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CALIFORNIA ENERGY COMMISSION

In the Matter of:	)	Docket No. 17-BSTD-01
	)	
2019 Building Energy Efficiency Standards	)	STAFF WORKSHOP RE: Draft 2019 Building Energy Efficiency Standards
	)	
	)	
	)	

CALIFORNIA ENERGY COMMISSION

ROSENFELD HEARING ROOM – FIRST FLOOR

1516 NINTH STREET

SACRAMENTO, CALIFORNIA

WEDNESDAY, OCTOBER 4, 2017

9:00 A.M.

Reported by:
Peter Petty

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AGENDA

AGENDA (Cont.)

P R O C E E D I N G S

9:02 A.M.

SACRAMENTO, CALIFORNIA

WEDNESDAY, OCTOBER 4, 2017

MR. BOZORGCHAMI: Good morning, everyone. We're going to start the pre-rulemaking workshop on the express terms. Right now, we've got a lot to cover, so let's get going. My name is Payam, forget my last name, the Project Manager for the 2019 Building Energy Standards.

So quick housekeeping rules, as everybody has been here multiple times and heard some of these presentations already. Restrooms are out the door to your left. Upstairs on the second floor is the snack bar. And in case of an emergency for evacuation we'll just go across to the Roosevelt Park and we'll reconvene over there.

The topics today there's quite a few of them. It's going to be a long day. Hopefully, we can through them all as there will be multiple people presenting. For the case of moving the project along there's a lot of substantive changes done to the Standards whereas un-substantive is just more for clarification and

grammatical issues. So those, some will, some will not be presented today.

The draft language has been posted on our website for the past few weeks and if you haven't they're there for you to review. We're not going to go through every little detail of numbers and values.

A quick history of the Standards, the Energy Commission was proposed in 1974. It was funded in Jerry Brown in 1975 when he came into office.

The Energy Commission, through Executive Orders has to look at multiple things. One is to hit this so-called ZNE goal by 2020 for residential buildings and the nonresidential by 2030.

There's also a lot on the carbon reduction programs through ARB that we have to also take into consideration.

The Energy Commission develops the Standards triennially with the help of its utility partners. I would like to give a quick thanks to Pacific Gas & Electric, Southern California Edison, Southern Cal Gas, San Diego Gas & Electric, Sacramento Municipal Utility

District, Los Angeles Department of Water and Power, Southern California Public Authorities, who with the help of the CASE Team helped us develop the 2019 Standards that you're going to be seeing today.

Also I'd like to thank Kelly Cunningham and Heidi Hauenstein who's helped the communication between the staff here at the Energy Commission and the CASE Team.

Also, one thank you to Marshall Hunt, with PG&E who's helped us -- pretty much he's never said no when we asked for a study to be done. He's always been there for us.

For California, being a little bit different than the rest of the country, 16 climatic zones, we have to evaluate all 16 climate zones for all of our energy measures. We've gone through a full life cycle cost analysis in all measures and based on a TDV.

Today's workshop is one of ten pre-rulemaking workshops that we've had, starting in April. We're hoping from today's discussion, that we'll get all your comments before October 20th. The sooner we get those the better it is. One of the reasons I say that is we're going into

the 45-day language on January of 2018, mid maybe the second week of January.

UNIDENTIFIED SPEAKER: What was that again? The 45-day language (indiscernible)

MR. BOZORGCHAMI: We're probably going to present at a workshop here at the Energy Commission on January of 2018 on the 45-day language, okay? So with that, we have to have the draft language for the 45-day posted in mid-November. So the sooner we get your comments, the better it is for us.

The utility sponsored stakeholders' website has all the final draft CASE reports presented and posted for your review. The Energy Commission will have those final reports with staff supplemental reports here shortly, after we have a lot of these discussions back and forth on the pre-rulemaking. Those will be on our Building and Efficiency Program website. And please submit your comments to that last link there below.

What I did, also I've added all the standard -- the staff that worked on the Building Standards language here on our website. Depending who has the subject matter you'll see

that there's the contact information for them.

The presentations from today will be posted on our website on Monday. What I need do is I want to add contact information for all the presenters to all the presentations.

Any questions? Yes. Please come up to the mic and state your name and the affiliation you're with. This is being recorded.

MS. MAXWELL: Yes, Chase Maxwell; Ellison, Schneider, Harris & Dolan. And on the CASE reports I was specifically looking for one CASE report, the Joint Utilities CASE Report, for their suggestions to the modifications to the Standards. And I didn't see it under the docket. I mean I was doing text searching. I didn't see it under the docket. Are these CASE reports being posted?

MR. BOZORGCHAMI: The CASE reports will be posted on the --

MS. MAXWELL: Yeah, the utility-sponsored stakeholder group I believe.

MR. BOZORGCHAMI: Yeah. They'll be all there for now.

MS. MAXWELL: They're all on that website, so they're outside the docket?

MR. BOZORGCHAMI: They're outside the docket.

MS. MAXWELL: Okay. But they are being considered by staff? Because I didn't necessarily -- I couldn't draw lines between, for example, what's being the CASE reports for the utility sponsored stakeholder and changes made, in the current draft Standards?

MR. BOZORGCHAMI: Yeah. We didn't want to put those on our website as of now, because there's going to be changes being done from these discussions that we have then what's being proposed by the CASE Team. So when that final decision is made or the final proposal, we have those posted prior to the 45-day language.

MS. MAXWELL: Okay. So this outside group, that is -- I'm sorry. I'm not being accusatory. I'm just intend to understand how it's working.

MR. BOZORGCHAMI: Yeah.

MS. MAXWELL: So this outside stakeholder group is doing a bulk collaborative effort that is not being moderated or directed by the Energy Commission staff; is that correct, or?

MR. BOZORGCHAMI: It has been.

MS. MAXWELL: It has been.

MR. BOZORGCHAMI: And that's why we've had the nine pre-rulemaking workshops here at - the Energy Commission. And we've had quite a few at the utility level within their jurisdictions also.

MS. MAXWELL: Okay. And then do you expect, or are you recommending that the language being proposed in these CASE reports be entered into the docket by this set of comments that are being solicited, what is it, by October 20th?

MR. BOZORGCHAMI: No. The October 20th is your comments from today's presentations. If there's any comments or you have any comments that you would like to make on what you hear today, you're more than welcome to, by October 20th, to our docket right there.

MS. MAXWELL: Okay. So I guess my ultimate question I'm trying to get at is the pre-rulemaking from what I understand, is an effort to get the substantive changes from the Standards in before the formal rulemaking takes place, so that everybody can kind of work out these details on the substantive?

MR. BOZORGCHAMI: Right.

MS. MAXWELL: But in this pre-rulemaking, we're not going to see an integration on substantive changes from the stakeholder effort, necessarily, in the language. We may not see that until the formal set.

MR. STRAIT: Actually, if I could jump in?

MS. MAXWELL: Yeah.

MR. STRAIT: The way that this structure works is any stakeholder can submit a code change proposal. We actually offer a template for that in our website. When we enter the formal rulemaking process, that's when some of those will become documents relied upon, and that's when they'll get docketed.

For now, because based on public commentary we may or may not chose to do what's in a given CASE report. We are not docketing those, because that would represent a final decision we have not made.

Right now, as we get this public commentary and we figure out what, out of those CASE reports, to include and how to embody them in the Code, that's part of what we're trying to solicit by having this pre-rulemaking draft

express terms. The draft express terms will show here's what we're considering. Here's what we're proposing. Some of that is based on CASE reports. Some of that is based on just need to improve the Code or research done by staff. For example, all the efforts for ZNE buildings have been done internally by staff.

For those CASE reports that we make into documents relied upon, because we have chosen to pursue changes that are recommended there, there will be staff supplement documents that will show and document staff's analysis of that CASE report, show what our thinking is, and how the changes that we've made on that subject area or on that topic really back the CASE Report. And especially in a case where the CASE Report might recommend have a 75 percent dimming level, a certain kind of lighting. And we'll say, "We think 50 is appropriate, 75 is too far."

All of that will come about, but for right now this workshop is about commentary on the pre-rulemaking draft express terms. Some of those changes might relate back to a proposal submitted by a stakeholder.

MS. MAXWELL: Okay. So it sounds like

you anticipate with the mid-November language, that you're going to provide in preparation for the formal, that so we should see recognition of CASE reports in that language? Is that --

MR. STRAIT: You will see at that point which CASE reports we have documents. And you'll also see staff supplements for those CASE reports.

MS. MAXWELL: Okay. That is very helpful. Thank you.

MR. BOZORGCHAMI: So any other questions? If not, I'm going to change it to Gabe Taylor, who will present on the subchapters 1, 2 and the hospital measures.

MR. TAYLOR: Good morning everybody. My name is Gabriel Taylor. I'm an Engineer in the Building Standards Development Office. And I am here today to present to you the Section 100. This is the first subchapter. And section 110, the second subchapter of the proposed changes to the Standards.

Most of these changes are just clean-up changes, so I'm going to go through them fairly quickly. This should be a fairly short presentation. And then we'll have two

opportunities for comments and questions during this presentation, so I'll put that up here in a few minutes.

The most major change that we're making in the Section 100 is a change to the scope of the Standards. And the Energy Commission has released a staff paper a few months ago and a revision to that staff paper in June that describes the legal justification for this change. I'm not going to go into a lot of detail there. Hopefully you've all seen that. If you have not seen that and you can't find it, please let me know. And I will get you a copy.

This change to scope extends the Title 24 Energy Efficiency Standards to licensed healthcare facilities in the state of California. The way that we're implementing this change is to add Group I occupancies to the scope and then to exclude separately, I-1, I-3 and I-4. I-1 is not used. It's a placeholder in the Building Code, so we'll probably drop the I-1 and just exclude I-3 and I-4.

The definition that we're adding to the definition section for healthcare facilities is here. And it references a separate section of

California Health and Safety Code. And specifically this is facilities that are licensed by OSHPD, by the Office of Statewide Health Planning and Development. We've worked very closely with OSHPD over going on a year now to develop the language. We've gone through every line of the Building Code, with OSHPD and with a number of their stakeholders, to try to identify a cogent proposal to go forward at during the pre-rulemaking phase. So this language that you see here is our initial proposal for these licensed healthcare facilities.

And then we've removed a few old definitions that were essentially workarounds, because of the perceived inability to apply the Standards to healthcare facilities.

The proposal here is the first phase of a multi-phase approach for healthcare facilities. In this first phase we're simply looking at the existing standards. And then we've looked very closely at the existing standards for places where they may not be cost-effective for healthcare facilities or they may cause some sort of conflict with health and safety issues in a healthcare facility; basically places where the

Standards need a little additional or a lot of additional examination or research in order to apply to healthcare facilities.

And in those cases we've proposed a flat exception. So in whole swaths of the Code there is an exception for healthcare facilities that simply say, "If you meet this definition, if you're a healthcare facility, you do not have to comply."

This leaves a fairly large amount of the Code still in effect for healthcare facilities. So I'm going to go through and highlight areas where we've proposed exceptions. However, I want you to focus on the areas where we have not proposed exceptions, because those still apply.

So I've separated the Code essentially, into these six major categories. This is a summary of the title and the Code, so this is a portion of the presentation I've given a number of times to the healthcare community to educate them on the purpose and structure of the Building Energy Efficiency Standards.

Obviously this was based on the 2016 Standards. The text that you see that's been posted online is an update of the 2016 Standards,

so the red-line strikeout of this original document.

So I'm going to go through each section, one at a time for healthcare. The rest of this two-day workshop will be section-by-section, very straightforward. We chose to put hospitals or healthcare facilities first, because it touches every section. So this is a high fly, kind of overview of the entire code. And then the remainder of this workshop, of this two-day workshop will be focused, more detailed on each individual section.

So in the systems and equipment section, we've proposed exceptions for water heating and for the solar ready section. After a little bit of a discussion with the healthcare community, we've determined that solar-ready requirements are not quite ready for healthcare facilities. And water heater heating, there's a few details in there that need to be corrected.

For Section 120 there are a number of exceptions particularly in terms of ventilation, mechanical, demand management, covered processes. There are a number of areas in healthcare facilities where there are special needs. And so

the Energy Code will need to be examined more closely.

Now again, I mentioned this is a multi-phase process. This first phase is simply bringing the healthcare industry, the healthcare community into the Code, so that they understand the Code, educating them on what the Code means. And then in future cycles and beyond, I anticipate that we will invite stakeholders to recommend changes for the healthcare community and staff will propose changes for the healthcare community.

We've also initiated a number of discussion groups with OSHPD and the Hospital Building Safety Board and a number of their subcommittees on specific areas that we need to focus on. So as we go forward, we're already working on the next cycle and on the areas where we're proposing exceptions.

This time, likely in the future we'll look at a sensible movement to impose those. But again this will be a very open process and include all the healthcare communities. So there will be no surprises in future cycles. That's the commitment.

In lighting and electrical, we have a number of exceptions as well in indoor and outdoor controls. This is a good example. I can give you some specifics. I'm not giving you many specifics here. That's in the proposal. But for example, in psychiatric and secure areas obviously you need to have a secure access to shut off light, shut off the switches. So similar to other areas where you have secure areas, we give an exception for healthcare facilities to move the area controls to a secure location.

Auto shut-off is probably -- that needs to have some additional research before we can propose auto shut-off, essentially on occupancy sensors in a healthcare environment. You have too many situations where you'll have a patient in a space that needs light and they're not mobile and you have trouble triggering the occupancy sensor. So we need to do some more research there.

The outdoor signage in healthcare facilities generally is for emergency purposes. And it needs to be lit, sometimes 24-7, sometimes not. But it certainly does not fit seamlessly

into our current control zone.

The performance and prescriptive section is essentially unchanged. We are proposing that healthcare facilities have the option of going through either the performance path of the prescriptive path. So this will be an area of education for the healthcare community and for the Energy Commission and all of our stakeholders as we move forward identifying areas where there are inconsistencies or problems. And we move to solve those, particularly with respect to the software. Although my understanding is that the underlying software for CBECC-Com does consider healthcare facilities, so it should be absolutely doable.

Additions and alterations, the language that we published -- this is important. This is a correction to the language that we published a couple of weeks ago. I have here a little snipped of the language. There was a line here that's missing. We had intended to propose an exception for healthcare facilities, for additions and alterations.

At this stage, the Building Standards, the Energy Efficiency Building Standards, are

proposed for only new healthcare facilities. Existing facilities will have an exception.

So I've received a number of concerns from people in the healthcare community, asking about the minor modifications they're making to the building and being forced by code to do all sorts of energy efficiency upgrades and what not. That is not going to happen. That will not be proposed without extensive vetting in the public process and research and proof that it is cost effective. That requires a little bit more research basically.

At this stage, however, there is ample sections of the Code, which are clearly cost effective. That is it is absolutely cost effective to put high-efficacy lighting, or sufficient insulation and sufficiently energy efficient demonstration in a healthcare facility that has no impact. In fact, it has a positive impact on patient well-being in many cases.

So, the sections of code where we've identified and again we've vetted it thoroughly with OSHPD and with the healthcare community, with a portion of the healthcare community. We have additional outreach to do, but this is one

section where we identified a certain concern and so we'll look at that in more detail in the future.

So at this point, I'd invite anybody to come up to the mic or to speak up if you have questions or comments on the healthcare section of the proposal. Again, over the next couple of days, we'll be going through each section of the proposal and we won't be speaking directly to healthcare under those separate sections, so this is the area to talk about healthcare.

MR. RAYMER: Bob Raymer with CBIA. And I realize this has nothing to do with residential. I was on the phone yesterday with Michael Nearman with the Building Standards Commission. And he mentioned that there was going to be a rather large meeting with OSHPD and the healthcare facility groups today and tomorrow. Are they aware of the exception that you just spoke of?

MR. TAYLOR: I did email it out to a number of people, both OSHPD and CHA, California Hospital Association. I have a webinar that is actually hosted by the CHA next Wednesday. I'm presenting for the fourth time to the Hospital Building Safety Board Energy Management and

Conservation Subcommittee next Thursday. So I'm doing everything I can to outreach and educate.

MR. RAYMER: That's great.

MR. TAYLOR: Do let me know if there's somebody that you contacted, or if there's any organization that you are aware of that is not aware, and I will contact them and I'll reach out.

MR. RAYMER: I think additions and alterations was going to be the biggest issue, so that's just in the cross talk that I've seen going back and forth.

MR. TAYLOR: Understood. Yeah, our initial proposal, back eight odd months ago, did include additions and alterations. In my initial presentation, I said additions and alterations points back to the rest of the Code. If we're proposing exceptions to everything that causes concern, why not include the additions and alterations?

After six months of discussion, we've determined that we'll push that to a following cycle. That needs a little bit more time.

MR. RAYMER: I think that's going to give them a lot of comfort with your proposal updates.

MR. TAYLOR: All right. We have one hand raised online. We're going to see if somebody has a comment online.

MR. WICHERT: Holder, you're unmuted. You can go ahead with your comment.

MR. TAYLOR: Will the person online, if you decide you want to comment on the hospitals, I'll have another comment section here in about two or three minutes. You can speak up then if you get a chance.

So I'm going to move on to Subchapter 2, this is Section 110. These are mandatory requirements for manufacture, construction, insulation systems.

So this was a point of confusion actually when we were proposing this update for healthcare facilities. There are Sections of 110 which point to systems and equipment that in some cases, if you read them, just on their face they seem like they would impose a requirement on your building. However if your building does not -- there are separate sections of the Code that point back to 110. And so it caused a little bit of confusion, but.

Proposed updates for section 110 are

predominantly cleanup. We have five specific areas of cleanup here that I'll go through. First is we're updating the minimum efficiency of equipment. This is to align with 2016 ASHRAE. As you know, ASHRAE was updated in 2016. The federal government has an 18-month clock to endorse those. However, we have a window here where we can update ours. And we, as a matter of practice, update whenever we get a chance. So we are aligning our efficiency requirements with 2016 Code ASHRAE.

We have a minor correction to the lavatory water temperature. This is for the lavatory sinks, where you wash your hands. There's a specification for the temperature of the water coming out of those sinks. And we identified a minor discrepancy between this and the California Plumbing Code. And so we're bringing our code into alignment with the Plumbing Code.

