is to be exclusive, not inclusive.

8 MR. HITCHCOCK: Well, I hear what you're saying
9 and maybe it's a little counter intuitive. But we're
10 always trying to sell the whole job, so when we go into a
11 customer we're trying to sell their whole space.

12 And unless they push back that's what we're
13 going to present. If they come up front and say, hey,
14 this second floor here, that's going to have to be a
15 second phase because of cash flow issues, we only have
16 this much we can spend, you know, can we do one floor at
17 a time, we do run into that occasionally.

18 And that's more frequent with larger customers,
19 actually. But we typically go in and try to do
20 everything in the space that we can and that has to pay
21 back within an acceptable time frame.

22 We think that the room-by-room requirement is
23 actually going to encourage more cherry picking or more
24 excluding of rooms that are less cost effective because
25 many times a building owner will look at the present,

1 look at the proposal and they'll try to pick out what's
2 least cost effective and say don't do that.

3 We're usually really successful at getting them
4 to keep that in the mix, but we think this is actually
5 going to make it easier for them to say, well, here,
6 let's just do this and these other ones we can see it's
7 going to -- the costs on those is a lot higher, let's
8 just leave those here.

9 So we really, the situation you described where
10 you're only doing a core space and you're not doing the
11 offices, we don't encounter all that often. I'm not
12 saying it never comes up but it's -- you know, I mean
13 we're dealing with, primarily with under 200 kw customers
14 for the Right Lights Program, and bigger ones for Lodging
15 Savers and Casino Green. But it's still our mindset is
16 to try to get the whole space, if we can.

17 And we think this is going to have one of those
18 law of unintended consequence consequences.

19 MR. FLAMM: Thank you. And I would encourage
20 that we have further discussion and it looks like Jon
21 McHugh has something to say.

22 MR. MC HUGH: And I'm just trying to clarify
23 something for Gene, so I think it would be good if you
24 could just stay up here.

25 MR. THOMAS: Okay.

1 MR. MC HUGH: So, Gene and I just talked about
2 this over lunch. So, my understanding of what Gene's got
3 in mind is that where what you have in mind for the rooms
4 is an "and" statement, so it's something "and" you have
5 to have more than 10% in a room.

6 What Gene's talking about is you have a project
7 and if the project is either over 40 ballast or it's more
8 than 10% of the fixtures in this permitted space that
9 he's retrofitting, then that's what triggers the
10 requirement. So in some ways it's probably more
11 restrictive than what you've proposed.

12 And so I think what's going to have to happen
13 is we're probably going to need to do a bunch of what-
14 ifs, so what about this space. And, you know, it's kind
15 of like that spread sheet I sent you, Gary, which has all
16 the various --

17 MR. SHIRAKH: We didn't look at the detail.

18 MR. MC HUGH: -- you know, it's the logic
19 diagram and, you know, each of these things, what are the
20 outcomes from each of these various spaces. And so I
21 think Gene might actually be on to something.

22 MR. FLAMM: The concern I've had through this
23 whole discussion, we've never regulated ballast change-
24 out before, so this is a brand-new thing that we're
25 doing. And we really need to differentiate between

1 routine maintenance, which somebody may change 40
2 ballasts in a building, that may be their job. All they
3 do, all their life is run up and down 27 floors of a
4 building and change ballast. That should not be required
5 to have a building permit because it's repair.

6 And so this whole construct of, well, let's
7 have a 40 threshold per building space, and in addition
8 to the 10%, basically protects that from having to be
9 routine maintenance and then is not a permitted issue.

10 And so how do we define -- we were trying to
11 look at how to define routine maintenance from a --
12 what's called a lighting alteration, how do we
13 differentiate that? And so that's been the whole
14 struggle we've had.

15 And so what I'm concerned about is we're back
16 there again. I don't think we should go there. We still
17 need to differentiate that, okay, this guy, you know, he
18 changes a hundred ballasts a year, but it's in a high-
19 rise building, that's maintenance and you can't expect
20 him to pull a permit.

21 So, I think that this is going to require
22 additional discussion amongst the group that I identified
23 and anybody else that wants to participate.

24 MR. THOMAS: I would agree and it would also be
25 our goal that maintenance is not lumped in where they

1 would have to require permits.

2 But in all the discussions up to this point, as
3 well, it was one of the assumptions would be that this --
4 from this cutoff point, whether it was 30 in the
5 beginning, or 40 now, that those wouldn't be subject to
6 getting a permit. They're not now, none of these jobs,
7 none of the alterations in place, as you're calling it
8 now, are getting permits.

9 So, we would want to maintain that and we think
10 there are -- I can't give it to you off the top of my
11 head, but we think in a discussion like you're talking
12 about we can accomplish both, both goals. Thank you.

13 MR. SPLITT: Pat Splitt, from APTEC again. The
14 question of permits seems to be on my mind. It's not
15 clear to me how you decide when, for just changing
16 ballasts, that you have to get -- I mean can you do that,
17 can you require that they have to go and get a building
18 permit and are they going to. If they don't get a
19 permit --

20 MR. FLAMM: That was the proposal. The CASE
21 proposal was when you change 30 ballasts in a building,
22 you will now be required to get a permit. And from that
23 there were a lot of discussions of, okay, how do we
24 differentiate between a lighting retrofit or a complete
25 ballast lamp change out, and routine maintenance?

1 And so the requirement is, okay, at some
2 threshold -- the proposal is at some threshold a permit
3 is going to be required for replacing ballasts.

4 But it's not only replacing ballasts, you know,
5 you're changing a four-lamp illuminare to a two-lamp, or
6 you're changing a HID illuminare to an LED illuminare.
7 You're doing a number of things where you're actually
8 gutting illuminare and so we're calling it an illuminare
9 modification in place, where you're doing something
10 different than for which the illuminare was manufactured.

