

BEFORE THE
CALIFORNIA ENERGY COMMISSION

In the matter of:)	
)	Docket No. 10-BSTD-01
Staff Workshop on Draft Lighting)	
Revisions for Possible Inclusion)	
in the 2013 California Building)	
Energy Efficiency Standards)	
_____)	

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

MONDAY, APRIL 4, 2011
10:00 A.M.

Reported by:
Peter Petty

APPEARANCESCommissioners

Karen Douglas

Staff Present

Mazier Shirakh
 Martha Brook
 Gary Flamm
 Ron Yasny

Staff Contractors

James Benya

Also Present (* Via WebEx)Attendees

Jon McHugh, McHugh Energy
 Owen Howlett, Heschong Mahone Group (HMG)
 Catherine Chappell, HMG
 Joshua Rasin, HMG
 Mudit Saxena, HMG
 David Wilds Patton
 David Goldstein, NRDC
 Pamela Horner, Osram Sylvania
 Mike McGarraghan, Energy Solutions
 David Watson, Lawrence Berkeley National Laboratory
 Charles Knuffke, Watt Stopper
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 Gene Thomas, Ecology Action
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 Peter Schwartz, LUMEnergy
 Bernard Bauer, Integrated Lighting Concepts
 Mark Lien, The Lighting Solutions Center
 Patrick Eilert, PG&E
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 *George Nesbitt, Environmental Design Build

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

2 APRIL 4, 2011 10:13 A.M.

3 MR. SHIRAKH: I'm Mazi Shirakh. I'm the Project
4 Manager for the Building Energy Efficiency Standards.
5 To my right is Gary Flamm, he is the Supervisor for the
6 Standards Development Unit. And Martha Brook is acting
7 like a Commissioner; she is my partner in managing this
8 effort. Not present in the room is Bill Pennington, who
9 is the Office Manager for this project. And sitting in
10 the back is Patrick Saxton, he is a Senior Mechanical
11 Engineer, he is also part of the management team -- he
12 is an Electrical Engineer, I'm sorry, I'm a Mechanical.
13 And Ron Yasny, he is the Contract Manager for this 2013
14 Standards and he is also running our audio-video.

15 So, we have a pretty full agenda. We're going
16 to start with some introduction. Ron, next slide,
17 please. There are various policy goals that we're
18 following as a guideline for this round and the next few
19 rounds of the Building Standards and most notably is the
20 Zero Net Energy Policy that has been set for us by
21 various legislation and Executive Orders. The goal of
22 zero net energy is basically for residential dwellings,
23 by the year 2020, and for non-residential buildings, it
24 is 2030. And the definition for zero net energy has yet
25 to be defined, but roughly it's going to be that we're

1 going to try to make the building envelope and
2 mechanical system and plug loads as energy efficient as
3 possible, in a manner that is cost-effective by 2020,
4 and then the remainder of the load will be met by
5 renewable sources. Do you agree with that, Martha?

6 That definition? [Nods her assent] Next slide, please.

7 So, there's, again, other goals with the Green
8 Building Standards Code, which was published in July of
9 2008, and that set the goals of the Reach Standards,
10 which is also part of this effort that we're doing. The
11 Reach Standards have two levels, Tier 1 and Tier 2,
12 which go beyond the base standards and so we're actually
13 going to be presenting topics from the Reach Standards
14 as part of these proceedings, too. And all of this is
15 supported, again, by various laws and Executive Orders,
16 and Governor Jerry Brown's Clean Energy Job Plan clearly
17 supports the goals and efforts of the staff related to
18 the Building Standards and zero net energy goals. Next,
19 please.

20 Our major collaborator for Building Standards
21 are - and you've all been familiar with the stakeholder
22 meetings, I'm sure you've been attending those, there
23 have been several of them, and these are efforts by
24 California's IOUs, Pacific Gas & Electric, Southern
25 California Edison, San Diego Gas & Electric, and the gas

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1 company, Southern California Gas - LADWP - have been
2 participating in these efforts and they're helping the
3 Energy Commission with these standards. PIER is always
4 an integral part of this process, you know, they help us
5 with the research and development and the field studies
6 and other types of field research that we need to
7 justify the standards, and we also received a
8 substantial amount of input from the general public.
9 Next, please.

10 So, these are familiar, the Rosenfeld Graphs,
11 and now it is updated, you can't see it, but it goes all
12 the way to 2010 and this is one of the reasons why we
13 actually bother with buildings and appliance standards,
14 and basically if you look at the graphs before 1976,
15 before the introduction of the first appliance
16 standards, the green is the California per capita energy
17 consumption, the red is the U.S. average. Basically,
18 they had pretty much the same slope, increasing at the
19 same rate.

20 So, what happened in 1976 is, when California
21 introduced the first appliance standards, and that's
22 where you see the first blip, and ever since then, it's
23 roughly the California energy per capita has remained
24 fairly constant, around 7,000 kilowatt hours per person,
25 largely - not entirely - due to our building and

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1 appliance standards, whereas the rest of the U.S. has
2 generally increased. Next slide, please.

3 This graph shows the per capita energy
4 consumption by 50 states. At the very top, the green
5 here, you see that's the California number, and this is
6 the U.S. average, around 12,700, ours is just under
7 7,000, and here is the State of Wyoming, I don't know
8 why they're using so much energy, but basically, you
9 know, we think that part of the reason why we're here is
10 some of it has to do with our climate, but certainly a
11 lot of it has to do with our building and appliance
12 standards. Next, please.

13 So, again, the major goal that we are pursuing
14 for this round is zero net energy and we're looking
15 toward 2020 and we're hoping that with each cycle of
16 standards there's going to be this one, 2013, there will
17 probably be one in 2016, and one in 2019, and with each
18 step we're hoping to save anywhere from 15-25 percent
19 energy relative to the previous cycle. And the 15 is
20 more for non-residential buildings, and the 20-25 is
21 more for residential buildings. And, again, we're going
22 to have Reach Standards as part of this and future
23 cycles.

24 Another thing we're doing this time is we're
25 aligning our timelines with the Building Standards

1 Commission's timeline. Title 24 has 11 parts; the
2 Energy Part 6 is only one part of it. In the past, we
3 haven't been in sync with the rest of the Building Code
4 and now we're trying to actually align ourselves with
5 the rest of the Building Code, so it's going to be a
6 shorter timeline, you have to stick to a three-year
7 cycle, whereas in the past, you know, it's been anywhere
8 from sometimes up to four years, so that's going to be
9 interesting.

10 We're pursuing certain goals and policies as
11 part of the 2013 standards and one of the things we're
12 trying to address is compliance and enforcement issues,
13 which has been a challenge. Part of that, you know,
14 you've always heard the standards are too complicated
15 and it's hard to enforce, so we've really tried to keep
16 the new changes, proposed changes to the standard, as
17 simple as possible. And we talk to our team and the
18 contractors, rules about simplicity, numerous times.
19 Some of the things we're trying to do to simplify the
20 standard is migrate some of the prescriptive measures
21 and make them mandatory measures. And the problem with
22 prescriptive measures is they can be traded and they can
23 change across climate zone boundaries, and so Building
24 Departments don't, most of the time, know what the
25 requirement is because it's not a fixed target.

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1 So the things that we're thinking about
2 migrating is mostly ducts sealing, refrigerated and
3 charge air flow measurements, and some of the other
4 residential HVAC issues. Another thing we are doing, we
5 are looking at all the exceptions to the prescriptive
6 requirements, exceptions, they are there for a reason,
7 but also they tend to complicate standards. And many of
8 them were put in there in the first place for a reason,
9 but those reasons may not be there anymore and, in those
10 cases, we're going to eliminate those exceptions. User-
11 friendly compliance forms, and create online interactive
12 forms, you know, our compliance forms have always been a
13 source of complaint for complexity and the number of
14 forms, so the approach we are using is creating an
15 online interactive form. This is not unlike Turbo Tax
16 that many of us are probably using to do our State and
17 Federal taxes. When you do Turbo Tax, not to try to
18 promote Turbo Tax, but any tax software, you don't
19 really need to know much about the forms, you know, the
20 software asks you a bunch of interactive questions and
21 answer them, and the software will generate and fill out
22 the forms for you. So, this is pretty much what that
23 effort is all about is to create an interface that you
24 answer the questions to the software and it will
25 generate the forms, and you don't have to go through the

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1 massive forms to try to figure out which ones to fill
2 out and which ones not to.

3 And we're also trying to simplify our
4 performance software interface, you know, we have a
5 number of residential and non-residential performance
6 software programs, many of which are not very intuitive
7 when you want to do - especially when you want to do
8 alterations, so the idea here is to create an interface
9 with a series of checkboxes that you can quickly explain
10 what your project is. For instance, if you want to do
11 tradeoffs between Cool-Roof and building envelope and an
12 alternation, you simply tell the building that you're
13 not interested in any of the mechanical or hot water
14 issues and the software will neutralize those fields,
15 and only leave active the fields that you are interested
16 in doing tradeoffs. So, that would hopefully really
17 simplify or help people with their existing building
18 improvements.

19 We're also going to be relying more on third-
20 party verification acceptance requirements. Another new
21 aspect of the 2013 standards is going to be improved
22 electronic recordkeeping and CEC central document
23 repository for both residential and non-residential
24 buildings. With the 2008 standards, we used to do that,
25 the requirement for registration with the HERS

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1 providers, data registries for certain buildings that
2 required the HERS verification measure; we're expanding
3 that and also creating a central repository where all of
4 the data that goes into those registers will be
5 automatically transferred into the repository, which
6 will be available to both Energy Commission, local
7 governments, utilities, and you can do enforcement
8 actions, as well as program evaluations, and many other
9 types of activities.

10 And another new area that we're considering is
11 integrating energy efficiency with Demand Response
12 controls and this so-called control ballasts that many
13 of you have been attending is an example of that. Next,
14 please.

15 We're trying to capture some non-energy related
16 - like greenhouse gas emissions benefits and that are
17 not directly energy related in this round of standards,
18 and these will be presented in a workshop later this
19 month. We're also for the first time going to have
20 water saving measures, directly, that are not
21 necessarily energy-related, as part of these standards.

22 Another big measure is going to be roof tech
23 insulation in residential buildings, in addition to the
24 ceiling insulation that you normally see, encouraging
25 proper building orientation probably as a compliance

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1 option, and treatment of photovoltaic panels for the
2 first time, in part of Title 24 and in response to a SB
3 1 requirement that we have to prepare a report to the
4 Legislature and the idea here is to allow photovoltaics
5 into the building standards in a manner that does not
6 compromise the energy efficiency of the building, but
7 would allow PVs in exchange for things that go beyond
8 some of the prescriptive measures like excessive west
9 facing glass, or total fenestration limits of the
10 standards. Next, please.

11 This is the schedule for the 2013 standards. In
12 this area right now, we're doing the staff workshops,
13 and all of this activity is going to be completed. The
14 dates that are marked in red are probably the most
15 important ones, the adoption date of the next standards
16 are going to be March 1, 2012. The publication of the
17 entire Building Code is going to be July of 2013, hence
18 the name "2103 Standards." And the effective date of
19 the standards is going to be January 2014. Next,
20 please.

21 As usual, we do have to do a lifecycle cost
22 analysis for each and every measure for climate zone,
23 for all of our mandatory and prescriptive requirements.
24 We had a staff workshop in November, November 16th of
25 2010, where we presented the updated weather files,

1 updated the Time Dependent Valuation, or TDV values for
2 both base and Reach Standards, and updated lifecycle
3 costing methodology. Before the 2013 cycle, this was
4 mostly an Energy Commission show where, from the onset,
5 you know, we had anywhere from 15-20 staff workshops,
6 and many of you have attended those workshops which were
7 very similar to this. We're doing things a little bit
8 differently this time. Next, please. This time,
9 because the IOUs, the Investor Owned Utilities, are
10 sponsoring the vast majority of the measures that are
11 going to meet 2013 standards, they actually have at
12 least two, sometimes three, or even four stakeholder
13 workshops in advance of these workshops, and the idea
14 was for them to actually engage the stakeholders, look
15 at the proposals, and try to resolve as many of the
16 issues as possible before we get to the CEC workshop,
17 which starts today. And hopefully, you know, we'll find
18 out whether that process worked or not, next month. Can
19 you go back one?

20 We're going to be holding seven or eight days of
21 workshops this spring, as opposed to almost 20 in the
22 past and, so, again, the intent is to keep the staff
23 workshops as short as possible. Next, please. So,
24 these are the schedule of the workshops that will be
25 coming up the next two months, today is the April 4th,

1 Res and Non-Res Lighting, April 11th, which is next
2 Monday, is going to be Non-Res Ventilation Boilers and
3 Data Centers, April 18th, which is two weeks from now,
4 another Monday. Then there is Non-Res Acceptance
5 Testing, Design Phase Commissioning, Refrigerated
6 Warehouses, and Supermarket Refrigeration, Solar Rated
7 Buildings and Solar Hot Water Heating. The last April
8 meeting is going to be on the 27th, HVAC Cooling Towers,
9 VAV Systems, Energy Management Control Systems, Air
10 Compressors, May 5th, 2011 is going to be Non-Res Water
11 and Space Heating, Radiant Cooling, Non-Res Envelope
12 Measures, including Roofs, Walls, and Fenestration
13 topics. And it's going to include residential domestic
14 hot water systems, so if you are interested in that
15 residential topic, you may want to be here. May 24th,
16 May 31st and June 9th, 2011, are going to be residential
17 topics, the agenda is yet to be developed or determined,
18 so just stay tuned for that, but if you're interested in
19 residential topics, it's going to be later in May.
20 Next, please.

21 So, developing the compliance software has
22 always been a challenge, having it in time and this time
23 we're fortunate to have Martha Brook working diligently
24 around the clock to determine, and I'm going to turn it
25 over to her to explain this part, these next two slides.

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1 MS. BROOK: Okay, thank you. This will be just
2 real quick. And if you've been paying attention to your
3 software development plans, you'd know that we are
4 trying to do things a little bit differently. We're
5 trying to do more of a collaborative development process
6 with other parties in the state and around the nation
7 that do public goods software development activities
8 specifically in this building energy analysis space. We
9 think there's a lot of leveraging opportunities and we
10 really haven't been taking advantage of those in the
11 past, so we want and intend to develop all of our
12 compliance software to make available in an Open-Source
13 Software license, and we actually have two solicitations
14 out to bid right now to do both the residential and the
15 non-residential compliance software that's necessary for
16 the 2013 standards. You can go ahead to the next slide.

17 We are trying to get the compliance software
18 completed as close to the adoption date as possible. We
19 probably won't meet that, it's a very aggressive
20 schedule and, you know, we have a year to 18 months to
21 meet that schedule. So, we hope that many of the
22 stakeholders that have been involved in our software
23 development plans are planning to partner together to
24 respond to these solicitations, which will be coming in
25 later this month, we'll start the work this summer and

1 go as hard and as fast as we can, given our limited
2 resources, to get compliance software developed later in
3 2012.

4 MR. SHIRAKH: Thank you, Martha. Next slide.
5 And because this is a mostly lighting workshop today,
6 all your comments should go to Gary Flamm, there is his
7 contact information and we ask you to provide your
8 comments by April 18th, which is two weeks from now, we
9 would appreciate it. So, that concludes my
10 presentation. I'm going to turn it over to Gary Flamm
11 to start the real stuff.

12 MR. FLAMM: Thank you, Mazi. So, while I ask
13 Ron to get the Internet up for me, I just want to say
14 that the purpose of today's workshop is to go over the
15 proposed lighting language. Now, a little over a year
16 ago, the utilities started having workshops where they
17 were vetting their ideas. We asked them to do something
18 different this year. Instead of bringing ideas to us
19 and then a lot of stakeholders not learning about the
20 ideas until we have a staff workshop, and then only then
21 do we have this dialogue between various stakeholders,
22 the utilities have done a really good job of being
23 transparent, of inviting everybody that wants to
24 participate, they have vetted their ideas, they have
25 shown their cost analyses, the technical issues, and so

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1 that's been going on and a lot of you have been involved
2 in those. And so, all of those efforts were prior to
3 the staff workshop, so those have all been pre-
4 rulemaking activities.

5 Now, this continues to be a pre-rulemaking
6 activity in that, until we open a formal rulemaking, we
7 consider this pre-rulemaking. So, today, myself and Jim
8 Benya are going to go through the proposed language. I
9 wanted to just take a minute, I'm going to change to a
10 different microphone and go over the website.

11 MR. SHIRAKH: While Gary is doing that, the time
12 we've allotted for each topic includes both the
13 presentation of the topic and some time for Q&As, and at
14 the conclusion of each topic, you know, you can come up
15 to the podium here, but for the benefit of the Court
16 Reporter, we ask you to identify yourself each time and
17 your affiliation, who you work for, and preferably give
18 them a business card so you can get a proper spelling of
19 your name and your company.

20 MR. FLAMM: And, to that end, Mazi, we seek your
21 comments. We are here to present the proposed language,
22 and we seek comments. Now, obviously we have a lot to
23 cover today and so we're not going to - you know, if we
24 get off on a particular topic, just because we move on
25 to the next topic does not mean that there are no more

1 opportunities to make comments. We want to stay on an
2 agenda, as a matter of fact, we're already behind, but
3 we want to try to keep this moving, if you have
4 comments, in the last presentation which will be posted
5 online, there's contact information for me. There's no
6 need at this point yet to make formal comments - you're
7 welcome to, as always, you're welcome to make formal
8 comments - but you're also just welcome to send in
9 formal comments directly to me, either call me, or send
10 emails to me.

11 So, what I want to show everybody is how to find
12 this information online. So, if you go to the Energy
13 Commission's website, Energy.Ca.gov, so that's
14 www.energy.ca.gov, and then I'm going to back up just a
15 little bit, from there, you go to the Building Energy
16 Efficiency Standards, you pull down that menu, and that
17 will take you to the Title 24, Part 6 website. And
18 then, on the left here, everybody sees where I'm
19 highlighting, there is the 2013 Rulemaking. You can go
20 to that website, to that link, and here is background
21 information about this rulemaking. Also, on the left
22 here, highlighting where it says "workshops," that's
23 where we are today.

24 If you go to that link, we are on the April 4th
25 workshop, so if you look at the April 4th website, you're

1 going to find the notice. There will be today's agendas
2 there, there's draft language, this is actually the
3 lighting excerpts from the language, and that has been
4 printed up as a handout that everybody here has a copy
5 of. This is the language we're going to trudge through
6 today. There was also one subsection, Lighting
7 Definitions, that I failed to get online, it's not here
8 as a handout, but it's just definitions in Section 101
9 that are lighting-related, so you might want to look at
10 that.

11 Here, we have a section called "Documents and
12 Reports for Review." This is where we are housing all
13 the case analyses, so each one of these, if you want to
14 open one of them, this is where you're going to find the
15 issues about the process that they went through
16 contacting public, responding to comments, the cost-
17 effective analysis, the technical issues, they're all
18 embedded in each one of these presentations - these
19 documents. So, that's where you can find things online.
20 Today's - Masi's Powerpoint presentation will be put
21 here, and then the next workshop is going to be April
22 11th, and there will be another subsection created here
23 for the April 11th. So, all the information that you
24 need is available online. If you can't find something,
25 contact Masi or myself and we'll help you find it.

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1 So, with that, Ron, I want to - do you want me
2 to just pull up the document here, the draft language?
3 Okay. Nope, that's not the one I wanted. Okay, now I'm
4 in Never Never Land. I went to Draft Language, Lighting
5 Excerpts. Ah, there it is. And, Ron, do you want to
6 scroll down this? I'm going to go sit down.

7 So, the first language we're going to go through
8 is Section 150(k), changes to the Residential Lighting.
9 As Masi pointed out earlier, one of our goals is
10 simplification and clarification of the standards.
11 There's a lot of strike-out in the residential language.
12 For the most part, I got rid of all the language that
13 had to do with high efficacy and low efficacy, the
14 calculation, and I replaced that with a table. There's
15 a new table 150-C, it basically says in this column is
16 high efficacy, by default, and in the right column is
17 low efficacy. The Hybrid Luminaires, that language is
18 taken from some of the language I deleted, so that's
19 just clarified and moved. Here is a change, Recessed
20 Downlights, it says that "recessed downlights shall not
21 contain medium screw-base sockets." So, that's new
22 language that's in the Residential Lighting Case Project
23 that is online.

24 Scroll down for a while. All of this language
25 is just scratched out. Then we're at Luminaire Wattage,

1 pretty much the same, a little clarification language,
2 Electronic Ballasts, the same. Night Lights, I got some
3 feedback, why do you require 5 watts or high efficacy,
4 just require 5 watts max, and I agreed with that and so
5 I scratched out for simplification, again, so the 5
6 watts is the same. The Integral Fan language is the
7 same. Switching and Controls, just some clarification
8 language, nothing significant. Again, a lot of
9 simplification. Lighting in Kitchens, we still have the
10 50-50 calculation, high efficacy and low efficacy. But,
11 because we are going to require utility-type rooms to be
12 both high efficacy and vacancy sensor, the trade-off now
13 for the extra 50 or 100 watts does not require these
14 spaces to be high efficacy because they're already going
15 to be high efficacy. It just requires them to be
16 controlled by vacancy sensors -- actually, no, it's just
17 the kitchen lighting has to be controlled by a vacancy
18 sensor dimmer Energy Management Control System (EMCS),
19 or a programmable multi-scene. Again, some
20 simplification language. Lighting Integral to Cabinets,
21 some clarification language, what is the length of a
22 cabinet? Is it the horizontal width? Is it the
23 vertical height? And so we added some clarification
24 language to that, to explain what we meant. Lighting in
25 bathrooms was broken out, bathrooms were combined

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1 together with a garage, utility, laundry, and bathroom,
2 were broken out as a separate classification now, and it
3 says a minimum of one high efficacy luminaire in
4 bathrooms. "All other lighting installed in each
5 bathroom shall be high efficacy or controlled by a
6 vacancy sensor." The only difference is, now, that one
7 luminaire has to be high efficacy. The next section,
8 you can see we scratched out Bathrooms and Closets and
9 removed that. The requirement is that these utility-
10 type spaces have to be high efficacy and controlled by a
11 vacancy sensor, that's different. And it says, for
12 Garages, that the vacancy sensors shall use only direct
13 line of sight type technology, some scratching of
14 exceptions for simplification. Lighting in Hallways,
15 hallways have been broken out separate from the group
16 they used to be in, all high efficacy or controlled by a
17 vacancy sensor or a dimmer, that's the same as the
18 current language. But it also says that pendants,
19 chandeliers, sconces, shall not have medium screw-base
20 sockets. So, then, some of these other
21 classifications, we ended up stripping language from
22 them, we stripped out "hallways," we stripped out
23 "bathrooms." No, really, changes to Recessed Luminaires
24 in insulated ceilings. Residential Outdoor Lighting,
25 there was some confusion between multi-family and

1 single-family, so, for clarification, I broke that into
2 two separate subsections. Also, somehow apartment
3 complexes got left out of the Outdoor Lighting
4 Standards, it was inadvertent. We require outdoor
5 lighting for single-family attached to a building, we
6 require outdoor sight lighting, which we have since
7 2005, and this just brings the apartment complexes into
8 that fold.

9 Multi-family buildings, there are some multi-
10 family residential buildings that are predominantly
11 dwelling unit and there are some that are not completely
12 dwelling unit, so if you have more than 20 percent of
13 the space is common area, then you meet the existing
14 standards, which is high efficacy, or controlled by an
15 occupant sensor. But if you are greater than 20
16 percent, that building shall meet the non-residential
17 standards. Parking Lots, again, broken out for
18 clarification. So, I believe that's about it.