We're moving lighting control specifications from Title 20. Anybody who is familiar with lighting control knows that we have a bunch of specifications for equipment in Title 20. It's been moved around a little bit, but

we're consolidating everything into Title 24. So rather than pointing to Title 20 and asking the Title 20 team to adopt code that we want to point to, we're simply going to adopt the code directly and move it all into Title 24.

The solar ready section has been substantially redrafted and this is not intended to change the requirements. This is simply redrafting it, so that it makes more sense, so it's easier to read and it's easier to follow.

And then finally and this is actually the point that I'm most interested on managing this section of the update, consolidating demand response language. So the Energy Commission has had authority to propose and adopt demand side management, demand response standards since the 1970s. This was part of the Warren-Alquist Act in '76. And we have adopted throughout the years, based on available technology and cost effectiveness, we have adopted a number of demand side management regulations.

At this point, we are collecting all those disparate regulations and they're all over the code. We're putting them all in one place. It's only going to be a couple of pages, two or

three pages really, of requirements related to demand side management, demand response. And we're going to make sure they're consistent with each other, so we're making terminology consistent.

So rather than having various different terms for a device that manages your demands, based on your specifications with an appropriate signal from price or what have you, we're simply consolidating all of those definitions under an energy management control system. So now a building has an EMCS and it controls demand side management. It's modernizing the code, in a way as well.

The biggest change, so all of this is going to be consolidated under a new section, in Section 110.12.

And then we are adding a proposal here. And this came from a number of different sources, so there was a question about the CASE reports. We've also had other stakeholders propose ideas to the Energy Commission. The CASE teams are obviously one of the best funded and one of the largest groups that propose regularly updates to the Energy Commission.

But other groups are welcome to propose code changes to the Energy Commission. And we welcome those. We entertain those. In order to go through the entire process, of course they need to meet a level of intellectual rigor and analysis, in order to withstand the rulemaking process. But staff looks forward to helping with that.

We received a proposal from a number of stakeholders to finally bring OpenADR into the code. Currently, the code specifies an open source communication protocol for external demand responsive communication. That has caused some confusion in practice. We've had a number of stakeholders who are basically builders say, "What exactly does this mean? Tell me what I have to do, so that I can know that I'm meeting the Code, rather than have this kind of nebulous terminology."

Open ADR was -- this is an Energy Commission success story. I'm really proud of this one. After the 2000-2001 energy crisis there was an identified need for an open source communication protocol, so that utilities could trigger demand response behavior at consumers who

wanted to engage in demand response automatically. There was a number of different manufacturers that had proprietary software and proprietary systems that would sometimes get abandoned. And it caused all sorts of costs and what not. So the goal was to reduce the cost of participation as much as possible.

The Energy Commission funded a research program through our PIER Program. And then a few years later we brought in the Demand Response Research Center in Lawrence Berkeley National Labs. And we ended up through that program, bringing in dozens of standards organizations, national and international standard-setting organizations and governing bodies.

And the OpenADR 1.0 was published by the Energy Commission. It was an Energy Commission document. And then shortly after, that was taken up by the nonprofit OpenADR alliance for Maintenance and OpenADR 2.0 was released relatively recently and 2.0b a little bit more recently.

At this stage, this is a well-vetted standard. This has been in the marketplace and has been used both nationally and internationally

for over a decade. And we feel that this protocol is sufficient for specification in the code. A lot of people have talked to me about picking winners and what not. That is certainly a concern. We've thought about this carefully. We have spent almost ten years now not picking winners in this space, because we wanted to be very, very certain that this was the right choice. We left it open.

The proposal that we're bringing forward here simply says that a demand responsive device needs to be able to communicate through OpenADR. It can communicate through other channels, if you want. It can do whatever you want. But it has to be able to have this as a backstop, so that you can talk to your utility or you can talk to an aggregator so you can engage, so that a consumer can engage in demand responsive behavior that they chose to engage in. It's about reducing that cost of participation, so that's a major proposal in the demand response section.

And that concludes my presentation. Again, if there's questions on Section 110, particularly on the demand response section, although I will also accept questions on

healthcare still.

MR. HODGSON: Good morning, Mike Hodgson, from ConSol, representing CBIA. In Section 110, page 89, Section 110.0, there's a note at the bottom of the page that's been struck. And we would like -- the building industry would like that note not to be struck. It's very useful in clarifying responsibility over who has the enforcing agency, as well as the testing responsibility. And we would like that to be left in place. Okay?

MR. BOZORGCHAMI: Mike, this is Payam. We heard about it yesterday and went through and fixed that already.

MR. HODGSON: Great, thanks. We're just making comments into the record.

MR. BOZORGCHAMI: Sure.

MR. STRAIT: Actually, and I can clarify, part of the reason that we struck that originally is that anything that's marked as a note, is something we've added that's not regulatory. It just restates things that are elsewhere in the regulation. We've gotten some pushback from the Legal Department, because that statement being non-regulatory it shouldn't be there like best

practice. But we agree that it has a use to the people reading the code, so in this case we're absolutely willing to restore that.

MR. HODGSON: Great, thank you. And in Section 110.10, which is the mandatory requirements for solar ready, we've talked to staff and we would like to probably work with staff to eliminate this section entirely. We think it's already covered in the standards, but I understand we really actually need to work through different types of exemptions and make sure all building types that we're anticipating are covered. And if so, than I think one section, 110, can be eliminated.

MR. BOZORGCHAMI: So are you going to submit that to docket? I see what you're saying and we're going to look into it with Mazi and Bill and so forth.

MR. HODGSON: Right, so we have kind of a two-fold, Payam. I think one is we'll send this comment in and then we'll take the responsibility of thinking of odd-building types, of shaded three-story structures, pancake multi-family that we think are going to be difficult in the code and then try to work through and make sure they

have the correct exemptions.

MR. BOZORGCHAMI: Beautiful. Thank you.

MR. HODGSON: Thank you.

MR. RAYMER: Bob Raymer with CBIA. Sort of adding on to what Mike just said on the solar-ready. A common theme that I'll be doing today and tomorrow is it would be very useful as the CEC goes forward to provide some rather simplistic examples of how you would envision the solar ready area, the new solar mandate area that we'll talk about tomorrow, and the community solar that we'll talk about tomorrow morning. To see how those things will actually apply out in the field.

Right now, I'm having a little bit of difficulty envisioning how some of these would apply. And what we may do is provide with you some of the examples of what we think is happening. But once again if you've got something that's already prepared or wouldn't take a whole lot of time to prepare -- I know that you're going to be smashed for time -- but to the extent that you could let us know how you would envision this applying to a production housing project that would be very useful.

We wouldn't want you to spend a lot of time on it, but anything that could help us better understand how you envision this applying out in the field would be helpful.

MR. BOZORGCHAMI: Okay.

MR. KNUFFKE: Good morning, Gabe, Charles Knuffke with Wattstopper-Legrand. Thank you very much for the overview.

I did hope that there would be a bit more explanation on the Title 20 versus Title 24. So we've spent quite a bit of time trying to work with building inspectors and getting folks to understand the difference between having a device in Title 20, which negates its sale in California versus something in Title 24, which merely negates its use or requires its use on a system.

So is Title 20 definitions going away, or is Title 24 going to work on and somehow cover the unitary devices that are also sold in California?

MR. STRAIT: So this change is primarily administrative. We want to make sure instead of simply pointing to Title 20, that we have that language in Title 24 in case there's a change in Title 20. And that way also, so any updates that

are found to be necessary in our code, we can make those same updates to the definitional language to that instead of saying, "Okay. Now the Appliance Team has to make an update."

MR. KNUFFKE: So we're not removing language. When you said moving it, somehow I would emphasize that you're copying the language then as opposed to moving it, because Title 20 will still exist for the unitary devices.

MR. STRAIT: What I would say to that is that Title 20 is also examining whether it's still worthwhile to certify these devices. Most lighting controls are now a very mature technology. There's less of a case where a lighting control will simply fail to perform a function. So it may be enough now, instead of saying you have to check all these true-false boxes and tell us yes your device does these thing, to just trust it when something says it does it, it can actually do it.

You know, again certification is a bureaucratic burden and we're always looking at opportunities to streamline that. In practice it would still mean the same requirements of Title 24 are going to exist about where and how you

install those controls. Whether we have a manufacturer take that additional certification step is a discussion we'd like to be able to have. So no decision has been made on that, but I know that we are interested in -- the Appliance Program is interested in discussing whether certifications still makes sense for these devices.

MR. KNUFFKE: And I would only offer that although a control says it does something, it probably does that. The example though that I would put forth is that there is not allowed to have the way of easily disabling devices. And we've all gone into the big box retailers and seen racks of devices that are occupancy sensors with a hand-off auto switch, that once they get put in has an out of the auto mode in to on, to stay on then forever.

So that's the concern that we would have taking that language out entirely from Title 20.

MR. STRAIT: Certainly. I know one of the things that we're having to contend with is this idea of whole building automation, whether there's going to be centralized and programmable control of a lot of lighting. So although there

won't be a switch effectively on the wall that does that, the central systems a lot of times are programmable meaning somebody could go into that system and say disable the sensor, ignore its input, things like that.

So if we're going to be treating both sides of that equation fairly, we have to kind of navigate that, thread that needle and find out how do we contend with separate wall box devices, versus integrated systems?

MR. KNUFFKE: And I understand the rationale behind that and I thank you very much for the explanation.

On a separate topic, I just wanted to say that the moving to OpenADR, I applaud the decision. I think that OpenADR 2.0, a and b or any other code that the CEC then decides that supersedes it would be a good thing, because it would allow the use of the equipment that's being installed right now that's not being used, that's actually being wasted.

I would hope that the simplicity for testing is kept in mind as to making sure that there is an easy way of verifying that. I'd also hope that it may not need to be OpenADR to the

lighting control system. It may be a central system that then communicates automatically to other systems, such as the lighting system, so that you don't have multiple different ways of communicating. I just hope that that would be considered as some place, a way of being a way of being able to respond automatically to an OpenADR signal that comes into the building. And then not necessarily picking winners or losers as to whether it's Modbus or BACnet or another protocol inside of the system itself, so.

MR. STRAIT: Yeah. I believe that's already considered in the code. We specify external communications for OpenADR. And then there's a separate section that says that any of the accepted internal communication protocols are fine, such as (indecipherable) --

MR. KNUFFKE: Terrific. I appreciate that. Thank you very much.

MR. STRAIT: You're welcome.

MR. FLAMM: Good morning, Gary Flamm with GR Flamm Consulting. I also would like to ask about the moving language from Title 20 to Title 24, on the lighting controls.

It appears to me that that's a

substantive scope change, that if it's not simply -- it can't be simply administrative, because Title 20 regulates all lighting controls that can be sold in California. Whereas, Title 24 only affects lighting controls installed within a building that is regulated by Title 24. So it is a substantive scope change.

MS. TAYLOR: I should correct when I said moving. Obviously, this is not a rulemaking proceeding for Title 20, so we're not making any changes to Title 20. This is simply a change to Title 24 and any changes that Title 20 makes in the future will be a separate rulemaking.

MR. STRAIT: And I should specify, all this is, is to places in 110.9 that pointed to language in Title 20 -- instead of having that pointer we have simply copied that description in. So instead of pointing to it, we just have it in place there. We're not changing any of the requirements, either in Title 24 or Title 20, related to those devices. We're just making sure that when we are pointing to language we instead have a copy of that language directly in Title 24.

MR. FLAMM: Okay. So Peter, clarify on

the long-range goal of the Energy Commission, I'm not clear of what you stated about -- is the Energy Commission considering taking lighting controls out of Title 20?

MR. STRAIT: Again, I can't speak for the Appliance Program. I can say what's -- in case they wanted to make changes or they were looking at whether certification of those devices to say they perform the functions they claim they perform, whether that makes sense. Anything that would go in that direction would be driven by that office. It would be subject to public commentary. They may or may not choose to do so.

But what we found was we still lack control of that language, if we don't have a copy of it directly in Title 24. So whatever changes happen in the Title 20 side of things, both we want to make sure it doesn't change what Title 24 requires, because that would be out of sequence with the Building Code. And when we update our language, we want to make sure we have the ability to update that language, to suit changes we might make in Title 24.

Right now, it's an administrative action. If there's a later action considered by Title 20,

to either reduce certification of those devices or change requirements in some other way that would be in a separate rulemaking proceeding, that would be subject to separate policy discussions and decision making.

MR. FLAMM: Okay. So one of the challenges with Title 20 rulemaking timeline versus Title 24 is they're never on sync. So in the event that either Title 20 or Title 24 wants to change definitions, how is the Energy Commission going to deal with any conflicts between the two codes?

MR. STRAIT: So because we participate in the triennial cycle with the Building Code if there's a change in Title 20, we would have to wait until the next cycle in the Building Code. This is actually better than the current solution of pointing to language, because strictly speaking we are not best practices. The California Building Standards Commission considers it, if a change to Title 20 can mean a mid-cycle change to what's required under the Building Code, which these pointers outside of the Building Code currently make the case.

So if there was a change in Title 20,

Title 24 would simply incorporate that change in the next update. And in terms of being responsive to the mid-cycle, we do have under 10-109 the ability to consider alternate compliance methods and we could use that process to adopt an interim solution that would allow us to maintain compatibility with Title 20.

MR. FLAMM: So are you saying that there will be language in Title 24 that says if there's a change in Title 20, that Title 24 will recognize that change?

MR. STRAIT: No, we can't have language that says that. What I'm saying is that procedurally if there's a change in Title 20 that would create a conflict with Title 24, we could use the process under 10-109 to recognize the difference and allow whatever that difference is under Title 24, should it be found to be appropriate.

MS. TAYLOR: Yeah. This all goes back to simplification and clarification. Right now, because of that pointer from Title 24 to Title 20, it just causes a little bit of confusion for the exact reasons you mentioned.

And as Charles mentioned, generally

speaking the perception is that Title 24 covers the built environment. Title 20 covers all devices sold and offered for sale in the state. So we're trying to teas that out through a multi-year cyclical rulemaking process. And the first step here is Title 24 is trying to pull back and make sure that all the code that governs built environment is in Title 24. And minimize pointing over to Title 20.

MR. FLAMM: Okay. So one of the reasons I wanted to ask the question is your presentation was just a bullet in today's workshop. Is the exact language going to be presented at another time or is that all you are presenting, is that one bullet?

MS. TAYLOR: Yeah. My understanding is that all the presentations that you'll see over the next two days do not include exact language. We have the exact language posted. Everybody should have a copy of it. I see a number of people with fat binders. And our staff will provide a summary and point the interested parties to the sections that are really pertinent to them. So we're trying to draw your attention to the changes we've made so you can flip to that

page and look at the exact language on the actual document, rather than trying to flash up some complex code language onto the screen here and have you read it real fast.

MR. FLAMM: Okay. Thank you.

MR. TAYLOR: You're welcome.

MR. NESBITT: George Nesbitt, HERS Rater. I did not have time to download all of the proposed language beforehand. And the Energy Commission's guest log-on will not allow me to even load the Energy Commission's home page.

But on the issue of Title 20 and Title 24 there are currently, within I think Title 24, there are some sections that are in multiple places where the same language I think is in sort of the preamble. And then it's also repeated in the actual Part 6.

So you've sort of answered some of the questions. Okay, so you're leaving things in Title 20, but you're going to take some of that language, repeat it in Title 24. One problem with that is when you have the same thing in multiple places you have the possibility of having errors between the two.

So I think what you're essentially saying

is you're going to take current Title 20, put some of that language in Title 24. And for as long as the 2019 standards are in effect, in a sense what you're saying is Title 24 trumps Title 20. Even if Title 20 changes and you could no longer make or sell say a given feature or product, you can still install it. You're requirement is still based on what's written in Title 24.

MS. TAYLOR: That does not sound totally correct. We're trying to tease them apart, so that they do not conflict. So our goal is to create language that doesn't conflict. So if you see a section where it conflicts, please let us know and we'll hopefully fix it.

MR. STRAIT: Well, also I should mention that Title 24 is trying to specify what the building's controls do. That is, here are the functions that they need to perform.

Title 20, as an appliance standard, is usually about here is specifically how you construct your appliance. Here are the things that it must incorporate.

That slight difference is we care less about how it's done, as long as it's

accomplished. And for example, when you talk about whole building automation, centralized approaches, as energy management control systems, as long as they perform the appropriate thermostat functions and lighting control functions, they just behave the right way, great. You've met the requirements for the building to behave certain ways.

Right now the language that we have in 110.9 should be identical in effect, if not in specific language, to what's in Title 20. And should Title 20 change, or should Title 24 change, we're going to work closely with that office to ensure either that we make the change at the same time in both sections. Or that if a change is made in one, that we have a way of accommodating a change in the other. We're not going to be operating blindly.

And yes, you're correct that it does create a risk that those two different sets of code can wander apart from each other. But going forward as we said, there's an administrative need to tease these apart. And we're going to remain hand-in-hand, so that we know what each other is doing and hopefully prevent situations

like that from occurring.

MR. NESBITT: Right. But on the one hand you're saying that currently because you point back to Title 20, if Title 20 changes mid-stream, that would then essentially become the Title 24 requirement. But you're saying you can't -- you're also saying you can't just put language to say that, but it seems like there's some conflicting in what you're saying. I mean do you want it to change midstream, or do you not want it?

MR. STRAIT: So this is where we have a difference between what the California Building Standards Commission requires for the Building Code as a whole, and what would be ideal for us as just the Energy Code. Obviously, if Title 20 makes a change in midstream, it would be ideal from our perspective if that also immediately made the change in Title 24. But that does conflict with the California Building Standards Commission and the mission of that body of law as a whole, to only change on a three-year basis and not have many changes that occur throughout a code cycle.

So even the intervening cycle for

example, is limited in what it can consider or be used to do. So in order for us to comply with what we're required to do under the Building Standards Commission we find that this is better for that, even if it does cost us the ability to always remain exactly in sync with the appliance regs.