11 And we're saying, okay, where's the threshold
12 where we're going to require a permit to be pulled. And
13 to me, that's what this discussion is all about.

14 MR. SPLITT: So, is CALBO on board with
15 figuring out how to do this and charge a fee, and how
16 they're going to inspect and all this?

17 MR. FLAMM: Well, Tom hasn't said anything to
18 me, yet, so I'm assuming he's happy.

19 MR. SPLITT: Okay, just one final thing,
20 though, if there's some threshold where you don't need a
21 building permit and above it you do, it seems like you
22 may have to, for whatever that number is, put some time
23 limit on it. Say, 30 ballast within some period of time,
24 because there are buildings where they have maintenance
25 people and they can just schedule this to we'll only do

1 so many at a time. And eventually they'll do the whole
2 building, but they'll stay under your threshold and never
3 get a building permit.

4 MR. FLAMM: So that language has come and gone,
5 and I don't know if it's come or gone now. We've had six
6 months, we've had a year, and it looks like it got lost
7 again, but that's something we can do.

8 MR. SPLITT: It looks like a loophole.

9 MR. GABEL: Mike Gabel. I just want to thank
10 staff, applaud the effort you guys have made on the
11 alteration section. It's been many years of discussions
12 of trying to work it out to make it, I think, a more
13 sensible public policy.

14 And I took a glance at the residential and
15 we'll talk about that tomorrow. I think keeping the
16 nonresidential on the same conceptual track is a good
17 idea. I just want to make sure I get included in the
18 discussions about how do we deal with nonresidential
19 fenestration, you know, whether we're going to shoot for
20 the threshold of the prescriptive, or something slightly
21 less stringent in the prescriptive in that small band
22 between a mandatory requirement and a prescriptive
23 requirement.

24 But thank you for your efforts on that.

25 MR. DEVITO: Eric Devito, Cardinal Glass

1 Industries, again, really, just a point of clarification,
2 sort of on the lines about the fenestration provisions.

3 Just so I'm understanding it correctly, under
4 the performance approach under alternations there's a
5 fenestration section. The other sections dealing with
6 additions and alterations -- dealing with additions, and
7 the performance, and the prescriptive just blanket refer
8 to the fenestration Section 140.3.

9 But in particular, with regard to the
10 alternations and the performance approach it just calls
11 out U factor and SHGC requirements. I'm just curious if
12 that was an oversight, why it was specific to them. Are
13 you intending to leave VT out? Obviously, another hot
14 topic to today or whether -- whether you should just be
15 generally referring to all the fenestration sections?
16 Really, just a question more than anything else, we don't
17 have to resolve it now.

18 MR. SHIRAKH: Yeah, I don't know if Eric
19 remembers, we went back and forth whether we should
20 require this for alterations or not. I don't know where
21 we landed.

22 MR. SHADD: This is Eric Shadd. We didn't land
23 anywhere, yet. I would like to see a VT requirement in
24 the alterations section, but I think there's more
25 discussion that needs to be had with Mike Gable, and Eric

1 Devito, and such around that, so we'll talk more.

2 MR. SHIRAKH: Yeah, we should do so. Eric?

3 MR. DEVITO: Just to follow that on, then I
4 would also suggest that, you know, the type of glass that
5 you're spec'ing for the U factor and the SHGC, you know,
6 new or alterations it really can be met the same way, so
7 there's really no point not to include the VT for
8 alterations.

9 MR. SHIRAKH: Okay, thank you, Eric.

10 So any other comments on alterations?

11 MR. THOMAS: Gene Thomas, just a follow up
12 regarding the permitting issue. As I mentioned before,
13 all of these alterations, you know, typically have not
14 involved getting a permit. And so, really, regardless of
15 where the cutoff is there's going to be a huge increase
16 in the number of permits that are needed for these jobs
17 that haven't needed them heretofore. And it seems like
18 that would be very, very taxing, potentially, on building
19 officials, and cities, and so forth to deal with those.

20 So, I was just going to suggest to the
21 Commission that there might be some workshop or some
22 other venue organized to bring together some building
23 officials and people that are doing retrofits, and other
24 stakeholders to try to minimize the downside of what that
25 would be, because I think we'd all want to try to avoid,

1 you know, major additional expenses, major additional
2 delays that are imposed. Because if you, you know,
3 multiply the number of permits that are required by ten
4 times, there's probably not enough staff, you know, in
5 the building departments to handle it without some kind
6 of plan, and that probably won't involve hiring a whole
7 bunch of new building inspectors to take up the slack.
8 So, it seems like it might be good to discuss that in a
9 stakeholder workshop.

10 MR. SPLITT: Thank you, Gene. I'd like to
11 believe I did that. I invited, I've called Tom a number
12 of times. I did reach out to CALBO, I've reached out --
13 we've had several conference calls. Not -- there were
14 some changes since the last conference call, but I really
15 made diligent effort to reach out to all of the parties.

16 MR. THOMAS: I believe you. Did you get any
17 feedback on it or was it --

18 MR. SPLITT: There was feedback, yes, and this
19 is the product that evolved from that.

20 MR. BENYA: Hey Gary?

21 MR. FLAMM: Yes?

22 MR. BENYA: Jim Benya, Benya Lighting Design,
23 consultant to the Commission through ADEC.

24 I just wanted to say that, you know, I think
25 there is definitely an opportunity here to address this

1 and maybe we do this a little offline. But, you know,
2 inspecting authorities have different ways of accepting
3 permit applications, checking permit applications, and of
4 providing inspections and everything else.

5 My hunch is that this would lead to a pretty
6 rational discussion about inspecting authorities being
7 able to have a short form, expedited retrofit permitting
8 process that would not totally burden them and would not
9 call for significant inspections and everything else and
10 that would make a lot of sense.

