

BEFORE THE
CALIFORNIA ENERGY COMMISSION

California Energy Commission

DOCKETED

14-AAER-01

TN 3037

JUL 10 2014

In the Matter of:)	Docket No. 14-AAER-1
)	
)	
Appliance Efficiency Pre-)	
Rulemaking - California Code)	STAFF WORKSHOP
of Regulations, Title 20,)	RE: 2014 Appliance Efficiency
<u>Sections 1601 through 1608</u>)	Pre-Rulemaking

STAFF WORKSHOP

TOILETS, URINALS, FAUCETS, AIR FILTERS, FLUORESCENT
DIMMING BALLASTS, AND HEAT-PUMP WATER-CHILLING PACKAGES

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

TUESDAY, May 6, 2014
9:30 A.M.

Reported by:
Kent Odell

APPEARANCES

Commissioner Present

Andrew McAllister

Staff Present

Harinder Singh, Rulemaking Project Manager
Consuelo Martinez, Office Manager, Appliances and
Existing Building Office
Tuan Ngo, Appliances & Existing Building Office
Ken Rider, Associate Electrical Engineer, Appliances & Existing
Building Office
Josh Butzbaugh, Senior Fellow, Appliances & Existing
Building Office
Jared Babula, Rulemaking Lead Attorney

Also Present (* Via telephone and/or WebEx)

Gary Fernstrom, Pacific Gas & Electric Company
Jerry Desmond, Plumbing Manufacturers International (PMI)
Fernando Fernandez, TOTO, USA, also representing
Plumbing Manufacturers International (PMI)
Daniel Gleiberman, Manager of Product Compliance and
Government Affairs, Sloan Valve Company
John Koeller, Maximum Performance Testing (MaP Testing)
Tony Brunello, Green Technology Leadership Group
Heidi Hauenstein, representing Statewide IOU Codes and
Standards Team
Tracy Quinn, National Resources Defense Council (NRDC)
Jon McHugh, McHugh Energy Consultants
Eddie Moreno, Sierra Club California
*Marianne DiMaseio, Appliance Standards Awareness Project
*George Nesbitt, HERS Rater, Green Rater
*Jim Kemper, Los Angeles Department of Water and Power
Randall Higa, Southern California Edison Company
Mark Sadler, Daikin
*Patrick Splitt, Aptech
Annirudh Roy, Air-Conditioning, Heating and Refrigeration
Institute
*Eddie Rodriguez, Daikin Applied
Jeffrey Steuben, on behalf of California IOUs
Stephen Irving, on behalf of Lutron Electronics
Daniel Young, representing California Investor-Owned
Utilities, Statewide Codes and Standards Team
Pierre Delforge, Natural Resources Defense Council (NRDC)
*Alex Boesenbergh, NEMA
*Richard Haring, Philips Lighting
*Alberto Mendoza, Philips Lighting

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

2 MAY 6, 2014 9:31 a.m.

3 MR. SINGH: Good morning. My name is
4 Harinder Singh. Welcome to the Energy
5 Commission, everybody. First we have just a few
6 housekeeping items before we begin. For those of
7 you who are not familiar with this building, the
8 closest restrooms are located as you go out the
9 door to the left. There is a snack bar on the
10 second floor under the white awning. Lastly, in
11 the event of an emergency and the building gets
12 evacuated, please follow our employees to the
13 appropriate exit. We will reconvene at Roosevelt
14 Park located diagonally across the street from
15 this building. Please proceed calmly and
16 quickly, again, following the employees with whom
17 you are meeting to safely exit the building. And
18 thank you. And now I would request my Office
19 Manager, Consuelo Martinez, to come and introduce
20 the staff.

21 MS. MARTINEZ: Good morning, everyone.
22 I'm Consuelo Martinez, Office Manager for the
23 Appliance and Existing Buildings Office. Thank
24 you all for attending today. Some of you have
25 come a long way and we appreciate the effort you

1 took to get here.

2 For those of you on the WebEx or on the
3 phone, thank you for your valuable time, as well.

4 We're looking forward to hearing from all
5 of you, not only today, but also in the future,
6 as we move forward to develop Appliance
7 Efficiency Regulations for water projects, heat
8 pump water chilling packages, HVAC air filters,
9 and fluorescent dimming ballasts.

10 Now I'd like to introduce our staff.
11 Tuan Ngo will be leading the Water Product
12 presentation. Tuan? That's Tuan. Ken Rider
13 will present Heat Pump Water Chilling Packages
14 and Fluorescent Ballasts. Josh Butzbaugh will
15 present HVAC Air Filters today. Jared Babula is
16 our Lead Attorney for the Rulemaking, and you've
17 already met Harinder Singh, who is the Project
18 Manager for this rulemaking. If you have any
19 questions related to this rulemaking process,
20 please contact him.

21 It is my pleasure also to introduce the
22 Efficiency Lead Commissioner, Andrew McAllister.
23 Commissioner.

24 COMMISSIONER MCALLISTER: I wanted to
25 just -- so this is a staff workshop, not a Lead

1 Commissioner Workshop, so staff is running the
2 show here. I wanted to first and foremost sort
3 of manifest my solidarity with staff and call
4 them out for doing a great job on the Appliance
5 Pre-Rulemaking process as it's getting ramped up
6 in the various categories of devices, this being
7 the first group. So more groups to come down the
8 road a bit. But I'm really excited to get the
9 process moving forward in some earnest, and I
10 think this first group is really important for
11 just setting the rhythm of getting through the
12 pre-rulemaking processes and then moving on to
13 the rulemakings.