19 Now, I deleted all this 30, 40, 50, 60 lumens
20 per watt, you don't have to worry about that anymore for
21 residential standards. And so, here is the table, if
22 it's in the left column, it's high efficacy by default,
23 if it's in the right column, it's low efficacy. So,
24 this is going to replace the 30, 40, 50, 60 lumens per
25 watt. Now, we also have a catchall table, proposed

1 table 150-D, that's for any new or unusual technologies
2 that were missed in this other table, so it allows
3 technologies to evolve. Also, reference Joint Appendix
4 JA8, it's very similar to IES LM-79, which is a testing
5 protocol for LED Luminaires. We deleted all of the
6 existing JA8 language and we are now citing LM-79
7 because LM-79 was not an official document, it was not
8 an adopted document when we went through the 2008
9 rulemaking. However, there are some testing lab
10 protocol that we wanted to keep, there was language in
11 Sections 119, 130, and Table 150-C, all having to do
12 with manufacturer responsibilities for high efficacy
13 LED, and that was all moved to reference Joint Appendix
14 JA8. And the efficacy for LEDs to be classified as high
15 efficacy, there is a minimum color rendering index,
16 there is a range of color temperatures, and there is
17 still the 30, 40, 50, 60 lumens per watt per the system.

18 So, those are the changes to the Residential
19 Lighting Standards. So, does anybody have any quick
20 comments about the Proposed Residential Lighting
21 changes?

22 MR. SHIRAKH: If you have any comments, please
23 come up to the podium.

24 MR. FLAMM: Right, if you come up to the
25 podium, please state your name every time you make a

1 comment.

2 MR. SHIRAKH: How about online? Anybody on
3 the phone who wants to make a comment? We have Dave
4 Patton.

5 MR. PATTON: David Wilds Patton, David Wilds
6 Patton Lighting Design. Is it necessary to put the
7 medium base thing in the hallways if we're not having
8 them anywhere?

9 MR. FLAMM: Well, it says Downlights. There
10 are two components that disallow -- that are proposing
11 to disallow medium base.

12 MR. PATTON: Right.

13 MR. FLAMM: One is all downlights, the other
14 is chandelier, pendants, and sconces in hallways

15 MR. PATTON: Okay.

16 MR. FLAMM: Medium base are allowed according
17 to the other rules, whether it's a vacancy sensor, a
18 dimmer, Energy Management Control System, so there are
19 like in the bedroom and the dining room places that the
20 medium base sockets are allowed -

21 MR. PATTON: Just not in downlights.

22 MR. FLAMM: Just not in downlights.

23 MR. PATTON: Okay, that actually wasn't clear
24 to me. I also have a question. Did you ever find out
25 if the dual technology vacancy sensors for garages are

1 cost-effective?

2 MR. FLAMM: I did not follow-up on cost-
3 effectiveness. We did get some input from the control
4 industry and the new language was actually proposed by,
5 I believe, one of the control manufacturers, I massaged
6 it a little bit. So, I see Owen chomping at the bit, is
7 there something you wanted to say about that, Owen?

8 MR. HOWLETT: Hi, this is Owen Howlett from
9 HMG. We didn't do an extensive costing exercise on
10 that, but from the initial data we looked at on cost, it
11 was cost-effective.

12 MR. PATTON: Okay, and then my last question
13 had to do with that new table, or, it's not a new table,
14 but that JA.H?

15 Mr. FLAMM: Yes.

16 MR. PATTON: I still think that those values
17 might be a bit high right now.

18 MR. FLAMM: So, those are the existing values.
19 Do you think that we need to reduce the values for LEDs?

20 MR. PATTON: I don't think we're going to go
21 there, are we?

22 MR. FLAMM: I would suspect not, but I'm
23 trying to understand what you're proposing.

24 MR. PATTON: Then, we're good.

25 MR. FLAMM: Okay.

1 MR. PATTON: Okay, thank you.

2 MR. FLAMM: Thank you, David. Anybody online
3 have - anybody else in the audience? Jon.

4 MR. MCHUGH: John McHugh, McHugh Energy.
5 Since this is the first time that all the stakeholders,
6 I guess, get to hear what the Commission has in mind for
7 residential lighting, I was wondering, are you going to
8 talk later on about what you have in mind for the Reach
9 Standards?

10 MR. FLAMM: I was not planning to address
11 Reach Standards today. It was not on the agenda, so,
12 no.

13 MR. MCHUGH: Okay, so you're planning that for
14 another meeting?

15 MR. FLAMM: Probably, yes. Yes.

16 MR. MCHUGH: Thank you.

17 MR. FLAMM: Well, it would have to be for
18 another time. Anybody on the phone have questions,
19 comments? Okay, and please, we want to hear from you,
20 that's the purpose of this is to lay out the language,
21 and to see if there's anything that we missed, any
22 issues that we missed. So, I'm going to go on to
23 Section 119, which are the -

24 MR. SHIRAKH: Gary, before you go there, one
25 other housekeeping thing I forgot, when you came in,

1 there was a sign-in sheet, make sure you either sign
2 your name or, better yet, staple your business card to
3 it so we have a record of who is attending. Thank you.

4 MR. FLAMM: So, Section 119 has been a project
5 that I've been shepherding, actually, for a couple years
6 and the concept is that we are stripping out self-
7 contained lighting control requirements out of Title 24
8 and moving them to Title 20, so there is a proposal for
9 a Title 20 rulemaking in which self-contained lighting
10 controls would be certified to Title 20. What would be
11 left over in Section 119 would be lighting control
12 systems, and so currently it's kind of clumsy because
13 you have to certify self-contained lighting controls and
14 lighting control systems to Title 24. And it's really
15 clumsy certifying a system as a device. So, what we're
16 proposing changing is that lighting control systems will
17 have to meet the same requirements as a self-contained
18 device, but one would have to go with acceptance
19 testing. So, there will be an acceptance requirement
20 for lighting control systems.

21 So, what we have here in Section 119 is what's
22 left over after we strip out self-contained lighting
23 controls. So, I'm not going to read all the language,
24 you can see I just basically deleted everything. I will
25 say that I'm thankful to the National Electric

1 Manufacturers Association Controls Committee, who we've
2 met a number of times, we've had a number of conference
3 calls, we've had a back and forth, and come up to a
4 consensus on what the language will look like. So, this
5 is the language where that's left over. Does anybody
6 want to make any comments about the proposed changes to
7 Section 119? Okay, seeing none, I'm going to keep
8 moving.

9 So, the next thing I'm going to address are
10 Section 130, Lighting Controls and Equipment - General.
11 This is just an overview of all of the mandatory
12 requirements for lighting control equipment. For the
13 most part, it's just been some clarification language.
14 In the Section 130(d), proposed to have fire stations,
15 the dwelling units, meet the residential standards. We
16 say that already in the Non-Residential Compliance
17 Manual, however, we've never said it in the standards
18 because fire houses are mixed use buildings, just like
19 high-rise res, hotel, motel, so we're proposing to
20 basically say here what we're already doing. Some
21 language changes with line voltage track, some
22 clarification language about, if you use line voltage
23 track for the integral current limiter, you have to have
24 acceptance testing; if you use the supplemental
25 overcurrent protection panel for track lighting, you

1 shall have acceptance testing. There is some confusion
2 over low voltage lighting, so I split out low voltage
3 track lighting from low voltage individual luminaires
4 for clarification. All the GU-24, most of the GU-24
5 language, has been deleted because, after we adopted the
6 2008 Standards, there were Title 20 Regulations adopted
7 for GU-24 luminaire sockets and adapters, so all of this
8 is no longer needed because it's in Title 20. Certified
9 Lighting Controls - this is basically a global
10 statement; instead of going through every single
11 subsection of Section 131, to say "shall be certified to
12 Title 20, Section 119, or Title 24," I just made a
13 global statement and that allowed me to scratch out a
14 lot of redundant language out of 131 through 133. And
15 any comments on the Section 130 general information?
16 Okay, Owen?

17 MR. HOWLETT: Owen Howlett from HMG. Do you
18 have a definition of a self-contained control system?

19 MR. FLAMM: Yes, in both Title 20 and in Title
20 24, there are proposed definitions. And if you look at
21 the definitions - that I didn't print, but they got
22 posted this morning - those definitions will be there.
23 Anybody online, Ron? Okay, hearing none, I'm going to
24 turn it over now so you can have a different voice here,
25 a more baritone voice. Jim is going to do some of this

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1 language.

2 MR. BENYA: Good morning, everyone. First of
3 all, in looking at your work on Section 119, it reminds
4 me of an English Professor I had hears ago, that's the
5 way our papers used to come back, all red lines. That's
6 quite a bit of work.

7 I hasten to point out as we start this portion
8 of the review that there have been a significant number
9 of changes. This is probably one of the most active
10 areas of changes in the Standards being proposed, thanks
11 to a tremendous amount of work in the Case Study Teams,
12 and a number of representatives of those teams are here
13 today. And Gary once again has done quite a bit of
14 crafting to put all of this together so that it makes a
15 lot of sense. I'm going to try and highlight some of
16 the key changes. Undoubtedly, you will find particular
17 words, or phrases, or something as you review these in
18 detail, and of course your ability to comment on those
19 is definitely a very important part of how we get this
20 right, so I will be highlighting the key points as we go
21 through this. And as we get through each section, we'll
22 take a break so that - I'll tell you what, we'll take a
23 break after each major subsection so that we can have
24 discussions in context before going on to the next
25 section.

1 I'm going to start with Section 131(a), Indoor
2 Lighting Controls That Shall Be Installed. The changes
3 in this section, although there is quite a bit of line
4 work here, one of the key things that these changes
5 propose is a clarification based on not only the
6 experience of staff, but also of some awareness raised
7 by the case study teams. There's not really, I wouldn't
8 say, anything profoundly important in this section right
9 now. You can see this exception, for example, 131(a),
10 Malls, Auditoriums, etc. These, again, are mostly - my
11 opinion, and I guess I can speak for Gary a little bit
12 here, too - clarifications that have been needed for
13 some time.

14 This next exception here has to do with the -
15 this is where we get into some changes that are
16 forthcoming. One of the issues that you run into here
17 is that emergency egress lighting, whether many of you
18 know this or not, is actually able to be turned off
19 under certain conditions and that's been part of the
20 Code for some time. And historically we've allowed a
21 significant wattage in a building to be left on 24/7 for
22 the purpose of emergency egress. This exception begins
23 to harvest that significant change in the Code so that,
24 in other words, if a building is unoccupied, you can
25 turn off the emergency egress lighting. There are a lot

1 of buildings for which this would be a significant
2 contribution.

3 Coming down further, Separately Switched
4 Lighting Systems, this one, in particular has been a
5 little bit of an ongoing issue with us in the standard
6 and this is making it super duper clear that there is an
7 expectation that there will be separate switches for
8 various lighting systems. This has also been moved
9 forward from Section 131(D) for those of you who are
10 keeping track.

11 Here is where there is going to be some fun.
12 Section 131(b), multi-level controllable lighting. This
13 is a rather significant study in which I participated as
14 the case study principal team leader, and what this
15 study is now proposing is that there will be a
16 significant increase in controllability of lighting for
17 all lighting systems. And so, the expression
18 "controllable lighting" has been put in to suggest this.
19 There will be a table that we'll be looking at shortly
20 that tells you what that controllability means. This is
21 where we make a major leap forward based on a case
22 study. You will see a number of exceptions have been
23 introduced and removed, classrooms, one of them that is
24 important is classrooms were determined not to be cost-
25 effective, necessarily for controllable lighting, but

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1 virtually every other space type does seem to be - and
2 the reason for classrooms, of course, is the limited
3 length of the school day. You see we have an exception
4 for school space that has only one luminaire with no
5 more than two lamps, is the exception for the
6 requirement for controllability.

7 The next group of strikeouts you see here have
8 to deal with daylighting and daylight area, and this is
9 being moved, we will get back to it in a little bit.
10 It's been reorganized substantially, simplified
11 substantially, so the deletions that we're looking at
12 right now are just simply reorganized and they will
13 reappear, don't worry, daylighting is still part of the
14 standard. Oh, going back - I just want to make a note -
15 Section 131(b), historically we've also allowed an
16 exception for corridors, again, the idea is that
17 corridor lighting needed to be left on 24/7 for safety
18 or security, or something like that; again, that is no
19 longer considered to be a Code requirement for egress
20 safety, therefore that Code requirement has been
21 reduced. There is still the ability to leave some
22 lights on, however, the wattage you're allowed to do
23 that is significantly lower than historically.

24 If I say something wrong, Gary, don't hesitate
25 to jump in, there's a lot of stuff here. Okay, you see

1 again daylight - everything having to do with daylight
2 has been relocated, so we'll take a look at that in a
3 second.

4 Okay, Section C, Section C has been, again,
5 the daylighting language has been relocated and the old
6 Section C is now a few more lessons in simplification
7 and clarification, and we'll get to it in a second. The
8 new Section C is moving the shutoff controls forward,
9 not any huge changes in the process, with the exception
10 of Exception 3. Exception 3, this is where we get,
11 again, in office buildings, up to .05 watts a square
12 foot, in any area within a building may be continuously
13 illuminated. This is getting at, again, what we see as
14 a rather significant waste of energy by lighting being
15 left on for "safety/security," [quote unquote] in
16 buildings. Yes, there's probably a need in some cases
17 for that to occur, however, we see that as being much
18 less than it has been historically. When we're trying
19 to light buildings at .6 and .7 watts a square foot,
20 allowing half the lights to be left on would seem rather
21 silly, so that's why this is being changed.

22 Section 131(c)(2), countdown timers, this is a
23 staff recommended change because countdown timers
24 apparently have been used as an alternative to other
25 forms of automatic shutoff and, after some deliberation,

1 some consideration by staff, it was determined this
2 probably isn't a very good idea most of the time, with
3 several very important exceptions. Exception 1,
4 electrical equipment rooms, and Exception 2, single-
5 stall bathrooms. Under 131(c)(3), there is some
6 clarifications, if an automatic control button device
7 other than occupant sensor, etc., again, staff
8 recommended changes based on experience.

9 Section 131(c)(4), areas where occupancy
10 sensors are required for shutoff compliance. This
11 includes existing requirements, corridors, stairways and
12 aisles, and parking garages. The reason for this,
13 number one, is staff clarifications. Staff felt that it
14 was important that we be very explicit about where
15 motion sensing devices are to be utilized, regardless or
16 it's taking away other options. There's also a case
17 study involving warehouses, and a case study involving
18 parking garages and lighting controls that have been
19 used to bolster this. So, in 4(A), you have in offices,
20 (B), which is new, in corridors, stairwells, aisle ways
21 to warehouses, etc. That's new and it's been added with
22 an exception, and (C) in parking garages, parking areas,
23 and loading and unloading areas, the requirement for
24 occupant sensing, again, exceptions that tailor it to
25 practical use. These have been supported by case

1 studies and by economic trial, and I can tell you from
2 personal experience, these are practices I'm already
3 using in my projects, and have never found them not to
4 be a very very good idea. So, this is some pretty solid
5 stuff and I think it's a real improvement.

6 Next up is going to be a very exciting new
7 section, Automatic Daylighting Controls. We all know
8 that daylighting controls is probably one of the next
9 great frontiers in building energy savings and it's a
10 frontier because, in the past, daylighting controls
11 sections have been a little complex, a little hard to
12 understand at times, and we haven't always been clear on
13 what we require or how we require this. So, Gary has
14 put in a lot of work along with the work done by HMG
15 into the case study. This has been combined to create a
16 very powerful new section that is, I believe, much
17 clearer and really helps people understand what is
18 required and what isn't. We still have the definitions
19 of the zones that have been certainly maintained pretty
20 much as they have been. But Item 2 here, luminaires
21 providing general lighting, in or out, this particular
22 section with all of its markups is really getting at
23 saying, "Here's what you have to control" in pretty
24 straight, simple, easy to understand language. As we
25 move down into (A), it says it has to be shown in the

1 plans. A lot of this is relocated existing language.
2 So, what we want to do is point out that it bore the
3 necessity of moving itself to a single consolidated
4 section where all of the requirements could be very very
5 clear. So, Section 131(D) is not so much a lot of
6 change as it is a great clarification and simplification
7 of the process of putting in automatic daylighting
8 controls.

9 This is a section, though, that does have a
10 significant contribution in change, that's the parking
11 garage daylighting requirements. As you can see in red,
12 there's quite a bit of new language here. A heck of a
13 lot of work went into this by the HMG team and they did
14 a really really good job, and Gary has organized it and
15 placed it into the standard in such a way that makes a
16 tremendous amount of sense. I think you can see,
17 parking garages, we all know, have had a tremendous
18 opportunity for automatic daylighting controls, and now
19 it's finally being placed into the standard.

20 Moving down to Section (e), Energy Management
21 Control System (EMCS) being required when using the
22 Tailored Method. An issue that is, I think, one that
23 we've all been very conscious of is the need to reduce
24 the amount of lighting consumed in retail, and the
25 Tailored Method is certainly the primary means for

1 demonstrating compliance for retail lighting. This
2 doesn't necessarily change that, our previous use of the
3 Tailored Method, and the way it's designed, but it makes
4 it super duper clear that if you're going to use the
5 Tailored Method, you must use an Energy Management
6 Control System that carefully segregates out the various
7 layers of lighting used in a retail establishment. I
8 think one of the questions I raised about this is a
9 better definition of EMCS, if we can find one that works
10 for small retail, as well as large. I think that's
11 something Gary has been working on and we probably have
12 a little bit of work to do on that.

13 MR. FLAMM: I would just like to interject
14 that the definition of Energy Management Control System
15 affects much more than just lighting, so the definition
16 that we have now in Section 101 has evolved because of a
17 number of influences.

18 MR. BENYA: Yeah. And I think this is one
19 where, Bernie, you and I have talked about this many
20 times over the last several generations of the Standard,
21 and a number of us need to give Gary a little bit of
22 hand in what do we do under certain circumstances. We
23 all know that there are some situations where it makes a
24 tremendous amount of sense just to have an Energy
25 Management Control System; other times, lighting and a

1 thermostat may be all that's needed and we need to
2 investigate that. I would say that, personally, is an
3 issue I'd like to raise, otherwise this is a wonderful
4 improvement. It makes it real clear what you have to
5 do, as well, and I think that's great.

6 Okay, next up, Section (f), Demand Responsive
7 Controls, and this is modified language, and the case
8 study team again produced this. I want to point out
9 that the red language here, "demand response signal
10 shall conform to a nationally recognized open
11 communication standard," this language is intended to
12 make it possible, along with (1) up here, that buildings
13 are equipped to respond, it doesn't mean that the
14 response will necessarily happen, it means that they're
15 equipped to respond so that, should the owner choose, to
16 make the arrangements with the utility serving the
17 building, that the building is now ready to go, and we
18 don't have to start thinking about ways of implementing
19 systems after the fact.

20 Section 131(g), there was a case study on task
21 lighting that produced this one and I think most of us
22 who work in office buildings, I certainly as part of
23 Southern California Edison's *Office of the Future*
24 project, I've become personally and professionally aware
25 of the issues surrounding the growth of plug loads.

1 Plug loads now exceed lighting loads in watts per square
2 foot and in energy use in most office buildings. And
3 this gets at the ability to control those loads.
4 There's a pretty significant change, a pretty
5 significant improvement, in the standard relative to
6 particularly task lighting, which is the appropriate
7 focus of this section. This table reverts back to the
8 controllability requirements and specifically this table
9 says which luminaire type and what is the required
10 control range, and what is the required level of
11 granularity, if you will, of the control. This was part
12 of the study that, again, I was a principal investigator
13 for, so that I can tell you that we worked closely with,
14 among others, the National Electrical Manufacturer's
15 Association, as well as the IOUs to come up with this
16 table, and we think it's in pretty good shape. It
17 changed back and forth a number of times. We have
18 established cost-effectiveness in all of these
19 requirements, and so this is a table that's basically
20 saying you don't have to put in dimmable ballasts for
21 fluorescent, but you're going to have to have at least
22 four light levels. And we have learned from the
23 manufacturers that you're getting into an area where the
24 cost differential between the two is not much. Other
25 sources, the regulations are a little bit different

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1 ranges, and those ranges are light source applicable so
2 that we're not trying to ask sources to be controlled in
3 a manner that they can't be. You can see that high,
4 medium, low, are definitions that give quite a bit of
5 flexibility. We did our best to try and make this match
6 the technologies that are in the marketplace today, so
7 that manufacturers have already invested in this level
8 of flexibility are not precluded from carrying forth
9 with those products to the best of our ability.

10 One of the other issues that comes up, of
11 course, in addition to that, is the uniformity issues.
12 In the past, the standards have always allowed, for
13 example, lamp switching as a way of maintaining lighting
14 controls that are at multi-level. In many cases, that
15 makes perfect sense; in others, switching lamps only
16 creates either an appealing appearance, at best, or,
17 worse, causes non-uniform lighting. So, careful thought
18 was given to the manner that lighting controls can be
19 used. Going back up for a second, for example, if you
20 look at the - we'll take the second group here, the
21 fluorescent luminaire, this would be most of your
22 mainstream of lighting systems, you can utilize step
23 dimming, continuous dimming, or switching alternate
24 lamps in the luminaire, and there is a footnote 3 which
25 we'll get to in a second; whereas, certain others, you

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1 are only allowed continuous dimming. This is so that,
2 frankly, the lighting systems can be maintained in a
3 reasonable uniform manner. We're not encouraging bad
4 lighting practices by doing so. Footnote 3, for
5 example, the fluorescent, says "luminaires with at least
6 three lamps illuminating the same area and in the same
7 manner." So, for example, if you want to do step
8 switching, it will be possible not having controllable
9 ballasts, at all, for example, but the luminaires have
10 got to produce the same light, the same quality, and the
11 same area. For example, High Bay T5 with six lamps in
12 the luminaire and three ballasts, you may be able to
13 meet those requirements, but you won't be able, for
14 example, to have continuous roll lighting where every
15 other lamp lights a different area, and turning off half
16 the lights that way won't be permitted.

17 MR. FLAMM: I'd like to interject something,
18 Jim. The last two tables are alternate options. One
19 version was from the case team, which Jim was the
20 primary author of, and the second one was my
21 interpretation of that, and I had already parked mine in
22 the language, and I didn't know what to do, I hadn't had
23 a chance to dialogue with Jim, the best way to present
24 this information. So, I'm looking for clarity and
25 simplicity, and that's what I was going after when I

1 rebuilt Jim's table, so these are just two alternate
2 options of relaying the same information.

3 MR. BENYA: So any input will be welcome. I
4 think we finished with this section now and it's
5 probably appropriate to take comments and questions.
6 So, David is going to start, and others.