11 But I think the notion of not having retrofit
12 fall within the standard always bothered me a little bit
13 and I think we've got an opportunity here for a pretty
14 good win-win scenario.

15 I like many of your suggestions, Gene. You and
16 I have talked privately and many of your comments have
17 been brought up in our internal discussions, and I want
18 to thank you again for all of your work. You've added a
19 lot of sensibility to the process and we'll continue to
20 take a look at these as Gary has suggested.

21 MR. FLAMM: Right. Thanks, Jim, those are some
22 good suggestions right off the bat there.

23 MR. GARCIA: This is Tom Garcia, representing
24 CALBO. I was a building official for the City of
25 Fairfield, actually building official for ten years and I

1 worked for the City of Fairfield in the Building
2 Department for 30 years.

3 So, in conversation with Gary on this, you
4 know, a lot of the things that I see it's like the train
5 coming down the track and you're not going to stand in
6 front of that train. We're going to do energy savings.

7 And I think I've been kind of just weighing all
8 of this, listening to this and watching what the industry
9 wants and what the professionals that have put this
10 paperwork together want.

11 And my feeling is that we, as CALBO, now have
12 to figure out how we're going to solve this and help be a
13 part of saving energy in California.

14 Part of that is as we start developing forms,
15 we are definitely going to need to have simplified forms
16 for this type of alteration so that we can have a fast
17 permit process.

18 I think the building departments, they're job
19 is to help build things and it's not to slow down. So,
20 that's kind of my input on this is that we will find ways
21 to do fast plan review, you know, have a simplified form
22 and a simplified process, but we're going to have to get
23 our hands around the sheer numbers, you know, how many
24 building permits will this affect?

25 And I think, and I'll be happy to say this in a

1 public form, there are going to be many cases where
2 people are just not going to get the permit and that's
3 what I don't like to see, because we want people to get
4 permits so that we make sure that things are done in a
5 safe and effective manner.

6 But the biggest thing we can do is educate,
7 simplify the forms, and try to work to save energy when
8 we have the chance.

9 MR. SHIRAKH: Thank you, Tom.

10 COMMISSIONER DOUGLAS: Yeah, thanks for your
11 comments, Tom, we'll definitely work with you on that.

12 MR. THOMPSON: Hi, my name's Mike Thompson, I'm
13 the Director of the CBPCA, California Building
14 Performance Contractors HERS Providership. And this
15 discussion has given me an opportunity to raise an issue
16 that I had hoped to be able to raise in these two days.

17 Sort of an elephant in the room here that puts
18 into question everything we're doing for these two days,
19 and that's simply that the majority of municipalities in
20 California today are not enforcing the Code.

21 We have 200 HERS providers plus. We just had a
22 meeting with the Energy Commission last week, where we
23 brought the HERS raters in and they produced a list of
24 over 50 municipalities in California where they didn't
25 collect any forms or didn't enforce -- or only collected

1 part of the forms.

2 And I've talked to building officials all the
3 time and my impression is that the reason this is
4 happening is that the building officials just can't
5 possibly keep up. And I'll bow to Tom, he's the expert
6 on this, but they can't keep up with the regulations we
7 have.

8 I just talked to a fellow today and he was
9 hopelessly over-burdened, he can't even try to keep up.

10 So, I do want to report that last week we had a
11 meeting with the Commission and we were very well
12 received, they said they were going to start a new
13 initiative to try to cooperate with the HERS providers
14 and try to solve this problem of enforcement at the
15 municipal level.

16 But unless that's solved, everything we're
17 going here today is relatively purposeless. So, I just
18 want to make that point and I want to encourage the
19 Commission to give whatever support they can to the
20 Commission staff to do better training and more
21 enforcement at the municipal level. Thank you.

22 MS. BROOK: Okay, if we don't have any other
23 comments, we'll move on to the last item on our agenda,
24 which is Title 24, Part 11 Nonresidential Voluntary
25 "Reach" standards.

1 So this is a new process for the Energy
2 Commission. We've been participating in the Green
3 Building Standards development since its inception within
4 the State of California and this time we're actually
5 developing the energy efficiency components of the Green
6 Building Standard within our Title 24, Part 6 stakeholder
7 process. We think it's a much more robust and rigorous
8 development process and it's also our authority to
9 develop energy regulations for the State, so it actually
10 belongs here at the Commission.

11 So what we'll be doing is adopting the Title
12 24, Part 11 energy efficiency components of the
13 recommended Building Code updates, along with Part 6, and
14 then submitting those adopted Code changes into the
15 Building Standard update that will happen all at the same
16 time in 2013, within a January 2014 implementation date.

17 So, for the nonresidential Part 11 "Reach" --
18 we call these "Reach" standards, they're voluntary,
19 they're more aggressive than our base standard in Part 6.
20 They go into the voluntary appendix of the Green Building
21 Standard.

22 We are trying to keep it lean and mean on the
23 green side by basically setting two performance tiers and
24 then a limited number of prerequisites.

25 So for Tier 1, the first voluntary level of

1 advanced energy efficiency we're saying that the energy
2 budget that's calculated in our compliance software must
3 be less than or equal to 90% of the Part 6 energy budget,
4 so that's a 10% better type of an energy efficiency
5 metric.

6 Tier 2 would be more advanced than that, it
7 would be that the proposed building energy budget is less
8 than or equal to 80% of the Part 6 energy budget
9 calculated in our compliance software.

10 So these are performance standards. We
11 don't -- we aren't developing a prescriptive alternative
12 to this performance standard.

13 We do, we are setting some prerequisites so
14 basically we're saying that we think that these measures
15 are so important that if you're serious about energy
16 efficiency and adopting voluntary measures of advanced
17 energy efficiency, you ought to be putting these measures
18 into every building.