MR. NESBITT: Okay. Yeah. I mean in Title 20, a lot of things, a lot of the date of change has to do with manufacturer. And so stuff that's already been manufactured can continue to be sold. So there's nothing definitive really date-wise in a lot of respects about Title 20.

MR. STRAIT: Yes, this concern and a number of the previous concerns about that nuance between Title 24 and Title 20, this is exactly why we're trying to tease them apart, is to prevent this kind of confusion.

MR. NESBITT: Right.

MR. STRAIT: Title 20 is about what you can sell in California. Title 24 is about what the building inspector looks for when they go to the project site. So these are separate regulation points and separate codes.

MR. NESBITT: Perhaps what you need to

really look at is what belongs in Title 20 and what belongs in Title 24 and get those separated, in a sense, so that there is clarity.

MR. STRAIT: Yes.

MR. NESBITT: On this solar ready issue, the solar ready section applies to all non-resident -- or I think pretty much all the non-residential buildings also. So obviously it can't go away.

I guess the big question with solar ready becomes if we end up requiring solar on all low-rise residential units, in those cases where it can't be done, what is that building or unit going to have to do instead? I mean, they're not going to have to make the investment in PV. They also don't get the benefit, so the real question will be what do they have to do to earn that exception or to do something equivalent?

MR. BOZORGCHAMI: So George, the Section 10-110 that Mike brought up earlier is something that we're looking into, so it's going to be clarified and clarified. So if you have comments to that, please submit it to the docket, all right?

I understand what you're saying about

110.10, but we're going have to look into it. And like Mike said he's going to be doing some analysis with staff here to see what we can do with that language. Okay? So we're not going to -- for commercial buildings, hotel, motels, we'll have to figure that out.

MR. NESBITT: Yeah. It would seem it needs to stay for that, although there may be portions of it that are no longer relevant.

MR. BOZORGCHAMI: Yeah. I don't think what Mike said was -- or meant, I shouldn't say said -- was to unrealistically rid of the whole thing. Yeah, for residential we're going to have to make some modifications, but also for non-residential commercial buildings we're going to have to figure that out also.

MR. NESBITT: Okay.

MR. BOZORGCHAMI: Okay?

MR. ROY: Good morning, Aniruddh Roy, with Goodman. I just had a question on 110.10.

There's an exception, which talks about dish washers, ENERGY STAR dishwashers and refrigerators. The question was, are you considering additional products, because ENERGY STAR also covers a wide variety of products.

MR. STRAIT: That product list was actually established in the 2016 code cycle, based on an analysis of how much energy is saved by those individual devices and how likely they were to be installed by the builder, as opposed to brought in by the tenant.

While there are other ENERGY STAR devices, we can't make it necessary to install additional ENERGY STAR devices, because the ones in the exception already cover as much energy savings as is needed to achieve parody.

In terms of alternative packages, that is so you don't install one of the ones on the list, but you install some other collection of equipment -- if there's one that can be shown to be as effective we might be able to consider it. It's a little bit late in our process for a new proposal, but if you've got another package that you're looking at, that you think achieves the same benefit, and is also ENERGY STAR recognized, I'd say go ahead and docket it and give our staff a chance to look at it.

MR. ROY: Okay, sure. And one follow up question was on 110.12. And that's the automatic demand shed controls seems to be moved from 120.2

to that particular section?

MR. STRAIT: That's correct.

MR. ROY: So I guess the requirements then also expand to low-rise residential or it would still be only commercial for that particular requirement?

MR. STRAIT: So in the section where it was there is a small snippet that says, "For demand response requirements go look over there," basically. The only change this should be making -- and I can have our staff review it, but I'm fairly certain this is the case -- is that we've moved those requirements to one section. We have not changed those requirements or expanded them.

It does mean, for example, we've noticed that on the commercial side you have energy management control systems. On the residential side, you have occupant control smart thermostats that are becoming more like energy management control systems. And it gives us an opportunity to maybe use common language to talk about both kinds of devices. But it's not intended to change or expand the requirements when one is required to be installed in a given setting.

MR. ROY: Okay. Yeah, it just came

across to me as it was expanding it to residential. So if you could just clarify that, it would be much appreciated.

MR. STRAIT: Sure.

MR. ROY: Thank you.

MR. WICHERT: We're going to an online comment. Ken Nittler, can you state your name and affiliation please?

MR. NITTLER: Yes, good morning. This is Ken Nittler. I'm with Enercomp here in California. Some of you probably know me from my work on software related to residential standards. But I also operate a business that does NFRC ratings for the fenestration industry.

And I'd like, this morning, to discuss a topic that's a concern, that wasn't discussed. It's in Section 110.6. This is the section that certification and ratings for fenestration products. And specifically, I'm asking that there's an exception one in three different subsections: 110.6(a)2, 110.6(a)3 and 110.6(a)4. And I'm asking that exception one be deleted from the standards.

Basically, these exceptions have proven to be a large loophole due to sort of the lack of

compliance and enforcement of the certification and labeling requirements. And I think what we're seeing is there's large numbers of nonresidential buildings that include the site built fenestration that's the subject of this exception. These are mostly products that one would call curtain walls and store front products, are getting installed without having appropriate ratings.

I'll put written comments in on this, so I'll just give you some short version of my reasoning today. A brief look at history, uniform fenestration ratings were first added to the 1992 Standards and referenced on the National Fenestration Rating Council. You'll know the abbreviation, NFRC Standards.

And then in 1995, the Standards went even further. And the administrative regulations referenced NFRC as the specifying entity for fenestration energy ratings. And so they have a special relationship in the standards and sort of a mandate that their ratings are the basis of our standards.

Strangely, even though most of this language was added back in the early '90s, really

for the 1992 Standards, implementation of the use of NFRC ratings on larger projects has pretty much not happened to the level that it should be, given the importance of fenestration to the performance of buildings.

And so I look at what would be the reason to this? Why are there so few certificates? As an example, I looked at the recent certificate activity for NFRC. And then that's public available at the NFRC website. And since 2010, there've only been 103 certificates issued for these larger site-built projects in California.

When one thinks about the size of the California economy and you think of the tremendous boom in construction, especially in places like San Francisco and Silicon Valley and Silicon Beach, in San Diego, in places mostly coastal regions. It would seem to me that there should be maybe ten times as many, an order of magnitude more certificates issued in California.

Take contrast, you can look at the State of Washington. There's sort of a hot bed of energy standards that are in the City of Seattle. The City of Seattle, over that same time period by itself, has 261 certificates. It's like 2.5

times more certificates than what we have California-wide. Now, Seattle obviously is also a booming tech hub, but California's GDP is about five times larger than the entire State of Washington. It's not very logical to expect there to be fewer certificates in California than there is in Washington.

NFRC has this unique relationship with the Energy Commission. NFRC invested millions of dollars to create an approach that accommodated the type of construction that typically goes on with site-built windows, where there's often glazing contractors involved and different suppliers of things like the framing materials, compared to the glass. And this process is largely going underutilized and it puts the Commission's investment and the NFRC's investment in this approach at grave risk, since it's so inadequately enforced, here in California.

I have a lot of experience helping glazing contractors and sometimes manufacturers get these certifications in California. It's pretty common for us to get calls where what people are calling to ask me is, is there a way they can get out of doing this requirement,

rather than what can I do to comply with the requirement? And I really believe a huge part of it is these exceptions that say if you have less than 1,000 square feet of these products than you can use favorable default equations.

And so I'm going to be requesting that those three sections, exception one be stricken from the standards and I'll put something in writing on that.

MR. BOZORGCHAMI: Thank you, Ken, a quick question for you. What is the average cost of doing one of these analyses, using the CMA model and what's the turnaround time to get the certificate for that?

MR. NITTLER: Well, I can only speak to the way we operate and --

MR. BOZORGCHAMI: I just need an average. I don't need exact.

MR. NITTLER: Typically the costs are somewhere between $300 and $700. And we are able, normally to turn around a certificate in just a day or so, from the time we get complete information about the product.

MR. BOZORGCHAMI: Okay. Thank you. Yeah, please submit that comment to the docket

and we'll review and start a dialogue with you on that.

MR. NITTLER: Thank you.

MR. BOZORGCHAMI: Thank you.

MS. TAYLOR: A quick reminder, we are recorded here for a transcript. So if you comment in person please give your business card to the court reporter. And if you're commenting on the phone, please enunciate your full name and your association as clearly as possible, so that that is available on the recording.

MR. STRAIT: And actually I'll also jump in. That comment is an excellent example. If there's a change that you are expecting to see in the code that you're not seeing, or something you would like to see the code do, feel free to express it as well.

We can't consider completely new proposals. For example, establishing a new standard for equipment or making drastic changes. But we are interested in hearing about other areas that we probably might want to look more closely at. Or things like this where an exception we've had on the books for a while might be having an unintended consequence. Thank

you.

MR. BOZORGCHAMI: Any more comments, R.J.?

MR. TAYLOR: Any more comments online?

(No audible response.)

MR. BOZORGCHAMI: So with that we're going to go to Sections 120. Mark Alatorre is going to be doing the presentation. This is for the non-residential, high-rise residential, hotel/motel occupancies and covered processes, mandatory requirements.

MR. ALATORRE: Good morning. My name is Mark Alatorre. I'm with the Building Standards Development Office. Like Payam mentioned, I'm going to be presenting Subchapter 3, which is mainly requirements for mechanical systems.

So we made a change to the scope of 120.1(a). And the change was really to, given that we are now going to be regulating healthcare facilities, we wanted to make it very clear right at the scope of 120.1 that the ventilation requirements for healthcare was going to remain in the mechanical code, given that OSHPD has done extensive amendments to what's being required there. The OSHPD amendments basically are

incorporating ASHRAE Ventilation Standard 170 now, which is specific to healthcare facilities. And we thought it was appropriate to maintain that.

Next, part of our proposal for 2019 was to adopt ASHRAE Section 62.1 and 62.2 respectively. And in that change, ASHRAE has now moved high-rise residential dwellings units to 62.2. So we felt a need that we needed to break this section apart and have specific requirements to high-rise residential dwelling units, separate from non-residential and hotel/motel occupancies. So we've created the new Section 120.1(b), which is specific to high-rise res dwelling units and 121.1(c), which would include all other non-residential spaces and hotel/motel.

In 120.1(b), what we have there is new requirements that are based in ASHRAE 62.2. I say based because there are some amendments to it. And this is also highly reflective to what's in our Residential Section 150.0.

So in summary, what we're going to be requiring for dwelling units is an increased filtration to a minimum MERV 13; also for that filter a minimum depth of two inches. The

dwelling unit will require to have balanced ventilation or continuously operating supply or continuously operating exhaust.

If somebody chooses to go with a supply or exhaust system, they must verify that the envelope of the dwelling has a maximum leakage of 0.3 CFM per square foot of the envelope surface area. This also carries field verification. And there would be verification of the minimum ventilation rate air flow. And it would also have a verification of the kitchen range hood performance.

120.1(c), the proposal is to adopt ASHRAE 62.1, again with some amendments. We will be requiring a higher filtration than what's required by ASHRAE. We would have a minimum MERV 13 across the state with a minimum depth of two inches. We are in alignment with 62.1 for the natural ventilation rate procedure. We are also aligning with the ventilation rate procedure for a single zone and 100 percent outside air systems.

However, we are amending what's currently in 62.1 for multi-zone and we are doing so. We are trying to incorporate what's currently being

proposed as addendum f to 62.1. However, it's in the public review process right now and it won't be final in time for us to formally adopt it. So we are proposing to go forward with the public language, for a simplified multi-zone calculation. We are also aligning with ASHRAE's exhaust ventilation requirements.

One thing I'd like to mention is what's posted in the draft language I've failed to give ASHRAE credit for. One of the things we need to do is go back and actually give a citation to where the language originated from, just so we can appease the ASHRAE committees.

So within that proposal we have created new tables. Table 120.1-B, which now includes the minimum ventilation rates; the categories that are there are exactly what's in 62.1. And it also includes classification of air, based on occupancy type.

Table 120.1-C has the adjustment factors for the zone air distribution effectiveness depending on the type of defuses or whatnot that are chosen by the designer.

Table 120.1-D is the minimum exhaust rate based on occupancies types. I want to note that

Table 120.1-A is designated for the simplified multi-zone calculations.

So 120.1(g), this is also taken from 62.1. In order for us to have a complete standard I felt we needed to bring in the recirculation and air classification requirements from 62.1 that limits the designer's ability to use transfer air and also how many times they can be recirculated, given the class category that's listed in Table 120.1-B.

We think that's a good requirement for source control and you won't be able to use transfer from a class two to a class one space and things like that. So we feel that the building will have improved indoor air quality, given these requirements.

This proposal which ended up in 120.1(d)3, it originated with the addendum to ASHRAE 90.1. And it increases the scope of our current demand control ventilation requirements. The major change is the deletion of an exception for classrooms, office spaces and call centers. And it really opens up demand control ventilation to be applicable to most spaces, given that they satisfy these requirements: occupant density of

25 people per 1,000 square foot and one of the following. The old language, you needed to have an air economizer and you needed to have -- all the triggers were dependent on each other. Now, it's just one of these things that you're going to have to install the demand control ventilation.

So the scope of this is going to really increase the amount of spaces that are going to require DCV.

This is another addendum to 90.1 that was the origin of this measure. It classifies a space, or defines a space or it uses the term "occupied standby." And what it does is it uses rooms that already have an occupancy sensor, because of the lighting control requirements. And it couples that with the occupancy space category, which is listed in our new Table 120.1-B.

If it's a space that the CD 2.1 Committee (phonetic) has deemed that it can go to zero ventilation when it's not occupied, then the controls must comply with these two bullets at the bottom. So the cooling and heating set points must be set up or set down. And the

ventilation rate can be reduced to zero for those spaces.

I would like to mention that in occupied stand by, it's when the occupancy sensor doesn't detect anybody for more than five minutes. It's not an automatic as soon as somebody leaves the room. It's a five-minute timer.

Just a note that the requirements for automatic demand shed that were in 120.2(h) have been moved to 110.12. Also, 120.2(I), the economizer fault detection diagnostic requirement that used to be applicable to only packaged rooftop systems over four-and-a-half tons have now been -- it's now expanded to be required for all cooling systems over four-and-a-half tons that have an air economizer, must have a form of fault detection and diagnostics.

The required faults did not change. Just the systems in which it is now required. And it really opens the door for EMS control systems with DDC controls to be required to detect economizer faults for these larger built-ups.

As with 120.1 and 120.2, the only changes to 120.3 through 120.5 have been there are some exceptions for healthcare where appropriate.

You'll see that throughout the standards, where appropriate there are exceptions. In 120.3, we added hot refrigerant lines under space heating systems that require insulation on the pipes. Currently, there's a list of heating types, or heating pipes serving heating systems. That does not include hot gas lines. And we just wanted to clarify that it was intended that any heating system that uses a hot fluid must have insulation on that pipe.

There was also some clean-up language on 120.3, where we just needed to be clear that the requirement was for a minimum amount of insulation. There was some funny language that made it seem that we were requiring the exact amount of what was in the table. So it was really just it was the minimum amount.

So new to 120.6, we added a new class of condenser systems, adiabatic condenser systems, or hybrid condensers. You know, the industry uses that term, hybrid condensers.

We added performance requirements for these systems while they operate in dry mode. And most of these requirements are similar to what a air-cooled condenser would have to comply

with. There's new design saturation condensing drybulb temperatures while in dry mode, condenser fan control and requiring that all condensers be controlled in unison, minimum condensing temperature of less than or equal to 70 degrees, again, which is the same for air cooled condensing temperature reset, and a minimum condenser efficiency. Again, all while in dry mode.

For 120.6(b), it's the same requirement for this 120.6(a) is for refrigerated warehouses, (b) is for commercial refrigeration or supermarket refrigeration. And what we did is just incorporate the same requirements for these adiabatic condensers, where it's appropriate in both.

120.7 b), this is for wall insulation. This is the only section in 120 that's not mechanical. There was a reclassification of, or a redefinition of what a light mass and a heavy mass wall is. And the threshold is 95 pounds per square foot, so if you're equal to that or less you're considered a light mass. If you're over that, you're considered a heavy mass.

MR. BOZORGCHAMI: Yeah. That's cubic

foot, not square foot.

MR. ALATORRE: Cubic foot, sorry.

And also there was a clarification that the slab insulation requirements for a heated slab was only if your slab was considered on-grade. Before, it was just any heated slab. It could have been the second floor slab or something and that wasn't intended to be insulated.

So with that, I'm at the end of my presentation. I don't think I have a questions slide, but I'll end it here and open it up for anybody who has comments or questions.

MR. NESBITT: George Nesbitt, HERS Rater. I'll start with your last slide and then I'll go back to your first slide. So you could have a heated slab in an elevated podium. I think you would want that insulated not only under, but at the slab edges. So not all heated slabs that need to be insulated are on-grade.

MR. BOZORGCHAMI: True George, but on an elevated like that you already have insulation underneath it. It's considered something similar to a raised floor, per se.

MR. NESBITT: Right. Although --

MR. BOZORGCHAMI: It doesn't matter if it's heated or not, does it?

MR. NESBITT: Yeah. I mean I think most elevated slabs are required to have some insulation, whether there's enough.

UNIDENTIFIED SPEAKER: Just back away from the mic just a little bit, there.

MR. NESBITT: Okay. Often people are not close enough to the mic.

So on the high-rise, multi-family ASHRAE 62.2, I support going to that strongly. The two questions, so if someone does exhaust only or supply, continuous supply or exhaust, you're asking for a blower door test in meeting a certain requirement. Is that required to be done by a HERS Rater?

MR. ALATORRE: Yes.

MR. NESBITT: The other thing is I think you mentioned verifying the kitchen fan performance, but I think you mean probably just that it's HVI-rated.

MR. ALATORRE: Right. I mean, it's a visual inspection, but you're verifying the specs that are on the hood are also in the HVI Directory and the performance of the fan is

adequate to what's required in 62.2. But it's a visual. It's not a measured.

MR. NESBITT: On the next slide was non-res and hotel/motel. Now, that's staying in ASHRAE 62.1. Although my question would be hotels and motels are probably a lot more like a residential unit. And actually most of them don't have kitchens, so why would hotel and motel occupancy not also go to 62.2?