7 MR. GOLDSTEIN: Hi, I'm David Goldstein,
8 Energy Program Co-Director at NRDC. I've been involved
9 in these proceedings just about since the beginning.
10 Jim, this is really good work, I think Title 24 has been
11 waiting a long time to have this level of
12 controllability built in, for two different reasons,
13 one, to create energy savings, but, two, because it also
14 improves occupant satisfaction, so you're getting the
15 best of energy efficiency and getting better energy
16 services and significant savings. One number that would
17 be interesting for me to see, and maybe you've done it
18 already, is what is this section equivalent to in energy
19 savings as a percentage compared to an LPD reduction?
20 I have one comment, it appears to be missing, an
21 opportunity that appears to be missing, but I'm not sure
22 it actually is, and so I'm a little confused, and that
23 has to do with hotel rooms. Everywhere I travel, except
24 in the United States, it's almost impossible to leave
25 the lights on in your hotel room because you have to

1 take the key out, and it would seem like the controls
2 requirement set up a lot of the ability to do that, but
3 don't actually require it. At any rate, it seems like
4 it wouldn't be very difficult at this point to require
5 that all of the lighting in a hotel room be turn off
6 able when you exit, and with some preference that that's
7 going to -

8 MR. FLAMM: If I could comment on that, this
9 is Gary Flamm. That was actually discussed in the 2008
10 rulemaking, it was Commissioner Rosenfeld's - one of his
11 pet projects, and we were kind of late in the proceeding
12 to introduce it. The only reason it's absent right now
13 was we don't have an analysis to support it, so we need
14 a cost-effective analysis when you look at the technical
15 feasibility. Even though I don't deny that it's a good
16 idea for it to appear without supporting evidence is
17 arbitrary, so nobody presented that as a proposal.

18 MR. GOLDSTEIN: Okay, well, consider it
19 presented now. At any rate, I think the point is that
20 my interpretation, perhaps incorrect interpretation, of
21 the controls that are already being required, would
22 eliminate the biggest barrier towards doing this, which
23 is the circuiting, the fact that it's now possible to
24 address ballasts individually, you know, from your
25 computer or something, it would seem like you're already

1 requiring enough of the infrastructure that just putting
2 in switches isn't going to be that tough.

3 MR. FLAMM: Again, I don't deny that it's a
4 good idea, but an analysis is pretty thorough which
5 looks at the environmental issues, it looks at state
6 energy savings, it looks at costs, it looks at technical
7 issues. We need an analysis to do that, so I think
8 Cathy is going to respond to that.

9 MS. CHAPPELL: Cathy Chappell, Heschong Mahone
10 Group. I believe that the Sempra case team has looked
11 at that and so we had the analysis, and if we haven't
12 submitted it to you, we'll do so. So we will
13 investigate that.

14 MR. SHIRAKH: I just spent some time in Europe
15 and you're correct, they have them, and it works really
16 fine. They have some of the outlets, they're always on
17 for computers and chargers and so forth. The rest of it
18 is all controlled with a key card, alone, so they
19 definitely save energy.

20 MR. GOLDSTEIN: Yeah, this has been discussed
21 many times in the past and the cost issue was the
22 separate circuiting, and the reason I'm bringing it up
23 now is it's my impression that the rest of the controls
24 requirements make it no longer necessary to do the
25 circuiting separately, and so the cost would be a lot

1 less. But if HMG is working on this, then we should get
2 an answer.

3 MR. BENYA: Thank you, David. Just a quick
4 comment. There are other methods other than cards and
5 you can use, if done correctly, motion sensing
6 technology. I say "done correctly," a simple motion
7 sensor does not work, and we've had that discussion the
8 last cycle, as well, but it didn't make it to the final
9 cut. I appreciate you raising the issue because it's
10 nice to know that Cathy is on it and we'll see something
11 before this cycle is over. Just a comment about
12 controls, what I can tell you from recent personal
13 experience is we retrofitted a Boeing building in Long
14 Beach with lighting controls, it already had T-8 lamps
15 and relatively low lighting power density, and we went
16 after strictly the control opportunity, and the first
17 month's report from the owner was the lighting energy
18 savings were 58 percent, strictly controls, they already
19 had a fairly efficient building. I think that's a
20 little on the extremely good side, but to expect savings
21 of 25, 30, 40 percent, I think we all know, is a
22 reachable possibility with even a modest lighting
23 control approach. That's why we're very excited about
24 making controllable lighting mandatory.

25 MR. GOLDSTEIN: Yeah, and we're very

1 supportive of that.

2 MR. SHIRAKH: Also, you'll see this afternoon
3 in Section 146, you know, we have dropped LPDs, but our
4 assumption is always the state-of-the-art technology,
5 but you have to maintain IES recommendations, so we've
6 gone as low as we can, we think. So any additional
7 savings will come from the controls.

8 MR. GOLDSTEIN: Well, we'll get back to that
9 in that session, but certainly the biggest savings are
10 going to come from the controls, I agree.

11 MS. HORNER: Pam Horner with Osram Sylvania,
12 and I'll give you my card momentarily. I have two
13 comments, the first is to say something nice, well, and
14 the second isn't to say something bad. I think I would
15 speak for all of the manufacturers to say that the pre-
16 the change in how this works, having the pre-workshops,
17 having all the stakeholders work together in advance,
18 has been marvelous, what a difference, and so here is
19 one testimonial to the process if you want to have that
20 in the positive checkbox. Regarding the table that Jim
21 just put up, the infamous Table 131A, that's an example
22 of coming to, I think, very good agreement through
23 stakeholder work. But I did want to put on the record
24 that there are a couple of areas that I think still need
25 some consideration, and they will follow, of course,

1 with comments. The first has to do with HID because
2 it's just HID as a big category, which includes two
3 items of concern, one is the self-ballasted metal halide
4 lamps that are extremely popular, that seem to be sort
5 of a little bit of the dolphin caught in the net here,
6 they're really not dimmable and they aren't really part
7 of a multi-lamp luminaire, so I think perhaps there is
8 some thought that needs to go into that particular kind
9 of product, especially in retail. The other is low
10 wattage metal halides, for example, it's very popular to
11 come up with, say, 15 or 20 watt metal halides now. And
12 to dim them is perhaps something we should consider and
13 a suggestion might be to put a wattage cap in this area,
14 or a wattage minimum, something above 40 watts, this
15 would apply, something of that nature. The second is
16 the induction product which, right now, is living
17 amongst the linear fluorescent, but in application,
18 induction lighting in the HID space and, having checked
19 with a lot of our product development people, I've
20 learned that there would be such significant
21 technological changes that would have to be done to the
22 induction coil to make it controllable down to the level
23 mentioned. I think it would be wise to look at placing
24 that particular source type with HID. But, again, thank
25 you for all the pre-work, we appreciate it very much.

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1 MR. SHIRAKH: Okay, any other comments on
2 Sections 131 and 132?

3 MR. RASIN: Josh Rasin with HMG. I think I
4 would just like to point out that the case team would
5 like to request that the exception to 131(f) be removed
6 for demand responsive controls. Thank you.

7 MR. YASNY: There are a couple of questions
8 online. The first question, "Will plug load controls be
9 addressed?"

10 MR. FLAMM: You want to state that again, Ron,
11 please? I'm sorry.

12 MR. YASNY: Plug load control?

13 MR. FLAMM: What about it? What's the
14 question?

15 MR. YASNY: Will that be addressed during this
16 meeting?

17 MR. FLAMM: That was actually - there is a
18 case proposal and it's for the circuit controls for
19 receptacles used for task lighting. So, there are
20 requirements for certain receptacles to be controlled,
21 to have separate controlled and uncontrolled circuits.
22 So, that is proposed and there is a case report to
23 support that.

24 MR. YASNY: Okay. And the second question
25 relate to the cost-effectiveness of daylighting controls

1 in parking garages. "Since LPDs are already low, and
2 since dimming and ON/OFF controls reduces component
3 life, what kind of documentation is there regarding
4 cost-effectiveness?" And that comes from Kevin
5 Madison.

6 MR. FLAMM: Actually, the parking garage
7 lighting and controls case study, done by Clanton and
8 Associates, Michael Mutmanskyy, did extensive cost-
9 effectiveness analysis on that. As a matter of fact,
10 that's one of the bigger case studies. So, if Kevin
11 would like to look at that analysis and would like to
12 discuss that with myself or with Clanton and Associates,
13 you're welcome to do that, Kevin. But it is actually a
14 pretty extensive analysis.

15 MR. BENYA: Yeah, I'd just like to chime in,
16 too. Keep in mind, one of the things that went through
17 this case study period for all of us was the fact that
18 the case studies were overlapping in their content and
19 the results. When you add the controllable lighting
20 into the mix, we had several meetings on this, when you
21 add controllable lighting into the mix, the controllable
22 lighting, just so that you all know how this worked,
23 controllable lighting is essentially paid for by tuning,
24 all right? For all intents and purposes, and we can get
25 into the details in the study if you want to read it,

1 but for all intents and details, just tuning alone pays
2 for now the cost of putting in controllable lighting,
3 particularly with respect to our main target,
4 fluorescent systems. Therefore, in the other energy
5 savings that are taken advantage of by using
6 controllable lighting, belong to that application. So,
7 daylighting, for example, then harvests savings over and
8 above that, that is used to offset the incremental cost
9 of putting in daylight sensors. But keep in mind, and
10 I'll say this because this has been a 20-30 year issue
11 with me here in this very room, has been that we've been
12 waiting for the day that we could afford controllable
13 lighting in the first place, and to make it mandatory.
14 This is that time - thank goodness. We've been saying
15 for the longest doggone time that, if we could only have
16 a fluorescent controllable ballast that cost \$25.00 or
17 \$30.00, that we could do just about anything that
18 happened for the first time ever. So, that is one of
19 the big breakthroughs of this Standards session from any
20 other we've ever had before. So, when you talk about
21 adding daylighting controls, what this means is you're
22 adding the daylight sensor in the logic, but you're not
23 adding the ballast. And that's important when you start
24 saying how cost-effective is it, because of the low cost
25 of the new electronic technology in sensors, both

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1 motion, vacancy, occupancy, as well as daylighting, all
2 of a sudden the economics are much easier than they've
3 ever been, so that's a general response to many of your
4 questions about cost-effectiveness. Keep in mind that
5 cost changes alone have been very favorable to these
6 longstanding ideas that we've always wanted to see in
7 the Standard.

8 MR. SHIRAKH: Just to add to Jim's point, this
9 last light fair in Las Vegas, we actually had an
10 opportunity to speak to many of the manufacturers and
11 the story was pretty much the same, that the cost of
12 these controllable ballasts and other controls have
13 significantly come down, and that's why we are so
14 excited about this.

15 MR. FLAMM: So, Kevin - excuse me, Kevin
16 Madison, I believe you're still with the University of
17 California, the University System, if I remember
18 correctly? Forgive me if I'm wrong, but I think it
19 might be worthwhile if you would look at that report and
20 then maybe have a conference call with myself, with the
21 folks from the California Lighting Technology Center,
22 with the Case Team, and anybody else that - and the case
23 team that wants to be involved with that. So, I would
24 look forward to a conference call with you on that.

25 MR. MCGARRAGHAN: Can I just add something to

1 one of those questions that came in? Mike McGarraghan,
2 Energy Solutions. I just wanted to follow-up on the
3 question about plug load controls. Gary mentioned that
4 there is a proposal here for circuit controls for
5 receptacles used for task lighting and that's for non-
6 residential applications, and I just wanted to add that
7 there is also a residential plug load control proposal
8 that is not being discussed today, but will likely make
9 the agenda for one of the residential workshops that the
10 CEC holds in May.

11 MR. SHIRAKH: Thank you, Mike. Sorry for the
12 delay.

13 MR. WATSON: Dave Watson, Lawrence Berkeley
14 National Lab. I'd like to ask for a clarification on
15 the comment by Josh Rasin about the case team requesting
16 deletion of the demand responsive lighting controls. I
17 wasn't sure exactly which - oh.

18 MR. SHIRAKH: Can you repeat what the
19 exception is so the audience knows, if you would come up
20 to the podium? He said 131(f) exception, we remove.
21 Can you repeat that?

22 MR. RASIN: Yeah, this is Josh Rasin with HMG.
23 So, the section 131(f), demand responsive controls, we
24 were just - the Case Team was requesting that the
25 exception to that subsection be removed, and that

1 exception states that "luminaires that are not
2 addressable, luminaires receiving a dimming signal from
3 a device other than demand responsible lighting control,
4 for example Photo Controls or wall dimmer." So we're
5 just requesting that exception be removed from the
6 language. That's all.

7 MR. WATSON: Thank you.

8 MR. SHIRAKH: So any other questions or
9 comments related to 131 and 132? Anything from online?
10 So why don't we move to the next section - okay, Jon.

11 MR. MCHUGH: So, I just had a few comments.
12 This is Jon McHugh, McHugh Energy. A couple of comments
13 about the language here. By the way, I think this is
14 much simplified and much more clear than the last round
15 of standards, so kudos, Gary. The first one is Section
16 131(a) for Area Controls. My understanding is that this
17 section, what it's supposed to be doing is indicating
18 that basically all lighting is manually switched by a
19 switch that's inside, or a manual control, it's inside
20 of the enclosed area that contains the lights. So, this
21 first part of the language talks about requires a manual
22 ON/OFF control for all switch legs, the issue isn't
23 really the switch leg, it's really that I've got a
24 manual control for all lighting that's in the space, so
25 I could have a number of switch legs that could all

1 manually controlled, but only control half the lighting
2 in the space. So, I don't think that's getting the
3 intent of what you're trying to get there in 131(a), but
4 for your thought. The next one is down on separately
5 switched lighting systems, 3(b) talks about floor and
6 window displaying being each separately switched on
7 circuits that are 20 amps or less. That could be
8 interpreted to mean that, if I had lighting that was on
9 a 30 amp circuit, I didn't have to switch it. I know
10 that's not your intent, so just, you know, that they be
11 on 20 amp circuits -

12 MR. FLAMM: Right. So that language has been
13 unmodified, just moved, so that is existing language
14 that was in 131(d) was moved and I didn't change it.
15 So, if you want to pow wow on some clarification
16 language, we could do that.

17 MR. MCHUGH: Right, thank you. Let's see
18 here. Then, on parking garages, there's language about
19 all general lighting be controlled by occupant sensors,
20 and there be one control step. I think the intent there
21 is that each luminaire has one control step, so I'm
22 thinking that, where it says "general lighting shall be
23 controlled," each luminaire of general lighting shall be
24 controlled by occupant sensors." In addition, there's
25 an exception to 131(C)(5)(c) and, there, it specifically

1 is exempting [quote unquote] "parking garage emergency
2 egress lighting." That could be interpreted to mean
3 essentially all the lighting in the parking garage
4 because you could declare that all of that is a path of
5 egress. So, this would be a loophole that you literally
6 could drive a truck through.

7 MR. FLAMM: It depends on the head height of
8 the garage.

9 MR. BENYA: Short truck.

10 MR. MCHUGH: Yeah. So, I would recommend that
11 this exception be stricken and there's a number of
12 reasons for it, first off, so we're controlling the
13 light to approximately half of its lighting power,
14 which, if you look at the egress lighting proposal that
15 is defined for interior lights, you're looking at .05
16 watts per square foot, so even the light that's left on,
17 after you've controlled the lights with these motion
18 controls, you'd still be above that .05, so there's no
19 limit placed on this exception. So, this would be
20 really problematic, essentially a non-requirement
21 requirement.

22 MR. FLAMM: So, I hear what you're saying,
23 Jon, I would like the author in a discussion to be able
24 to defend that proposed language, so, you know, perhaps
25 the three of us need to discuss it.

1 MR. BENYA: Jon, one quick observation since
2 I'm involved in designing a number of parking garage
3 standards these days. The problem is that the IBC path
4 of egress, lighting level requirements under normal
5 power conditions are very very similar to the light
6 level requirements for electric lighting in IES RP-20;
7 as a matter of fact, they're almost identical. So, it
8 does sort of - this gets into the whole big question of
9 whether the area is occupied or not and it's a complex
10 one, and I think this does deserve some additional
11 attention, thank you for bringing it up.

12 MR. MCHUGH: Thank you very much, Jim. You've
13 kind of hit the nail on the head, which is the intent of
14 this is to dim the lights during unoccupied periods, and
15 I'd be remiss in not noting that, you know, there's a
16 million square foot parking garage down by John Wayne
17 Airport that's been using motion controls since 1992,
18 and just turning lights all the way off, so this is not
19 rocket science or some really weird technology.

20 Moving on to automatic daylighting controls,
21 as Jim has brought up, there's been fantastic
22 improvements in technology over time, the cost, it's
23 kind of like - I've forgotten the guy's name, was it
24 Groves law, or whatever, with the processors where the
25 costs are going down and the capabilities are going up -

1 anyway, the issue here for daylighting is that - I've
2 done a number of studies on how daylighting controls
3 work and where they don't work, and what I've found is
4 that, when there are situations where the controlled
5 zone has areas that are not receiving full daylight,
6 that the response to that situation is that the controls
7 are disabled, and my recommendation is that we have -
8 that we keep all the language that's here and just add
9 to this that, for those luminaires that are behind
10 obstructions, that those luminaires are separately
11 controlled. So, we're still controlling all the area,
12 it does not reduce the area of the daylit zone, it just
13 says that there are additional controls. So you could
14 still have the same controller, it just has an
15 additional control zone on that same controller, so the
16 incremental cost is miniscule. We just talked with a
17 manufacturer who says that they make a four-zone
18 controller, so if you had a space that was side-lit, if
19 you have a primary zone, a secondary zone, you could
20 have obstructed zones in those two primary and secondary
21 zones, and you'd still be able to meet all the control
22 requirements with that single controller. So, you know,
23 the technology exists and what that does is it protects
24 the savings of the luminaires that are in the day-lit
25 zone, that they're not - because you've got really two

1 choices if you don't re-circuit your lights, which is
2 you either leave someone in the dark, or you control to
3 that darkest part of the zone and now you're essentially
4 losing most of the savings associated with the rest of
5 the lights. Thank you.

6 MR. SHIRAKH: Thank you, Jon, good comments.

7 MR. KNUFFKE: Good morning, Charles Knuffke
8 with Watt Stopper. Thank you for the opportunity to
9 come before you and make some comments. I just had very
10 few ones, but before I even lead off into them, in
11 regards to feedback, would you prefer a single email in
12 regards to any issues to have in the Code? Or would you
13 prefer emails specific for each section so that they can
14 be treated separately?

15 MR. SHIRAKH: Send us all in the same email.

16 MR. KNUFFKE: The same email is fine, okay,
17 very good.

18 MR. SHIRAKH: And to Gary and to myself,
19 please.

20 Mr. KNUFFKE: One thing in regards to the
21 shut-off controls, section (c) now, it talks about
22 shutting off the lighting when the building is
23 unoccupied. I actually think that having the building
24 unoccupied is a rather large caveat, I've actually
25 suggested that be "when the space is unoccupied."

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1 Second one, in regard to countdown timer switches, I
2 actually would like you to reconsider whether or not
3 those should be automatically exempted from having
4 automatic shut-off control. I believe that there are
5 several areas, in fact, data centers, which often
6 because of racking concerns, may actually prefer to have
7 a countdown timer set at the section of the rack so
8 that, when somebody goes into the racking, they override
9 the lights, the lights are only on for two hours, or an
10 hour, whatever that time may be. So, I do believe that
11 the case is that countdown timers are actually
12 applicable for certain applications, so I would ask that
13 we reconsider whether or not they should be eliminated
14 entirely. And I notice that you've excluded electrical
15 rooms, which is wonderful for all the electrical
16 brethren out there, I do pity, however, the poor
17 mechanical engineer that is inside working on an HVAC
18 system, whose hands are inside a box and may, in fact,
19 not have met that exemption and have the lights go off
20 on them while they're working. So, again, I would ask
21 that that be reconsidered.

22 In regards to the daylighting controls, I
23 notice that the zone size, the exception to that, is
24 when it is less than 120 watts at HMG's meeting two
25 weeks ago, I believe on the 16th of March, I thought that

1 language was proposed as being 240 watts, so I just was
2 kind of wondering why it's been reduced from 240 watts
3 to 120 watts.

4 MR. BENYA: Charles, I can answer the last one
5 first. That was my fault.

6 MR. KNUFFKE: The fault that it's in there at
7 120 or -

8 MR. BENYA: Yeah. I actually felt it could be
9 even lower, that was a compromise, but my cost-
10 effectiveness study says that 120 watts, for sure, are
11 cost-effective.

12 MR. KNUFFKE: All right, I'll probably respond
13 to that in an email, then.

14 MR. BENYA: Well, part of the reason why, to
15 be blunt, 120 watts now constitutes the lighting for an
16 area roughly 150 square feet, and I think of Kosta [ph.]
17 and I were working on this together a few weeks ago, and
18 Kosta [ph.] kept bringing up all of the office buildings
19 with all the Class A spaces that are all lining the
20 curtain walls and the number of luminaires, you look up
21 and you see on in the middle of the day the spaces that
22 have several hundred foot candles of natural light, and
23 the fact of the matter is that many of these spaces will
24 be adequately illuminated, you know, with two
25 luminaires, each having two T-8 or T-5 lamps and there's

1 no reason why all of that energy couldn't be saved. If
2 we didn't have a low enough threshold, people wouldn't
3 put in their sensors.

4 MR. KNUFFKE: Okay. Thank you very much.

5 MR. FLAMM: So, I would like to respond also.
6 The daylighting is going to start off this afternoon, so
7 we're going to be revisiting some of this and expanding
8 significantly. We really made an effort to simplify the
9 daylighting language and I think we succeeded at that,
10 and so the 120 watts became a proxy for day lit area
11 where we - we used to require the building inspector to
12 look how many square feet of windows do you have, and it
13 was - how can we simplify that, and so it was basically
14 coming in a simpler way to say the same thing.

15 MR. KNUFFKE: Okay, thank you very much.

16 MR. SAXENA: Mudit Saxena, Heschong, Mahone
17 Group. I just wanted to add to the point here that, at
18 the meeting that you were talking about, Charles, the
19 250 watts that was presented, we built in a lot of
20 conservatism into getting down to that number and, based
21 on the feedback we got from Jim and others, even at 250,
22 we still have quite a bit of conservatism built into our
23 calculations, and I can share our spreadsheets with you
24 and you can take a look at all the conservatism we have.
25 But 120 is still quite fine.

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1 MR. BENYA: Thanks, Mudit. And just, again
2 Charles, this is one of those where, once you've already
3 bought the controllable light source some other way,
4 once you've already bought the dimming ballast, the
5 additional - the incremental cost of adding the sensor
6 to the circuit is what we're trying to amortize.

7 MR. SHIRAKH: I'm sorry, Charles, you need to
8 - sorry.

9 MR. KNUFFKE: Sorry, I thought I had gotten
10 away there. One of - I guess the only issue is, I
11 understand that, I'm just wondering whether or not
12 existing technologies that are actually required for
13 those spaces have been taken into account, such as if we
14 are talking about individual offices, there is a mandate
15 for an occupancy sensor currently in that space, whether
16 or not the time off that the occupancy sensor provides
17 was included in that calculation? So I understand that
18 the controllable ballast gives you great freedom and
19 latitude, the question is whether or not, though, the
20 calculations did include things that already mandated in
21 the Code that are already affecting the energy savings.

22 MR. BENYA: Yes, there were.

23 MR. KNUFFKE: Thank you.

24 MR. BENYA: And when we look at an office
25 occupancy, we're looking at the statistically reasonably

1 verified number of typical occupancy hours during
2 daylight.

3 MR. KNUFFKE: Right, but you're using -
4 correct me if I'm wrong - this is the data for that? Is
5 that -

6 MR. BENYA: I can't quote it.

7 MR. KNUFFKE: Right, and so I just would like
8 to check that. Thank you.

9 MR. FLAMM: Jon, before you get up, there's a
10 question came over the Web and it has to do with where
11 occupant sensors are required and, in corridors,
12 stairways, aisle ways, warehouses, the lighting shall be
13 controlled with occupant sensors, automatic reduced
14 lighting power by at least 50 percent, each luminaire
15 shall be controlled by no more than two occupant
16 sensors. "Would the case author want to elaborate on
17 the purpose of each luminaire shall be controlled by no
18 more than two occupant sensors?" In the areas where
19 occupant sensors are required for corridors, stairways
20 and aisle ways and warehouses, the very last part says,
21 "Each luminaire shall be controlled by no more than two
22 occupant sensors." Could you clarify the purpose of
23 that?