19 The prerequisites for the nonresidential
20 voluntary standards are that the installed outdoor
21 lighting power is, again, less than or equal to 90% of
22 Part 6 allowance, so that's a 10% improvement.

23 The reason we have to call this out as a
24 prerequisite is because our compliance software doesn't
25 include outdoor lighting. So to be comprehensive in a

1 "Reach" standard, if you want to do 10% better, you also
2 have to address outdoor lighting power. And so we're
3 doing it this way as a prerequisite.

4 And then through our commercial refrigeration
5 stakeholder process, when we're developing the covered
6 processes mandatory requirements for commercial
7 refrigeration, we also identified one very important
8 "Reach" measure and this is -- is important for both
9 energy efficiency and for reducing greenhouse gas
10 emissions, so it's very appropriate for this to be
11 adopted in a green building standard. And that is that
12 we tell food stores greater than 8,000 square foot, and
13 that's the same limit we have in the base standard as far
14 as the size of grocery stores that need to comply with
15 our commercial refrigeration standards.

16 Use CO2 indirect or cascade cooling for
17 refrigerated display cases and walk-ins. And the
18 exception being that if you -- if a store really wants to
19 use indirect glycol, which is -- which it has to make up
20 the difference with additional efficiency measures
21 because it is less efficient than the CO2 secondary
22 system.

23 And we think most stores, as far as our market
24 intelligence goes, would be doing CO2-based refrigerant
25 systems. There still are some stores interested in

1 having an option for indirect glycol, so we think that's
2 fine as long as they make up the difference in efficiency
3 that makes it comparable to the CO2 indirect system.

4 Another prerequisite that's still partially
5 under development, so we're not quite done with this, is
6 that for very large independent restaurants, the water
7 heating for those large restaurants needs to have a
8 portion of its water heating provided by solar thermal.

9 So, a minimum of 25% of their annual water
10 heating energy would need to be met by a solar water
11 heating system. But because this is a prerequisite,
12 basically, we don't want to eliminate other options that
13 for a particular restaurant might be better, so we are
14 thinking of other -- sort of like the indirect glycol
15 thing, if there's other things that are comparable, that
16 people would want to do instead of solar water heating to
17 basically have the same energy saving impact, then -- and
18 they're clearly applicable to this large restaurant
19 building sector, then we will include them here.

20 And I think that's all we have.

21 Does anybody want to make comments on our
22 voluntary energy efficiency recommendations?

23 MR. GABEL: Mike Gabel. Martha, can you go
24 back to the first slide in this section?

25 MS. BROOK: Uh-hum.

1 MR. GABEL: So, the revised Cal Green standards
2 is going to include language that I proposed to specify
3 that the reduction in energy used below the Title 24
4 standard, in the calculation to achieve this 90% that we
5 exclude unregulated energy-use --

6 MS. BROOK: That's right.

7 MR. GABEL: -- components, like process
8 receptacle.

9 MS. BROOK: And that's right, and the reason
10 that "Energy Budget" is capitalized there is because it's
11 defined in our Part 6, 140.1 as just regulated loads.

12 So, we can definitely make a note of that --

13 MR. GABEL: Okay. Yeah, we just want to make
14 sure that this time around we capture that definition.

15 MS. BROOK: Yeah. Okay, good.

16 MR. SPLITT: Pat Splitt from APTEC.

17 MS. BROOK: Uh-hum.

18 MR. SPLITT: Just a couple things. One, just
19 to comment on the last item you spoke of, the restaurant
20 solar DHW --

21 MS. BROOK: Uh-hum.

22 MR. SPLITT: -- you have to figure out the
23 configuration of the building. If a restaurant's on the
24 first floor of a high rise, it might be very difficult
25 for them to put solar panels anywhere.

1 MS. BROOK: Right. But I think that the
2 intention of this is that's a huge restaurant and I think
3 we actually -- didn't we agree that it would be
4 independent, it wouldn't be part of another building? I
5 thought that might have been part of what we were
6 proposing. But, anyway, your point's well taken.

7 MR. SPLITT: And if these are going to be
8 incorporated into the Green "Reach" levels, would that
9 mean then if some municipality approved -- say, went to a
10 Tier 1 Green Code, would they still have to go to the CEC
11 to get their energy code certified?

12 MS. BROOK: They still have to go through that
13 process, yes. And the other thing is they don't -- they
14 can change, they can adopt anything they want. So, if
15 they don't want to have a solar water heating requirement
16 for restaurants, but want to adopt the rest of the
17 recommendations, they're free to do that.

18 MR. SPLITT: But what happens a lot of times
19 is, even though we're calling these voluntary, is that
20 once a municipality adopts it --

21 MS. BROOK: It's mandatory.

22 MR. SPLITT: -- it becomes mandatory.

23 MS. BROOK: That's right.

24 MR. SPLITT: Yeah.

25 MS. BROOK: Voluntary to us, but it won't be if

1 it's adopted by a local jurisdiction, that's right.

2 MR. GABEL: I could speak to that briefly, just
3 a minute, Mike Gabel. I work with several dozen local
4 governments on their "Reach" Codes in the last few years
5 and in a very few instances they adopted a Tier 1
6 standard without looking under the hood to see what was
7 there. It happened in a few cases.

8 But given the new economic and political
9 climate, and given the stringency of the new Code, I
10 think Martha's right, it's going to be a buffet, they're
11 going to look at the Tier 1 as a buffet and they'll pick
12 out things that they want. And if they don't feel
13 they're appropriate for the local government jurisdiction
14 they won't include them. So, I don't think there's a
15 fear that they're just going to swallow the whole thing
16 whole.