MR. ALATORRE: I believe that's what the definition of a dwelling unit, but I'll let Jeff answer that one. He's more close to the subject.

MR. MILLER: I think the issue is whether the dwellings are transient occupied. Occupancy is transient. So for residential, high-res residential that's not transient occupancy, but hotels/motels, it is.

MR. NESBITT: Okay, although I can't -- I know that part of the high-rise multi-family going to 62.2 from 62.1 was essentially a reduction in ventilation rates and therefore actually energy savings. I can't imagine that the ventilation rates for hotels and motels wouldn't also be a reduction if you went to 62.2.

MR. MILLER: And I'm not sure what your

point is?

MR. NESBITT: It just seems they are far more like a residential occupancy than a non-res. But --

MR. MILLER: Okay. I acknowledge your comment. I --

MR. ALATORRE: Yeah, what we're doing is we're staying in line with what the 62.1 and 62.2 Committee have made. They made their choice and we're just staying with that.

MR. NESBITT: Okay.

MR. ALATORRE: Thanks.

MR. HODGSON: Mike Hodgson, ConSol representing CBIA. Good morning, Mark.

MR. ALATORRE: Good morning.

MR. HODGSON: Just kind of a quick question on 120.1(b), where we're talking about the air filter having a depth of two inches. I presume the rational for that is to decrease pressure drop across the filter?

MR. ALATORRE: Yes.

MR. HODGSON: All right. So my concern is in multi-family, pancake units, which are put in the hallway, they're very tight in space. Have you talked to the manufacturers of those

units who can get a two-inch filter into there?

MR. ALATORRE: I think you're saying that in high-rise multi-family, it's going to be more difficult?

MR. HODGSON: No, in multi-family in general, there's very limited space there, Jeff. You know, in design you probably have 18 to 22 inches. And now we're adding an inch? And I'm just wondering if you've talked to those manufacturers to see whether or not they can --

MR. ALATORRE: Manufacturers of what?

MR. HODGSON: -- of the pancake HVAC units, it's like a hydronic unit, to see whether or not it would fit. And if not, is there a solution where you could specify a minimum pressure drop against the filter and let them go with one inch?

MR. ALATORRE: There are solutions. You can build a plenum around the pancake unit and provide a larger surface area filter. It's one solution that I've seen. There may be others.

MR. HODGSON: Right. But would that then also drop it an inch in depth? I mean, this is looking the mandatory requirement that your filter must be two inches in depth?

MR. ALATORRE: Yes.

MR. HODGSON: Right?

MR. ALATORRE: That's what's currently is proposed, yes.

MR. HODGSON: And I'm just saying is there a solution? I'm fine with it, as long as there's room. I don't know the answer to the question. If you guys have checked great, if not there may be a solution that the manufacturer comes up with, where they could get a similar low-pressure drop with a one-inch solution. Would that be acceptable? That's my question.

MR. ALATORRE: We could consider that.

MR. HODGSON: Okay. So my recommendation -- I have no language. I'm just thinking we need to talk to these manufacturers, because it's such a dominant part in our market right now --

MR. ALATORRE: Okay.

MR. HODGSON: -- and make sure that they can meet the two inches, thumbs up, we move forward. If they can't, maybe there is a kind of performance metric that you come up with on pressure drop, which is the issue here to resolve the problem.

MR. ALATORRE: Okay.

MR. HODGSON: That's my only concern.

MR. ALATORRE: Okay. Thank you.

MR. HODGSON: And real quick, I know you probably caught this already, but your page 169 120.7(b)4, a little typo on pounds. It says 9S instead of 95. I'm sure you'll --

MR. ALATORRE: Yeah. No, I did catch that when I was reviewing this thing.

MR. HODGSON: We'll submit all these comments too.

MR. STRAIT: And please give us all the typos you spot, because nothing's perfect. I already know there's one embarrassing one in 10-106. (Laughter.) So if you spot them, let us know.

MR. WICHERT: We do have a question online. Philip, I'm going to unmute you. Please state your name and affiliation. Thank you.

MR. HOLLANDER: Yeah, sure. My name is Philip Hollander, from Baltimore Aircoil Company. I have a question that is on 120.6, regarding adiabatic condensers.

I was curious if you could go into more detail about why the performance criteria were established to be the same as air cooled

condensers, rather than there were evaporative condensers or something more unique to them themselves?

MR. ALATORRE: The CASE Report that was submitted came to these conclusions and said that there was more data that was needed, that the technology was more in its infancy than it was in a maturity. And they don't want it to create requirements that would prohibit any kind of growth of this type of system. So they left it kind of for when you're operating in dry mode to hit these targets. And they thought that it was easily doable for the technologies that were available now.

MR. HOLLANDER: Yeah. I'm not sure if whether it is or it isn't possible to achieve it. But I think there may be some concerns with putting the requirements in that, I'll say on that metric. Because it's a little odd that it's being measured on the metric of another technology rather than on its own, because on a summer day, on a warm day for a lot of the year, it's not running dry. But yet the performance efficiency criteria are as if it was another product.

MR. ALATORRE: Okay.

MR. HOLLANDER: And so by measuring it this way, it could potentially lead to manufacturers somehow relabeling air cooled condensers as adiabatic. And then because the numbers are lower than an air cooled, because the product when running wet is much more efficient. And so by measuring in that same way, but with a lower target assuming that it's going to run wet, somehow someone could try to substitute something instead of it; if that makes any sense?

MR. ALATORRE: No, it does. So you're talking about the 45 BTU per hour, I mean yeah per watt, 45 BTU per hour per watt (indiscernible).

MR. HOLLANDER: Correct. The reason why that works is because when it's wet it's much more efficient. So it would seem as if having some metric for when it's running wet would be more in alignment with what it is. And would avoid anybody from trying to substitute or come up with something strange that would ultimately will result in facilities, whether it's in Section (b) or (c), in facilities using more energy than what was analyzed in the case study.

Because I think in the case study, the whole analysis was based on the assumption that it is running wet for whatever percentage of the year.

But in here it doesn't really seem to reflect that, unless I'm missing something?

MR. ALATORRE: No, yeah it does and all the requirements are for when it is running in dry mode.

And again, the analysis they didn't want to make any determination of performance in the wet mode, because they felt that they were going to kind of put limits on this tech, going forward. But please submit your comment. You and me can have a dialogue about this and see if there's something more appropriate.

MR. HOLLANDER: Okay. That sounds good.

MR. ALATORRE: Thank you, Philip.

MR. HOLLANDER: Yeah, also I have something prepared. I'll submit that. Thank you.

MR. ALATORRE: Thanks.

That's it? Okay.

MR. BOZORGCHAMI: Are there any other questions from the audience? If not, for some funny reason we're ahead of schedule big time.

So I think we should maybe start moving on the afternoon presentations and maybe have Peter do the Section 130s, the mandatory requirements for lighting systems and electric power distributions.

MR. STRAIT: I'm happy to.

MR. BOZORGCHAMI: Let's take a ten-minute break real quick, if possible. Mazi's tired.

(Off the record at 10:32 a.m.)

(On the record at 10:46 a.m.)

MR. STRAIT: All right, so this next set of slides is on Section 130. This is non-residential, high-rise residential and hotel/motel occupancies, mandatory requirements for the lighting systems and equipment, and electrical power distribution systems. I'm going to again -- much like the other presentations, this is a flyover view. Your homework assignment is to go and read the actual language if you are so possessed and to give us good comments on it.

So starting off, Section 130.0, we rewrote the entire section for clarity. This was a general request that we had related to the lighting controls language or lighting language to make it read better and be clearer to a

reader. Most of these changes are non-substantive. I'll highlight here where we've made an intentional substantive change.

The biggest change that we've made in this section is that we allowed recognition of the installed lamp wattage. Previously, Title 24 ignored any installed lamps and said this luminaire is going to be rated at the worst possible performance it could have.

Now we're saying the lamp that is installed there, you can consider that for compliance. This mainly applies to a lot of screw-in or removable LED products that we know have upwards of a five-year life time and very efficient performance.

We've also updated the track lighting language that we have to refer more broadly to modular lighting systems. This accounts for new modular approaches, primarily LED tape lighting and LED remote ballast systems.

There's still kind of an open question. We've received some commentary about what to do about power over Ethernet systems. We're considering that internally. But right now, the main intent of the changes here is to broaden

that approach and look at the -- basically what is your bottleneck on that system and that'll be what you're going to be rated by.

In 130.1, once again we rewrote the existing sections for clarity. We aligned the automatic shutoff requirements to Building Code Section 1008. 1008 has to do with minimum levels of egress lighting and right now we had some automatic shutoff that would say turn lighting completely off in areas that Section 1008 would say you needed some minimal amount of lighting on at all times there's an occupant anywhere in the building that might use that route as a means of egress.

So that does mean that there are more areas potentially that are required to have partial off behavior, instead of full off behavior. But that's also if there is a dedicated egress lighting system, separate from the general lighting, then that wouldn't apply.

We moved demand response of control requirements to Section 110.12. We moved them. We didn't fundamentally alter them. We added a new Section, 130.1(f) to describe and clarify the expected interaction to lighting controls.

One thing we're very often asked is you are asking to install five different types of controls that do different things, how are they supposed to relate with one another? So we've tried to put something in code that specifies, "These are now they should permit the other controls to act."

We did add occupancy sensing as a requirements for restrooms in Section 131(c)3. And we clarified some of the daylighting requirements in Section 130.1(d) relating to overhangs and to atrium spaces.

I've got a few slides here to show the change we've made for daylighting. The skylit daylit zone here, you'll notice there's some spillover on this top floor. But on these lower floors we're not extending the daylighting zone sideways in the same manner.

Similarly, if you don't have spillover on this top floor, you continue to not have spillover on these lower floors. It's simply the area that's going to receive skylight on the bottom floor.

And the biggest changes here, where instead of the size of the opening determining

all the way down to the bottom floor what your daylit zone is, if you have an overhang that's limiting some of that it's going to be the size of that vertical area inclusive of different occlusions that occur between the top and the bottom.

For Section 130.2(c), our outdoor lighting controls, we deleted section 130.2(a). That was motion sensor controls for certain types of legacy light sources that really would not be installed under current lighting power allowances.

We modified section 130.2(b). We now simply refer to Part 11 for the outdoor luminaire bug requirements. This is to avoid duplication in the Building Code. And also, only the backlight and uplight requirements were able to be adopted in this section where the glare requirements really complete that package where it will be adopted in Part 11. Now, Part 11 includes all of that language and we simply need to point to it rather than having it stated in two sections.

We modified Section 130.2(c). This consolidates and revises outdoor lighting

requirements. Outdoor controls shall now be capable of first turning off outdoor lighting when daylight is available same as before, but it's more clearly stated.

Secondly, dimming and/or turning off outdoor lighting during nighttime when the area is unoccupied. This was formerly called part-night behavior. And we're trying to use some simpler language to refer to it. And we're currently proposing that you can accomplish this through automatic scheduling controls and/or motion sensing controls.

I'll point out here that we've also had some commentary already from folks who've downloaded the document that there are some areas where really you do want to require that occupant motion sensing and not allow someone to just use an automatic scheduling control. We're considering, much like we do in the indoor controls a section or paragraph following that would say, "In the following circumstances, you are required to use the occupant sensing."

And third, we allow override of automatic scheduling controls for up to two hours. That's just to be consistent with our indoor

requirements.

And just to give you an example of how we've managed to simplify and clearly state this language, this is now the entirety of Section 130.2(c). There's a lot less detail, but it captures nearly all of the same requirements. And if there's more nuance that we need to add, like I said to add a part three down here to say where occupant sensing is required, we'd like your feedback on that. But, you know, brag a little bit about the good job we did drafting this code.

For 130.4 lighting control installation certificate requirements, we removed Sections 130.4(b)3 and 4, relating to certification requirements for line voltage track lighting integral current limiters and supplementary over-current protection panels.

We no longer require that example products be submitted to the Energy Commission, and manufacturers just certify product information, partly based on the clarification we've made for modular lighting systems and partly based on just -- again, this is a fairly robust technology at the moment. And it doesn't

seem to make as much sense as far as people to be submitting physical products to the Energy Commission for us to inspect.

I want to clarify though the acceptance testing is still required for these systems that happen to use those components, under the general requirements of 130.4(b)1. And we are interested in feedback on acceptance test protocols for modular lighting systems that can be added to NA 7.7. Again, based on the changes we've made in the 130.0.

For Section 130.5, the electrical power distribution system, the only change we've made is to move the demand response controls and equipment again to Section 110.12. We're trying to consolidate all of those.

And that's the entirety of the presentation that I've got. Anyone that has any comments on the changes that are being proposed for these sections, please step up to the mic.

MR. KNUFFKE: Good morning and thank you very much for that speedy overview and allowing us so much time to make commentary, because it definitely is appreciated. Charles Knuffke, with Wattstopper-Legrand, a couple of items that I

noted and just I hope you don't mind if I go through these one at a time.

But 130.1(a), so previously there had been an allowance for in addition to, or rather a switch in a space was required, but you could have it if it was a pilot light someplace else. And I see that definition of those spaces has been expanded. And I think that's a good thing. I think that designers should actually be allowed the latitude of putting those devices wherever they want.

However, what's now missing is the key switch. So there was language in there that talked about switches that are accessible only to authorized personnel. And working with specifiers quite often, the spaces that that comes up regularly in, is two or more stall bathrooms, stairwells and corridors, and parking areas where you don't necessarily want to have a key or switch that is accessible to somebody just walking in the area.

I'm just wondering, why did that section get deleted?

MR. STRAIT: Again, the intent was not to remove that. It might have been moved, because I

don't have that language on the screen in front of me. I thought we had retained those allowances to place it in an area that is only accessible to authorized personnel or requires a tool for access. That was the phrasing that we used. I can take a look at that, but the intent would be to retain that.

MR. KNUFFKE: Excellent, because it's not there. So appreciate that.

MR. STRAIT: Okay.

MR. KNUFFKE: Jumping to 130.1(c)1. So this is where we define that there are automatic shut off controls. One of the items that's called is occupancy sensing, automatic time switch captive key or other control functions. A captive key switch is not an automatic shutoff control device. A captive key is merely an interface to a scheduling system or an occupancy sensing.

With the language the way it is right now, somebody could just put captive keys wherever they wanted to and then leave those on 24/7. So I'm sure that wasn't the intent of the Code. I just wanted to point out that that was something that was there.

MR. STRAIT: Certainly. Actually, the intent there was that we allowed captive key for hotel/motel spaces. And it wasn't clear if that should be limited to those spaces, if there are other areas that made use of the captive key system, mainly industrial, people on the floor doing things. If it made sense to say, "When that person is no longer in the space, they have to take that key with them, therefore that's going to cause the lighting to shut off," treating it as equivalent to having other things that shut off the lighting when the person's left the space.

If you feel that would not be appropriate then that would certainly be a comment that we would like to have.

MR. KNUFFKE: Very good.

In regards to section 130.1(c)3, this is the areas where occupancy sensing controls are required. In the 2016 Code language was added so that -- to take advantage of the spaces that had dimming controls in there. Where when you had a dimming capability or a code mandated dimming in a space that instead of the lights turning automatically 100 percent on, that they were

either manual on or partial on?

MR. STRAIT: Uh-huh.

MR. KNUFFKE: That section now is gone and that seems like that's a substantive change, because that was to me one of the major energy saving devices we had was making sure that in certain spaces when somebody walked in to drop a letter on a desk, the lights didn't turn on for 20 or 30 minutes.

And additionally, speaking of 20 or 30 minutes, the code requirement previously had moved the time delay to 20 minutes. And the new code in the, I believe it's Section 110.9, now is calling it out as 30 minutes.

MR. STRAIT: Right. So there was a conflict in 2016 where that level was specified in one place to be 30 minutes and in another place to be 20 minutes.

And it is a non-substantive change to go with the more permissive. When there is a conflict like that and a reasonable person reading the code, what they will say, "This seems to allow me 30 minutes, this seems to say 20 minutes, I'm going to choose to do 30 minutes." We wouldn't be able to put that person in front

of a judge and say this person broke the law. So that way that this was a non-substantive change is to have it at the 30-minute level because that would be consistent with the conflicting requirements in 2016.

If it's preferred to move them universally to 20 minutes, we could look at going in that direction.

MR. KNUFFKE: And quite honestly, I thought it had. But to me, the bigger issue with the language is the lack of now partial on or manual on in spaces. People have paid for the dimming capability, the ability to go partial on or manual on -- the fact that it was in the 2016 Code -- to remove that seems like the entire code, the goal of moving forward with energy efficiency, this is actually a fairly significant step back.

MR. STRAIT: Well, we can look at that. I know that there's -- we looked closely at when we were requiring a partial on behavior and if there was consistency there and if that made sense.

I know that we had looked at whether language strictly required that the controls

operate in that manner or not. Or if it was simply much like we had some permissive language for partial off, where say you can turn to a dim level or to off, meaning that a full off control would technically satisfy those requirements.

For those it wasn't clear whether mandating partial on behavior or rather back up a little bit -- we have had some questions about whether automatic on controls are allowable under the code or whether they are prohibited in California by the Energy Code. The intent of the California Energy Code is not to prohibit an automatic on functionality. So I know that was part of what we're looking at when we looked at partial on and manual on behavior.

Mandating a partial on capability, I think was just not well embodied in that code, but we can look at language that might hue closer to what was required in 2016. I know there was an issue though with mandating it.

MR. KNUFFKE: As I'm sure, myself and many others applaud the idea of trying to clarify the code, making it simpler to understand. However, where we've tossed the baby out with the bath water, and in this case I do believe the

energy savings that was being rewarded by partial and manual on would be considerable, and at exactly the time of the day when you wouldn't want to lights turning on. So just appreciate the comment and the opportunity to possibly look to see if that was an error.

MR. STRAIT: Sure.

MR. KNUFFKE: Section 130.1(c)4. This is the section now that talks about going to what was a partial off, is now there. By calling out those areas, what I saw was the partial off requirement. What I didn't see clearly was that those lights still have to go off when nobody's there.