24 MR. HOWLETT: Yeah, this is Owen Howlett, HMG.
25 The purpose of that is that, without that exception, or,

1 sorry, without that clarification, a space would have
2 networked occupancy sensors and it could require that
3 all of the occupancy sensors read that the space was
4 unoccupied, before any of the lights got shut off. So,
5 we wanted to make sure that each one of those warehouse
6 aisles is controlled separately, so that when that aisle
7 is not in use, the lighting in that aisle gets shut off,
8 the system doesn't wait for the whole building to be
9 unoccupied before it shuts off any of the aisles.

10 MR. FLAMM: Okay, if the person on the Web
11 would like to make further comments after this, please
12 send them to me. Thank you.

13 MR. MCHUGH: Hi, Jon McHugh again. Under
14 Section 4 where occupant sensors are required for
15 compliance, Section B has corridors, stairwells, aisle
16 ways, warehouses, and open spaces in warehouses, and I'd
17 just like to recognize Sempra's - they have a case study
18 on just this issue in terms of bi-level occupant sensing
19 controls in warehouses, and my understanding is that the
20 intent of that case study is to look at the issue of,
21 for instance, a warehouse where you have forklifts or
22 people moving around and the area is occupied, but the
23 particular aisle might not be, you know, someone might
24 not go into that aisle, you know, only a couple times
25 out of the day. But, in terms of safety, they might

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1 want to leave that aisle at 50 percent, especially if
2 they've got HID type fixtures, or are wanting to have
3 them dimmed, but not turned off. And the intent there
4 is that this is reducing energy consumption while the
5 space is occupied. Having this in the automatic shut-
6 off control section implies that that space does not
7 need to be controlled on some kind of schedule so that,
8 for instance, after hours, all of the lighting is turned
9 off. So, I would like the Commission staff to consider
10 the idea that this is actually - this kind of section is
11 actually moved to a separate section that is describing
12 not that it's a shut-off, or the end of the day, but
13 that this is during the normally occupied periods, so
14 that a time clock would be layered on top of the motion
15 sensing, bi-level motion sensing.

16 MR. FLAMM: Okay. We can discuss that, Jon.
17 I would like to propose that we move on and any other
18 comments on this section, send them to me, we're getting
19 off schedule a little bit. And I know I'm pushing up
20 against lunch, and so I'm going to ask Jim to move with
21 the Outdoor Lighting, Section 132.

22 MR. SHIRAKH: Actually, the next topic is
23 Section 133, it's Sign Lighting.

24 MR. FLAMM: No, we didn't do 132 yet.

25 MR. SHIRAKH: Oh, okay.

1 MR. BENYA: Okay, Section 132(A) Outdoor
2 Lighting Controls. You'll notice a whole bunch of
3 strikeouts here, particularly removing all of the
4 exceptions for the most part. Now, correct me if I'm
5 wrong, Gary, well, I'll let Gary explain why.

6 MR. FLAMM: So, we evaluated all of the
7 exceptions. Exceptions, for the most part, exist
8 because there were unresolved issues at the time the
9 Standards were adopted, or there were unknowns and, so,
10 rather than throw the baby out with the bath water, we
11 created every kind of exception one could think about.
12 Part of our effort in simplifying this, and this is so
13 building inspectors don't have as much to have to be
14 responsible for, a lot of this stuff -

15 MR. BENYA: Isn't the reason, let me just ask,
16 because this one I didn't totally get, either, isn't it
17 because you inserted the word "incandescent?"

18 MR. FLAMM: Oh, at the very beginning? Well,
19 those are - right.

20 MR. BENYA: I mean, that changes the whole
21 meaning of Section A.

22 MR. FLAMM: Well, Section A basically said, if
23 you look between the lines of Section A, it basically
24 said if you have mercury, vapor, or incandescent
25 luminaires that were over 100 watts, you had to put it

1 on a motion sensor. And it was a way to promote people
2 to use - if you're going to have a high watt lumen
3 package, to use HID or fluorescent, that's really, if
4 you read between the lines, that's what it says. So,
5 because mercury vapor are basically no longer existing,
6 this is basically saying, still, well, if you're going
7 to use incandescent luminaires - let me back up - if you
8 want a large lumen package, don't use incandescent
9 because this only applies to incandescent, so a way to
10 simplify this, instead of taking - it takes the guess
11 work out of the, you know, between the lines, we don't
12 want you to use high lumens for mercury vapor and
13 incandescent, it just says if you're going to use
14 incandescent, and it's a large lumen package, put it on
15 a motion sensor. And so all those exceptions, you're
16 right, basically applied. So now, if you want something
17 equal, you know, over 1,700 lumens, or whatever it is,
18 use a fluorescent, use an HID, don't use incandescent.
19 Or an LED.

20 MR. BENYA: Great, thanks. It's actually - I
21 think this is a great improvement. I think you needed
22 to understand that that was the gist of a major change
23 in what (A) is supposed to be all about.

24 MR. FLAMM: Right, and this is the effort to
25 simplify.

1 MR. BENYA: Okay, looks good. Section (B),
2 cutoff requirements have been reduced to 150 watts. Let
3 me find that - there it is, right up there. So, all
4 outdoor luminaire lamps rated 150 watts in hardscape
5 areas - it makes reasonable sense. Do you want to just
6 add a comment?

7 MR. FLAMM: This is something we proposed in
8 2008 and we ended up dropping it. This is consistent
9 with the metal halide luminaire standards in Title 20,
10 it's basically, on a number of levels, 150 watt has
11 become a threshold for integral controls, etc. And so
12 we wanted to again propose going down to 150 watts.
13 Anything above 150 watts would have to be cut off, so we
14 had for two cycles of the Standards 175 watts, anything
15 greater than 175 watts had to be cut off, which means
16 full cut off, or cut off qualified. And so this is
17 trying to put all those pieces together where the real
18 threshold and other elements of this Codes and Standards
19 is 150 watts.

20 MR. BENYA: Section 132(C) Controls for
21 Outdoor Lighting. You've added large permanently
22 covered outdoor areas subject to occupancy, 24/7, so you
23 are allowed to leave lights on in those circumstances.
24 Now, here's a whole bunch of stuff. So, getting rid of
25 some original language, all permanently installed

1 outdoor lighting circuit and switch turnoff independent
2 of other electrical loads, all permanently installed
3 outdoor lighting with two or more luminaires used in
4 automatic lighting control systems shall be used with
5 some exceptions. Permanently installed outdoor area
6 lighting, meeting all of the following requirements,
7 shall be controlled with motion sensing control, in
8 addition to photo cell, the dual control system shall be
9 capable of reducing lighting power by at least 50
10 percent. Pretty good changes.

11 MR. FLAMM: And this is also supported by the
12 outdoor lighting case study.

13 MR. BENYA: Anybody have any questions or
14 comments? Online, any questions or comments?

15 MR. SHIRAKH: No.

16 MR. BENYA: Jon.

17 MR. MCHUGH: Would you go back to 4(A) for a
18 second? So, I think the intent of the case study was
19 that the control system be capable of reducing the
20 lighting power of each luminaire by at least 50 percent,
21 so I think that little change, I think that would more
22 accurately capture the intent of that case study.

23 Thanks.

24 MR. SHIRAKH: Thank you.

25 MR. BENYA: I'm not necessarily going to go

1 with you on that one. I designed a number of facilities
2 where I turned off large areas of lighting because you
3 have reduced needs. For example, a hospital, many types
4 of businesses, you only need a small portion of your
5 parking lot, you know, from normal business of 9:00 to
6 10:00 p.m. until dawn, and I think the intent is to give
7 some flexibility to the designers here.

8 MR. MCHUGH: I think that this section is
9 around the motion sensing portion of the control. I
10 absolutely agree with you in terms of scheduling
11 controls in that it does make sense to look at turning
12 off portions, you know, turning the lights all the way
13 off in some portions, but my understanding is that all
14 the cost-effectiveness and the evaluation that went
15 behind this is, you know, based on the PIER work that
16 was done, and I guess as part of the lighting
17 specification for parking lots at the UC System where
18 the feeling of security is maintained by having bi-level
19 control and the relatively uniformity of the lighting,
20 and that areas that could be turned completely off, that
21 that is something that is more of a scheduling
22 opportunity, but I think we can probably have some more
23 discussions about that later. Thank you.

24 MR. YASNY: Gary? Gary? There was a question
25 online as to whether any of the lighting standards

1 relate to underwater lighting in swimming pools, spas.

2 MR. FLAMM: So, the standards in a number of
3 places have just excluded underwater lighting. It says
4 lighting regulated by California Electric Code 680, I
5 believe it is. And a lot of that exceptions I deleted
6 because it wasn't an area of lighting anyway, it just -
7 it was language there for no reason. Even in excluding
8 the exceptions of underwater lighting in a couple of
9 cases, I don't see that it's really impacting the
10 Standards. However, if we had a standard for
11 underwater, I'm not confident that we need to allow only
12 low efficacy lighting, but the Standards aren't going
13 there, even so. The Standards are really silent. So, I
14 don't see any proposed standard that will require
15 underwater lighting to be regulated.

16 So, if you look at Article 680, if I could
17 elaborate, basically, it has been misinterpreted by some
18 people saying, "If I have a water feature somewhere, all
19 the lighting is exempt." Article 680, as cited, is
20 basically lighting that is inside the water, or lighting
21 directly above water, or lighting within five feet of
22 the edge of water, that's the only - those are the only
23 areas that are exempted according to current exceptions,
24 so I think the way it currently is stated is broadly
25 interpreted and I don't believe the exception is needed.

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1 MR. BENYA: And I'll support that because of
2 one major change in our marketplace. Actually, I put
3 that in 20 years ago, by the way, but the reason I did
4 is because, up until fairly recently, the best way to
5 provide underwater lighting for swimming pools was with
6 a large tungsten source, typically 300-500 watt
7 luminaire is used. You can now accomplish roughly the
8 same level of lighting underwater with about a 50 watt
9 LED, and the reason why is change of spectrum, for those
10 of you who are interested. Remember, the water absorbs
11 red, yellow, and incandescent spends most of its energy
12 generating red, yellow, and so if you generate primarily
13 shorter wavelengths, they actually do a far better job
14 of lighting underwater because the enter isn't absorbed
15 by the water, it's simple. It took me a little while to
16 figure that out, but that's why this makes a lot of
17 sense. By putting lights under the water that are
18 spectrally tuned for the application, you don't need the
19 kind of wattage we used to have. So, I support this.

20 MR. FLAMM: Okay, I'm going to go hopefully
21 pretty quickly through the proposed changes for Sign
22 Lighting standards - somewhere down here, I keep
23 scrolling. So, Sign Lighting Controls - these are
24 Controls for Sign Lighting - there was actually a typo
25 that was adopted in 2008 in the outlining of the control

1 requirements in that Subsection (5) was kicked over as
2 to the language related to Subsection (4). In doing
3 that, the language is actually nonsense, subsection (5),
4 so I kicked that back over the outline, so that
5 basically corrected the Errata. And the current
6 language was kind of clumsy, I have to admit, I had to
7 interpret it to the sign industry and I had to go
8 through a lot of mental gymnastics to understand what we
9 meant, so I made an attempt to simplify the language and
10 I broke out indoor sign lighting controls from outdoor
11 signed lighting controls with basically really no
12 changes, it's just a simplification of language, so the
13 correction of an Errata and simplification
14 clarification. Does anybody want to say anything about
15 the Sign Lighting Controls? Okay, anybody online, Ron?
16 Okay, so I shall move on.

17 The next section is Nonresidential Lighting
18 Control Acceptance. Now, this section definitely needs
19 more work. There's a domino effect when you change
20 subsection names that have to be reflected. I think
21 that this needs some definite wordsmithing. There are a
22 few things, the work I've been doing with Section 119
23 for lighting control systems for track lighting integral
24 current limiters, for supplemental overcurrent
25 protection panels, those all have to be added to this.

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1 So, the requirements for acceptance testing of lighting
2 controls has been elaborated a little bit, but this
3 section definitely needs some more work. Any comments
4 on that?

5 MR. SHIRAKH: So, if there are no more
6 comments, we can adjourn for the morning. We're about
7 15 minutes ahead of schedule, so that gives us a good
8 one hour for lunch. Please be back at 1:15, one hour
9 from now, and we'll start the afternoon session. Thank
10 you.

11 (Off the record at 12:17 p.m.)

12 (Back on the record at 1:15 p.m.)

13 MR. SHIRAKH: Again, the agenda this afternoon
14 starts with Daylighting and Jim Benya is going to go
15 over the proposed Daylighting language, and then, after
16 that, we'll get into the prescriptive requirements for
17 Indoor Lighting, Outdoor Lighting, and also proposed
18 changes to Section 149, which is Additions and
19 Alterations.

20 MR. BENYA: Okay, welcome back everybody. I'm
21 going to return us backwards to Section 131(C) Automatic
22 Daylighting Controls, excuse me, I'm going to go back
23 for a section, Section 131(C), as you'll recall, this
24 was rearranged into the new Section 131(D) Automatic
25 Daylighting Controls. Daylight Zone definitions have

1 been cleaned up a little bit. One of the problems we
2 historically run into is, all of the stuff you might
3 have to put on the drawings to identify daylight zones,
4 and the process by which you determine those, so this
5 has been simplified. And the mandatory measures, as
6 you'll see coming up here throughout this and other
7 sections all now dovetail, work together. As I pointed
8 out earlier this morning, we looked at this before,
9 Section 2, this clearly defines which luminaires must be
10 controlled. And this is where, among other things, some
11 of the points we discussed this morning we addressed.
12 So, I'm not going to spend a lot of time on this, but I
13 wanted to remind you about this important section here
14 because we're going to move, as we move forward, to look
15 at Sections 141, 143, and 146, these become very
16 applicable. Specifically, in Section 141, first of all,
17 there's a new method for determining what the
18 daylighting controls must do, and in the past we've had
19 a fairly complicated formula. Again, some case study
20 work done in the daylighting team led by HMG and Mudit,
21 in particular, had developed a pretty nifty new model of
22 something that is called "Watt Method," and basically it
23 uses some of the familiar language, but in a formula
24 that allows for one to calculate the wattage that needs
25 to be controlled by automatic daylighting controls,

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1 based on all the typical fenestration factors that are
2 needed.

3 Section 141 is the first place that embodies
4 this and that's very important because what it means is
5 that the method is applied to the performance method per
6 section 141, as well as throughout Section 143, as we
7 will get to in a second. Next up is Section 143.
8 Section 143 made headlines with previous additions of
9 the standard when it said that you have to provide
10 daylighting for certain spaces. That has caught on, on
11 a national level, and I'm pleased to see other standards
12 have followed through on this, but Title 24 was the one
13 that really started all this. That has been expanded
14 and modified in the Section 143 as proposed here, it has
15 minimum daylighting requirement which modifies our
16 existing minimum skylight area requirements. If you
17 look at number one, it says at least 75 percent of the
18 floor area will be within a horizontal distance of one
19 head height from windows with .7 time average, ceiling
20 height from the edge of rough openings of skylights.
21 That's pretty significant because it's now increasing
22 the area of certain building types that must actually
23 have daylighting. And it expands it somewhat into
24 allowing our clearly simply measures for how much
25 fenestration you have to have, either skylit or sidelit.

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1 The all skylit daylit zones and the primary side daylit
2 zone shall be shown in the plan, general lighting in
3 daylit zones shall be controlled in accordance with
4 131(D) that we were just looking at. So, a bit of
5 simplification here that really, I believe, helps with
6 daylighting's mission and will increase the number of
7 uses.

8 One thing I'm going to go back to for a
9 second, this is something that some of you may wish to
10 discuss, you'll notice that I'm circling it right here,
11 that an 8,000 square foot area has been identified as
12 the minimum. We know that 90.1 and other standards are
13 looking at smaller areas and that maybe someone will
14 want to discuss that, I certainly would like to flag
15 that as an important difference right now between Title
16 24 and other standards. And we can stop here if you'd
17 like to discuss that? Sure, go ahead. Mudit?

18 MR. SAXENA: So, some late analysis has been
19 done by us and Jon McHugh, it shows that if you look at
20 the analysis that we did in the last round to get to the
21 8,000 square feet, with the updated costs, the Photo
22 Controls, and cost of energy, it is actually cost-
23 effective all the way down to about 1,000 square feet.
24 So, by moving it from 8,000 to 5,000, I think we will be
25 pretty much within a great extent of conservatism and

1 also, additionally, be consistent with ASHRAE 90.1. So,
2 I think we have two things going for it and I would just
3 like to put it out there, that's a reasonable change
4 that we can make.

5 [Commissioner Douglas joins meeting at 1:31
6 p.m.]

7 MR. SHIRAKH: Thank you.

8 MR. BENYA: Would anybody else like to speak
9 to that? This is a pretty important number, folks. And
10 I'm very excited to see it, but I'm almost - maybe I'm a
11 little aggressive, I'd like to see an even smaller
12 number. Can I hear a smaller number? Is anybody
13 bidding a smaller number? David, do you want to bid a
14 smaller number?

15 MR. GOLDSTEIN: David Goldstein, NRDC. If
16 it's cost-effective down to 1,000 square feet, we've got
17 a zero net energy goal that we're reaching for, why do
18 we want to do anything other than the 1,000 square feet?

19 MR. SHIRAKH: Because we've got another 20
20 years before 2030.

21 MR. MCHUGH: I think, actually, when we looked
22 across the three ASHRAE climate zones -

23 MR. FLAMM: Excuse me, please remember
24 everybody to introduce yourself for our Court Reporter.

25 MR. MCHUGH: Thank you, Gary. Jon McHugh,

1 McHugh Energy. When we looked at the three ASHRAE
2 climate zones that is in California, 3(c), 2(b), 4(d)
3 and 5(b), oh, well, I guess there's one more, anyway,
4 when we looked across those climate zones, we found that
5 it was cost-effective down to 2,000 square feet, so I
6 just wanted to clarify that. But you also reduced some
7 costs, too, Mudit, is that right? And you got to 1,000
8 feet? I just -

9 MR. SAXENA: Right, we updated the cost of
10 Photo Controls, which, Jon, you had not looked at when
11 you were looking at your spreadsheets. So, I just
12 wanted to also note that we will - this is a late
13 analysis that we recently done and we will send out our
14 analysis to stakeholders and get some feedback from them
15 because that hasn't happened in the process of the three
16 stakeholder meetings that we have done until now, so
17 that's something that we will do. But, just to finish
18 up the point here, that by updating the cost of Photo
19 Controls, there are about 1,000 square feet is where we
20 are.

21 MR. SHIRAKH: So, a follow-up question on that
22 - when you did your lifecycle cost analysis for
23 buildings down to 1,000 square feet, are you considering
24 acceptance as to commissioning costs because, you know,
25 as the building gets smaller, these costs become a

1 larger portion for the building, so have you taken that
2 into consideration?

3 MR. SAXENA: Yes, so we've taken it into
4 consideration, the cost of commissioning ballasts, and
5 that's the cost to put - well, we considered the cost of
6 Photo Controls, the cost of wiring, and then also the
7 cost to commission each ballast, so with the smaller
8 area, actually, that cost is a little smaller, it's a
9 bigger percentage of the cost for the building, but the
10 cost is smaller, with smaller areas. The cost for Photo
11 Controls is the same. Now, we do consider the lifespan
12 of the envelope to be 30 years and we consider the
13 lifespan of Photo Controls to be 15, so we have an
14 additional cost of replacing Photo Controls, and that's
15 been factored in.

16 MR. SHIRAKH: Thank you. Please.

17 MR. FLAMM: Could I just interject, please,
18 and welcome Commissioner Karen Douglas to our staff
19 workshop.

20 COMMISSIONER DOUGLAS: Thank you, Gary. I'm
21 glad to be here.

22 MR. SHIRAKH: For everyone's information, just
23 one second, Karen is the current Presiding member of our
24 Standards Committee. And she is the only Commissioner,
25 we only have one, so welcome, Karen.

1 MR. DIGERT: Great, good afternoon. I am
2 Neall Digert with Solatube International and I am very
3 excited to see the potential reduction in area sizes
4 with daylighting mandates. But I would also like to
5 request that the Commission continue to look at lowering
6 the ceiling heights, as well, for mandated daylight
7 spaces. We routinely apply products to ceiling heights
8 that are 10 feet, or even nine feet in height, and we'd
9 love to see getting a more aggressive stance on these
10 for daylight.

11 MR. SHIRAKH: So, I think the case team did
12 look at lowering the height. Do you want to respond to
13 that?

14 MR. SAXENA: This is Mudit Saxena from HMG.
15 Yes, we did take a look at reducing the ceiling height,
16 but we couldn't complete our analysis because of
17 limitations of assimilation software that do not allow
18 for us to really look at the benefit of products like
19 tubular data devices like Solatube has, or other specula
20 light wells, so, without look at those products, when we
21 just looked at regular skylights with traditional
22 drywall light wells, the cost-effectiveness did not pan
23 out. So, we brought it up to that point and, after
24 that, we couldn't do the last bit. Now, there are other
25 pieces of evidence that exist, some studies have been

1 done for PG&E by HMG and others that show that there is
2 monitored energy savings from these tubular data
3 devices, but they're not comprehensive enough for us to
4 expand that into a 16-climate zone wide study that we
5 typically do for a case study, but there are pieces of
6 evidence that exist that show us that these products can
7 successfully provide daylighting in less than 15-foot
8 ceiling heights. So, this is where we are right now.

9 MR. SHIRAKH: Thank you. Any other questions?
10 Jim.

11 MR. BENYA: I was just going to say are there
12 any other comments.

13 MR. GOLDSTEIN: David Goldstein, NRDC. I
14 wanted to elaborate a bit on my previous comment about
15 the subject of what is a conservative error in the
16 context of Title 24. I would submit broadly across all
17 disciplines we're covering that post AB 32, a
18 conservative error means something different than it did
19 in the last Code cycle. Every kilowatt hour that we
20 don't save is a zero carbon generation source that we
21 are committed to buying someplace else, which is going
22 to be pretty expensive. I would argue there are no
23 conservative errors, you try to get the right answer as
24 best you can, and you don't fudge it one way or another
25 for uncertainties, you just come as close as you can to

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1 what the truth is, and base the standards on that.

2 MR. SHIRAKH: I think your comment is welcome,
3 now, we're going to be looking at that again, and what
4 we have heard is from one to two thousand square foot is
5 cost-effective, so we'll look at the threshold again and
6 see if we can come up with something more aggressive,
7 that saves more energy.

8 MR. GOLDSTEIN: Thank you, Masi.

9 MR. SHIRAKH: Thank you.

10 MR. BENYA: I just want to remind everybody,
11 these are mandatory requirements for actually putting in
12 glazing, not lighting controls, because if you put in
13 the glaze, then you have to put in the lighting
14 controls, so I just want everybody to remember, this is
15 about glazing, it's not about lighting controls, but the
16 interaction between the two is hard to deny.