17 MS. BROOK: Okay.

18 MR. SPLITT: Yeah, it seems like a waste of
19 time to me if we've gone through all this process, and
20 incorporated -- the Energy Commission's incorporated it
21 with the Green Code, and everybody's all -- it's already
22 all been vetted, why would the city have to come back and
23 go through this whole process of applying to the Energy
24 Commission? What are you going to find? I mean they
25 just adopted what you approved, it doesn't make any sense

1 to have to do it.

2 MS. BROOK: Well, I think part of the
3 requirement is that they vet the proposal at their city
4 council and that they have some due diligence to say that
5 it's cost effective.

6 And we didn't go through a rigorous cost
7 effectiveness evaluation for these voluntary standards,
8 though we did quite a bit on the residential side. It's
9 not the -- we think there are definitely ways to meet
10 this in a cost effective manner, but we didn't go -- we
11 didn't develop that whole -- you know, we didn't use the
12 lifecycle cost analysis approach, we didn't document it
13 in the CASE reports. So, that's the due diligence that
14 still needs to be required for the Commission's process
15 to approve local code.

16 MR. SPLITT: But it --

17 MS. BROOK: We're still, hopefully, trying to
18 make it easier. I mean but they still -- don't you think
19 they still need to vet that with their public?

20 MR. SPLITT: Well, I know some municipalities
21 that, say, have Green Code ordinances in my area and
22 they've done this, and the building department adopts the
23 Energy Code complete, res/nonres, they've adopted it,
24 they've adopted your Code.

25 Then they go beyond that, the planning

1 department maybe adopts this Green Code and has some
2 other -- gets credit for other energy things.

3 MS. BROOK: Yeah, uh-huh.

4 MR. SPLITT: Well, why should they have to come
5 back to you to justify doing more, if they've already
6 approved and said we're going to follow your regulations?
7 What else do you want?

8 MS. BROOK: Okay.

9 MR. SPLITT: It just seems like you're adding a
10 lot of bureaucracy, you know.

11 MS. BROOK: All right. Well, appreciate your
12 comment and I don't have all the answers to that one.

13 MR. SPLITT: Well, anyway.

14 MS. BROOK: Yeah, Jon.

15 MR. MC HUGH: Hi, this is -- sorry, this is Jon
16 McHugh. Just a short clarification, I believe that all
17 the measures that you're showing here are measures that
18 we did have case study -- the California State IOU, Codes
19 and Standards Program, had case studies that indicated --

20 MS. BROOK: The prerequisites.

21 MR. MC HUGH: -- cost effective -- even for the
22 prerequisites.

23 MS. BROOK: No, no. I think it's true of the
24 prerequisites. I don't know that anybody did an analysis
25 to say that 10 or 20 percent is cost effective, that we

1 all believe it will be.

2 MR. MC HUGH: Okay.

3 MS. BROOK: I don't think we did that analysis.

4 MR. MC HUGH: Okay, I thought -- I just want to
5 make sure that the prerequisites have all worked out to
6 be cost effective.

7 MS. BROOK: The prerequisites are.

8 MR. MC HUGH: Okay.

9 MS. BROOK: And that was actually how we drew
10 the line, as you know.

11 MR. MC HUGH: Okay, I just wanted to have that
12 for the record. Thanks.

13 MS. BROOK: Uh-hum.

14 MR. JOHNSON: Hi, this is Karl Johnson again.
15 First of all, I'd like to compliment you on a great job,
16 this is really making a big progress, some big
17 improvements.

18 And, secondly, an observation and a question
19 which is these are making such fundamental changes, like
20 shifting to 10% for the threshold, and matching these
21 stretch goals. How do those sync with the other
22 programs, particularly the incentive programs on the CPUC
23 incentives, because they're always based upon Title 24.

24 MS. BROOK: Right, right.

25 MR. JOHNSON: And I think it's kind of clear

1 that we have to think through that really carefully. So,
2 I think it addresses the gentleman's question on adding
3 the controls, is that's where they need to shift their
4 rebates. It's not a percentage against the Title 24 and
5 the illuminaires for light, only, it really starts
6 shifting.

7 MS. BROOK: Uh-huh.

8 MR. JOHNSON: Because if they don't, it will
9 make the rebates almost disappear.

10 MS. BROOK: Right. Now, that's a very good
11 point and one of the reasons that -- you know, typically,
12 we've always set our voluntary tiers to 15% and 30% and
13 one of the reasons we backed it down for nonresidential
14 to 10% and 20%, or 90% and 80% is that we think that
15 we're making significant advancements in the
16 nonresidential code this update, and our stakeholders are
17 telling us that they weren't sure that they could easily
18 meet a 15% next step.

19 MR. JOHNSON: Uh-huh.

20 MS. BROOK: And in fact, the information coming
21 back from Savings By Design was that they typically are
22 at the 10% level for entry into that program --

23 MR. JOHNSON: Yes.

24 MS. BROOK: -- and that's where they do a lot
25 of the work, so we wanted to make that consistent.

1 And we are working with the PUC, hopefully more
2 now than we have in the past, but even in the past we've
3 tried to align our tiers with their incentive programs.

4 MR. JOHNSON: Oh, I know, but I'm saying this
5 could reach new challenges with the changes.

6 MS. BROOK: Yeah.

7 MR. JOHNSON: So, yeah, thank you.

8 MS. BROOK: Thanks.

9 MR. THOMAS: This is Gene. I just wanted to
10 make a follow-up comment on that. As part of the -- one
11 of the proceedings at the PUC, the decision that just
12 came down on ex ante values, they address a lot of what
13 you're talking about in terms of the approach of the
14 program.

15 So, if like the programs that we are typically
16 geared into are retrofit, early replacement, and those
17 are treated where it's existing equipment to new
18 equipment, existing equipment being the baseline and you
19 capture those first-year savings.