MR. STRAIT: Again, that's because of the issue here with the automatic shut-off requirements aligned to Building Code 1008.

So there are areas where we were requiring lighting to go off, where Section 1008 says those lights are not allowed to go all the way to off if there's anyone in the building. So we've had to look closely at how to align that language.

MR. KNUFFKE: But those wouldn't have been egress areas. When we're talking about

things like warehouse aisles, open areas of the warehouse, those would not typically be an egress area. So I understand completely why the code changes are being made to try to accommodate egress areas. But the idea of not turning the lights off in a warehouse seems like, again that is a -- the way I'm reading it looks like that is allowance. If I'm reading it wrong, please let me know.

MR. STRAIT: Sure. I know that for those areas, they are allowed to have partial off controls. They are not required to go full off. That's consistent with what's in 2016.

MR. KNUFFKE: Right, but at some point when the building is empty the lights have to go off. That's the way the Code is right now in 2016 and I don't see that that's where the requirement is in the current -- the draft language in (indiscernible).

MR. STRAIT: I'll reexamine that. My understanding is that that section is consistent with the 2016 Code, but if there's a discrepancy, we'll look at getting that fixed.

MR. KNUFFKE: In regards to exterior lighting, so the significant reduction came with

one exception that I was kind of surprised about, which was that there was an entire list of lighting -- there is a mention made that says now all lights going off, based on daylight. I understand that completely, that there was this additional requirement of lights going to a partial off based on 50 percent or lower, when they are in an unoccupied period.

There was a whole list of lighting types though, that were exempted previously from these things. And those were the things that were called out in Section 140.7 and that included items like temporary lighting, landscape lighting, public monuments, ATMs. I was just surprised that that exemption that was in the code before wasn't carried forth in the section that we're talking about.

MR. STRAIT: Sure. We're looking at whether it makes sense. Again, this is to dim or turn off lighting. It's trying to strike the balance between having a simple code that applies pretty universally to say these are what the controls should be capable of. And if a person wants those controls to behave that way or not, it's up to the operator to say, "I'm going to say

this is landscape lighting. I want have it at this level for this period."

So from our perspective, we would like the controls to always be capable of enabling those behaviors. And then turn it over to the person that's actually making use of the space to say, "How would I like to configure these controls?"

MR. KNUFFKE: And what I would suggest is just taking a look at that list again in 140.7. Because trying to make capable of, for temporary lighting or ATMs that are -- it just seems like that would be an additional cost that maybe wouldn't serve as a payback.

The last item I believe that I've got on my list for the override. I understand that the desire of trying to match what's going on in the interior, which is a two-hour override with the exterior, the only issue that I would caution about is in the interior you pretty much know where your switches are. For exterior lighting, where are those override switches going to be mounted?

So I do know that oftentimes, when somebody is doing something, they're doing --

they're cleaning the floors inside the building and they're going to be going in and out to the trucks constantly. You know, to try to find an override switch to turn on the exterior lights might be a problem. So there is one key difference between interior and exterior. And that's if you've got a wall to put them on that's clear.

So I'd just offer a caution on that about trying to mandate a two-hour off, without making it clear and easy for somebody to be able to turn it back on.

So thank you very much for the opportunity to make the commentary to the Commission.

MR. STRAIT: Certainly.

MR. FLAMM: Gary Flamm. Thank you, Peter, for making that presentation. The Building Code, section 1008, I think that was the number?

MR. STRAIT: Uh-huh.

MR. FLAMM: I've not read that.

MR. STRAIT: It was formally Section 1006 in the most recent. In the 2016 version, it's 1008.

MR. FLAMM: Okay. So what would expect from that is a very broad interpretation, because any building, some time of the year can be assumed to have an occupant in it. So I would expect that to be a significant loophole. And I'm not sure if you've considered that.

MR. STRAIT: We did. We actually had to talk to the State Fire Marshall and determine what the appropriate language would be, because unfortunately the State Fire Marshall's guidance will trump our language. And previously the Fire Marshall had, on some occasions issued guidance to say ignore that section of the Building Code, because you need to comply with Section 1008, or 1006 at the time.

MR. FLAMM: Well, I just believe that's going to be a significant loop hole. All the egress lighting will be on all the time.

Another thing is the track lighting, all the language that was deleted. Historically that language was put in there to constrain the use of such products to only track lighting. And I'm wondering if the changes are going to allow current limiters and supplementary over-current panels for all lighting systems. I'd have to

really look at the language to consider that, but the red flag that went up for me was, "Will this then allow such products for all lighting systems?"

MR. STRAIT: The current language still uses that it has to be a modular lighting system that allows the lighting to be changed without any rewiring. So that same phrase about track lighting where you can add or remove lighting without rewiring the system at all, still applies.

So if it's non-modular systems, your normal ordinary wired circuits would not be able to take advantage of a supplementary over-current protection panel, in order to de-rate the installed value that they're coming up with.

MR. FLAMM: Okay.

MR. STRAIT: If there's a better way to phrase that, please do submit that in comments, but the intent is to still say this is only applicable to modular systems, where again it's snap on/snap on kinds of things such as track lighting.

MR. FLAMM: Okay. So I will look at it and mull over that. Thank you.

Okay, again Charles Knuffke brought up about controls not accessible to unauthorized personnel. There are a lot of spaces where one wouldn't want a stranger to turn the lights off. And I would just ask that you relook at the language and make sure that there are not some safety/security issues there.

MR. STRAIT: Yeah. If it's not present in the published language, that may be an error. My understanding was that we were still retaining that language that said, "For those spaces, you can have a control that's not accessible to unauthorized personnel." So I'll take a look at what happened to that.

MR. FLAMM: Okay. Thank you.

MR. NESBITT: George Nesbitt, HERS Rater. Can you explain a little bit more on the issue of screw-in bulbs and using the installed wattage, rather than an assumed wattage?

MR. STRAIT: Certainly. This is a change we made in 2016 to residential lighting, to say we can look at what's populating the socket. Instead of just saying that's a screw base socket, we're going to assume incandescent.

Right now, with current federal law,

again with some uncertainty given for the current Administration, the current federal law already prohibits the incandescent lighting that we were worried about.

In addition, we've got a lot of questions about LEDs to say we just want to be able to use just screw-based LEDs. And right now a screw-based socket is assumed to have a 50 watt incandescent bulb in it, which is far too punitive. So the question is can we do something similar on the non-res side as to residential?

We no longer have the fear that we had as recently as six or three years ago about those bulbs fleeing. About the second the building inspector leaves, the expensive bulbs get taken out and cheap ones get put in.

We think if the building starts with LED lights we can be confident those things are going to be in there for five or ten years. And in five or ten years' time when they get replaced, they're going to be replaced by even more efficient LEDs. So we have less of a concern over going back to the socket and saying, "Because the socket is a line voltage screw base, it's necessarily going to end up with an

incandescent in it." And are more comfortable saying, "Whatever that original lamp is, you can start there for the purpose of rating that."

MR. NESBITT: Okay. So in non-res, what is the assumption if you have a screw-in outlet to wattage?

MR. STRAIT: Under the 2016 Code, I believe it's assumed that each of those is a 50 watt lamp.

MR. NESBITT: Okay.

MR. STRAIT: Assumed as a 50 watt lamp.

MR. NESBITT: Although certainly, it's legal to buy higher wattage than that in incandescent or halogen bulbs.

MR. STRAIT: Yes. If you're asking where did we establish those values at, I couldn't tell you. But I know that now most of those bulbs are illegal under state and federal law, a majority of those high-wattage bulbs.

MR. NESBITT: Okay. I'm just wondering to what extent if on the one hand, the nice thing about a screw-in bulb is you can change technologies. You can change wattages. You can change light temperature to fit needs better. As opposed to a pin-based technology, you're pretty

much always stuck with that technology and that wattage, without making changes.

So to what extent, assuming that the initial installed wattage is reality, that that would encourage people to put in more screw-based and actually maybe put -- whether that ends up meaning they put in higher wattage and even swap out.

I've had electricians tell me, "Oh yeah. We put that in to meet code, but we're going to take it out." I mean, that kind of thing goes on a lot. I mean we can't completely eliminate it. I'm just wondering to what extent we're creating sort of like an easy loop hole for someone to drive large trucks through.

MR. STRAIT: Well, again right now if there are efficient LEDs populating those sockets when the building inspector comes through, we think there's a minimal chance of those being different by the time somebody moves into the building. Certainly we do want to make it so that folks have an easier time updating their lighting, when it comes time to do so. And especially we're seeing now there are LED prices also integrate. It's also a Wi-Fi hub. It also

provides some other services. It's color tuning and color dimmable.

As this lighting technology evolves, having that additional flexibility, we don't think it's going to result in less efficient lighting, because we're seeing the LEDs are become more and more popular. And so the idea that it's going to snap back to a florescent or an incandescent or halogen technology, we don't have the same concern we would have had five years ago.

So I mean, it's a valid comment to say it is certainly a worry that we also have, that we're giving this allowance. We're simplifying compliance, we're simplifying installation, at the cost that somebody could walk that backwards and install less efficient equipment than when we first looked at the building.

On the one hand it's not necessarily that different than if somebody starts with an efficient HVAC system and then when that equipment dies in 12 years, they bring in a less efficient system. So it's a risk. It's one that we're saying we think it's appropriate to take.

But if your comment is maybe that's not

appropriate we'd certainly like to get public feedback on the record to see how people feel about it.

MR. NESBITT: Yeah. I mean, I don't know to what extent you might want to limit its use. Just have some limit or some assumption of watts per square foot or whatever, that essentially you can't just put everything into all of your lighting in that.

But anyway, the other issue I want to raise although it's not technically controls, but I just don't see anywhere else to put it, is issue with outdoor lighting and the calculation methods for figuring out your allowable wattage.

MR. STRAIT: Oh, that's actually in 140, so Section 140.3 and 140.6. Later on we'll talk about the lighting power allowance discussion.

MR. NESBITT: We are, okay. Okay. I'll talk about it later then.

MR. STRAIT: Yeah. Not that I don't want the comment, but there is a presentation for that.

MR. BOZORGCHAMI: R.J. is anybody on?

MR. WICHERT: I'm going to go to an online comment. Tanya, I'm going to unmute you

now. Go ahead and state your name and affiliation.

MS. HERNANDEZ: Okay, high. This is Tanya Hernandez with Acuity Brands. Can you hear me?

MR. STRAIT: Yes, we can hear you.

MS. HERNANDEZ: Great. Thank you.

So thank you Peter, for the presentation. I will tell you it went by so quickly my head was somewhat spinning. So you'll have to forgive some of the comments that are more questions than probably comments.

MR. STRAIT: Sure.

MS. HERNANDEZ: The first thing was in the agenda, it actually states that in what looks like Section 130.0, allowing lamp efficacy to be used in determine light power density. I am assuming that you meant wattage there? I didn't see anything about efficacy, but I want to make sure I did not miss anything.

MR. STRAIT: So in terms of determining whether following the normal procedure in Section 130.0 for determining wattage for comparison against the allowed lighting wattage for the space, I think possibly using the word efficacy

was incorrect in the agenda.

MS. HERNANDEZ: Okay. Great, thank you. There was in Section 130.2(b) where it is reduced -- and I don't think you addressed this one at all -- it's the exemption that moved it from a 150 watt lamp to 30 watts, yes?

MR. STRAIT: Yes.

MS. HERNANDEZ: Okay. So there, that being an 80 percent reduction, even though it's based on the aggressive efficacy level for LEDs, we'd like to comment that we think that 30 watts is every severe, especially given what the technology will do. And because this is outdoor lighting, where there's way more builders just equally as many distribution requirements that will effect efficacy that we think 30 watts is a little too steep for that.

I wanted to also make the comment about backlight with a BUG rating. I want to make sure Part 11; is that CALGreen or no?

MR. STRAIT: Yes.

MS. HERNANDEZ: Okay, great.

MR. STRAIT: CALGreen, just to clarify, has both mandatory provisions and voluntary sections. These are part of the mandatory

requirements in CALGreen.

MS. HERNANDEZ: Okay. And so my question is because now backlight requirements are being added where they were not there previously, would that require some type of cost effectiveness or additional review?

MR. STRAIT: No. They're being moved, so they're still part of the Building Code, they're simply in a different section of the Building Code.

MS. HERNANDEZ: Okay. All right, and I think that was it for that section. Thank you.

MR. STRAIT: Thank you.

It looks like that's it for the online comments. I think this is going to be the last presentation we have before -- oh, we're only at 11:15.

Payam, do we want to go ahead and have an earlier lunch or how do we want to continue?

MR. BOZORGCHAMI: I think we should have an earlier lunch. What do you guys think; 12:30 or 1:00 o'clock to be back here? 1:00 o'clock. Okay, I got 1:00, so let's take an early, longer lunch and be back here at 1:00 for the second half of the afternoon. Thank you.

(Off the record at 11:17 a.m.)

(On the record at 1:04 p.m.)

MR. BOZORGCHAMI: So we're going to start the afternoon on the performance prescriptive requirements for nonresidential in Section 140. Mark Alatorre is going to start with that and when we get to the lighting sections, we're going to switch it and Simon's going to do a discussion on that or presentation on that, excuse me.

MR. ALATORRE: Good afternoon. My name is Mark Alatorre. I'm an Engineer with the Building Standards Development Office. And I'll be presenting the mechanical systems in 140. I'm also going to talk about the changes to the Envelope Section, 140.3.

Most of these changes were clarification. The items that we wanted to point out were clarification in 140.3(a)3 where we clarify the exception to the roof construction with a weight of at least 25 pounds per square foot, that it was dependent on weight, not the thermal mass. The current 2016 language had a term "thermal mass" in the exception, which is not the case. It was really based on the weight of the roof assembly rather than the thermal mass.

Updating Tables 140.3-C and 140.3-D to align with the new thermal mass definition that's in 120.7,

where the threshold is 95 pounds per cubic foot, so whether you're being considered as a light mass or a heavy mass.

140.3(a)5, this had to do with fenestration. We added an exception for demising walls. That they are not subject to the fenestration requirements for SHGC when you have fenestration in a demising wall, an interior wall.

All right, now we're into the mechanical systems. So 140.4(a) and (b), the changes here were to accommodate the healthcare facilities now that we are bringing those into the scope of Title 24.

And what we did here, we with worked with OSHPD and the edits that were made here are not new requirements. It's consistent with what's current practice. And all the changes that we made were to give healthcare facility designers direction on where to get their design information, you know, for occupant densities and what not. And most of it's pointing to other sections of the California Building Code.

And again we worked with OSHPD on this language specifically, so it shouldn't be a surprise to anybody. It's right along with what's currently being done.

We are proposing, in 140.4(c) to adopt new fan power calculations. This was originally meant as

alignment with 90.1, however the actual numbers that are in Table 140.4-A for fan power limitation, those numbers are not consistent with 90.1; they're a little more stringent. And those numbers are based on what is currently under the 2016 and what was under the 2013 assumption for the standard design.

So if anybody that was complying, using the performance approach in either 2013 or 2016 Standards, the standard design assumed specific fan power. And those numbers are what are being proposed in the table. And again, it's more stringent than what's currently in 90.1.

The change in 140.4(d), there used to be an exception that allowed for re-heating or re-cooling of air. And it was a pretty detailed exception on the specific scenario when it was allowed and what load was required by the control system. And it just seemed inappropriate to being in an exception, so what we did is we rearranged 140.4(d) to basically make it an option for compliance instead of an exception to the section. And so it looks like a lot of new language, but in reality it's just getting rid of the exception and putting it into the actual standards language as an option.

140.4 for economizers, so expanded the water economizer requirement to not just forced air systems.

Currently, it was limited to chilled water systems that used forced air. So now, it also includes chilled water cooling systems without a fan or with induced air flow. And for those types of systems there's Table 140.4-C, which has system capacity thresholds for when the water economizer would be triggered for the non-fan systems.

Also, once a water economizer is used, there's new language for the performance of the water economizer, so limitations on pressure up. There's a maximum pressure drop. It has to be less than 15 feet of water, or there must be a secondary loop to bypass the heat exchanger when the economizer is not in use.

And also, there's language to explicitly require full integration, so that way it provides partial cooling when you could still benefit from some economizing.

140.4(h)5, this is a new requirement for a cooling tower efficiency. And it's limited to open circuit cooling towers that are greater than 900 gallons per minute or 900 gallons permitted and greater. The minimum efficiency of that tower must be 80 gallons per minute per horsepower.

There are exceptions to this requirement: towers serving Climate Zones 1 and 16. And also in the alteration world if the existing tower is roof mounted or

inside the building or in, I think we use the term building mounted towers, they would not be subject to this requirement.

Duct leakage, we made this change again because of the healthcare facilities coming under the scope of Title 24. Currently, the way OSHPD handles duct leakage is they've made amendments to the California Mechanical Code. And so we just made it explicit there that we expect duct systems in hospitals to still comply with the California Mechanical Code requirements, as amended by OSHPD.

And again, this is not really imposing a new requirement on the industry. This is something that they already are doing.

140.4(0), the basis of this measure was an addendum to 90.1. And it sets limitations on the amount of conditioned air that is delivered to a space and that space, having mechanical exhaust.

The limitation is as follows: the conditioned air shall not exceed the greater of supply flow required for the heating or cooling, or the ventilation rate, or the amount for mechanical exhaust minus available transfer.

And the reason why this is a requirement is according to the author of the addendum that they're

doing peer review of other engineer work and they noticed that this was not the case, that people were supplying conditioned air and not using available transfer. And so they felt that it would be easily complied with if there was a prescriptive requirement. And it just goes into good design practice.

Along with this requirement, we added a definition for what is considered available transfer air, so I brought it up here just to highlight it. We define it as, "The portion of total outdoor ventilation air that is not required to satisfy other exhaust needs, or to maintain pressurization of other spaces and that is transferrable, according to Section 120.1(g)."

If you guys were here in the morning, you know that 120.1(g) is where we have the air classification section and recirculation limits and transfer air limitations. That's out of 62.1.