17 MR. SHIRAKH: Just one comment related to
18 David's, what we're finding is there is going to be a
19 competition on the roof area between skylights,
20 mechanical equipment, plumbing, and PVs, so that's
21 another thing to keep in mind because skylights actually
22 take up a lot of space because there has to be access
23 around them, they cannot be used, and you cannot put PVs
24 right up to the edge of the skylights, and same thing
25 goes for mechanical, so the roof is going to be a pretty

1 crowded place as a result of some of these changes we
2 recommend. That's another thing to keep in mind. Jon
3 has a -

4 MR. MCHUGH: I won't belabor this too much.
5 When we look at the area of skylights, we're looking at
6 something that's essentially no more than five percent
7 of the roof area. Admittedly, there's still the access
8 area around that, so maybe that's 10 percent if you
9 think about walkways and things like that associated
10 with the skylights. The transmittance of a skylight is
11 around 50 percent and the efficacy of sunlight is around
12 100 lumens per watt, so if I use PV, which has an
13 efficiency of 10 percent, and then I'm then using that
14 to generate electric lighting that has a luminous
15 efficacy of, you know, somewhere about 70 lumens per
16 watt, you're talking about that same - you're able to
17 essentially get six times more useful light per square
18 foot of skylight as you would be for that same square
19 foot of PV. So, thank you.

20 MR. BENYA: Jon, that's a good comment. We
21 actually finished a project which we skylighted a
22 gymnasium and received the same rebate as if we had for
23 a PV to power the lighting in there and the payback
24 period is about five times faster. So, this is a very
25 exciting idea. Daylight is available for both PVs and

1 for daylight, and when it's not available for
2 daylighting, it's not available for PVs, so your logic
3 is great, thank you.

4 Okay, next up, we're going to move into
5 Section 146, you know, for - you didn't warn me about
6 all this. Section 146 has, again, been our section
7 where some of the most important discussions about
8 lighting occur. What we see here is some very important
9 changes that have occurred, and one of them is the
10 simplification of the daylighting calculations. I think
11 this is fundamental, I've asked many an architect if
12 they even understood what these sections had to say and
13 many an engineer on how they applied them, and I got a
14 lot of cross-eyed looks. So, I believe the importance
15 of what we're looking at right here is getting rid of a
16 lot of that language and replacing it with much simpler
17 language and much more logical connection between the
18 Sections 131, 143, 141 and, finally, of course, 146.
19 So, all of this stuff goes away and it is replaced with
20 this simplified language.

21 Automatic Daylighting Controls and Secondary
22 Daylit Zones. Here is the big simplification, I want to
23 make sure everybody is really clear on this. You are
24 now required to put in automatic daylighting controls in
25 the primary daylighted zones. Okay? By Section 131.

1 Section 146 is changed dramatically because, throughout
2 the last 25 years or so, we've had power adjustment
3 factors for utilizing automatic daylighting controls.
4 Now that they are mandatory for the area where they have
5 the greatest benefit, the whole process is dramatically
6 simplified, that's why all this language has been struck
7 out and we're now looking at (d) being an automatic
8 daylighting controls in the secondary daylit zones.
9 This is where you will get power adjustment factors as
10 you've gotten them before, but you no longer get power
11 adjustment factors for your primary daylighted zones.
12 This is profound. The impact upon projects is really
13 really remarkable. So, I want to stress everybody
14 really clearly understands why we're showing you these
15 things in this particular order. Does anybody have any
16 questions at this time? Because we're going to be
17 moving to other sections, otherwise. Jon.

18 MR. MCHUGH: So, Jim, my understanding is
19 that, in addition to reducing the threshold for the
20 mandatory requirements for daylighting controls, you
21 know, it went from 2,500 square feet, which would have
22 been essentially airport concourses, down to - was it 25
23 feet of glass, or 120 watts, for the secondary sidelit
24 zone, we're actually not talking about power adjustment
25 factors, we're actually talking about a prescriptive

1 baseline that these controls would be prescriptively
2 required in the secondary zone and, if you use the
3 performance approach, then you can then use the
4 performance approach, the computer software method, to
5 conduct tradeoffs between whether or not you use those
6 daylighting controls, or you put in better glass, or
7 better air-conditioning.

8 MR. BENYA: Yeah, I stand corrected. The PAF
9 is all gone for that, I was going on my last
10 understanding. You are right. My new understanding is
11 exactly what you just said. Thank you.

12 MR. SHIRAKH: To kind of recap, the primary
13 site of control, they are mandatory requirements, right?
14 You have to do it, you can't trade away. The secondary
15 daylit controls, those are prescriptive requirements?

16 MR. BENYA: The secondary controls are
17 prescriptive if you use Section 146 prescriptive method.
18 If you go to the performance method, then you get new
19 tradeoffs -

20 MR. SHIRAKH: Get tradeoffs.

21 MR. BENYA: That's very important, thank you.

22 MR. FLAMM: Right. I just would like to
23 summarize. I think the daylighting changes are
24 significant. We had a lot of language for Section 141
25 Mandatory Daylight Controls, and that's where

1 everybody's eyes were glazing over about ratio well area
2 ratio and visible transmittance, and a lot of things
3 that people really didn't have to worry about, unless
4 they were trying to get out of doing the control, even
5 so, it was causing grief for a lot of people.
6 Significantly simplified Section 131 in deleting all of
7 that language. It basically says in 131 that primary
8 daylight area, sidelit area, and skylit area, you shall
9 have a control, period. It gets rid of all the
10 tradeoffs, all the exceptions, and then, in 141, if you
11 have exceptions, you can always go now to a new
12 performance method. And in the performance method, one
13 of the challenges the software generators had was in
14 trying to convert a geometric standard into software,
15 and I don't believe any of the software vendors got that
16 right, and so the new wattage calculation method
17 proposed by HMG will now be the new performance methods,
18 that's significant. So, we don't have to worry about
19 all these exceptions that we used to have to try to
20 write into the Code because, if you've got exceptions,
21 then you go performance. And that's a significant
22 simplification on what we had, so a lot of the
23 terminology that people were having heartburn over goes
24 away, and so I think we landed in a very elegant place.

25 MS. BROOK: Hi, this is Martha. I can't find

1 that wattage calculation method in this paperwork, so
2 can you tell me -

3 MR. FLAMM: It's not in the paperwork, it's
4 going to be in the ACM.

5 MS. BROOKS: So, and this part of the Code
6 uses - goes to the ACM, and have you actually documented
7 that? And is that part of the case report? Or is that
8 something that's going to happen later?

9 MR. SAXENA: This is Mudit Saxena from HMG.
10 Yes, we have documented as part of our case report.

11 MS. BROOKS: Okay.

12 MR. SAXENA: And it has to be done into ACM
13 language which is our next step, but the process has
14 been documented and we've tested it multiple ways in
15 many many places, so we are very comfortable.

16 MS. BROOKS: All right, thanks.

17 MR. BENYA: Okay, further comments, questions
18 on this - we will come back to Section 146 after we
19 finish talking about daylighting. I think you've
20 noticed that there's been a really positive
21 rearrangement of sections here, so the daylighting is in
22 specific sections and so we're kind of sticking with the
23 daylighting topic for the moment. The next one is
24 Section 149, daylighting required for alterations.

25 Gary, do you want to make just a comment about your

1 thinking here?

2 MR. FLAMM: Sure thing. So, we still need to
3 develop language for 149. Section 149 has to do with
4 alterations and additions and, in our last few
5 conference calls, it was brought to our attention that
6 there are exceptions for alterations, needed for
7 alterations that do not exist for new construction. And
8 so, in our effort to keep the standards simple, as
9 Section 131, instead of trying to identify every
10 contingency possible in 131, we said, "Okay, let's look
11 independently at alterations of daylighting." So, what
12 I imagine we're going to do in Section 149 for
13 alterations is come up with some language how to deal
14 with existing obstructions, how to deal when you don't
15 know the visible transmittance of the space, of the
16 fenestration. So, there needs to be some further
17 development on Section 149, how to fold the daylighting
18 requirements into alterations.

19 MR. BENYA: So, suggestions will be
20 appreciated. Any other comments? Yes.

21 MR. THOMAS: Gene Thomas, Ecology Action.
22 Yeah, I would just hope that you could have stakeholder
23 involvement in that part of determining what language
24 would be appropriate, and that also - and we will
25 probably get into this as we go through the rest of the

1 section - that you try to get as much stakeholder
2 involvement into some of the other language with regards
3 to retrofit.

4 MR. FLAMM: Thank you for bringing that up.
5 We do value your input and we have a core group who have
6 been participating in this for a year. Anybody in this
7 audience, or anybody on the phone who wants to be a part
8 of these discussions, please contact me because we want
9 you involved in these discussions. Thank you.

10 MR. BENYA: Further comments about Section
11 149? Okay, we're going to slip back into Section 146
12 and now talk about a few other things. So, first up is
13 the - okay, early on, it says "Lighting power tradeoffs
14 comply with (b) and general lighting and secondary
15 sidelit zones complies with lighting controls
16 requirements in (d)." So, again, this is distinguishing
17 between the two different ways of providing lighting
18 controls. Working our way down, now, 146(a), okay, as
19 we know, those of us who have been with this process for
20 many years know that the portable lighting in office
21 buildings, in particular, has always been sort of an
22 enigma to us, and we've tried to handle this several
23 different ways. In this case, the requirement for the
24 actual indoor lighting power is the total watts, subject
25 to the following specifics, and the first one that comes

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1 up is our exception, "...up to .3 watts per square foot of
2 portable lighting for office areas shall not be required
3 to be included in calculation of actual lighting power
4 density." Okay, so what this is doing is this is making
5 that task lighting exception, but there are some rules
6 that go with this, multiple interlocking lighting
7 systems, reduction of wattage through controls with
8 power adjustment factors, and a number of other
9 adjustments as you see here. You'll notice that (e) has
10 been stricken for automatic daylighting control, power
11 adjustment factors, because of course, we now are
12 already requiring automatic daylighting controls. I
13 think everybody is clear on the concept that you either
14 require controls, or you allow them to be used with a
15 power adjustment factor, but not both. If something is
16 required, you cannot take the power adjustment factor
17 for using it. So, that resulted in the striking of all
18 this language, which we looked at a little while ago,
19 that's why all this is gone and I think we can probably
20 all say for the better. Okay, moving along.

21 Section 146(a)(3), lighting wattage excluded.
22 There are several minor changes in here, lighting
23 installed by the manufacturer in refrigerated cases is
24 now struck, walk-in freezers, vending machines, etc.
25 remains. I'm sure that was something that came up often

1 in -

2 MR. FRAMM: Well, refrigerated cases have been
3 moved away from the group that was into a separate
4 group, and refrigerated cases less than 3,000 square
5 feet are regulated by Title 20, so, to be consistent
6 with Title 20, I pulled out that language out of the
7 group and re-entered it below as a standalone.

8 MR. BENYA: Under Item T, you see lighting in
9 a videoconferencing studio has been reduced from 2.5 to
10 1.5 watts per square foot, specifically for video
11 conferencing. I presume this was done because cameras
12 are that much better?

13 MR. FLAMM: This was proposed in 2008 by Lee
14 Hedberg, he was our subject matter expert in developing
15 this. And we actually landed somewhere different than
16 he proposed. We ended up a watt larger because he
17 thought that this was the entirety, he didn't realize
18 that this was in addition to the general lighting power
19 allowance; so, he said, "You know, you guys have got it
20 wrong, you're giving a watt greater than my analysis
21 justified in 2008."

22 MR. BENYA: Yeah, and with videoconferencing
23 starting to become more popular, thank goodness, because
24 it reduces carbon footprint, but some work that I'm
25 doing with the infocom industry, tell me now that the

1 cameras are working very very well at lower light levels
2 than ever before, so I don't see any problem with this.

3 Okay, we're going to come down to the complete
4 building method, just a few minor corrections down here.
5 The complete building method, we're going to see some
6 modifications to the tables for both complete building
7 method, the Area Category Method, and the tailored
8 method, and we're going to just note a few of these as
9 we go through. In complete building method, that's just
10 a table number change, Area Category Method, and pretty
11 much table number changes until we get to (b) -

12 MR. FLAMM: I want to interject something
13 there, Jim. All of the table numbers in Section 146
14 have changed because tables 146A and B had to do with
15 skylights and specular skylights and there were two
16 look-up tables, and because we deleted all that
17 language, it caused a domino effect. So, a lot of the
18 changes that you see scratched out in a different table
19 number were just because of that resulting domino effect
20 of deleting existing tables 146A and B.

21 MR. BENYA: Okay. Sub (b) here in the red,
22 additional lighting power, if I understand this
23 correctly, this is just more or less solving a problem
24 that has been a result of the way the category has
25 evolved, with the additional lighting power allowances.

1 It's really not new, it's just clarifying the intent.

2 Am I correct?

3 MR. FLAMM: That is correct. This language was
4 taken out of the table as extensive footnotes in a
5 table, and we just moved it here to simplify the
6 language in the table, and basically to clarify the
7 intent of those task lighting allowances.

8 MR. BENYA: Does everybody understand this
9 doesn't mean much, what it does is it clarifies that the
10 additional lighting allowances permitted for the Area
11 Category Method, so in other words, you get a general
12 lighting allowance plus certain additional allowances
13 under certain circumstances. Those additional
14 allowances are "use it or lose it" allowances, and the
15 clarification in the rules here will make it easier for
16 the rules to be interpreted and used in the field.
17 Everybody clear on how that works? Any questions?
18 Okay, so that's what all that red stuff is.

19 Okay, moving down into the Tailored Method,
20 again, a little historical perspective, once upon a
21 time, the Tailored Method was our predominant method for
22 calculating interior lighting power allowances. It took
23 a lot of time, required a lot of calculations, and
24 frankly, it had a few loopholes in it, too. It has been
25 narrowed down in its focus over time and today's focus

1 is, you still can use it pretty much the way it was
2 always intended, but it's limited in scope, you can no
3 longer use it quite the way you could have used it some
4 10 or 12 years ago. We're going to see some different
5 values coming up and then there are some - could you
6 explain what happened here in sub 1, Gary?

7 MR. FLAMM: Sure thing. So, in sub 1, the way
8 the Tailored Method is constructed is you have a general
9 lighting allowance, which is typically lower than the
10 area category, and then you get layers to add upon it.
11 So, sub 1 was how to calculate the general wattage
12 allowance, and there used to be sub (1)(a) and sub
13 (1)(b), (1)(a) was if we gave you an a, b, c, d, e, f,
14 g, that would be the category of classification of
15 illumination you would use. And in the sub (1)(b) it
16 used to be, if it said IESNA Handbook, you could go to
17 the IESNA Handbook and, from there, derive an a, b, c,
18 d, e, f, or g illuminants level. Sub (b) has been
19 stricken out because it has been taken out of the table,
20 so what we have left here is (a)(1) is how do you
21 determine general wattage allowance based upon the new
22 table a, b, c, d, e, f, g. And it goes into the room
23 category ratio calculation, etc. So, it is an
24 explanation on how to derive your general wattage
25 allowance, using the new table.

1 MR. BENYA: Is there any plan to modify this
2 or update it when the new handbook comes out?

3 MR. FLAMM: It would make sense. Now, I was
4 privy - IESNA did send me some documents, minor
5 selection of documents, and we could update the table,
6 the numbers in the table, and I believe the Case Teams
7 are looking over that IESNA data right now that we have.
8 Now, the Tenth Edition Handbook is supposed to be out in
9 - yeah, two months ago - and so it is my hope that we
10 cite the Tenth Edition Handbook instead of the Ninth
11 Edition Handbook that we currently cite. So, as soon as
12 it's published, we're going to change that cite again
13 and we hope that it's in the right timeframe.

14 MR. BENYA: Good. Any other questions about
15 the Tailored Method? Okay.

16 MR. FLAMM: Jim, do you want to relay his
17 comments for the Court Reporter?

18 MR. SHIRAKH: The gentleman said he had some
19 comments about the entire section, but he's going to do
20 it -

21 MR. BENYA: In a couple minutes. Let me
22 finish the section.

23 MR. SHIRAKH: Okay, I just wanted to make sure
24 the Court Reporter got his name or his comments.

25 MR. BENYA: Yeah, Gene Thomas will be invited

1 up here as we finish Section 146. Section 146 has a
2 number of other minor improvements in the Tailored
3 Method here.

4 MR. FLAMM: Subsection (B) are the layered
5 allowances for wall display, floor display, very
6 valuable merchandise, that is all sub (B), that all
7 stays the same. The new information is the sub (C).

8 MR. BENYA: Here we go. So, sub (C), then,
9 provides for general lighting allowances using IES and,
10 by the way, we're going by IES now, are we not? Not
11 IESNA anymore? So change to IES? Okay. This is a
12 method to be used to determine the general lighting
13 using the criteria and, as you can see, this is a - I
14 would describe it as a clarification of something we've
15 been saying pretty consistently for the last couple of
16 editions of the standards, so this is not really new,
17 this is organization and clean-up.

18 MR. FLAMM: This is all of the IESNA criteria,
19 generic statements that were in the table were taken out
20 of the table, and inserted into this Sub (C).

21 MR. BENYA: Good. (D), we've already
22 discussed, the automatic daylighting controls and
23 secondary zones. I hope everybody noticed that the
24 threshold is 120 watts, like we discussed earlier.
25 Striking out all of the well efficiencies. Now, here

1 are some lighting power adjustment factors. Again, this
2 - what is tricky about this is, when you make certain
3 things mandatory, you can't get a correction factor for
4 using them. So, this has been fixed to correspond to
5 mandatory automatic daylighting controls. That's all
6 the strikeouts you see in there. This does not change.

7 MR. FLAMM: Okay, Jim, before you go on, I've
8 not asked the question yet, now that we have the
9 controllable ballast, the controllable lighting stuff,
10 and this was something we developed with Francis
11 Rubenstein in 2008, saying that if you had a dimmable
12 ballast, and that dimmable ballast was earning a power
13 adjustment factor, that dimmable ballast had to be
14 certified that it met this minimum relative system of
15 efficiency. We need to discuss what that means to this
16 language, I don't know the answer.

17 MR. BENYA: Should this move to Section 131?

18 MR. FLAMM: Are we still going to require a
19 relative system efficiency for some ballast? We don't
20 have to discuss that now, but when I put this language
21 together for this workshop, I realized that this is an
22 unanswered - unasked question, rather.

23 MR. BENYA: Does anybody have an opinion
24 they'd like to express? Okay, so we'll - Owen?

25 MR. HOWLETT: This is not on the relative

1 efficiency, but you skipped over one thing, which people
2 want to know for the area category changes that are
3 coming up. At the top of the table here, we're
4 proposing the new Power Adjustment Factors there for
5 occupant sensors used in office open areas. So,
6 depending on how - these are occupant sensors looking
7 down the cubicles, basically - depending on how many
8 cubicles the occupant sensor is controlling, you get a
9 varying Power Adjustment Factor, so probably you get the
10 highest PAF of .4 when it's controlling basically one
11 cube and 25 square feet, and you get progressively less
12 Power Adjustment Factor as the occupant sensor controls
13 more cubes. Now, that's important because that is part
14 of the justification for the area category reduction for
15 offices coming up.

16 MR. BENYA: Yeah, thank you for reminding me
17 of that. Yes, we had this discussion the other day and
18 this - one of the things that we're beginning to run
19 into, we're seeing this in some of the offices of the
20 future test projects, is that you will have - an open
21 office area will have -

22 MR. SHIRAKH: May I ask the people on line to
23 please mute yourself? We're getting a lot of background
24 noise in here, it's very loud.

25 MR. RUBENSTEIN: Actually, that may actually

1 be me. This is Francis. Can you hear me?

2 MR. SHIRAKH: Yeah, we can hear you loud and
3 clear.

4 MR. FLAMM: Hello, Francis.

5 MR. RUBENSTEIN: Okay, sorry about that. I
6 just - I heard my name and, yes, to answer that
7 question, yes, RSE is still necessary, you still want to
8 have an efficiency - a minimum efficiency that you
9 require for controllable ballasts, yes, that definitely
10 needs to be in there.

11 MR. FLAMM: Thank you, Francis. I was hoping
12 you'd answer that. Now, how do we apply it, because the
13 current language, it doesn't apply it to anything. We
14 have to figure out how to apply it now. So, we can
15 discuss that offline.

16 MR. RUBENSTEIN: Okay.

17 MR. FLAMM: And to Owen's point, what you
18 point out is a deficiency in the language, still, in the
19 fact that we added some language to the table for which
20 we do not have corresponding narrative in the very
21 beginning of this section. So, what we need to do is we
22 need to make sure we have a corresponding narrative to
23 this table.

24 MR. MCHUGH: So, now that we're back to Table
25 146(A), I'm going to ask the question that the RSE

1 brought up, so are we giving credit for having dimming
2 ballasts, if dimming ballasts are required under the
3 control of the lighting proposal?

4 MR. FLAMM: Well, the answer is yes right now
5 only in the fact that we haven't discussed it. So, the
6 current language has not removed that language, so
7 that's the question I'm asking. It was an oversight
8 that I just recently recognized.

9 MR. MCHUGH: Yeah, it might be an oversight, I
10 mean, if something is mandatory or even a prescriptive
11 requirement, you wouldn't give a credit for something
12 that you already require, so something definitely for
13 later discussion.

14 MR. FLAMM: Okay, Peter is getting excited.

15 MR. BENYA: Well, before you go, Peter, I want
16 to point out, Table 146(B) now, used to be (D), is
17 minimum required system efficacies for certain
18 combinations of lamps and ballasts, in other words,
19 there are ordinary electronic ballasts, there are
20 efficiency electronic ballasts, and we're trying to
21 force people into using the efficient ones. So, that's
22 the question that Francis opined on, and we want to get
23 more thought about this, I was asking, does this belong
24 in Section 131, or should we be moving it forward
25 because it's going to apply to all controllable

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1 lighting, not just in Section 146. Now, coming back to
2 the point that Owen had made about these occupant
3 sensors in small offices, this is new language and a new
4 concept, and I think that everybody ought to give some
5 thought to whether these numbers are - whether the
6 concept is a good idea, or whether the numbers are a
7 good idea. I happen to like them a lot and I've done
8 projects this way. To the point you were just raising,
9 though, for example, dimming systems, you have manual
10 dimming systems, you still get credit for that in
11 certain facilities, perhaps we want to continue that,
12 but here you see manual dimming of dimmable electronic
13 ballasts, all building types, 10 percent. And the
14 question is, do we persist with that or not. The reason
15 why is, the ability for the user to make the adjustment
16 is different than the lighting being controllable by
17 some automatic means. Okay? And the question is
18 whether this is a valid contribution with the power
19 adjustment factor is something opinions would be
20 valuable on. Thank you.

21 MR. SHIRAKH: I do have one comment directed
22 at credits for occupant sensor, there are three layers
23 in here, and I don't know if the case team has looked at
24 this for the sake of simplicity, having one number,
25 maybe .3 that would apply to all sizes, whether that

1 would change the dynamics?

2 MR. SCHWARTZ: Well, I've been standing here
3 for a while, so if you don't mind, I'd like to
4 interject. Peter Schwartz with LUMEnergy. Just to go
5 back on the comment about the power adjustment factors
6 and with dimming ballasts being mandatory and whether or
7 not we should give credit for controls. You know, it's
8 a similar thing as putting in the demand response,
9 enabling technology, but then giving credit for actually
10 using it. Well, we can have dimming ballasts that are
11 mandatory, but to take advantage of them, we need to
12 provide credit for the systems that control them. In
13 the case, you know, Jim has been referring to the office
14 of the future, and as we look ahead and push toward net
15 zero, we see a lot more office buildings going to
16 heavily bent sensor networks, and work station specific
17 lighting, we need to allow for power adjustment factors
18 in those circumstances. So, it's not only just having
19 the dimming ballasts, but how do we employ them, whether
20 the granularity, the sensors tied to them, and the rest
21 of the controls. As we're, again, trying to move away
22 from the manual, the other piece of it that you were
23 just talking about it personal control because, if we
24 have work station specific lighting, we can now have
25 applications on their laptop, or their smart phones,

1 that enable them to tune their lighting to their
2 particular preference and get additional savings. We
3 want to encourage that and the only way to do that at
4 this point is through additional power adjustment
5 factors. And this goes beyond just, you know, a slider
6 on the wall. So, I would say let's be careful and use
7 proper semantics about which piece of the control
8 systems that these credits are going towards. Thanks.