20 If it's replace on burnout or new, then it's
21 code minimum to what you're putting in. And so even with
22 these changes in the Code, those two approaches still,
23 you know, rule basically, is what the decision says. And
24 you may have to show evidence as to which, you know,
25 justifying, yes, this is an early replacement retrofit

1 strategy here and not it broke and we were going to have
2 to replace it anyway type of thing. But that's part of
3 where that's coming, that's all.

4 MR. YASNY: There are a couple of comments
5 online.

6 MS. BROOK: Okay.

7 MR. YASNY: KC, let me unmute him.

8 MR. KOLSTAD: Yes, can you hear me?

9 MR. YASNY: Yes.

10 MR. KOLSTAD: Great. Yeah, we have some
11 concerns regarding the commercial refrigeration
12 requirements.

13 MS. BROOK: Uh-hum.

14 MR. KOLSTAD: So, we've test a liquid CO2
15 refrigeration system for --

16 MS. BROOK: Hold on just a second to clarify,
17 this is KC with Target?

18 MR. KOLSTAD: Hi, KC Kolstad, Target
19 Corporation, yes.

20 MS. BROOK: Okay, thank you.

21 MR. KOLSTAD: And we've tested a liquid CO2
22 refrigeration system for over a year in a small format
23 grocery market, with approximately 9,000 square feet of
24 grocery area. Our results indicate that this system
25 requires 70,000 to 100,000 kilowatt hours per year in

1 increased electrical demand when compared to a
2 traditional direct expansion type refrigeration system.

3 This is approximately a 30% increase in
4 electrical demand.

5 We believe that this increased electrical
6 demand is counterproductive to the goals of Title 24.

7 Furthermore, our testing has also shown that
8 the electrical demand from these CO2 systems increases
9 faster than a traditional direct expansion system as the
10 outside air temperature increases.

11 We expect that these systems will place a
12 disproportionately larger load on the grid when electric
13 demand is highest.

14 Even though the supermarket refrigeration
15 efficiency report made an effort to model the energy
16 consumption of these types of systems, we believe that
17 their theoretical models did not capture the multitude of
18 variables associated with such a highly complex system.

19 We request that their models be validated in
20 empirical data, such as the information that we've gotten
21 through extensive third-party electrical sub-metering of
22 actual stores.

23 Also, since we believe that the technologies
24 utilized for those type of systems are not scalable to
25 small market sizes due to the component availability, we

1 ask that the Committee redefine the requirements for CO2
2 based on the connected refrigeration load or required
3 refrigeration horsepower.

4 Also, through extensive testing empirical data
5 show that using commercially available refrigerants with
6 TWP values of 1,500 or less can drastically reduce the
7 overall system carbon footprint without impacting energy
8 consumption, such as with these CO2 systems.

9 Therefore, we also ask the Committee to change
10 the definition of a load GWP refrigerant in Appendix
11 J(a)(1) to any component or blend of components with a
12 GWP value of less than 1,500.

13 MS. BROOK: Okay, thank you for those comments
14 and we will definitely work with you and our consultant,
15 Doug Scott, to work through your issues.

16 MR. KOLSTAD: Great, thank you.

17 MS. BROOK: Thank you. Any other comments on
18 our "Reach" standards.

19 MR. YASNY: George Nesbitt.

20 MS. BROOK: George.

21 MR. NESBITT: Yes, can you hear me?

22 MS. BROOK: Yeah.

23 MR. NESBITT: Yes, George Nesbitt. First, I
24 wanted to touch on alterations and additions. It's a
25 little hard to get it -- get our attention on the phones

1 sometimes. So it appears that all mandatory measures,
2 all nonresidential mandatory measures and all
3 prescriptive measures are required for not only
4 additions, but alterations, almost without exception.

5 What I did not see is the prescriptive process
6 requirements applying in any of those conditions.

7 MR. SHIRAKH: Not sure what you mean by
8 prescriptive --

9 MR. NESBITT: So, basically you only -- you
10 referenced basically Sections 110.0 all the way through
11 140.8, and 140-9 is the process requirements. So,
12 basically what you're saying is if you're doing an
13 addition and you put process equipment in it, that
14 doesn't have to -- you know, if you're altering process
15 or putting in a new process, it does not appear to apply.

16 MS. BROOK: So we're going to clarify that. I
17 don't know if you were on the phone when Mark Heydeman
18 called in, but he also requested us to work with them on
19 clarifying where covered processes are also --

20 MR. NESBITT: Right.

21 MS. BROOK: -- also need to meet the mandatory
22 and prescriptive requirements that are elsewhere in the
23 Code and we definitely will clarify that, and potentially
24 the --

25 MR. NESBITT: Yeah, I may have missed that, I

1 had stepped out to --

2 MS. BROOK: No, that's okay. That's a good
3 point and we will definitely reorder the items in the
4 proposed language to make that crystal clear.

5 MR. NESBITT: Yeah. And then on the above code
6 I ran a recent low-rise residential project, zone 4, to
7 about 38 percent above Code. Now, if I tell the software
8 it's a high-rise residential, it drops to 18. And this
9 is taking no HERS credits, nothing on the low-rise side
10 or on the high-rise.

11 So 20%, and this is 2008 Code, so 20% is not
12 exactly easy. I mean this is a building with condensing
13 furnaces, water heaters, you know, good insulation, .23
14 solar heat gain windows, very little windows on east and
15 west, and we're talking about Zone 4 which is
16 quote/unquote, not an air conditioning climate. The TDD
17 energy use increases by about 40% and the only -- the
18 only HERS credit you can get is duct testing.