All right, so now we're going into the service water heating section. Currently, the requirements point to 150.1 for these types of spaces and within 150.1, there's a requirement for multifamily to comply with a solar fraction, using solar thermal. The proposal is to give an exemption for buildings of five stories and higher. And the analysis that went into that showed that buildings of four stories and less would still benefit

from solar-thermal, while it's not practical for buildings bigger than that.

That's going to conclude my portion. Before we jump into the lighting, I wanted to pause and take questions or comments now, before we switch off.

MR. GOODMAN: Aniruddh Roy, Goodman. Thank you Mark, for this presentation, I just had one question on fan power limitation. Could you walk me through what was behind the decision making to go more stringent?

MR. ALATORRE: Yeah. So under our ACM rules, the alternative calculation method, there is a standard design and a proposed design. The standard design is (indecipherable) for compliant building. And for the 2013 cycle and the 2016 cycle, the assumption for fan power is what we are proposing to be formally incorporated into the prescriptive requirements. That's the basis of that decision.

MR. GOODMAN: Okay. But in terms of the stringency compared to 90.1, what was the decision to go higher, I guess? That's really --

MR. ALATORRE: Our thinking was that currently, people are being compared against that already. People complying with Title 24 now using the performance approach, are already being compared against that level of stringency on the fan power. So we think that because

people are already complying with it on a performance level, that it's appropriate to bring it in as a prescriptive requirement now.

MR. GOODMAN: Okay. And I may have missed it, but was that captured in the CASE report, like that decision making?

MR. ALATORRE: Yes.

MR. GOODMAN: Okay. Thank you.

MR. ALATORRE: Sure.

And I'll just point out that at the end of the -- Simon's going to come up and discuss some lighting things. I'll come back on for the last part of 140, 140.9. And at the end, there'll be another chance for comments if anybody has something that they're pondering and they want to ask later, that's fine.

Next would be Simon Lee. He's going to discuss lighting.

MR. LEE: Thank you, Mark, for presenting those early sections. And I will continue on lighting sections 140.6 first, and 140.7 second. And then I'll hand it back to Mark to continue on section 140.9.

In this code cycle LED lighting is used as the baseline for both indoor and outdoor lighting power allowance. The complete building method, the area category method, and the tailored method have all been

updated with modify lighting power density values.

For the complete building method, they are added to the building occupancy types. Similarly, for the area category method they are added to the primary function area types. For primary function area types not listed, our reasonably equivalent type is permitted to be used for the area and the LPD values.

Table 140.6-B is for complete building method. Some of the changes to the table are shown on this presentation slide. For complete building method, besides the update to the lighting power density values they are also added to add new building types such as assembly buildings.

So let's look at one example for a minute. Assembly buildings as defined in Section 100.1, is a building with meeting halls in which people gather for civic, social or recreational activities. A combination center building can be qualified as an assembly building.

Table 140.6-C, this is for area category method. So this table contains the lighting power density values for different building functional areas. Besides the update to the LPD value, the other important changes to this table is the addition of two new columns to the right-hand side of the table.

One column here is for the qualified lighting

systems. And other column shows the additional lighting power for the qualifying system. And this is important that I would like to point out, as it relates to the next slide. So this additional lighting power is use it or lose it. Let's look at two examples: auditorium and open office.

For auditorium, additional lighting power is provided for ornamental lighting. And it is .30 watt per square feet. Accent, display and feature lighting is allowed for an additional lighting power of .20 watt per square feet. And this additional power is use it or lose it. Another example is office area, for office area and additional lighting power is provided for portable lighting for .20 watt per square feet.

Table 140.6-D for the tailored method, again they are modified values on the lighting power allowed. I have just listed one of the areas, auditorium area. There are some other function areas that are no longer listed in this table for tailored method. The reason being is that there is already additional lighting power provided under area category method.

And let me switch back to one slide. So this is the area category method. So to the far right-hand side, those are the additional lighting power. And let me come back to 140.6-D, so continuing on tailored

method.

There are two other tables for tailored method that I want to mention here: Table 140.6-E and Table 140.6-G. For Table 140.6-E, we have updated with modified adjustment factor for wall display and for display lighting. On Table 140.6-G, we have added with modified general lighting powers values by room cavity ratios and general illuminance.

Section 140.6(a), this is for calculation of actual lighting power. I will skip over the first bullet point as I have talk about briefly early on. There are two new subsections added to Section 140.6(a). They are 4B and 4C. 4B is for tunable lighting, which covers tunable-white lighting and dim-to-warm lighting. This subsection is for small aperture luminaires as small aperture luminaries can use as much as double the power as the fixed CCT luminaires.

Subsection 4C is for wall display and floor display lighting under the tailored method.

I'll switch gear a little bit and we'll talk about daylighting devices for power adjustment factors. This is a new subsection under 140.6.

The qualified daylighting devices for this subsection, for these new requirements include clerestory, light shelves and horizontal slats. I want

to point out that there are two sections actually related to this daylighting device measure. One is in Section 140.3-D. And the other part is Section 140.6(a) and Table 140.6-A. For the performance requirements, they are in Section 140.3-D. For the power adjustment factor values they're in Table 140.6-A. So on the slides, the power adjustment factors for these DYs (phonetic) are shown.

I have just highlighted the changes in Section 140.6. I will pause here and open the floor for comments and inputs.

MR. MARTIN: So I am John Martin from the International Association of Lighting Designers. Nice job and I would like to just use this opportunity to raise a couple of sort of ancillary points, Simon, to what you've outlined.

With respect to lighting power density calculations in general, on a long-term basis these are fine. Most people would be able, given solid state lighting, to comply with them. On a longer-term basis, though, we would urge the Commission to commission some studies to look at what are the performance impacts of these requirements on humans in spaces that meet the requirements. That is, what is the impact on human comfort and productivity?

Aside from the savings and energy, I realize this isn't technically within the strict purview of the Commission, but the Commission's involved in the driverless vehicle business. You might as well get into some other things too.

Also, as a general effort I would commend you to continue the work of aligning your power density requirements with other major energy codes that are used in the United States and elsewhere. So for example the closer you come to both the space-type definitions and the values of ASHRAE/IES 90.1, that makes life better for everybody who's involved in the lighting business, because it reduces the confusion and temptation to assume that there's something to evade here, rather than just simply getting on with what are accepted to be valid values.

So good job, keep it up. Extend your thinking little bit. Thank you.

MR. LEE: Thank you, John, for the comments.

The staff at the Commission, we always look out on new research and new findings. And this topic of the lighting impact to human health is definitely on our radar. And then in terms of aligning the requirements with other energy codes, one of the major codes that we have paid close attention to is ASHRAE and so we'll

continue this effort.

MR. KOTLIER: Good afternoon. My name is Bernie Kotlier and I represent the California Labor Management Cooperation Committee. We represent thousands of contractors, electrical contractors, in California and tens of thousands of electrical workers.

I know I'm a little bit out of order here, but because the agenda was advanced I wasn't able to make some comments on some earlier lighting points, which I would like to do now as a catch-up, if that's okay?

MR. LEE: Certainly.

MR. KOTLIER: Thank you. So first of all, I'd like to support for vacancy controls. In the current 2016 Code we have manual on, auto off, vacancy type controls. What we're seeing in the 2019 Code is that some of those requirements have been removed.

For 2019, we support a mandate for specific areas, for vacancy controls. Without those manual on, auto off types of controls, we will have significant energy loads that could be easily saved.

I'll just give you one example. There are certainly probably hundreds, but one obvious one is in schools. If we're just relying on a scheduling pattern and timers for turning off lights, if someone forgets to do that for a holiday we could have a whole week or

multiple weeks where those lights are on. It's just common sense to have vacancy controls. And they're in the 2016 Code and we'd like to see that continue in the 2019 Code.

The second point I'd like to make is also something that's in the 2016 Code that we're not seeing in 2019, that seems to have been changed and that is exterior lighting occupancy sensors. They are required in 2016. Apparently they're being dropped in 2019. It's proposed, from what I can see that it goes to a scheduled system.

And once again, this is a very similar situation. Occupancy sensors are going to save a lot more energy than a schedule system. And the industry strongly supports continuing with the 2016 requirement for occupancy, as opposed to a scheduled system. Thank you.

MR. STRAIT: Thank you.

A quick two points on the presentation for Section 130, for 130.2, for the outdoor controls? We've already received commentary and we're looking at adding in matching requirements that specific spaces have occupancy controls specifically and not simply be allowed the scheduling controls. We're looking at phrasing that the same way as it's phrased in Section

130.1, so that issue has been raised. We're already looking at how that might be done.

Regarding the vacancy sensors we had that conversation with Charles Knuffke and we did some research and clarified with them over the lunch break.

Right now the 2016 Code requires that when you have occupant-sensing controls -- that if you have a sensor in the space that can tell you whether the space is occupied or not -- you can either have them as a vacancy control, meaning that they have a manual on function. Or if they have automatic on, that it'd only be partial on, that it only would turn on the lighting to a certain percent.

The current code is you can have either manual on or auto on without that limitation. And if it's auto on that it only come on of between 50 or 70 percent. We can look at adding -- again since the intent was not to change those requirements, we can look at adding a quick sentence or a section that says when you have multi-level controls and an occupancy sensor in the space, and you have automatic on as a function that the automatic on be capable of coming on to between 50 and 70 percent, matching the requirements of the 2016 language.

So that's what we're currently looking at, on that. And I just wanted to make sure to keep the

conversation moving. We are looking closely at that and seeing what can be done.

MR. BENYA: This is Jim Benya, Benya Burnett Consultancy, advisers to the Commission team.

Getting back to 140.6, one of the things I wanted to point out, that people don't know some of the stuff's going on in the background. Excuse my voice. I just gave an all-morning class. It's mud.

But one of the things people don't know that's going on in the background is that CASE Team has used the same spreadsheet system that is used by ASHRAE/IES. In fact, it's using the same spreadsheet. For those of you who know these things it's called the "Big Ugly Spreadsheet," or the BUS, because it is rather large and it's very complex. But that spreadsheet was used by the CASE Team and working with staff we reviewed every one of those values to make sure that we felt they were consistent with our understanding.

And for the most part the values that are embedded in the current draft standard we're looking at are virtually identical to 90.1 in many, many ways. So you may find small differences, but you're not going to find big differences.

MR. MARTIN: So John Martin, IALD again. That's a great comment, Jim. I would point out that the

IALD and the IES -- the Illuminating Engineering Society, which is the cosponsor with ASHRAE of the ASHRAE/IES 90.1 Standard -- and ASHRAE, along with the British Colombia Power Authority are funding a study to validate the values that are derived from the BUS, the Big Ugly Spreadsheet, because there is great suspicion on the 90.1 Lighting Subcommittee that the values are not entirely valid in given modern equipment.

And I don't want to go into a lot of detail about a pretty technical topic, but I would say that to the extent that the Commission can continue to keep an eye on what the 90.1 Lighting Subcommittee does over the next year as it learns the results of this validation study, which will be undertaken starting around the 1st of November and will conclude in the middle of June next year. That's a great opportunity to just sort of everybody check the numbers and see if we all still think they make sense. Thank you.

MR. STRAIT: There is one issue there that we will likely have already progressed the rulemaking to the point of adoption before June, so we might not be able to incorporate the results of that study. We are of course, interested in paying attention, but the timing might be an issue.

MR. MARTIN: That's certainly understood, that

the timing could be an issue. I think that the bigger issue here is as we go through every three-year code cycle, if the ASHRAE/IES 90.1 Committee by this time next year says, "Woops, we've got about a 15 percent correction to make in the many of our values," or some number. I have no idea what it will be. That'll be plenty of opportunity for California to take note and say, "Hey, we've got to make sure we do something about this in '22," or whenever.

MR. STRAIT: Absolutely. Actually, that's part of the purpose overall for the Building Code, of having a triennial cycle, is to be able to stay that agile, so absolutely.

MR. MARTIN: Thank you.

MR. MCHUGH: John McHugh, McHugh Energy. I thought I'd just mention a little bit more the harmonization between the ASHRAE committees and the CASE Team. So this spreadsheet that was used, as Jim points out, was the BUS. We actually changed it a little bit and called it the VAN, because we actually compressed the spreadsheet, used the same equations but fixed broken links, did a number of changes to the spreadsheet, including the wall wash model that's in there is now based on different -- before the wall wash model it was based on one value. And now we have wall wash

calculations that vary by the various luminaires.

The updates to the Standards, in addition to just the values in the spreadsheet as Jim knows, we didn't blindly just use the spreadsheet. It went through a very significant review including review by the 90.1 Committee, because we took many of these same recommendations to ASHRAE 90.1. They were too far along in the process. And then we took that to ASHRAE 189, which is the Green Building Standard. So there's been a fairly significant amount of harmonization with ASHRAE, using the same mechanism and the same inverse lumen method to calculate the LPDs.

One area where we're not in harmonization and actually would provide some additional energy savings is that for the open office, open plan buildings, portable lighting is exempted in ASHRAE. We actually provide a credit, so that it's essentially fairly much the same thing. But ASHRAE, in exempting their portable lighting, they require that it be placed on either a time switch controller or an occupancy control. And this harmonization has added controls, I think makes sense, because those are one of those areas where lights get left on when people leave. Thank you.

MR. BENYA: All right, just Jim Benya, just to respond to John Martin. The process of the BUS and now

the VAN has involved IALD professionals who have significant design background and fairly seniority in the profession.

And nothing's going to be perfect. This is trying to turn lighting design into numbers and values in a spreadsheet is a dangerous leap at best. But we had at least two IALD professional members either involved in developing that or reviewing it. And I'm glad to hear that there's going to be a validation process, because the Big Ugly Spreadsheet, which was invented in the late 1990s by yours truly and a number of other members of the Committee, probably has needed that for a long time.

So that's very, very good news and I will do my best in supporting the staff to embrace anything that comes out of it as quickly as possible. So thanks for bringing that up, John.

MR. WICHERT: We actually have a question online, Simon.

I'm going to go to you, Kelly. I'm going to unmute you now. Go ahead and state your name and affiliation.

MR. SEEGER: Hi. This is Kelly Seeger, from Philips Lighting. Can you hear me all right?

MR. WICHERT: Yeah, we can hear you.

MR. SEEGER: Okay. I just have a couple of

comments. First, I wanted to thank the Commission for the opportunity to have this workshop and to be able to comment. We really appreciate the engagement and the sharing of ideas and sort of the development of the standard.

Where I wanted to comment was on the classification, the luminaire classification and power language. And we've been going back and forth with -- have been going back and forth with the CASE Team in the development of this. And I know Simon, you and I, we also had a meeting discussing multi-channel LED systems. And we actually still have a lot of work going on in this section, and of course taking into account the people in the space and health and well-being.

And I guess our concern is around the small aperture description of these types of luminaires. In the work that we're doing, it's much broader than that. And we're speaking about this in terms of the built environment, specifically in patient rooms and the patient experience environment. And so I would ask the Commission to further consider and discuss what types of luminaires might be on the market in 2020, when the standard is adopted?

We think that that tunable light systems and also systems for circadian support are going to be pretty

readily available. And they're going to be in all shapes and sizes and there's going to be a lot of changes going on and a lot of refinement. So we would hope that the Commission would look at that and perhaps think more about that term "small aperture" and how that is potentially limiting to innovation that comes out in many shapes and forms.

And as far as the patient room on limit, the lighting power density of 0.55 that's proposed, that is true that it is very close to ASHRAE 90.1 2016. I believe the number there is 0.62, for instance. And I agree with Jim Benya. The numbers are very close.

I can say now as the new Chair of the Lighting Subcommittee of 90.1, we are embarking as John Martin has said, on a very ambitious effort to really look closely at all those values. And it's a validation, but it's also an evolution of the Standards. You know, it's taking the standards from looking at these numbers and having a couple of people comment.

And as Jim said we do have a number of lighting designers who are very well known and very well versed in all things lighting, who've been working on this, but we realize that we need to evolve. We need to take advantage of AGI and other methodologies to really put numbers out there that are going to make sense, so all of

the LPDs are under consideration right now. So I just want to also bring that to the Commission's attention.

And since 90.1 is a continuous maintenance standard, kind of all the time we are looking at new ideas and evolving things, so just to keep that in mind as well.

So those are just the couple of comments that I had. Again, I thank you for the opportunity.

MR. LEE: Thank you, Kelly. Just a quick response on small aperture luminaires, the reason being we are focusing on just the small aperture is because on the other side, large aperture, the efficacy of large aperture is very close to the rest of the LED luminaire products. So that's why we decided that there is no need for additional lighting power for small aperture luminaires.

And then the other comments about a patient room, so we'll take it into your comments and we'll look at that internally in our office.

MS. SEEGER: Thank you.

MR. LEE: Thank you, Kelly.

MR. KNUFFKE: Charles Knuffke, Wattstopper-Legrand, just wondering is there a definition for what counts as a small aperture luminaire? I was checking in the definitions section and I don't believe I found one,

so I was just wondering what the qualification would be for a small aperture?

MR. LEE: Yes. There is a definition for small aperture luminaires, if their width is four inches or less. For all luminaires that is a requirement, but let me turn back to the actual language.

MR. KNUFFKE: Okay. Thank you very much.

MR. FLAMM: This is Gary Flamm. I want to talk about portable lighting, the allowance.

Back in 2008, I believe it was, the Energy Commission demonstrated that offices almost always had portable lighting, at least 0.2. So what the Energy Commission did was subtract 0.2 watts per square foot from the ceiling. And then give a quasi-credit for 0.2, as a way to encourage low general ambient task lighting systems.

And I believe that's been quite confusing, because the Commission has always all planned portable and all planned permanent lighting to be accounted for. But in open offices there was an assumption that at least 0.2 was being used. And I found it curious that Jon McHugh brought up that 90.1 exempts portable lighting in offices. And if the Energy Commission is interested in simplifying the standards, that actually sounds like a more elegant way to deal with portable lighting than what

is currently there. Thank you.

MR. LEE: Thank you, Gary.

Charles, I found the section for your inquiry. It's in Section 140.6(a)4 under tunable white luminaires and dim-to-warm luminaires. So there is a definition requirement on what is considered to be a small aperture.