9 MR. SHIRAKH: Thank you, Peter.

10 MR. HOWLETT: Owen Howlett with HMG. Just to
11 answer Mazi's question about why do we have three
12 different numbers for the occ sensors in open offices,
13 those numbers correspond to control of either one, two,
14 or four work stations by a single occ sensor, and the
15 reason that we wanted to provide those three different
16 numbers is that the savings change dramatically,
17 depending on how many people are in that control group,
18 because if you've got an occ sensor looking down on four
19 people, all four of those people need to be gone for
20 lunch or in a meeting, or whatever, before that, and the
21 lighting is going to turn off, so it impacts the savings
22 quite a lot compared with having one occupant sensor per
23 person. So, it also represents a four-fold increase in
24 cost, you know, having one per person instead of one per
25 four people, so we thought it was justified to have

1 those three separate levels.

2 MR. SHIRAKH: Okay, thank you.

3 MR. BENYA: Owen, could I ask you a question?

4 MR. SHIRAKH: Pam has a - well, after Owen,
5 Pam, you can come up.

6 MR. BENYA: Did you anticipate that this
7 particular approach could be work station or desk
8 mounted, as opposed to ceiling mounted?

9 MR. HOWLETT: Yeah, after Dorene Maniccia
10 mentioned that, we did include that in our
11 consideration, yeah. So, initially, we had language
12 that said it was only a ceiling mounted sensor, and some
13 people may remember from the first stakeholder meetings
14 that we had, it had always been phrased as being a
15 ceiling mounted sensor, especially for when you've got
16 one per work station, it could equally well be a desk
17 mounted or a partition mounted sensor, so all of that is
18 now allowed by this new language that we have.

19 MR. FRAMM: So, I want to add to that, the
20 concern that I've raised is that this is a building
21 standard, and the builder needs to be able to build
22 something and turn something over that they can get
23 signed off, and this is all before the furniture is
24 installed. So, we cannot hold the builder responsible
25 for controls that will be put in after the building has

1 been signed off. And that's the challenge with
2 controlling cubicles. And so, I believe it's a good
3 concept and there's probably other vehicles by which we
4 can get there, except I don't see how we can fit
5 anything beyond the building into a building standard,
6 and that's been my concern.

7 MR. BENYA: Well, you know, Gary, I don't want
8 to belabor this too long because we've still got stuff
9 to cover here, but you have to pull an electrical permit
10 to put in furniture systems.

11 MR. FRAMM: I didn't know that was a truism.

12 MR. BENYA: Well, the minute you start doing
13 wiring on branch circuits, you know, hard wiring to the
14 extent that that is involved, technically you are
15 supposed to get a permit. And so, would we not want to
16 consider how we might modify the standard to address two
17 phases of the same project?

18 MR. FLAMM: I don't know the answer to that.
19 I don't know if you want to speak to this. I have
20 concerns because it is my understanding that permits are
21 not pulled for office furniture.

22 MR. THOMAS: Gene Thomas, Ecology Action. I'm
23 glad I heard you say what you said, Gary, about applying
24 it to the building because a lot of this language is set
25 to be applied to retrofit situation, and so you have to

1 be able to address that part of it, and once you get
2 into a retrofit, it's a whole different set of cost
3 effectiveness calculations in the real world, compared
4 to a new construction kind of thing. And so we would be
5 going into a situation with an office set up the way
6 that it's set up right now, with either high partitions,
7 or low partitions, or none, or as the case may be, and
8 from what I can see, if it meets the triggers, then this
9 is going to be applying to it, so that's something that
10 needs to be worked out, too, in the context of how
11 language is treating retrofits.

12 MR. FLAMM: I would ask that you read the
13 retrofit case study if you haven't already. Thank you.

14 MR. SHIRAKH: Pam, do you want to - can you
15 come up, please?

16 MS. HORNER: Pam Horner, Osram Sylvania. I
17 have a question for Gary and Jim and Francis, if he's
18 still on the line. This is relative to the new Table
19 146(B). My question has to do with what has both T-5
20 and T-8 fluorescent lamps, and, Jim, did I understand
21 you to say that this could be applicable in Section 131,
22 as well?

23 MR. BENYA: That's correct.

24 MR. SHIRAKH: Can you put up the table so
25 people can see what we're talking?

1 MR. FLAMM: So, I want to clarify that that's
2 an existing table that is not proposed to be changed,
3 other than the name of it.

4 MS. HORNER: Understood, and that was my
5 question of you three, is that the new Department of
6 Energy ballast rulemaking that's going on right now for
7 electronic ballasts, is moving to the efficiency metric,
8 so is that something that is of interest or concern? Or
9 not? Because I'm just saying we have one metric here
10 and just regarding what's going on in another arena, we
11 do have another metric, so I just wanted to bring that
12 up. Thank you.

13 MR. SHIRAKH: Francis, do you have a reaction
14 to that?

15 MR. FLAMM: Well, let me say something first
16 there. If this is a credit, as it currently is, we
17 don't push up against any federal preemption because
18 it's a credit, however, if we move this to Section 131,
19 as Jim is suggesting, we would be subject to any federal
20 preemption, so, as a credit, we're free to have our own
21 metric. As a requirement, we're not.

22 MR. BENYA: Well, let me just ask a question
23 and maybe, Francis, we know you're there.

24 MR. RUBENSTEIN: I'm here, I'm here, really.

25 MR. BENYA: Maybe Pam or Francis can enlighten

1 us a little bit here. If the Federal rulemaking goes
2 ahead, my guess is that these numbers will probably be
3 close to the Federal rules. Does this whole idea become
4 superfluous? I mean, this won't be the first time we've
5 gone through this, I know.

6 MR. RUBENSTEIN: No, this is Francis, no, and
7 first of all, while the dimming ballasts - the current
8 rulemaking that is going on, the one that Pam was
9 referring to, that actually - this does not cover
10 dimming ballasts at all. So, that part of it is not
11 going to be covered. But Pam is right that they are
12 considering a different metric, rather than BEF, or
13 relative system efficiency, it's going to be ballast
14 efficiency - I have some gripes about that, but that's
15 another question - but I think the bottom line is that,
16 whatever the Feds come up with as a rulemaking, we would
17 need to show deference to what they're doing, we'll have
18 to recalculate these numbers to make them correspond to
19 whatever is happening at the Federal level. But for the
20 moment, the dimming ballasts are not part of the ballast
21 rulemaking.

22 MR. FLAMM: So, this is Gary. We have to know
23 what we need to know in the course of our rulemaking
24 proceeding, and so if there is something ongoing, we
25 need to have some intelligence about where that might

1 end, and hopefully we land in the right place with what
2 we adopt because -

3 MR. RUBENSTEIN: I'm hooked into that process
4 and I will provide you input into that, Gary.

5 MR. FLAMM: Okay, thank you.

6 MR. RUBENSTEIN: Okay.

7 MR. MCHUGH: This is Jon McHugh. Just to
8 clarify what I thought I heard Francis saying, is that
9 regardless of what occurs with the Federal rulemaking, t
10 won't preempt Title 24, so if you decided to put this in
11 131, that would be okay, and it doesn't even have to
12 match the Federal standard because the Federal standard
13 is covering static ballasts. But -

14 MR. RUBENSTEIN: That is true. That is true.

15 MR. FLAMM: Okay, this was a worthwhile
16 discussion and we need to identify a subgroup to discuss
17 this after this staff meeting.

18 MR. BENYA: Okay, any other points? Okay.
19 Let's move along. These are the proposed changes in the
20 lighting power density values. Each time we go through
21 the standard, we look at changes in technology or
22 something else that allows us to reduce the lighting
23 power density standards. As I have told a number of
24 you, there have not been any significant changes in the
25 efficacy of light sources that we have available right

1 now for these applications, since the last time we went
2 through this. So, the numbers are not going to be going
3 down much. The energy savings that are going to result
4 from this generation of standards are going to become
5 more from controls, mandatory and otherwise, that are
6 going to come from lighting power density. Now, that
7 said, this is kind of a slippery slope because we've got
8 to make some decisions now, based on technologies that
9 will be available three and four years from now. And
10 that's a little bit hard. Solid state lighting has
11 proven itself to finally beginning to achieve some of
12 its long promise of higher efficacies and more cost
13 affordability, but it isn't quite there yet and we would
14 be guessing as to whether or not it would be there and
15 how it would be there by 2013 and 2014. So, at this
16 time, the power density numbers for the most part are
17 going to remain the same, these are the whole building
18 numbers, and you can see only two of them change, and
19 these were fairly well researched. Office buildings,
20 one of the reasons why office buildings can change,
21 folks, to be blunt, is there have been some changes in
22 luminaire efficiencies, so not so much lumens per watt,
23 as it is the efficiency of the luminaires putting those
24 lumens into the space. In office buildings, we're
25 seeing a drop from .85 to .8, but it is reasonably

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1 possible to light an office building at .8 and that's
2 not a big deal. Parking garages have taken a big jump
3 downwards from .3 to .2. And, again, from my personal
4 experience, this s easily done in standard practice
5 today and I don't see any reason to particularly
6 question it. Any comments about Table 146(C)? David?

7 MR. FLAMM: I want to interject something
8 there. The office, both in a complete building method
9 and in the Area Category Method, the office LPDs went
10 down, which corresponded to the task lighting allowance
11 going from .2 to .3. So, that kind of happened in
12 tandem.

13 MR. GOLDSTEIN: Yeah, this is David Goldstein
14 at NRDC. And I want to suggest an avenue for some small
15 additional reductions in LPDs with the appropriate
16 humility that I may be remembering some of this
17 incorrectly, and in any event, I certainly would agree
18 with the prioritization that you've expressed in all the
19 presentations so far. The big savings are from controls
20 and from the daylighting improvements and the retail
21 Tailored Method adjustments. What I'm suggesting would
22 be relatively smaller. But I do seem to recall that I
23 asked Jim earlier whether there was a new LPD
24 calculation spreadsheet compared to the previous go-
25 round, and he informed me that that hadn't really

1 changed since 2005. It's my recollection, and I've
2 looked very carefully at that 2005 spreadsheet, you
3 folks in the room can take credit for the fact that the
4 Chinese lighting power densities are about 10-20 percent
5 below where they would have been, because the lighting
6 experts there were able to use that spreadsheet and
7 verify what you did. But I seem to recall that the
8 luminous efficacy for the fluorescent lamp category,
9 which was the biggest one, was not based on the latest
10 generation of lamps and ballasts, but was based on a
11 ballast that was one generation below what you can do
12 today, which I believe would be cost-effective today,
13 even if it wasn't in 2004. So, I would encourage you to
14 go back and look at that, and see if that is correct.

15 MR. FLAMM: If my memory serves me right, I
16 believe, in the 2008 standards, those models which use
17 linear fluorescent, we use 90 lumen per watt, third
18 generation T-8, is what I believe was used.

19 MR. GOLDSTEIN: I think, in terms of the
20 lamps, it was series 800 T-8s, in terms of the ballasts,
21 it was not the state-of-the-art, as I recall, so anyway,
22 we can check and - it's not a big effect, it's probably
23 a 5-10 percent effect, but -

24 MR. BENYA: I think you're partly right. I
25 think we harvested out the 2008 standards, we didn't

1 exactly go through the spreadsheets, but we did actually
2 go through and see, you know, extreme circumstances,
3 office buildings, and office buildings went from 1.0 to
4 .85, going from 2005 to 2008, so there were a number of
5 rather substantial changes that occurred going from 2005
6 to 2008, to take advantage of that very change you're
7 talking about, so I think we already harvested those
8 back in the 2008 standards.

9 MR. GOLDSTEIN: Well, let's check. When I was
10 looking at the numbers, what came into my mind was the
11 non-office occupancies, particularly since the case
12 studies emphasized office retail and parking garage, I
13 didn't really look at anything else.

14 MR. BENYA: You know, I'm just going to say,
15 one of my bigger concerns about the non-office
16 occupancies is our calculational methods and our
17 modeling make me a little nervous, you know, offices and
18 schools and certain space types are relatively easy.
19 When you start talking about libraries and restaurants
20 and a lot of projects like that, we don't go after them
21 quite so aggressively because primarily, one, they don't
22 use linear fluorescents, they tend to use smaller and
23 more point sources. And I think we're going to see a
24 big change in the next few years as LEDs step into the
25 point source marketplace more. But until they do, I'm

1 not sure we can make a lot of difference. I think we
2 took advantage of it in 2008. I would be glad to look
3 at it with you.

4 MR. GOLDSTEIN: Yeah, I think it's worth
5 checking because, again, while I agree with your
6 philosophy that you can't rely on LEDs for broad basing
7 of this standard upon them, you can rely on them as a
8 compliance option to at least allow people to build a
9 project if we're getting too tough on the LPD for a
10 particular project.

11 MR. BENYA: Yeah, but the problem is we have
12 to prove they're - if we start to make a standard that
13 effectively requires them, we've got to prove the cost-
14 effectiveness.

15 MR. GOLDSTEIN: Right.

16 MR. BENYA: We're not there yet. We are in a
17 few places, but not generally.

18 MR. GOLDSTEIN: Thank you.

19 MR. BENYA: Thank you.

20 MR. FLAMM: So, I would like to interject
21 there, again, that I suspect that the Tenth Edition
22 Handbook changes in foot candle levels is probably
23 going to be more impactful than the technology change
24 because I believe Jim did a lot of models in 2008, and I
25 think that's where we really should be looking.

1 MR GOLDSTEIN: Well, that's one of the
2 reasons, I completely agree, that's one of the reasons I
3 mentioned the spreadsheet, because the spreadsheet would
4 allow you to make those change if there are some pretty
5 directly, so I would encourage that step as well, yeah.

6 MR. SHIRAKH: Thank you. Bernie.

7 MR. BAUER: Yeah, Bernie Bauer with Integrated
8 Lighting, and also one of the key members from the
9 utilities Code and Standard group. And to speak to
10 Handbook 10, one of the other things, if anybody looked,
11 when you looked at our retail studies, in addition to
12 looking at technology, for example, CMH, heavier use in
13 retail, because we had privy to - I was on the
14 committee, still on the retail lighting committee - we
15 used RP211 which is in print right now, as our
16 guideline, therefore, at one time, and the reason I'm
17 coming up to speak in terms of whole building is because
18 we didn't address whole building, but possibly a couple
19 for those areas in whole building, that are attuned to
20 retail, such as grocery stores, might have a tick to be
21 dropped because, again, under the old RP2, you had 100-
22 foot candles for a grocery store. There is nothing in
23 RP211 now that suggests that electric lighting, general
24 lighting, be higher than, let's say, 50-foot candles.
25 So that might be one of the things we might want to

1 explore is to look at that. We did do that in Tailored
2 Method, and when Jim presents that, you'll see that
3 we've played around with that, lowering some Tailored
4 Method retail, as well as lowering area method retail,
5 and then putting those ticks back up for certain kinds
6 of retail that might need a little more power density,
7 but, again, thinking in terms of big box, which is
8 monolithic, bringing them in line with both what IESNA,
9 or just IES, is saying for current retail, as well as
10 what new technology is saying. Thank you.

11 MR. FLAMM: So, I'll take a tangent from where
12 you went, Bernie, you were talking about RP2, 2011, any
13 documents that we cite in developing our standards, we
14 have to own a copy of, so we cannot cite future
15 documents, so we need to make sure the documents are
16 publicly available by the time our standards go into
17 effect.

18 MR. BENYA: Okay, good. I was wondering where
19 that was headed, so that's very good news. Any other
20 comments pertaining to whole building method? I'm going
21 to move forward, then, and we're going to take a look at
22 the table next for the Area Category Method, and you can
23 see one of the first things is there has been a
24 restructuring of some of the footnotes to correspond in
25 part with the changes in the language, and to correspond

1 in part with changes to the table. We see some
2 commercial and industrial storage has been removed,
3 parking garages have been changed, retail merchandise
4 sales has been dropped quite a bit, grocery dropped
5 quite a bit, and then the footnotes have been modified
6 to refer back to the language which we saw earlier. Any
7 particular questions? Well, let's stick with this and
8 we'll do the footnotes next. Any comments or questions
9 about the body of the table here? We'll look at the
10 footnotes.

11 I hasten to point out that, you know, office
12 areas and other things, there are a couple of rather
13 significant drops here, and I presume those have as much
14 to do with changes as I pointed out, in some cases,
15 technology, but also in practice. Okay, slipping down
16 into the footnotes, when the Area Category Methods began
17 to evolve, the idea was that we sought to find sort of
18 the best way to do most of the calculations, so you
19 break the building up into various space types, and so
20 the space types have a general characteristic, we
21 separate toilets from work areas, and things like that
22 in the calculations. Then, over time, we have moved
23 more and more building types and project types into this
24 by taking them out largely with the Tailored Method, and
25 in some cases out of the whole Building Method, because

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1 it made more sense. And, in doing so over time, we've
2 added additional allowances for certain space types to
3 provide for task level lighting and similar decorative
4 lighting and a few other things. So, I want you to just
5 take a quick look at this. It doesn't look like there's
6 - Gary, is there a significant departure from this? Are
7 these numbers a lot different than we've had?

8 MR. FLAMM: No, the numbers are not that much
9 different. What we did is we gutted the Tailored
10 Method. In the Tailored Method, there were a number of
11 different constructs into one table, and we moved some
12 of that into the area category. So, what we left in the
13 Tailored Method was general lighting, which has several
14 other layers, floor allowance, wall allowance, there
15 were some - you know, we kind of filtered the tailored
16 method and there were some that had only one layer of
17 allowance. There were some like schools, you know, and
18 then you allow a white board, and so, in those cases, it
19 didn't make sense to leave that as a Tailored Method,
20 but to move it into the area category, and to give an
21 allowance for white boards and chalk boards. So, in the
22 simplification of the Tailored Method, some of the data
23 entered up into the area category method.

24 MR. BENYA: Right. So, we have .2 watts per
25 square foot for specialized task work, .5 for a

1 different type of specialized task work, .5 for
2 ornamental or special effects lighting, .7 for
3 chandeliers and sconces, 1 watt a square foot for
4 precision commercial and industrial work, 5.5 watts per
5 lineal foot for white boards or chalk boards, accent
6 display and feature lighting, luminaires, be it
7 adjustable or directional, .3 watts a square foot, and
8 .2 watts a square foot for decorative lighting primary
9 function decorative, in addition to general
10 illumination. They apply to different types of spaces,
11 some spaces are not allowed any additional allowances,
12 and some spaces have rather specific ones that allow the
13 light and power levels to be increased, depending upon
14 need. Any questions about this? Gene?

15 MR. THOMAS: Yeah, Gene Thomas, Ecology
16 Action. Have you given any consideration to aged eye
17 aspects in any of these? I haven't seen anything
18 related to senior facilities.

19 MR. FLAMM: There have been no models done
20 differently than in previous as far as the aging eye.
21 That poses a philosophical question in the fact that any
22 building can be assumed to have somebody with aged eye,
23 so do we build all of our buildings with extremely high
24 light levels because of aged eye? Or, do we allow aged
25 eye illuminants through task lighting and other methods?

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1 We have not - that's a pretty slippery slope that we've
2 never opened that door.

3 MR. THOMAS: And facilities that are dedicated
4 strictly to seniors?

5 MR. FLAMM: And there is in the Area Category
6 a senior allowance - a senior - Jim, do you want to go
7 up to that Area Category Table? Senior sleeping area,
8 housing, public commons area, that is dedicated - the
9 lower left there.

10 MR. THOMAS: Oh, is that senior, [comma]
11 sleeping area? Or is that senior sleeping area?

12 MR. FLAMM: I believe, to tell you the truth,
13 I am totally confused by that whole subsection right
14 there. What our intent was in '05, what our intent was
15 in '08, and I've asked you this, Jim, I think it's worth
16 that we look at that whole classification of dormitory
17 senior, etc. So I would like to look at that.

18 MR. BENYA: Yeah, and from what I have heard
19 of the Tenth Edition Handbook, I've heard rumors to the
20 effect that the concern of the aging eye is going to be
21 more pronounced in the handbook. This is a worrisome
22 area because the work that's been done in this area has
23 been limited, it's controversial, IES has published a
24 document, RP28, which is very insightful. The big
25 question is, how much impact should it have upon

1 standards development. I have worked in a number of
2 senior facilities and one of the issues that comes up,
3 and I've heard this over and over again, is there's a
4 lot of pressure to increase the light levels in certain
5 areas, and yet the people who live there don't want you
6 to do it because they - many of them don't want to work
7 or live in facilities that make them feel like they're
8 institutions. And so there's a balancing act between
9 people wanting to live normal lives and people having
10 enough light to see what they need to see. It's a
11 tricky one, a slippery slope was a very good phrase for
12 it. So, I think we'll put this on our to do list, Gary.

13 MR. SHIRAKH: Jim, obviously there are people
14 that need more light, but must that be hardwired into
15 the general lighting? Or can it be provided through
16 task lighting, modular lighting, you know, there's other
17 means of providing - in my own eyes, it's kind of - you
18 need more light.

19 MR. BENYA: This is difficult because, first
20 of all, to which facilities does it apply? Does it
21 apply to a middle school that has adult education in the
22 evening? Does it apply to, you know, community centers
23 because you might have a senior class there, one out of
24 20 might be for people over the age of 70? I don't
25 know. And this is part of what makes it difficult.

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1 MR. SHIRAKH: Peter, go ahead.

2 MR. SCHWARTZ: Peter Schwartz of LUMEnergy.
3 First, I think it's more troublesome and wearisome to
4 Jim because, when we started this process, 20 blah years
5 ago, we didn't have gray or falling out hair, so it's
6 more worrisome because we're reaching that point. But,
7 with that said -

8 MR. BENYA: You had to remind me, didn't you?

9 MR. SCHWARTZ: Well, you know, it's been a
10 long time. One of the things we have to keep in mind is
11 the intent with the energy savings that are coming out
12 of this round of proposed changes to the standards, more
13 important, is the advancement in lighting quality
14 because of the types of systems that are being promoted
15 here, so having spent much of my career crawling around
16 on the field in a wide range of facilities, and putting
17 a lot of senior facilities and skilled nursing
18 facilities, one of the advantages of the systems that
19 are being promoted here is more comfortable and
20 controlled lighting, we're not dealing with systems
21 where we have the glare bombs of exposed troughers with
22 K12 lenses, where, again, as Jim points out, to seniors
23 that are experiencing institutional feel, you know,
24 we're now able to dim lighting to appropriate levels,
25 eliminate a lot of glare and too much, you know,

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1 inappropriate contrast ratios in different spaces, so
2 we're getting more comfortable lighting so they can
3 actually see better. And I think that's an important
4 thing. The other thing is, you know, I work on a lot of
5 very large facilities with Union issues and older
6 workforce, where they do have to adjust the lighting.
7 The beauty of the controls is you can adjust them up or
8 down, the overall advantage, however, is the whole
9 system on a whole building is way down with these types
10 of controls, which is what we're driving at. So, I
11 think at this stage, to kind of split out the aged
12 workforce is a little bit difficult to wrestle with for
13 the reasons that were just mentioned, how do we know
14 whether it's a youthful or an elderly workforce in the
15 building, and how do we know that won't change upon
16 building sale or change? So, we need to understand that
17 the controls will get us a long way there and, as Mazi
18 pointed out, if someone needs specific additional
19 lighting, there are task lighting that can deal with
20 that and we have a lot of very efficient LED sources
21 doing that in the field right now.