19 And, you know, so in high-rise residential and
20 nonres basically you can't get anything from quality
21 insulation or, you know, most of the EERs, or air flow,
22 refrigerant charge, none of that -- none of that gives
23 you anything. So, other than duct testing, you know, you
24 have purely insulation values, window values, orientation
25 and equipment efficiencies, so there's no --

1 MS. BROOK: So are we recommending that we
2 have -- we extend our acceptance tests and credits for
3 those HERS verifications to more of the high-rise
4 residential measures, is that what you're recommending?

5 MR. NESBITT: Absolutely. I've been on lots of
6 especially high-rise and low-rise residential and I can
7 tell you insulation is not installed well as the default.

8 MS. BROOK: Uh-hum.

9 MR. NESBITT: You know, definitely get to all
10 of it. It's just not -- you know, I've done enough
11 nonres, as well as res testing, small commercial to tell
12 you that if it's not being tested, it's not likely being
13 done to a higher standard.

14 MS. BROOK: Uh-hum.

15 MR. NESBITT: And so, I mean I've been harping
16 on this for some time, I definitely believe that those
17 credits should be available and especially if we're going
18 to maintain some ability to go above Code.

19 MS. BROOK: Uh-hum.

20 MR. NESBITT: Because like with high-rise
21 residential you're talking about making the water heating
22 system a high efficiency with solar hot water, with the
23 best distribution system as the standard budget and that,
24 you know, takes away a significant ability to gain any
25 margin.

1 MS. BROOK: Okay, that's -- thank you for your
2 comment and we will discuss that and work with you on
3 that. Thanks.

4 Any other comments? Our next section is just
5 general comments so if -- and you all get to look at the
6 cute pictures of the ducts stuck with duct tape. That's
7 why we're here today, for this final slide, I know you've
8 been waiting.

9 So if you -- if you have any comments, now's
10 the time, and we'll be back here tomorrow to talk about
11 residential and administrative Code recommendations.

12 MR. HOROWITZ: Hi. Hello?

13 MS. BROOK: Hi.

14 MR. HOROWITZ: Hi, this is Mike Horowitz, I'm
15 speaking on behalf of Cal-OSHA. Two things, one is we
16 did write a letter in July which, looking online today,
17 we can't find it in the public record, so we'd like that
18 to be in the public record.

19 MS. BROOK: Okay.

20 MR. HOROWITZ: And in that letter we expressed
21 our continuing concern, which has been consistent through
22 a number of iterations of changes to the Title 24 here
23 about the adequacy of some of the like demand control
24 technology to adequately ensure that sufficient makeup
25 air is always supplied for these processes, like

1 laboratory hoods. And so, specifically, we were
2 concerned in this iteration with the laboratory hoods in
3 the kitchens.

4 I think you've worked with us on the garages
5 pretty well. So that, you know, people's health and
6 safety is not contradicted by the energy requirements.
7 And we just remain, I guess, unconvinced.

8 MS. BROOK: Okay. We have been working with
9 you and we appreciate your participation in our process
10 and we will respond to your letter, and keep working with
11 you on this.

12 MR. HOROWITZ: Okay. You'll make sure that the
13 letter is put in the public record?

14 MR. SHIRAKH: I remember you gave us that, it
15 was a -- not an electronic communication, it was on
16 paper.

17 MR. HOROWITZ: No, it was mailed, it was dated
18 July 28th.

19 MR. SHIRAKH: Yeah, and we've scanned it, I
20 have it on my computer. We'll put it in the public
21 record, that's not a problem.

22 MR. HOROWITZ: Okay.

23 MR. SHIRAKH: And, you know, we'll be working
24 with your staff on various proposals for the garages,
25 kitchens and the labs, and I think we've addressed many

1 of them, but there may be still some remaining issues.

2 You know, we'll work with you to finalize.

3 MR. HOROWITZ: Thank you.

4 MS. BROOK: Any other comments? Pat?

5 MR. SPLITT: First off, I'll let you know I'm
6 not going to be here tomorrow, so that may mean it will
7 be lots quicker.

8 MS. BROOK: Oh, okay.

9 MR. SPLITT: Just a few comments, one that was
10 mentioned earlier about the enforcement not being very
11 well implemented in some areas and in my area, too, and
12 actually around the State we see something similar, that
13 it's spotty. And I try to come up with some way of not
14 waiting for 2014 to do something about this and the most
15 efficient way I can think of the Commission handling this
16 is to try and to concentrate on the third-party plan-
17 checking companies. Because with a lot of the cities
18 being under-staffed, a lot of them in my area at least
19 are going out to third-party checkers, and they don't
20 seem to be doing a very good job.

21 And I think if you -- I don't know how many
22 there are, half a dozen, a dozen in the State, there
23 aren't that many and they handle a lot of different
24 building departments.

25 And I think it would be most cost effective for

1 you to try to just really train them and make sure they
2 really toe the line, and that will get you a lot of
3 effect around the State for more bang for your buck.

4 With the requirements for VLT today, and I
5 think it's similar tomorrow, I just want to be sure that
6 there's still going to be some way, if somebody actually
7 wants to do a passive solar building, that they can do
8 it, that they can put in, you know, high solar gain glass
9 and trade it off somehow.

10 And I was thinking about this similar concept
11 with having a cool roof on a ski resort. If it's a
12 building that's just used in the winter, it's
13 counterproductive to put a cool roof on there, so maybe
14 you need some sort of exception for something like that.

15 MR. SHIRAKH: Yeah, I think we talked about
16 that. What's the impact on passive solar? Of course,
17 res doesn't have a VT requirement, this is for nonres
18 but, still.

19 MR. SHADD: Eric Shadd from AEC. Yeah, we
20 looked at passive solar gains on a cost effectiveness
21 basis and it didn't turn out to pay off in general for
22 most buildings. But there still is the flexibility
23 within the Code to construct a passive solar sort of
24 building. You would use the performance approach or you
25 would use the -- it's no longer called the overall

1 envelope approach but, yeah.