I hear there's no more comments, so we'll continue on Section 140.7. This is the section for prescriptive requirements for outdoor lighting. The updates in this section includes modify lighting power allowance for general hardscape lighting and specific application lighting.

The slides on the screen shows a portion of the update to Table 140.7-A with modified LPA values. And besides the updates to the LPA lighting power density values a lighting power allowance is added for narrow band spectrum lighting, where we cry by local or state laws. No band spectrum light sources are less efficacious than broad band spectrum light source and that's the reason we provide this lighting power allowance. And usually narrow band spectrum light sources are required for mentally sensitive areas such as astronomy observatories and natural habitats.

Table 140.7-B, this is for specific application lighting. And we have also updated the LPA values in

this table.

So those are my two slides for Section 140.7. And I will pause here and open the floor again for inputs and comments.

MR. BOZORGCHAMI: If there's no comments we're going to move on to Mark Alatorre again on the mechanical systems.

MR. ALATORRE: Okay. For the changes to the 140.9 there was nothing -- well, I'll mention the changes to the computer room section. We added a trigger for computers rooms that are compliant using an air economizer, that they also incorporate the FDD on to that economizer. And we make a reference to the 120.2(i).

Other than that, there were no other changes to these two sections other than add exemptions for healthcare facilities. That was again working with OSHPD and getting their input on the applicability of these sections in healthcare design.

The significant changes to 140.9 happened and (c) is now titled "Laboratory and Process Exhaust Systems." We added a requirement, 140.9(c)2 to align the exhaust system transfer air to what's written, the new proposal on

140.4(o). And that's to set limitations on the amount of conditions that are being supplied to the space at head height exhaust. That way they take advantage of available transfer.

The other requirement in this section is the 140.9(c)3 and that's for the system. It's titled "System Power Consumption," and this is only for labs spaces that have exhaust systems greater than 10,000 CFM. The requirement is for these systems to meet the discharge requirements of ANSI Z9.5-2012 version, and they will have to comply with one of the three following requirements.

One, being that the fan system power be less than or equal to 0.65 watts per CFM or that the exhaust system be variable air flow and the speed be based on wind speed and wind direction from a building mounted anemometer. Or that the exhaust rate be variable based on measured contaminate concentrations from contaminant censors in the exhaust deck.

The fan system power consumption section comes also with a new acceptance test. The acceptance test is applicable only for the systems that choose to comply using the wind

speed and wind direction, or the contaminant censor approaches.

Still in 140.9(c) there's a new subsection, (4) and this would be for automatic closing fume hood sashes and the trigger would be on fume head intensive laboratories. There's a new Table 130.9-B, which characterizes the type of laboratories that would be considered fume hood intensive.

And the automatic feature of the closing sash must be capable of the following: They must be able to detect people with a dedicated zone presence censor and the zone would be directly in front of that hood.

Also, the controls -- have controls that prevent closing against a force of 10 pounds, so in a case of an accident and it's starting to close and somebody puts their hand in or something like that, they can hold a resistance of 10 pounds and it would stop it from automatic closing.

Also, be able to detect transient materials or anything in the way or any obstruction in the way of the sash that would prevent it from closing.

Along with these requirements also comes an acceptance test to verify proper function of the sash control, the automatic sash control.

That concludes the 140 Section. I will now open it now for any questions or comments on these new proposals.

MR. WICHERT: I have one online.

Joe, I'm going to unmute you now. Go ahead and state your name and affiliation.

MR. CAIN: Thank you, Joe Cain with Solar Energy Industries Association. And I am backtracking a bit to Section 140.5 "Prescriptive Requirements for Service Water Heating Systems" and 140.5(b) "High-rise Residential Hotel/Motel." You are indicating that new Exception 2, buildings of four stories or greater are not required to comply with the solar fraction requirement of Section 150 dah-dah-dah. (phonetic)

So the question I have is we still have the goal of Zero Net Energy Commercial by 2030. Now, this is high-rise residential hotel/motel, but with the Zero Net Energy goals of course what catches my eye is providing an exception that would say you are not required to meet a solar

fraction requirement. And the first question of concern is, is that kind of going away from the goal?

And I think also specifically these buildings typically have a lower ratio of skin. You know, in the building envelope they typically have intensive hot water demand based on the higher density of occupancy. I also understand they in some cases, have a more congested roof space.

But I'm interested to hear a little bit more about why that new exception would be in there to just eliminate the requirement. And if there is some concern, or that the requirement is difficult to meet whether the Commission would go on the path of exploring some alternative rather than just an exception. Thank you.

MR. TAM: Hi, this is Danny Tam, Building Standards staff. So that was a requirement that went in to the 2013 Standards.

So over the years we received a few comments for really tall buildings, it's very difficult to next to impossible to meet that requirement. For example, like a 40-story building just doesn't have the roof space to meet

the solar fraction requirement.

So for that reason we looked back in the original CASE reports, so they did look at high-rise residential, but only at four stories. So that was the reason why we picked five stories as the exception. But we're open for additional comments.

MR. STRAIT: Yeah, this is Peter Strait, the Supervisor. I would reiterate that. The question isn't whether there's some ratio of roof space to building space where a percentile fraction of the heating load is not the right approach for solar requirements. The question is what is that dividing line, so we know we have to have some forward specification to say after this height or some other demarcation that a solar fraction is just not possible to be met.

If, again and we're going back to the CASE reports to say we have justification for here, but beyond this we actually don't have what we feel would be necessary to impose that requirement. So that's as Danny said, that's where that exception is coming from.

MR. CAIN: This is Joe Cain again. Is there other alternatives that can be explored

rather than just saying it's hard to meet, so we're going to eliminate it?

MR. STRAIT: In order for us to pursue an alternative we would need basically a code change proposal. So certainly probably not in this code cycle, but if there is something equivalent that might be proposed, again in service of the ZNE goal for 2030 for nonresidential or similar, we would encourage you to take a look at that template. It's available on our website. And look at possibly submitting a code change for 2022.

MR. NESBITT: George Nesbitt, HERS Rater. In the San Francisco Bay Area there are a lot of multi-family projects with solar hot water, new as well as existing buildings that have been retrofit. And many of them in the five and six-story.

And if that's a prescriptive requirement -- well, most compliance is not prescriptive. So it really plays in, in the performance and the budget. So it doesn't seem like it really should or is a big barrier.

MR. ALATORRE: Thank you, George.

Mazi real quick, one thing I wanted to

point out is in the draft language that's posted I believe it says the exception is four stories and up. In reality, it should be five stories and up. That way we can include the four-story high-rise.

MR. STRAIT: Okay, if that sounds like a typographical error, it should be "greater than four" instead of "four or greater."

MR. ALATORRE: Okay.

MR. SHIRAKH: Yes, Mazi Shirakh. You are still online?

MR. CAIN: Yes, I'm still online.

MR. SHIRAKH: So if you have any suggestions for other alternatives let me know, we'll look at it.

MR. CAIN: Okay.

MR. SHIRAKH: Thank you.

MR. CAIN: Yeah, it's interesting. I mean hearing the comment that if I want to submit a code change proposal it would not be in this cycle, but would be in the next cycle. It seems that one possibility would just be simply to not add exception to the standard.

And I think there are various types of systems, and I think what the Zero Net Energy

goals are going to have to be getting creative about, how to apply renewables. So I'm sure that I will issue some public comment on this. I probably need to give it some more thought.

MR. STRAIT: Certainly, and actually I should clarify, if it's a proposal for a completely new requirement that hasn't been seen we might need a (indiscernible) who is available to absolutely please talk to staff. And get Mazi any suggestions you might have about reasonable alternatives.

MR. CAIN: Okay. I'll give it some thought. Thank you.

MR. ALATORRE: Okay. We're going to meet Laura online. Go ahead.

MS. PETRILLO-GROH: Hi, sorry. I was double muted. Can you all hear me?

MR. ALATORRE: Yes, we can.

MS. PETRILLO-GROH: Thank you.

So this is for Mark and backing up a bit to his first presentation --

MR. BOZORGCHAMI: Excuse me, Laura, can you announce yourself?

MS. PETRILLO-GROH: Oh, yes. I'm so sorry, Laura Petrillo-Groh for the Air-

Conditioning, Heating and Refrigeration Institute.

So during the fan system power proposal or presentation of the draft language, you know I appreciate that the justification for the increased values for 90.1 is in the Draft CASE Report. But also within the Draft CASE Report for indoor air quality, it was noted that many of the analyses had been conducted with the MERV 9 filter or maybe it was set at a previous rating.

However, I was wondering if CEC has gone back and looked at the impact of the fan system power with the proposed air filter level of MERV 13?

MR. ALATORRE: Yes, I believe the Final CASE Report does have the MERV 13 assumption in it.

MS. PETRILLO-GROH: I look forward to seeing that. Thank you.

Also, the original proposal was for MERV 13 filters to be installed in a location with an outdoor quality of, I guess of PM 2.5 nonattainment areas was the language I believe that was referred to. That would require that enhanced filtration. It seems that the current

proposal exclusively -- well this is on MERV 13 for all spaces -- is there any information in the Draft CASE Reports about how much of California experiences this air quality that is of concern and requires in CEC's opinion, the enhanced filtration?

MR. ALATORRE: Yes, if I'm remembering correctly the CASE Report, the Final CASE Report does give a discussion on that. And through our communication with the CASE Team we had a dialogue and we found that according to the Cal ARB attainment maps, that the majority of the state in the high-population areas is considered to be in nonattainment for PM 2.5.

And if you look at PM 10 the whole state is nonattainment for PM 10. And if you look at the performance of MERV 13, it effectively removes both PM 10 and PM 2.5 at a very efficient rate. If you go anywhere below, like if you went to the 11 or MERV 8 categories the PM 10 efficiency drops. And so what we're really targeting is not just PM 2.5, but PM 10 as well.

MS. PETRILLO-GROH: All right. Thanks Mark, I appreciate that and I look forward to

looking at the CASE Report.

MR. ALATORRE: Thank you, Laura.

MR. MCHUGH: Yes, this is Jon McHugh. Just following up on the question, there's a Table 140.4(b), which has a specific allowance or pressure drop adjustment for the MERV 13 filters. I'm not sure Laura was aware of that, but --

MR. ALATORRE: Yeah, I think her comment was more on the analysis for energy savings. It wasn't assuming the 13 power drop; I mean the adjustment factor for 13. It was using the adjustment factor for 9.

MR. MCHUGH: Okay. Thank you.

MR. ALATORRE: Thanks, Jon.

MR. BOZORGCHAMI: So, Kelly?

MS. CUNNINGHAM: Kelly Cunningham, PG&E and CASE Team, just a reminder to Laura and everyone that the Final CASE Reports as they stand now are available on title24stakeholders.com for download, and have been for a few weeks. So if you weren't able to find them there, there is a link from the Commission site. There is a link from the different energy, different utility sites, but they are on the site. So you can download them

and read them there in public. Thank you.

MR. ALATORRE: Thanks, Kelly.

MR. BOZORGCHAMI: So with that, we're going to take a ten-minute break real quick and get back to doing lighting alterations in Section 141.

(Off the record at 2:07 p.m.)

(On the record at 2:18 p.m.)

MR. BOZORGCHAMI: We're going to start with Section 141, the Additions and Alterations Section for Nonresidential Buildings.

MR. CHAU: Welcome everybody back from break. Thank you.

So I'll be starting Session 141.0, which is the nonresidential high-rise residentials and hotel/motel occupancies. This is the additions, authorization and repair.

Throughout the two sections 141.0(a) and (b) we made some non-substantive additions to those two sections. I just want to point out a couple of the changes here as examples. We substituted the thermostatic controls for the thermostat currently in the 2016 and we also clarified exception to the Section 141.0(b)2Bi and ii is dependent on weight, not on thermal

mass.

MR. BOZORGCHAMI: Thao, can you go back to slide 1 for a second?

That Exception 2 is the discussion on thermal mass roofs, so since if you have a low-sloped roof and you have the roofing product more than 25 pounds per square foot or a thermal mass roof you're exempted from the cool roof requirement. A thermal mass roof doesn't exist; it's a mass roof, so it's based on the weight. And the weight is that 25 pounds per square foot.

MR. CHAU: Thank you.

So Section 141.0(b) continues, so here we did one major merge of the three current sections: 141.0(b)ii, (j) and (k), which are the entire luminaires alteration, luminaire component modification and the lighting wiring alteration into one single simple section with the name of the "Altered Indoor Lighting Systems." So just one section for all of the lighting alternation projects.

We updated Table 141.0-E, which is the control requirements table to be clearer and more readable. And we also made some small adjustments to Options 2 and 3 just to simplify

and streamline compliance options.

So then Option 2 is now in the new Section 141.0(b)2Iii, it's kind of weird but -- So we reduced the lighting power, that's the limit for Option 2 from 85 to 80 percent for a full allowance. We're allowing the Option 2 to have the same requirement controls for option iii. And we also limit Exception 2 to apply to spaces with one luminaire instead of the two or fewer.

Lastly, we made some improvement as well to the Option 3. So there is a new requirement here, which limits Option 3 to lighting projects that are 5,000 square feet or less. Otherwise Option 3 cannot be applied and we also use 40 percent uniform lighting power reductions to all occupancies instead of the 35-50 split currently in the 2016 code.

So here is the current sample language that we have for all of the lighting projects. We shrank it down to half a page. This is all of the lighting system for alterations: i is their Option 1, ii is Option 2, and iii is Option 3. So you can see that's extremely simplified and reduced in terms of our effort to continue to

streamline and make the language more easy to understand, easy to apply, that kind of thing.

This Table 141.0-E, we made improvements to this table. This is the control requirements for each of the indoor lighting systems, so every control is called out specifically pertaining to what section and under what option it is applied.

And what's most important here is that Option 2, which is the second to last column from the right, and the Option 3 which is the last column from the right -- they have identical requirements, so multi-level controls, daylighting controls and the demand response controls are not required under Option 3 and Option 3.

And last, modification to the Additions or Alterations Section is 141.1, which is the covered process for laboratory and process facility.

The main change to this section, similarly because of the new requirement in 140.9(c)2, 3 and 4 as Mark had discussed right before the break: so 140.9(c)2 is the limitations on transfer air for exhaust air makeup. Labs/process facilities with an exhaust system

greater or equal to 10,000 CFM must meet the requirement in §140.9(c)3. And lastly, the fume hood automatic sash closure, for fume hood intensive labs, which is the Section §140.9(c)4.

And that's all I have. If anyone has any common questions please come up to the mic, state your name and your affiliation. Thank you.

MR. NOLAN: Hello, my name's Luke Nolan, Central Coating Company. I'm a commercial roofing contractor with offices in Madera and San Jose.

I wanted to talk about a section that was in the '13 and '16 codes that is not being proposed to be looked at for '19. And talk about kind of what the real-world implications or implementation of that, that we're seeing and propose that the exceptions be looked at for '19.

The code currently has a requirement that when the roof of an existing commercial building is replaced that insulation will be added to that building. Then that is modified by exceptions that are quite broad. And what we're seeing day to day is that those exceptions are broad enough that nearly -- almost no buildings are required to have insulation added to them. And that

includes the buildings that are very poorly insulated, in fact uninsulated.

And because of this we're also seeing that building departments are not aware of this section. It's not something that we're being asked as roofing contractors to document how we intend to add insulation or what exceptions might exist that would require us not to meet that requirement. So it's been there for two code cycles and we're still having some of California's worst buildings not added, not having insulation added to them. We make them white, we add cool roofs. I can tell an owner, "I've upgraded you to Title 24, but you still have an uninsulated building."

All I would propose is that we look at the exceptions for the '19 cycle and we're not trying to change every building out there, but just take California's worst commercial buildings and bring them up to some level of insulation. Thank you.

MR. BOZORGCHAMI: So, Luke let me just bring the history on to this.

The code says if you're doing a roof replacement, a low-sloped roof, and you're going

to the building nonresidential versus residential you have to double check and see what the insulation level is. Is it either R8 if it's a nonresidential building or is it an R14 if it's a high-rise residential or a hotel/motel.

Back in 2008 when we were developing the 2008 code cycle under Charles Eley being the proponent for this. We proposed this and what happened was we had the Roofing Contractors Association, the insulation industry, they came unglued on us. I think Jon, you were very active on this and I remember Mazi, we were dealing with this.

The issue was the curb height, not just for the mechanical system, but it was for the skylights and the penthouses where they store the mechanical systems up on the roof and so forth, not the living spaces per se.

We're having problems meeting the curb height issues (indiscernible) to the insurance companies that were participating at the time said, "If you go below an eight-inch curb height we will void the warranties. Okay, water comes through. One of the drainages is blocked. We're going to void that warranty if it's not eight

inches or greater."

So the Code said, "All right, fine. We get it."

If you already have an R7 insulation, I think Jon you did the cost analysis on that? I don't remember.

MR. MCHUGH: (Off mic - indiscernible)

MR. BOZORGCHAMI: Okay. So Jon McHugh did the cost analysis on it and Charles Eley, at the time did the analysis on it that says if you already have an R7 below the roof deck or an equivalent U factor, .089, it's not really cost (indiscernible) to go to an R8 or an R14.

Or if your curb height is eight inches or we don't want you to put more insulation, because now the building owner has to deal with the whole insurance and all the other fiascos that goes with it. So we said you try to maximize the amount of insulation that you could put up there, but also keep the eight-inch curb height.

So that's where the history of this came. For this code cycle if you have any studies or if you have any verifications or any type of CASE report is what we call it, I'm willing to look at it. If not, then most likely this is something

that we could revisit in 2022.

MR. NOLAN: Well, we'll certainly follow up.

MR. BOZORGCHAMI: Okay. Fair, enough.

MR. NOLAN: I understand what you're saying about the curb heights, but that is not something that we encounter.

MR. BOZORGCHAMI: Yeah, but I'm in a situation that the cost is an issue when the mechanical system -- what the Roofing Contractors Association and insulation guys came and told us is, "The cost for the homeowners have to take on to get the crane to come out here to lift the mechanical system, to add the curb height or to adjust the penthouse wall or the parapet wall and to be able to seal that proper is just not there. So we prefer not to go there."