22 MR. SHIRAKH: Exactly. There are facilities
23 that are designed for older folks, that is one thing,
24 but for buildings like this and I'm finding I need more
25 light to do things for reading, fixing stuff, and

1 finding task lighting is perfectly suitable for that
2 task. Bernie.

3 MR. BAUGH: Yeah, Bernie Bauer again with the
4 Utilities Codes and Standards Team. First of all, by
5 way of an explanation, and, Jim, you mentioned both
6 retail and grocery, the significant drop, and then we
7 picked up these pointers, if you build that back up, we
8 really haven't suggested cutting it that significantly,
9 but what we've done is we've put this into the category
10 now, "use it or lose it," so those simplistic retail and
11 grocery store spaces that are using these monolithic
12 lighting systems will have a stretch, coupled with
13 daylighting to do good lighting design, and yet when we
14 get these other retail spaces that, let's say, are not
15 necessarily to the point where they need to jump in the
16 Tailored Method, but they do have some secondary and
17 third layers of lighting, they can still do that
18 responsibly. And then the other thing, which we never
19 did tackle, and I think on my part it was an oversight
20 because we were not dealing with areas specifically, but
21 I believe that when we had this .7 for decorative
22 lighting, that is kind of archival, back to '01, and
23 that my suggestion would be that we just roll in .3 and
24 .4 and make both - just add chandeliers and sconces to
25 that terminology, and put the .5 watts per square foot

1 as the use it or lose it allocation, as opposed to the
2 .7.

3 MR. FLAMM: As long as we have a rationale
4 that is shown for doing that.

5 MR. BAUER: Yes, that rationale would simply
6 be the same when you look at the models that we did,
7 simplistic models for various types of decorative
8 lighting, and this has also been supported out by a
9 number of the stakeholders I talked to that, if it was a
10 dimming system, and as long as we allowed some kind of
11 an incandescent mode for that, which, i.e., is the use
12 of halogen because there are a whole plethora of halogen
13 lamps now, even in the incandescent market, that can
14 allow us to take a 25 watt candelabra and essentially do
15 what a 40 watt candelabra has done up until now. So
16 that is just the carryover, and I take it, just because
17 we were not tackling areas specifically, or whole
18 building, that kind of number just went besides us, but
19 I would say that I recommend that we just fold those two
20 together and use it as the .5 watt.

21 MR. FLAMM: So, my point is that the case
22 analyses would have to be updated so that we have a
23 document which shows that proposed change.

24 MR. BENYA: Other comments? Okay, we're going
25 to move down now into the Tailored Method allowances.

1 In this case, let's see, commercial industrial storage
2 is going away, correction facilities are going away,
3 dressing rooms, education facilities, at least in part,
4 food service facilities - as Gary says, everything that
5 didn't have layers went away. Libraries should have
6 layers. We could arm wrestle about some of them. So,
7 offices are going away, medical and clinical care - in
8 all fairness, you know, what this - this probably isn't
9 the most profound set of changes in the world. As we've
10 migrated from the Tailored Method to the Area Category
11 Method, over the years some of these have become fairly
12 redundant. And so, I'm not having any heartburn with
13 any of these, myself. The one thing that -- we'll get
14 down to the next group down here, here we do, retail
15 merchandise sales and wholesale showrooms, this has
16 always been the battle of the standards development for
17 the last two code cycles. And Bernie and Jon and I have
18 gone around and around and around. I see the numbers
19 going from 17 to 14, 1.2 to 1, and .7 to .5. I think
20 I'll ask the question, is that far enough? Is that -
21 would you describe that as consistent with 90.1? Jon,
22 you're very knowledgeable about this, would you say
23 these values are consistent with 90.1 2010?

24 MR. MCHUGH: So, this is similar to 90.1 in
25 terms of the reductions, but what's different is that,

1 in California what we do is we look at regulating the
2 space type, as opposed to what is sold inside of the
3 space. ASHRAE 90.1, even though it has a completely
4 different format and it's based on the types of products
5 that you sell inside, so it has a certain general
6 lighting allowance, and then it has certain watts per
7 square footage in terms of the types of product that you
8 sell, and I've been participating with the lighting
9 group for a number of years now and, even though to some
10 extent I like what they've done, but at the end of the
11 day the problem I have with that format is that the LPDs
12 are based on the products, and it's hard to tell in
13 advance what those products are and, you know, for
14 instance, just about any store sells china, but you get
15 this extra credit if you're selling china, so regardless
16 of whether you're selling Wedgewood or you're selling,
17 you know, sort of the bottom of the - whatever, so
18 that's kind of problematic. And I think I'd actually
19 rather turn the speaker over to Bernie as he has done a
20 fairly detailed comparison of the proposal here, ASHRAE
21 90.1 2010, and also the Washington State Energy Code,
22 which also has a fairly stringent set of - and you
23 worked up on Washington, so you're familiar with that,
24 as well. So, Bernie.

25 MR. FLAMM: So before you get up, Bernie, I'm

1 just going to ask you to make it really short, we're
2 getting behind on our agenda and we need to push
3 through. That's not to stop dialogue, you have
4 comments, please send them to me, or work with the case
5 teams. So, comments continue to be welcome, but we need
6 to move the agenda.

7 MR. BAUER: Okay, so what I'll do is refer you
8 for the details of what I'm going to talk about to our
9 case report, I don't - I get this blown up on my iPad,
10 so I don't know the exact sheet it's on, but it's toward
11 the end and it says comparison where we took a full
12 comparison of our basic AGI models and we looked at
13 those against our proposed 213 numbers, and Washington
14 210, and ASHRAE 210, and, for example, the high atrium
15 space, that one is a little bit higher than the two
16 Washingtons, but a number of them, especially the higher
17 end retail spaces where precious jewelry, we're at 3.84
18 for our model, vs. we would be allowed 4.05 under
19 Washington, and 4.056 for that same model under ASHRAE,
20 and then that goes through to the rest of them. We did
21 not put it in the report, we were working on it, but did
22 not get into the draft report right now looking at our
23 second series of models, which are the Excel spreadsheet
24 models where we have surveys and we can easily calculate
25 and change numbers from what we found to what other

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1 things could be in there, and the 70 or 80, those
2 models, and knowing from these models and knowing from
3 other experience, I could guarantee that a good 70-80
4 percent of those models, when they ran through Title 24
5 to '13 as we are proposing, will be equal power
6 densities, if not a tick lower. Again, the big thing is
7 that we have to remember, because of the way Title 24
8 Tailored is done compared to ASHRAE, you start out with
9 a higher base, we start out with this very low base; in
10 theory, you can layer all this stuff on and get this
11 super high number, but that's in an almost hypothetical
12 world that's never built.

13 MR. BENYA: So in your qualitatively speaking,
14 you're saying that this particular proposal in 90.1
15 ASHRAE IES 9.1 2010 are very close.

16 MR. BAUER: When you run the models out. And
17 one of the things we have done, if we were to talk, I
18 believe ASHRAE has taken 100 percent CMH as their model,
19 we did not do that because of, again, what we termed
20 last time as the Mama Papa lower end retail and so
21 forth, and so we did look at the stretch there using the
22 next generation of IR, using again the design models
23 from the new RP-211, which said, okay, if you're willing
24 to do lower ceilings, less general lighting, then you
25 might be able to do that with some fluorescent and some

1 advanced generation halogen and just touches of CMH. If
2 you want this 50-60 foot candle store and accent
3 lighting besides, in the 12 or 14-foot ceiling, you will
4 use you metal halide.

5 MR. MCHUGH: So, I just want to follow-up,
6 Jim. Are you suggesting that we should be looking at
7 lower display lighting allowances than we have currently
8 in the proposal? Was that kind of the line of reasoning
9 that you were investigating?

10 MR. BENYA: No, all I'm trying to do here is
11 show there is a correlation between Title 24 and 90.1.
12 I consider that to be, you know, pretty important these
13 days. ASHRAE IES 90.1 has significantly increased its
14 stringency under a lot of pressure from Congress and
15 other places, and to the point where I want to make sure
16 we are tracking and not lagging - for sure, not lagging
17 in areas.

18 MR. MCHUGH: Thank you.

19 MR. BENYA: Okay, there are adjustments for
20 mounting height above floor, these changes are
21 relatively small, they are meant to be clarifications,
22 these aren't bothering me any. The luminous categories,
23 this is just a change in the table number. So, any
24 further comments about Section 146? Bernie.

25 MR. BAUER: Yeah, Bernie Bauer again, and just

1 a reminder, coupled in to IES Handbook 10th Edition,
2 because I have seen - I don't remember what the numbers
3 are, but I know those luminance categories we have right
4 now, if one were looking at really reducing wattage,
5 everybody would love it because, for example, (D), I
6 think, in the new handbook, which is we convert to a .9
7 watts per square foot, would be something like .1 watt
8 per square foot. So, we will need to get, as soon as we
9 can, that Handbook 10 information and get our numbers --
10 our letters -- lined up accordingly.

11 MR. BENYA: Okay, great.

12 MR. SHIRAKH: So, we're allowing these
13 conversations to take place because they're important,
14 we're not trying to cut off discussion, but we are
15 running behind schedule, so we may actually run over our
16 agenda time, so be prepared for that.

17 MR. BAUER: Yeah, one more, quickly, on the
18 mounting height, and with the Commission's agreement, we
19 might want to look at doing away with that 20-foot
20 mounting height, and reworking something, let's say, the
21 16 to go to a 17, and dropping that 1.5 mounting height
22 because, again, the assumption being that most of the -
23 especially as a couple retail things that are mounted at
24 that height, you're not going to be doing tons of
25 display lighting and you're going to be definitely using

1 CMH at that point.

2 MR. FLAMM: Okay, we could discuss that later.

3 MR. BENYA: Okay, moving into Section 147, a
4 few minor adjustments, one of them is a lot of lighting
5 power based on local ordinance, our experience has been
6 that there are no local ordinances that have undertaken
7 this change, or this particular bullet point, so number
8 three goes away. In calculation of allowed lighting
9 power and the sum of the additional power lighting
10 allowances - okay, this has just been clarified
11 language. And the numbers have gotten, in a couple of
12 cases, smaller. Now, personally, I can tell you, I
13 spent a lot of time working in the area of outdoor
14 lighting standards and I think that there's quite an
15 opportunity to reduce general lighting coming up in the
16 near future and from what I've heard of the handbook,
17 this might affect these values, as well. Unfortunately,
18 what I've heard about the handbook is good, effected
19 either way. So, we'll have to take that under
20 advisement as it comes out. Any comments or questions
21 about Section 147? Changes in values? Here are the
22 additional lighting power allowances. As you can see,
23 the way it works is you get so much for general
24 illumination and then you get a use it or lose it
25 allowance for certain types of outdoor lighting. I can

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1 tell you that some of these values, I have heard through
2 the grapevine, that particularly vehicle service station
3 canopies and outdoor sales and others, the new handbook
4 values are going to be significantly lower and these
5 values will need to be adjusted accordingly. This table
6 goes away because, of course, we're removing the option
7 for individual ordinances in various communities.
8 Comments or questions about Section 147? Hearing none,
9 we shall move on. Gary.

10 MR. FLAMM: This is Gary Flamm. I'm going to
11 finish the last two modules. Section 148 Requiring for
12 Signs, there's only one minor change. In the option of
13 using an approved list of technologies as the alternate
14 to watts per square foot, the language was constructed
15 so that you had to use electronic ballasts in addition
16 to high color rendering index lamps and, to clarify
17 that, we said you could use either electronic ballasts
18 or ICR lamps, that is the only change in the sign
19 language. Anybody want to make any comments about that?

20 The last section, additions, alterations,
21 there are some changes here. The note upfront that
22 we've had there forever, saying that replacement of
23 lamps and ballasts, etc. was - I was always having to
24 navigate people to that note, it was really - it evolved
25 into a poor place, so that language was moved down here

1 into the body of the standards. However, two
2 significant changes in alterations, currently if you
3 change or remove and replace - relocate 50 percent of
4 the fixtures in a room, you have to meet the new
5 standards, that's going down to 10 percent. And so, if
6 you change 10 percent of the fixtures in a room, you
7 have to meet the current standards; sometimes that means
8 the lighting power densities, sometimes it means
9 controls. The other change is that ballast replacements
10 for basically 30 ballasts or more under one time, has to
11 meet the new lighting power density requirements, and
12 some of the control requirements. Some of the control
13 requirements have changed in that we now have - we don't
14 have to pull hard wires all the time for controls, for
15 shutoff controls, there's power line carriers, there's
16 radio controls. So, the alterations have change
17 significantly, so controls are required more often than
18 they currently do, lighting power densities have to be
19 met at 10 percent alteration, and ballast change-outs
20 are now affected, except if you are at 30 ballasts or
21 less. So, those are the alteration changes. What's
22 still missing are the daylighting changes. Now that we
23 have simplified the daylighting language, we have to
24 translate what that means in alterations, and I believe
25 there are a couple more things that are going to change

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1 there. So, does anybody have any comments about the
2 alterations?

3 MR. THOMAS: Yeah, Gene Thomas, Ecology
4 Action. We're doing some analysis on sample sites for
5 PG&E to help inform part of this process, and that's not
6 yet totally complete, and just by way of background,
7 Ecology Action is implementing a number of different
8 programs for utilities and local government partnerships
9 and municipal utilities. And a lot of what we do is
10 lighting. And so, we and some other implementers or
11 other stakeholders that have been involved in this
12 process have some real difficulty with primarily the
13 elimination of the ballast exemption, so I went and
14 looked at all of our lighting that we had done in 2010,
15 and looking at just the linear fluorescent fixtures,
16 indoor wet ballast retrofits, eliminating those where
17 we'd put in new fixtures, or 5A's or whatever, and so
18 that was 495 sites, that was about 16 million kilowatt
19 hours of savings, and then I looked at how many of those
20 were 30 or fewer luminaires that were affected in 31 or
21 more, and so it was almost exactly 50 percent that was
22 30 or fewer and 31 or more, but 90 percent of the
23 savings, 89 percent of the savings, came from the one
24 with the 31 or more, and we feel that that - imposing
25 both a daylighting controls requirement and imposing a

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1 dimming ballasts requirement on those retrofits puts at
2 major jeopardy that achievable savings. You know, maybe
3 25 or 30 percent of those customers will go ahead and go
4 with it, complain, or whatever, they're not forward
5 thinking that they'll do it, but we feel really strongly
6 that another 40 or 50 percent will look at that cost and
7 say, you know, sorry, I'm not going to do that, and then
8 you will not get the savings that you're looking for.
9 So we looked at just the cost for the ballasts, so we
10 only specify third-generation energy saving ballasts in
11 our retrofits, and the cost of those for a typical site,
12 just the cost of the ballasts to the customers,
13 \$2,637.00, on average. If those were dimming ballasts,
14 and that's just taking the \$30.00 cost that they are
15 saying they can get to, and adding a contract or mark-
16 up, that's \$5,813.00, so it's a 220 percent increase for
17 that, and then if you layer on controls, that's going to
18 be another \$.50 or more a square foot, and people are
19 just - they're not going to go along with it, so we feel
20 very strongly that you should really think carefully
21 about imposing this in retrofit situations. I mean,
22 it's almost like if you were to - somebody broke a
23 window and you would tell them, "Well, now that your
24 window is broken, you can't just replace that window,
25 you have to replace all of the windows in the building

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1 with argon fill," you know, it's that kind of thing, or,
2 "You can't add insulation in your roof, you have to add
3 insulation in your roof and poke holes in your walls and
4 put it in your walls, and put it under your thing, and
5 people would say, "Oh, I guess I won't, I'll just turn
6 up the heater instead." So, we're still completing our
7 analysis on these sample sites to go back and do another
8 walk-through, do another audit, and specify what the
9 real costs would be of that new Title 24 compliant
10 retrofit, and provide that information to the utilities
11 and other stakeholders, but this is very problematic.
12 And, although I think there's been a good effort on the
13 part of getting stakeholder involvement, there still has
14 been surprisingly minimal involvement from the major
15 players that are out there doing retrofits. So, not a
16 lot of involvement from BOMA, and not a lot of
17 involvement from Nesco and Sylvania, and so on. And I
18 think once this starts continuing through the process
19 here at CEC, and these people become more aware of it, I
20 mean, just one of the major players when he found out,
21 he said, "Even though I'm located in California, we'll
22 just stop trying to get business in California, because
23 we won't be able to cost-effectively go out and do that.
24 So, I would be interested to hear what you folks have to
25 say about that.

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1 MR. FLAMM: So, have you reviewed the
2 assumptions put into the case analysis for retrofit?

3 MR. THOMAS: Yes, and realistically, we think
4 that, you know, we commend your efforts and we think
5 what you're suggesting has great applicability for new
6 construction, but not retrofits, so it's - if you were
7 to make allowances, if you were to say, well, for
8 example, we wouldn't have a problem getting down to the
9 watts per square foot of Title 24, we can do that with
10 fixed ballasts, and we can do that with switching of the
11 luminaires, even putting photo controls in there on the
12 perimeter parts, to switch off, you know, every other
13 luminaire and still get perfectly acceptable uniformity,
14 but it seems like the Code is precluding those
15 approaches, and those would be the ones necessary to get
16 the kind of traction in the retrofit market that you're
17 looking to get. So, I mean, it's a very significant
18 expense and typically these owners of the facilities, or
19 the operators of them, two out of three are leased space
20 that we serve, if it's not a year payback, most of them
21 will say no. And you're talking about cost-
22 effectiveness of, well, if it's within 15 years, or the
23 lifecycle, they would just laugh at that, so it's really
24 something to think about.

25 MR. FLAMM: Okay. What I would ask you to do

1 is look at the analysis. I know that they put a lot of
2 time into looking at cost, and find work with us and the
3 case team, if you disagree with any of those assumptions
4 that would be helpful.

5 MR. BENYA: Well, but what he's saying,
6 though, I think we need to remember this, is that one-
7 year payback is a whole lot different than a three-year
8 payback, or a five-year payback. And I think that's the
9 strength of Gene's point is, is that when owners expect
10 a one-year payback, you have to do pretty basic stuff.
11 The Boeing project I talked about earlier, which was
12 very successful, including incentives from Southern
13 California Edison, is a three-year payback. They had to
14 put in all dimming ballasts and controls, but it's a
15 three-year payback after incentives.

16 MR. THOMAS: Yeah, we're not saying that we
17 wouldn't do any of those, but we're saying that a lot of
18 the jobs, that's one that especially in this economy
19 that they would put off.

20 MR. BENYA: Then that's a critical point. If
21 Boeing said, "For us, this is a good time to make an
22 investment like that -

23 MR. THOMAS: And I think you'll find the
24 people that do that, if you look at this whole 500 jobs
25 that we did, the people that are going to be most likely

1 to say, "Sure, we can do that," are going to be the
2 people at the very top end who have real healthy
3 facilities management budgets, and so forth. I mean,
4 we've just moved into really the greenest existing
5 building in Santa Cruz, our new headquarters, with
6 Cruzio, an Internet provider, we share the building, and
7 you've got continuous dimming on one side of the
8 building, and step dimming on the other, to demonstrate
9 that, we've been there for six weeks, it's still not
10 working right. So, in this market, you've got a lot of
11 people that are responsible for facilities maintenance
12 that English is their second language, and if you put in
13 a requirement for real complex controls, it's
14 problematic. And the thing I think to keep in mind is,
15 if you can look at retrofits and say, "In this Code
16 cycle, let's really be concerned with getting them to
17 the target, watts per square foot, and make our biggest
18 inroads in new construction, and for retrofits, get them
19 down to kind of the watts per square foot that we're
20 looking for, and the controls that we mandate, and let
21 them be a more simplified way to get there," so fixed
22 ballasts, alternation of luminaires with simple photo
23 controls, and occupancy sensor, and I think you can get
24 95 percent of what you're looking for.

25 MR. FLAMM: So, looking at the proposed

1 language, the controls are kind of graduated according
2 to how much work you do. If you have a single switch
3 leg, you have - and then you're not touching that,
4 you're just replacing ballasts, do you have less that
5 you have to do than if you're doing a more comprehensive
6 change-out?

7 MR. THOMAS: Our typical - our meat and
8 potatoes is four lamp to two lamp retrofits with new
9 reflectors and that's a huge part of what we do. And
10 eight-foot conversions to four-foot, and so on, and
11 we'll do some checker-boarding and alternating lamps in
12 a strip fixture to get, you know, that's something that
13 makes a lot of sense for perimeter areas for retrofits,
14 and even the mom and pop places will go along with that.

15 MR. FLAMM: So, I think the proposed control
16 construct takes into account the complexity of the
17 retrofit as to what kind of controls you need, so the
18 basic shutoff control is required, you know, the ON/OFF
19 switch, the shut-off, and then there's another threshold
20 you meet where you need to do multi-level, and then the
21 daylighting controls and such are really much higher on
22 the hierarchy where you have to pull out individual
23 luminaires. So, from what I see in the proposed
24 language, it does not look like the control requirements
25 are going to be onerous for a simple ballast change-out.

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1 MR. THOMAS: Well, it's like Jim said, once
2 you've got dimming ballasts in there, then the cost-
3 effectiveness of the controls is there, and that's one
4 of the major expenses in the retrofit if you're bringing
5 them into it that is going to be stumbling block.

6 MR. FLAMM: Okay -

7 MR. THOMAS: If you could do everything for,
8 you know, \$25.00 or \$30.00 net cost to the customer,
9 including contractor mark-up, but not labor, that's one
10 thing, but it's going to be -- not even the
11 manufacturers are projecting that.

12 MR. FLAMM: Okay, so would you like to
13 continue a dialogue with us?

14 MR. THOMAS: Absolutely.

15 MR. FLAMM: So why don't we have you and the
16 case team work on this and anyone else who is
17 interested, discuss this offline.