2 MR. SPLITT: Yeah, just so we can get credit
3 for things like thermal mass and that sort of stuff.

4 MR. SHADD: Oh, yeah, yeah, that --

5 MR. SPLITT: Because if you can't do that, then
6 you can't do it.

7 MR. SHADD: Right, yeah, you would use one of
8 those other two approaches. But, you know, building a
9 passive solar building has so much to do with, you know,
10 your exposed square footage, and how much windows you
11 have in there, and the ratio to your density of
12 occupancy, and things like that, so it's best addressed
13 in the performance approach and things like that.

14 MR. SPLITT: Something like daylighting.

15 MR. SHIRAKH: Well, my understanding is passive
16 solar has a more function of SHGC than VT, isn't that
17 true?

18 MR. SPLITT: Well, they're very similar,
19 usually they track. But yeah, SHGC would be the --

20 MR. SHADD: Right, yeah, so you would encourage
21 a higher SHGC so you can help to heat the building. And
22 also with the -- you know, he's talking about strategies
23 such as solar mass -- or not solar mass, but mass walls
24 where you can use the time constant or the -- you can
25 delay the heat gains to occur at night and have the

1 cooling gains from the nighttime, you know, sort of eek
2 through the wall to come out during the day.

3 MR. SHIRAKH: So what I'm hearing is, you know,
4 even given the current prescriptive requirement you can
5 still do passive solar, just do tradeoffs against the
6 mass, against the higher SHGC and VT, is that what
7 you're --

8 MR. SPLITT: As long as the new software is
9 going to still model thermal mass and light and take
10 those credits.

11 MR. SHIRAKH: Yeah, which I expect. I don't --
12 there's been no --

13 MR. SPLITT: Well, expectation, I expect it,
14 too, but I expect a lot that never seems to happen.

15 MR. SHADD: Well, let me say this, it would be
16 pretty hard to get a software that does energy modeling
17 for buildings to not take thermal mass or solar heat gain
18 into account, you would have to cripple it on purpose.

19 MR. SPLITT: Okay. I just want to be sure if
20 somebody actually, really does want to design a building,
21 that they can still do it.

22 Let's see what else I have? Oh, one other
23 thing, I think I mentioned this at some other meetings,
24 but I'd also like to see, especially if we're shooting
25 for zero net energy buildings, that even if it's just an

1 additional couple of lines of report in the performance
2 method that along with the TDB energy that nobody can
3 understand, that we also report either site or source
4 annual energy, and maybe break it down into different
5 categories, so it means more to somebody when they're
6 making changes, you know, it's more intuitive.

7 MS. BROOK: Yeah. No, you did -- you actually
8 came with a group and talked with me and Mazi about that,
9 and we support that concept.

10 MR. SHIRAKH: Are you sure you don't want to be
11 here tomorrow? We'll miss you.

12 MS. BROOK: Any other comments? Does our
13 Commissioner want to make some final comments?

14 MR. EMBLEM: Martha, this is Erik Emblem, can
15 you hear me?

16 MS. BROOK: Yeah, we can, Erik. What happened
17 to you?

18 MR. SHIRAKH: He's just here.

19 MR. EMBLEM: Well, I came back to the office
20 and I've been multi-tasking.

21 MS. BROOK: Okay, good for you. You're the
22 only one that can do that.

23 MR. EMBLEM: But I've been with you in thought
24 and mind. But just I want to kind of tag team with what
25 Cal-OSHA said there about keeping our focus on IAQ and

1 ventilation, what's going on in these buildings and being
2 careful that we don't tradeoff health and safety for
3 energy.

4 That's something that's near and dear to us and
5 it gets back to these -- these acceptance forms, and
6 who's filling out the data, and who's checking these
7 systems.

8 And, particularly, when you're talking about
9 fume hoods in laboratories, but not only there, when
10 you're talking demand control in school rooms and school
11 buildings, and where school districts are broke and they
12 don't have maintenance staff. And if these systems
13 aren't working when they first start, we're putting a lot
14 of other people at risk.

15 And I just want to emphasize that the data that
16 is collected on the acceptance forms is crucial, not only
17 for you for collecting energy efficiency and determining
18 whether the Codes are effective in accomplishing their
19 goals, but they're also necessary for things like indoor
20 air quality and verifying ventilation.

21 MR. SHIRAKH: So these TAB contractors that you
22 mentioned earlier, are they trying to do acceptance
23 requirements for -- for these type of systems?

24 MR. EMBLEM: Yes. Yes, they are.

25 MS. BROOK: Okay, thank you, Erik.

1 MR. EMBLEM: In fact we have a whole new
2 certification program going right now just on fume hoods,
3 and it's an NSF certification program.

4 MR. SHIRAKH: Thank you, Erik.

5 MR. EMBLEM: Thank you. See you tomorrow.

6 MR. NESBITT: This is George Nesbitt.

7 MS. BROOK: Hi George.

8 MR. NESBITT: Hi. I will be coming tomorrow,
9 to Pat doesn't have to worry, we'll make sure we don't
10 get out too early.

11 I wanted to sort of follow up on something Pat
12 said earlier about the solar fraction for space heating.

13 MR. SHIRAKH: Yeah, we're waiting.

14 MS. BROOK: Are you going to do that tomorrow
15 or today?

16 MR. SHIRAKH: Okay, thank you George.

17 COMMISSIONER DOUGLAS: All right. Well, he'll
18 be here tomorrow to repeat that comment.

19 MS. BROOK: Yes.

20 COMMISSIONER DOUGLAS: So we'll move on. If
21 Mr. Nesbitt does call back, let him know that we'll give
22 him time tomorrow and plenty of it, no doubt.

23 So I wanted to thank everybody for your
24 participation in this workshop. It's been a long day and
25 we've got another long day planned for tomorrow.