And they brought the case to the Commission. It was a last-minute decision the Commission had to do at the time, because well that's what it was.

MR. NOLAN: Of course, we'll follow up in the interest --

MR. BOZORGCHAMI: Sure.

MR. NOLAN: -- of everyone's time, but

just in closing there's a disconnect between just looking at above-deck roof insulation, which is what those sections talk about. Many, many or probably most California buildings also rely on non-continuous below-deck roof insulation.

And if you have high-quality, very well installed fiberglass batt or whatever type of insulation below your deck, that should -- I can certainly say that's good enough. But what we see are buildings that are nearly uninsulated or very poorly insulated and I think those should be looked at.

MR. BOZORGCHAMI: I agree with you.

MR. NOLAN: Thank you.

MR. FISCHER: It's Mike Fischer with Kellen and I'm representing the Asphalt Roofing Manufacturers Association and the Polyiso Insulation Manufacturers Association as well as the Center for Polyurethanes Industry.

On this whole discussion of re-roofing and roof replacement, I think there is an opportunity to look at improving the language. And I would say those exceptions are something that we jokingly say you can drive a truck through.

And there are very creative yet simple ways to deal with those problems. And that's called tapered insulation. If you're using a spray foam like Luke's company you can add thickness in other areas and you end up with an average (indiscernible) --

MR. BOZORGCHAMI: Sure, and then you get water ponding.

MR. FISCHER: -- there are ways to accommodate that. Well, you can do crickets and saddles and direct water towards drains. So there are ways to resolve this, but what I'm here to say is there is a disconnect between the Building Standards Code and the Energy Code. And that's what I'm going to put in some public comments.

Under the Building Standards provisions there's only two types of re-roofing: either a roof recover where you don't remove anything and you put a new roof covering down, or you do a roof replacement in which case you have to go all the way down to the deck. And that's a requirement for insurance purposes, for fire performance, as well as for structural wind uplift.

That's in the Building Code and what is included in these exceptions in some cases is allowing what's called a partial tear-off. That the Energy Code is essentially saying you can do this. The Building Code prohibits that, so we've got to resolve that disconnect. And I think we want to come up with hopefully some suggestions in the public comment process that may give us a way out.

MR. BOZORGCHAMI: So Mike, you were here earlier this morning when I admitted I accidentally deleted that note under 100?

MR. FISCHER: Right.

MR. BOZORGCHAMI: Well, that note supersedes which is better, safety or whatever. And so in that situation it becomes a re-roof. It's not a tear-down or tear-out pretty much you could say, for repair purposes.

MR. FISCHER: Well, the definition of re-roof in the Building Standards says it's either roof recover or roof replacement.

MR. BOZORGCHAMI: Okay.

MR. FISCHER: And so there isn't such a thing as partial, it's either --

MR. BOZORGCHAMI: Yeah, but the Building

Code doesn't say you have to put insulation either. The Energy Code does.

MR. FISCHER: Right.

MR. BOZORGCHAMI: And so does the North American Roofing Contractors Association protocol and so does the single-play roofing industries. They want you put that insulation there, but do the building officials verify that? I don't know. I think some of this is going to be some education to the local jurisdictions.

MR. FISCHER: Yeah, there is a job. Yeah, the national model codes have a requirement that if you have insulation entirely above the deck and you do a roof replacement, you must bring that roof insulation up to current code standard. California is horrifically, horrifically unprogressive on this issue, way behind the rest of the country.

So I think we have an opportunity as to what Luke said, and I'll arm wrestle with you over the Code language later, Payam.

MR. BOZORGCHAMI: Fair enough.

MR. FISCHER: But the reality is that I think we've got it -- we do have an opportunity, I think to fix it. To resolve the conflict and

then approve the existing -- remember 75 percent of roofs produced in the United States don't go on new buildings. They go on existing buildings and that's low-hanging fruit that we should be jumping on, so thanks.

MR. BOZORGCHAMI: Okay. Thank you.

So any comments on any other parts of the alterations section: lighting, mechanical? Going once, twice?

UNIDENTIFIED SPEAKER: Here he comes.

MR. BOZORGCHAMI: I knew you had it in you.

MR. KNUFFKE: Yeah, absolutely. I've never missed a code section that I didn't want to comment on, I'm sorry.

Charles Knuffke with Wattstopper-Legrand. In regards to the altered indoor, altered lighting systems, thank you very much. Having presented on the Code at least 1,000 times in the last two years to different groups and people we go through the Code, the Code is very prescriptive, very understandable.

And then we hit the additions and alterations section and it just seems like we have to completely switch gears and try and get

people to understand things. So I think that the approach that's taken by CEC is very straightforward. We appreciate the simplicity of it and look forward to actually training people on it.

There is one item in that section that does still have an exception for any enclosed space with only one luminaire. In talking to the Commission before, I had gotten an impression that what that really meant was where the entire project was in an enclosed space with only one or two luminaires according to the old code.

I would just hate to see that somebody who had a building with a lot of individual spaces, little study areas or things like that, that you're seeing in some of the building designs, that that would have a complete exemption to all aspects of the alterations section. So I just would point that out.

The second item that I'd like to bring up, and this is my Don Quixote moment to tilt at a windmill, which is circuit controls for receptacles and controlled receptacles. The current language in 2016 and proposed still for 2019 for entirely new or complete replacement of

electrical power distribution systems. That to everybody that I know says, you've got to basically remove load centers before you have an alteration where you have to put in plug load controls.

The manufacturers have certainly responded in different ways to offer plug load solutions that are relay panels, modules that connect to existing occupancy sensors, wireless controlled receptacles. There are more ways than you can shake a stick at to do plug load control and the fact that you don't have to do it on an alteration unless you completely replace the electrical power distribution system seems like it is a missed opportunity.

So I would offer up solely that a simple correction such as for entirely new or complete replacement of an electrical circuit, that circuit shall meet the applicable requirements of Section 130.5(d) would be a significant step forward. Especially as we're looking at plug loads being more and more of the energy usage of the building, so thank you very much.

MR. BOZORGCHAMI: Thank you.

MR. STRAIT: Oh, I can speak on the

single space, the one luminaire exception. There is a concern if we're requiring full suite (phonetic) controls, that is your entire compliance with 130.1 to control a single luminaire, whether that's cost effective. So we'll look at that.

MS. CUNNINGHAM: Kelly Cunningham, PG&E. One comment on simplification, thank you to the Commission for responding to all of the cries from the building community on simplifying the language of the standards.

So with that in mind, listening today, looking at how Option 2 and 3 for lighting alterations now is identical. And looking at the 70 luminaires and less that's also a trigger. Looking at the 5,000 square foot proposed cutoff line. Then just suggesting that in the next few weeks the Commission take one more look at reducing complexity and is Option 3 still adding enough value in comparison to what it causes in terms of having three options to teach in terms of the compliance improvement side of this once the Code is in effect.

So it's a suggestion. The CASE Team would be happy to look at savings tradeoffs

further and so on to support this if you want to continue. If not, then I'll leave it at that.

MR. STRAIT: So one clarification I can offer about Option 3 is that when it was proposed in 2016 part of the purpose of it was to offer an alternate method of determining the lighting power allowance for space. People were concerned that for irregularly shaped spaces like the conference room or hearing room that we're in today, that it becomes difficult to calculate with any accuracy what your watts per square foot would be, because to calculate on a square foot value is difficult.

Plus that made that square foot value prone to fudging. If I wanted to install more lights in the space, and I had a circular room I could say, "Well, it's a little bit bigger than you think it is." Whether somebody's actually going to go down and do that calculation and a building inspector say, "Oh, wait. You've oversized this room by 15 square feet," is difficult to say.

So we have this alternate route, because it was requested. People are saying, "We want an alternate way to do this." And it hits the same

target with that percent reduction, so at some future point it may not be necessary. But right now so far as we've been told by what was essentially a small business community is they want a different way to do this. And we might split that out to where you can say you have these two methods of determining how much lighting you can put in the space. And it's separate from what the control requirements are.

So it's kind of step one of getting there, is if we can make the control requirements the same we can then separate out the idea of how you calculate how much lighting you can install.

MS. CUNNINGHAM: And maybe there's clarification that could be made that that's the only thing that's different that may not be clear by looking at the table and seeing Option 1, 2 and 3. Somehow preserving that lighting power density calculation exception for that without adding the additional full option.

MR. STRAIT: Right, so the reason that we have it in that format currently is to facilitate this discussion. So if we made that wholesale of a change I don't think we'd get the same feedback. After this code cycle, we might look

at since we've had the discussion about whether these options should be different or not if people have agreed or are at least comfortable with them being identical then moving on to the next step in 2022.

MR. BOZORGCHAMI: Kelly, we'll take at though.

MR. STRAIT: Yeah.

MR. BOZORGCHAMI: For simplification.

MR. MCHUGH: This is Jon McHugh. I've just got a follow-up question related to this, just trying to understand the logic. Because my understanding is that nothing's required if you're altering less than 70 luminaires. And so multiple by around 100 square feet per luminaire, that's 7,000 square feet. And yet this option doesn't apply to anything over 5,000 square feet.

I mean, on paper saying well we're giving some additional choice, but the reality is it applies to something where you're already exempted. So what's the thought behind having something that only applies up to 5,000 feet, but really you're not required to do anything up to 5,000 feet? Thanks.

MR. CHAU: Do you want to make a comment

on that, Peter?

MR. BOZORGCHAMI: Do we have any comments from online?

MR. CHAU: We don't have any comment online. No.

MR. BOZORGCHAMI: Okay. With that I'm going to our last discussion topic, the nonresidential ACM -- or excuse me, not nonresidential -- the nonresidential dependencies and Mark is going to --

MR. STRAIT: Yeah. And I think there's on slide in there about the nonresidential alternate compliance method approval manual?

MR. BOZORGCHAMI: Yeah, and there's one slide there too at the end.

MR. STRAIT: Yeah.

MR. ALATORRE: So I thought I was going to be the last presenter, but apparently there's one more slide after me.

I'm going to present the changes to the Nonres Appendices starting with the Third Party Quality Control Program. So this is here mainly because we do have HERS verifications in nonres buildings, so there's existing language for what we call TPQCP. And so there were changes to the

res side and we wanted to mirror the changes to the nonresidential side. And it was for clarification mainly on the responsibilities of the TPQCP.

Included in the language was an emphasis on what was the original intent, and that was for contractors to be able to identify faults in real time while on the job site. And also, correct the issues when they find the faults, so and bring them into compliance prior to leaving the jobsite. That's what gives them the allowance of having increased sample sizes for HERS verification. And so we just wanted to emphasize that in the new language.

And like I mentioned, given that this is in the Nonres Appendices, I just wanted to make everybody aware that it was only applicable where HERS verification is triggered. This isn't applicable to any of the acceptance testers.

And moving on to a new section, given that now the proposal is for high-raise residential to comply with 62.2. We carried over the verification procedures that were in the residential appendix into this new section of the nonresidential appendix. The procedure's

identical, because we're anticipating that the ventilation is very similar. It's intended to be performed by the HERS Rater. And they're going to be identifying the minimum airflow rate as well as the kitchen range hood.

I just wanted to mention that we got the comment in the morning, the kitchen range verification. That's to verify that the kitchen range hood is listed in the ADRI Directory. (phonetic) And that the airflow that it's rated to pushes in compliance with the requirements from 62.2 and that it exhausts to outdoors. But that's a visual verification, not a measurement of the airflow passing through the range hood.

Also, there's another new section NA2.3. This is to give procedures for dwelling unit envelope leakage. Again, this is applicable to high-rise residential for when they are choosing the option of using a continuously operating supply or a continuously operating exhaust ventilation system. They have to perform this air leakage test to verify that they're not leaking more than .03 CFM per square foot of envelope area.

This procedure again is identical to

what's found in the Res Appendices and it's intended to be conducted by a HERS Rater.

Earlier, as Simon mentioned, there's a new section, 140.6(a)2L that gives allowance for lighting power adjustment factors. Along with that allowance also a new acceptance test gets triggered and it's intended for it to be here in 7.4.4. This particular procedure is applicable to Clerestories. The procedure involves verifying the height of the clerestory, the head height and the glazing height match the plans. And also to verify that the shading control is separate from the fenestration shading control.

What's published in the draft language in Section 130.4 does not yet have a reference to this section. And we intend to update that for anybody who is looking through the Standards.

Similarly, in that same section an allowance for power adjustment factors, there is a separate qualifying device for this measure, interior and exterior horizontal slats. And this is intended to be in 7.4.5 with a very similar procedure to verify slats are installed and the height is in accordance with what's on the plan, verify visible reflectance and visible

transmittance value match the plans and then to fill out the proper forms.

On the same topic of power adjustment factors in 140.4(a)2L, the third option there is for interior or exterior light shelves. They qualify for power adjustment factors and this is another procedure that's going to be added to the appendices. I believe it's going to be 7.4.6, not 7.4.5 and the verification is going to be to verify the light shelves are installed at the height according to the plans. And then again, verify the visible reflectance match the plan.

So here's a new procedure. This one is for the new FDD requirement for using DDC-based systems. Part of the proposal in 120.2(I) -- well, let me back up a little bit. Currently, FDD devices have to be certified to the Energy Commission. The new proposal identified that algorithms using DDC technology that's using a central management system the algorithms themselves are -- there's several people who could be responsible for them.

And it was unreasonable to assume that they would have the ability to have them certified prior to them being programmed in the

field. So there was an exception for those type of FDD technologies in the ones that are DDC based and not have to comply with the certification requirement. But that turned into a new acceptance test and this acceptance test is intended to go step by step through, and intentionally trigger false and verify that the algorithms that are programmed are able to detect the proper fault as they're outlined in 120.1(i).

There was some changes to the existing outdoor lighting controls acceptance test. The automatic scheduling control acceptance test was deleted as well as there as clarification to the procedures for the astronomical time switch control and part-night outdoor lighting control.

And these changes were to the construction inspection and that was just to verify that the controls programmed with and on schedule and an off schedule. And that it matches the construction documentation. If the schedule's unknown to verify that it is -- the controller's program schedule matches a default schedule, off from midnight to 6:00 a.m.

Additionally, the part-night control functional test was altered and it was

redeveloped to include the following: the functional test for part-night control used along with motion sensor control. And they had to verify that all controlled lighting is off during daytime to simulate motion in the area under the luminaire control to see if it would trigger the lighting. And during the simulation of normally occupied schedule, simulate no occupancy to verify that the light is controlled by the sensor.

This section, NA7.10.3.3 is new for adiabatic condensers along with the new requirements that we have in 120.6(a). This procedure only gets triggered for -- under that section -- only for refrigerator warehouses. There's no acceptance test for the supermarket systems. And the procedure along with the requirements of 120.6 is very similar to the air-cooled procedure.

And we got comments earlier from industry that probably isn't the best way to characterize the performance using the dry-only mode or the dry mode. So I anticipate we're going to get similar comments on this procedure, which may -- so what's being proposed may need to be changed.

So what's current most likely will get amended.

Lastly, there's new procedures for the laboratory ventilation systems. There's a new acceptance test for whether you're using the wind speed control or the contaminant censor control and depending on which one you use, there's a different test. But each one, each test includes a simulation. For the wind speed control you simulate no wind to see if the control drives the exhaust fan to change. And also for the contaminant censor control you simulate a source of contaminant in the hood to see if it would drive the exhaust to kick on. And anybody that wants to see these procedures, these have been included in the draft language.

And that concludes my presentation for the changes to the Nonres Appendices and I'm opening it up now for questions.

MR. NESBITT: George Nesbitt, HERS Rater.

So there's one chapter that's actually joint appendices, which is the acceptance testing end of things. Although I think there's a couple of those tests that are actually have to be done the same as a HERS Rater. I guess now there is some possibility in some cases for some of the

duct tests and I think airflow and maybe refrigerant charge in some cases to be done by either/or.

So on the HERS side we have Title 20 section whatever the heck it is, which puts out all the rules. And there's a technical manual, all the rules for the HERS providers, the raters, the registries and all of that.

So then we have what we call a residential appendices, which is all of the HERS measures. And then you have what you're calling the Nonres Appendices, which includes HERS now adding the 62.2 as well as the blower door test for the apartment unit and the leakage out of each unit.

And so you're duplicating language that's in the Residential Appendices in the Nonres Appendices. And a lot of the language that's in the Nonres Appendices is talking about HERS providers and raters and registries. That's all either part of the Residential Appendices or it really is all really part of Title 20.

So why we duplicate efforts in multiple places, I don't know. Because every time you duplicate you run the risk of having conflicting

information. It just seems that all the HERS measures and related information should be in one appendices. It's not a Residential Appendices, it should be an HA, a HERS Appendices.

And even within that it's one thing to give a summary of the HERS system and providers and raters and what they do. But not duplicate what's really a part of Title 20.

MR. ALATORRE: Thank you, George.

MR. BOZORGCHAMI: So, if there's any more comments on the -- so if there's no more comments I thank you all for participating today.

The formal comments for this workshop is due by October 20th and if you folks could get to it sooner, the better it is. We have -- oh, sorry, hold on one second. I forgot there's one slide on the Nonresidential ACM and I forgot it.

UNIDENTIFIED SPEAKER: It looks like it didn't get shuffled into the back slide deck, so I can --

MR. BOZORGCHAMI: Okay. We'll print it off tomorrow.

UNIDENTIFIED SPEAKER: Okay.

MR. BOZORGCHAMI: So we'll do it all tomorrow.

Okay. We have some minor updates that are happening to the Nonresidential ACM mail that is very minimal that we want to talk about. But I guess the slides didn't get incorporated, so we will do those tomorrow with the Residential ACM.

With that of comments, if you guys could get it to us sooner the better, so we can start implementing and reviewing comments. And try to get ready for the 45-day language, which we're hoping that we could get posted on our website hopefully by mid-November.

With that, I thank you for your participation.

(Whereupon, at 3:00 p.m., the workshop was adjourned)

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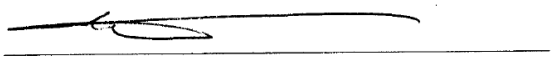

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