18 MR. THOMAS: Great, thanks, Gary.

19 MR. FLAMM: Okay. Peter.

20 MR. SCHWARTZ: Yeah, Peter Schwartz with
21 LUMEnergy. I'd like to speak to a couple points because
22 I've managed and run a lot of utility programs over the
23 years, recently some advance technology programs. And
24 one of the things we have to keep in mind is that we're
25 talking about 2014, we're talking about an electricity

1 market environment that is changing to a Smart Grid era
2 with real time pricing. And one of the things we have
3 to look at with the business owners in California, at
4 the end of the day, are we going to enable them to
5 function in a Smart Grid real time pricing environment
6 if we stick with static solutions? Are we doing them a
7 service or disservice with doing just simple static
8 replacements? And I understand that there's a challenge
9 to doing things cost-effectively, but I think with what
10 Gary was saying and with the limits that we're talking
11 about here, you need to imagine these projects when you
12 have real time prices going on, the payback has changed
13 substantially. So the question isn't how is it doing
14 today, but how is it going to do in 2014, in 2015, in
15 2015, 2016, on out. Because the systems that we're
16 putting in are going to be in there 20-30 years. So,
17 even mom and pop, you know, imagine them trying to
18 function when the price of electricity is north of \$1.00
19 or \$2.00 a kilowatt hour on peak? You know? What's
20 their answer going to be? How did you leave me in this
21 situation where I have to close my business because it's
22 too expensive to turn my lights on? That's one thing.
23 The other is, looking ahead, you know, Jim talks about
24 that we're able to put in cost-effective advanced
25 controls now, whether it's new construction or retrofit,

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1 because I've got to tell you, 99 percent of the projects
2 we deal with are retrofit, ranging from small projects
3 all the way up to a million square feet. And I think
4 what we need to keep in mind is, we're not doing the
5 premium package on the smallest spaces, but we do need
6 to bring them up to a point where they do have the
7 controls necessary to move forward and function in this
8 new environment. And the fact that you're talking about
9 one-year payback, we have to remember that we do not
10 invest in buildings, we do not determine the building's
11 value by simple payback, we don't buy stocks that way,
12 we don't buy houses and cars that way. So, yeah,
13 there's a mentality that we have to deal with simple
14 payback, but that's why the utilities spend all this
15 money on education to talk about proper evaluation of
16 energy efficiency, and that's also - to get at your
17 point - is the cost-effectiveness here is relative to
18 previous code. When we go into retrofits, they're
19 making decisions based on their existing equipment,
20 they're getting bidding the actual savings and value out
21 of those projects, not relative to Code, but relative to
22 their bill. The cost-effectiveness for this process is
23 relative to previous Code. So, if it's cost-effective
24 relative to previous Code, it's only going to be more
25 cost-effective relative to reality, so I'll just leave

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1 it at that. Thanks.

2 MR. SHIRAKH: Thanks, Peter. There is a
3 gentleman there, then Pat.

4 MR. FRAMM: So, I would like to open up now -

5 MR. SHIRAKH: Are we done with the -

6 MR. FRAMM: Well, after this, let's just
7 evolve straight into comments for about 15 minutes,
8 general comments, and then I'd like to open the line on
9 the Web.

10 MR. BENYA: We've got a couple of new
11 comments.

12 MR. FRAMM: Okay, let's deal with the comments
13 for retrofit, first. Sure thing.

14 MR. LIEN: Thanks, Jim. Mark Lien with The
15 Lighting. I was asked to come out here by one of our
16 companies that is headquartered here in California
17 because their customers that have heard about this draft
18 were very concerned and their customers are primarily
19 retrofitters, one of our divisions deals directly with
20 energy service companies. And so, through that company,
21 I've asked that the Nalco people be on this call and
22 they are, at this point, so that we get some of the
23 energy service people involved. They may be able to
24 help with metrics here, as well. I applaud everything
25 you're doing in this document, I think, Gary, what

1 you've done and, with Jim, is taken a very complicated
2 issue and the refinement to Title 24 is important in
3 terms of simplicity and aggressiveness. The only aspect
4 of it that we are concerned about is the 10 percent
5 number for alterations. And it's our belief, although
6 it's intuitive at this point and it would be good to get
7 a metric on this, that if we get to a 10 percent number,
8 as Gene had mentioned, many people are not going to do
9 this because, even though it is just a culture and a
10 mentality, return on investment is what motivates these
11 retrofit jobs, and the smaller jobs, many of them will
12 put off. The National Lighting Bureau says, and this is
13 a statistic they came out with last year, that there are
14 2.7 million commercial buildings in this country that
15 are 30-years-old or older, and 2.2 million of those have
16 their original lighting systems. If you have one of
17 those older buildings, and I'm sure there are a lot of
18 them in California, and you have to bring it up to the
19 2013 Code, then the return on investment is going to be
20 very long, and likely that project will just be not
21 done. And so our concern is that this could hurt energy
22 efficiency, not that it's hurting Hubble lighting, but I
23 think the goal of Title 24, if people don't do the
24 projects at all, even the small incremental ones, then
25 it hurts energy efficiency long term. There is a

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1 different approach, and I'm wondering if you've
2 considered this, in New York City, they have the
3 mandatory energy audit law that's recently gone into
4 effect, every 10 years beginning in 2013, commercial
5 buildings have to have their buildings audited for an
6 energy audit, and they have to bring them up to current
7 code within a certain period of time. In San Francisco,
8 it's every five years now. So, we're starting to see it
9 approached in a different way that forces those existing
10 buildings to be brought up, people have a little bit of
11 warning in terms of time, but it forces an ongoing
12 process of making all existing buildings meet your most
13 current goals. Is that something that was considered at
14 all?

15 MR. SHIRAKH: That's basically for a local
16 ordinance, I don't know if we can do that at the State
17 level. But, you said the 10 percent is the problem
18 area, do you have a different suggestion?

19 MR. LIEN: Well, if you were at 40 percent,
20 you're still more aggressive than anyone else because
21 typically it's at 50. It sends the message that it
22 needs to be more aggressive, and I think that would be a
23 good goal. Take it down incrementally. I just think
24 going to 10 percent is radical and it may be
25 counterproductive to your goal.

1 MR. FRAMM: Didn't the 10 percent, if I
2 remember correctly, came from 90.1, it was a 90.1
3 proposal?

4 MR. LIEN: Yeah.

5 MR. FRAMM: So that's looked at nationally.

6 MR. BENYA: So, let's hear from Pat.

7 MR. EILERT: Thank you. Patrick Eilert from
8 PG&E. So, first, I'd like to thank Gene Thomas for his
9 assistance, we're looking at this issue pretty hard. We
10 understand - we, the IOUs - understand this is a pretty
11 big change and so we've been looking at how we could
12 handle this from a program point of view, and it's
13 pretty clear to us that, for now, there's no policy
14 barriers to implementing what we would call early
15 retirement programs, so these are the kinds of programs
16 that are based in part on existing equipment for energy
17 savings and in code for usually the last two-thirds of
18 the measure life of the lighting project, for example.
19 So, we're pursuing this as a bridge to get to the
20 future, we sort of feel like codes, along with early
21 retirement programs, will get more savings for the state
22 than either alone.

23 MR. SHIRAKH: David?

24 MR. GOLDSTEIN: David Goldstein, NRDC. I
25 wanted to speak in favor of this proposal for a couple

1 of reasons, first, of course, it's a large amount of
2 energy savings in a triennium where there's probably not
3 going to be that much new construction, and so retrofits
4 become relatively more important, but primarily because
5 it eliminates the problem we've dealt with, with utility
6 programs over the years, and that the other commission
7 has set up a lot of rules about, it's what they call
8 "green skimming," it's doing the measure half way, like
9 putting R-19 insulation in the ceiling when Title 24
10 calls for R-38. You're never going to make it cost-
11 effective to go back and fix that, so, while you think
12 you're getting savings in the short term, and you are,
13 you're forever foreclosing the bigger savings that are
14 involved in coming up to code. So, my concern would be,
15 if you put in a static ballast right now, and ballasts
16 last, what, 20 years, you know, you're going to be stuck
17 with a non-dimmable ballast in 2030, and wouldn't be a
18 lot better, even if the retrofit project waited for a
19 couple years until people got the financing together, or
20 the utilities got the programs together to solve the
21 problems, to just wait until you can do it right, rather
22 than doing it halfway and getting stuck with something
23 that doesn't serve your needs, and then it would really
24 be non-cost-effective to do anything about for a very
25 long time in the future. So, I think the issue of

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1 paybacks is important, but I would respectfully flip the
2 argument made by a previous gentleman on its head; if
3 people aren't investing in one-year paybacks, that's
4 what codes are for. So, I would encourage you to look
5 at ways you can address the comments, but do so in a way
6 that recognizes that the purpose of handling retrofits
7 in the Code ought to be to make an old building perform
8 as well as a new building, so that it doesn't become
9 obsolete, and then impose burdens on us 15 years down
10 the road that are going to be much more difficult than
11 they would have been if we did it right in the first
12 place. Thank you.

13 MR. SHIRAKH: Thank you. Do ballasts last 20
14 years? I'd like to put some of those in my kitchen. We
15 hear both sides, obviously, and we need to look at this
16 and we'll probably have some discussions with various
17 stakeholders so we can come to resolution on this one.
18 Are we done with the language?

19 MR. FRAMM: That's the language. The last
20 part of the agenda is opening it up to - I'd like to
21 recommend to the floor first, and then to the phone.

22 MR. SHIRAKH: Well, basically, this is the
23 part of the workshop that is open for any comment
24 related to anything that was presented today, related to
25 these topics. Anybody - Gene?

1 MR. THOMAS: This is Gene Thomas, just a
2 follow-up and clarification, first, right now, for all
3 of the IOU programs that are doing retrofits, they're
4 already using existing equipment as the baseline, not
5 code, minimum as the baseline. And lamp ballast
6 retrofits, for us, I hear your point on the 10 percent,
7 and that's somewhat of a problem for us, but less so
8 than the lamp ballast exemption, part of it, because
9 only about 13 percent of our savings comes from actual
10 retrofits of fixtures as opposed to - excuse me,
11 replacement of fixtures with new fixtures, as opposed to
12 retrofits. So, and the other thing is with respect to
13 retrofits, we're not doing green skimming, putting in
14 third-generation high performance energy savings
15 ballasts and 3,100 lumen low mercury T-8s and new
16 reflectors, this is not a green skimming measure, it's
17 what you want to have going on. And the other point is
18 that a dimming system is inherently more inefficient
19 than a fixed ballast system, and it gets less efficient
20 the more you dim it down. It makes perfect sense to do
21 that with solid state lighting, it makes a lot less
22 sense in an existing building situation to mandate that
23 particular approach because maybe in the next code
24 cycle, we'll have linear LEDs that are actually
25 affordable, and then that fancy dimming ballast will

1 just have been a waste of money because we can still
2 implement a control system and one that takes
3 daylighting into account with fixed ballasts. And I
4 have yet to see, and some other stakeholders have yet to
5 see, evidence that provides a real clear-cut case that
6 dimming ballasts are a better solution in retrofits than
7 fixed ballasts, so that was my point of clarification.

8 MR. BENYA: Now, just a comment, I'm not sure
9 that you're correct on the IOUs using existing as a
10 baseline, I know at least in some of my work with
11 Edison, the baseline is code, not existent.

12 MR. THOMAS: If 50 percent of the fixtures are
13 replaced, that's been the typical - the typical IOU
14 response is, "Have you replaced more than 50 percent of
15 the fixtures?" "No." "Then it's existing equipment."
16 If now that's going to go down to 10 percent, if you
17 kept the lamp ballast exemption in there, then we could
18 deal with that, but because you're doing them both, that
19 means almost everything that we do is going to trigger
20 practically the full gamut of Title 24, and if it was
21 cost-effective to take an existing building up to the
22 current Code standards in every aspect, lighting, HVAC,
23 insulation, everything, you know, we would be doing it.
24 The fact is that it's rarely cost-effective to take an
25 existing building and bring it up to the current

1 standards. The older it is, the more expensive it is.
2 So, you have to fight your battles and decide where do
3 you want to put your focus and what do you expect to get
4 out of these existing buildings? And the cost-
5 effectiveness calculation, unfortunately, it's not a TDV
6 calculation. I mean, once again, most of these people
7 that we're dealing with are in leased facilities, but
8 many of them aren't even themselves paying the utility
9 bill, it's - you know, they pay their rent to the
10 landlord and the landlord pays that, we get their
11 involvement anyway because it's so attractive, but if it
12 moves into a five, seven, 10, 15 year payback, there's
13 just not - many of them are not going to do it. And so
14 you might get a quarter of them, the early adopters that
15 will go ahead, but you're going to get half of them that
16 are going to lag behind and it seems like, for them,
17 once the solid state system's price comes down, and
18 dimming is more efficient on those, the more you dim
19 them down, then they don't need ballasts either, that's
20 the time to try to harvest those.

21 MR. FRAMM: So, I have a question, Gene.
22 Apparently you've looked at your data because you said
23 earlier that the 30-31 ballasts is kind of the 50
24 percent mark -

25 MR. THOMAS: In terms of sites, yes.

1 MR. FRAMM: Okay. Is there another sweet spot
2 where the numbers are significantly different, let's
3 say, 40 ballasts?

4 MR. THOMAS: If you look at all of the gamut,
5 that whole 500 sites, the average number is 79, if you
6 look at the number of sites, there were 249 of them that
7 were 31 or more, the average number of ballasts there
8 was 155. I mean, I know one of the numbers that was
9 floated in that earlier iteration was 100, that would be
10 better, but still, you know, that would have a pretty
11 significant impact. I think, if you can find some way
12 to target it towards the upper echelon, you know, the
13 top 20 percent, maybe, of buildings, that's where you're
14 going to get your biggest traction. And I thought,
15 well, maybe you could do it by utility code, but then I
16 was told, no, you really can't write that into the
17 E19S's and so forth that are the biggest customers, if
18 it's 500 KW and above, you know, they've got to do the
19 whole kit and caboodle. I was told you can't accomplish
20 that in code. So, that would be one way because those
21 are the ones that are pretty much going to go along with
22 what you're putting in here. But the ones that are, you
23 know, 200-300 KW, I mean, we primarily are serving for
24 white lights, anyway, 200 KW and below, you know, a very
25 large proportion of them, we really don't think are

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1 going to. And we're on your side, we're the good guys,
2 we want to see these savings happen.

3 MR. SHIRAKH: Just following on what Gary is
4 suggesting, you know, we're going to have to have more
5 discussions about this, but maybe 30 is not the right
6 number. Maybe a higher number with a different
7 approach. Obviously -- just a moment, Owen -- I think
8 it would be a shame if a large building is retrofitting
9 and we kind of miss that opportunity and go with static
10 ballasts, I mean, those ballasts are going to be there
11 for a decade or so. So, maybe there's a different
12 threshold we need to use and I would encourage this team
13 to regroup after this workshop and work through some of
14 those numbers.

15 MR. THOMAS: I mean, one of the sample sites,
16 I haven't got all the data yet for all of them, but one
17 of them we got down to .41 watts per square foot, that's
18 pretty darn good, and are you going to layer another
19 \$5,600.00 or \$10,000 by the time you add the controls on
20 and everything to that job and jeopardize even achieving
21 it when you could have already gotten them down to that?
22 That's the kind of balance that you want to try to keep
23 in mind.

24 MR. SHIRAKH: Okay, thank you. Owen.

25 MR. MCHUGH: Owen Howlett, HMG. I just want

1 to clarify, we are intending to hold some more
2 discussions on this, we know that this is a complicated
3 one, and a lot of vested interest is at stake, a lot of
4 markets at stake. I want to say a quick word about the
5 30 ballast threshold, the reason why we chose that
6 particular number, the measure is actually cost-
7 effective in terms of 15-year TDV payback, at a much
8 lower number of ballasts. We picked that 30 ballasts
9 number because we worked out the approximate cost of the
10 total project of replacing 30 ballasts and it came out
11 about the same as the cost of replacing a typically
12 small HVAC system, and the reason we did that comparison
13 was because we didn't want to impose onerous costs on
14 building owners in terms of pulling permits for small
15 jobs, so we wanted to make sure that the size of job
16 which we are requiring people to pull a permit wasn't
17 any smaller than the equivalent HVAC job on which they
18 would be required to pull a permit. That was our kind
19 of guiding principle on that, but also the 30 ballasts
20 is also a design to exclude just routine maintenance,
21 you know, if you got a bunch of failed ballasts, you
22 might go around replacing some of them, typically that's
23 just going to be a handful, so 30 or so allows us to
24 exclude those routine maintenance jobs. So, for all
25 those people who are intrigued by how we came up with

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1 those numbers, that's how we came up with that one.

2 MR. SHIRAKH: Thank you. Any other questions
3 or comments about anything that was presented today?
4 And, by the way, just because the workshop phase of this
5 proceeding has started doesn't mean there aren't going
6 to be anymore stakeholder meetings that is probably
7 going to continue until we resolve all the substantial
8 issues that remain. So, if there are no comments, I
9 would just note, I think that the stakeholder meetings
10 we've had over the past year and a half seems like it
11 was very successful, and I think this was a very
12 successful workshop. I would like to thank the IOUs and
13 HMG, you know, a great job. Hopefully this will
14 continue for the future workshops, again, we're going to
15 have almost one a week from here on out. And I have a
16 feeling that some of the future ones are going to be a
17 little bit tougher than this one because of the topics
18 we're presenting. So, anybody on the phone that has any
19 comments?

20 MR. FLAMM: I understand there are three
21 people on the phone who would like to make comments.

22 MR. YASNY: First up is Ernesto Mendoza. Go
23 ahead, Ernesto.

24 MR. MENDOZA: Yeah, when we were discussing
25 about the metric for ballasts, I wanted to make a

1 comment that I support -- I have yet to have only one
2 metric the same as the Department of Energy, otherwise,
3 we have to attempt this further from many different
4 ways, and then you are risking to be inconsistent.

5 MR. FLAMM: Excuse me, could you please
6 identify yourself?

7 MR. MENDOZA: Ernesto Mendoza from Philips
8 Lighting.

9 MR. FLAMM: Thank you.

10 MR. MENDOZA: Thanks a lot.

11 MR. YASNY: Okay, next we have George Nesbitt.

12 MR. NESBITT: Yeah, George Nesbitt,
13 Environmental Design Build. On the residential
14 lighting, I'm glad to see the 50 percent kitchen
15 lighting to remain, there was, I guess, a proposal to
16 change that, although the 50 percent is not perfect, I
17 think it's better than what has been proposed. And on
18 that and the bathroom, I'm wondering if we should add
19 language saying that the high efficacy lighting should
20 be the first switch so it's the switch you're most
21 likely to flick, as opposed to having like the first
22 switch the low efficacy, and then that's what always
23 gets used.

24 MR. FLAMM: I can respond to that.

25 MR. NESBITT: Sure.

1 MR. FLAMM: We had that for years and it was
2 so subjective, there were as many interpretations of
3 that as there were people. It really didn't work, and
4 that's one of the reasons we evolved to where we are. I
5 think that it would just make the standards more complex
6 because you end up getting in arguments "which is the
7 first switch?"

8 MR. NESBITT: Right.

9 MR. SHIRAKH: Sometimes you can enter a room
10 from two different directions and you can argue which is
11 the first switch. So we kind of basically left that to
12 the market, the builders, you know, to decide where they
13 want to place the switches.

14 MR. NESBITT: Yeah, okay. A couple other - in
15 the garage, the garage door opener lights, any -

16 MR. FLAMM: So, the standards - I believe it's
17 in the manual, it says that if the garage door lights
18 are on a timer so that they time out with the garage
19 outdoor operation, then they're not regulated, however,
20 if they're separately switched, so as to be work
21 independent of the garage door opener, then they are
22 regulated lights.

23 MR. NESBITT: Okay, and then the last thought
24 I have at the moment is how the lighting rules relate to
25 alterations. So, if someone changes a fixture or adds a

1 fixture, you know, without doing anything else, do these
2 lighting requirements apply? Because the alteration
3 rules are specific for some items, but don't really say
4 anything about a lot of other stuff.

5 MR. FLAMM: Are you talking about residential
6 or non-residential?

7 MR. NESBITT: Residential, yeah, all
8 residential.

9 MR. FLAMM: We have some language in the
10 residential manual which helps to clarify. I agree that
11 the Section 151, is it, for res alterations -

12 MR. SHIRAKH: One fifty-two.

13 MR. FLAMM: -- 152 for res alterations does
14 not have very much information. In the manual for
15 kitchens, we say if you replace one fixture, that
16 fixture has to be high efficacy until you reach your 50
17 percent high efficacy requirement. That's about the
18 only thing we say about residential retrofits right now.

19 MR. NESBITT: Yeah, because I can tell you my
20 experience is people add a lot of wattage, a lot of
21 recessed cans and they're just dumping more and more
22 watts in to their house.

23 MR. SHIRAKH: Well, I think that would be good
24 to actually look at Section 152, Gary, rather than
25 relying on the manual, we should put some language into

1 the code.

2 MR. FLAMM: Okay.

3 MR. YASNY: Last, we have Francis Rubenstein.

4 MR. SHIRAKH: Francis who?

5 MR. RUBENSTEIN: Am I unmuted now?

6 MR. FLAMM: Hello, Francis.

7 MR. RUBENSTEIN: Great, okay. Hi there. A
8 few comments, by the way, a great meeting. Hearing from
9 the phone, it sounds like there's a lot of good dialogue
10 going on and I'm glad to see things are proceeding
11 ahead. Just a couple quick comments. One of the
12 previous speakers was discussing how dimming ballasts
13 are less efficient than instant start and program start,
14 that's a lot less true today than it was a while ago.
15 Today's modern dimming ballasts at full light output are
16 at only about four percent less efficient than the most
17 efficient instant starts, so there is not that much of a
18 gap between the two of them at this point. The speaker
19 also said that, as you dim fluorescent ballasts, that
20 your efficiency drops. That's true, but it's also true
21 also with pulse modulated LEDs, as well, so you're not
22 out of the woods with LED on that one either. And then,
23 finally, I think one of the biggest points was the issue
24 of - is the fixed level ballast going to be good enough
25 for retrofit, I heard a lot of comments on that, and I

1 guess it is one where I would say fixed level is
2 probably not enough, or isn't enough in my opinion, even
3 in retrofit, by bi-level might be, and so that might be
4 a conversation we would want to reexamine again as we go
5 forward - with respect to retrofit, only, that the bi-
6 level would be acceptable. One final point to Ernesto
7 Mendoza's point about the efficiency metric that DOE is
8 using. At this point, I'm not convinced that ballast
9 efficiency that is being considered in the NOPR is even
10 applicable to dimming, or to controllable ballasts, and
11 so one would need to figure out whether that is
12 applicable or not, and I think at this point, I guess
13 the jury is not out on that, but I'd be happy to ask
14 Dylan Webber [ph.] about that issue.

15 MR. SHIRAKH: Thank you, Francis. Good
16 responses.

17 MR. FLAMM: So, I just want to say that I
18 appreciate everybody's participation, both in person and
19 on the phone. And this is not intended to be the end of
20 it, we value your dialogue, we value your input. So, if
21 you have comments that you were dying to make and didn't
22 get to make them, you can send emails to me. I would
23 like to see some follow-up groups. I've been working
24 with the case teams on whatever issues are identified,
25 so if you are in the audience or on the phone and you

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1 want to dialogue on a particular subject, please let me
2 know so we make sure you get plugged into that, and
3 Cathy has something to say.

4 MS. CHAPPELL: Cathy Chappell, HMG, I have a
5 follow-on to what you just said, Gary. What is your
6 expected process and timeframe for dialoguing? Will you
7 set up calls?

8 MR. FLAMM: I was afraid you were going to ask
9 that question. I need to give it some thought because
10 we don't have unended [sic] time, this is going to have
11 to go pretty quick. You know, we're not having anymore
12 lighting workshops -

13 MR. SHIRAKH: This was the last lighting
14 workshop, I think. There are some unknown issues today
15 that we need to organize the calls as soon as possible,
16 I don't see any reason for waiting.

17 MS. CHAPPELL: So that IOU case team can work
18 with you -

19 MR. FLAMM: Right, right, so we need to make
20 sure that anybody that identified issues gets plugged in
21 and we reach a conclusion on whatever those issues are.
22 I'm not prepared to give a drop dead date, maybe by next
23 Friday might be good, but I think we have a little
24 longer than that.

25 MR. SHIRAKH: Okay, so any other questions on

1 the phone or in the room? With that, I'm going to close
2 the workshop. Again, I'll probably see some of you next
3 Monday, and we'll do this all over again. Thank you.

4 [Adjourned at 3:37 P.M.]

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