14 Now, this group is kind of a mix of
15 devices, as you can see, some water, electricity,
16 energy generally, and partly in conformance with
17 other parts of the Building Code and partly to
18 harvest some new energy savings potential based
19 on new technology. So I think there are really
20 some great opportunities here and really look
21 forward to all your input. And I want to really
22 thank everyone for coming. As Consuelo said,
23 I'll reiterate that we really appreciate your
24 effort to get here and participate and provide
25 substance to the process.

1 The final think I'll say is just by way
2 of setting the larger context. California's
3 Appliance Efficiency Standards are really our
4 bread and butter. They're something the
5 Commission has been dedicated to for decades and
6 something that has demonstrate over and over
7 again the social good that it generates for the
8 state, not only environmentally, but for our
9 consumers. It's really just a win across the
10 board, however many times you want to state it,
11 and at relatively low cost we have a relatively
12 high impact.

13 And certainly Appliance Efficiency
14 Standards that make it to the end stage of being
15 adopted and going into law have demonstrated that
16 they are cost-effective for the consumer and that
17 they generate all sorts of benefits to the state
18 at relatively low cost, they are cost-effective.

19 So my goal actually coming in a few years
20 ago now as Lead Commissioner on this topic has
21 been to really make absolutely certain that the
22 process supports participation and that at every
23 step of the way, we have open communication, open
24 dialogue, opportunities to participate and submit
25 comments on the record from all the stakeholders

1 who are involved in each of the topics, and so
2 it's the foundation really for getting to an end
3 result that has consensus, or at least has a very
4 sound basis in the record. And if we get there
5 and somebody doesn't agree, then it can't be that
6 they haven't had opportunities to participate.
7 We really want to base everything on technical
8 evaluation and viewpoints from the marketplace,
9 viewpoints from the various stakeholders who are
10 involved because we realize that what we do
11 affects all of the folks out there in the world.

12 So again, this is really just a
13 longwinded way of saying please participate,
14 please offer your best information, your most up
15 to date information, your viewpoint that is hard
16 won from the marketplace wherever you happen to
17 sit in it, because that's the basis for the
18 record and that's what we're trying to create
19 here is a process that collects all of those
20 viewpoints and uses them to make good decisions.
21 That's what we need to do here is come out with
22 good decisions that benefit the State of
23 California.

24 So that's kind of my filter that I put
25 things through and I will be very sympathetic to

1 folks who sort of put in a good faith effort to
2 participate and submit their hard won knowledge
3 and information into the record, so that we can
4 use it to make decisions. So with that, I want
5 to pass back to Harinder, Consuelo, and wish you
6 all a good workshop. Again, thanks for coming
7 out and your comments will be welcome whenever
8 you choose to submit them, and there will be some
9 timelines stated throughout this workshop and
10 future workshops on the Appliance Efficiency
11 Rulemakings. So thanks again and have a great
12 day.

13 MR. SINGH: Thank you, Commissioner.
14 Harinder Singh again. I have a few slides for
15 this presentation before we begin and I hand it
16 over to Tuan.

17 I just wanted to mention that California
18 Energy Commission is the State's primary energy
19 policy and planning agency, created by the
20 Legislature in 1974. Responsibilities include
21 promoting energy efficiency and conservation by
22 setting minimum Appliance and Building Standards,
23 and other cost-effective measures.

24 The Commission Appliance and Building
25 Energy Efficiency Standards have saved California

1 more than \$74 billion in reduced electricity
2 bills since 1975. The State's statutory mandate
3 to the Energy Commission is the Warren-Alquist
4 Act, it is Public Resource Code 25402. It
5 requires the Commission to adopt to minimum
6 levels of operating efficiency and other cost-
7 effective measures, to promote the use of energy
8 and water efficient appliances whose use require
9 a significant amount of energy or water on a
10 statewide basis.

11 So the purpose of this staff workshop is
12 the Commission has posted two Staff Reports, they
13 are staff's analysis, a staff report for water
14 appliances that includes toilets, urinals, and
15 faucets. And the second staff report is HVAC air
16 filters, fluorescent dimming ballasts, and heat
17 pump water chilling packages.

18 The workshop is an opportunity for the
19 stakeholders to comment and seek clarifications
20 on the draft staff analysis, read and comment
21 period has begun on April 18th after we posted
22 the staff reports, and stakeholders can submit
23 their comments by June 6th any time between April
24 18 and June 6th. All comments received will be
25 evaluated and staff will update the proposed

1 Draft Regulations as needed.

2 So if you have to submit the data, this
3 is how you submit written comments. They should
4 be submitted to the docket by 4:00 p.m. on June
5 6th; that is Pacific Standard Savings Time. The
6 Commission encourages interested parties to send
7 information up to five megabytes by email at
8 Docket@Energy.Ca.Gov. Please include the docket
9 number 14AAER-1 in the subject line. And if the
10 file size is more than five megabytes and if the
11 information includes an application for a
12 confidentiality designation, or if you prefer
13 paper copies of responses with electronic
14 information, you can provide it on a CD or DVD
15 and sent it to California Energy Commission,
16 Docket Office, Mail Stop 4, Docket No. 14AAER-1,
17 1516 Ninth Street, Sacramento, CA 95814-5512.
18 For confidentiality in data, or comment, or
19 information, if interested parties need to
20 maintain the confidentiality of specific data
21 information, they should contact Jared Babula,
22 he's our consult in the Commission's Chief
23 Counsel's Office, before submitting a response to
24 the invitation or a response to the comments, or
25 response to the Staff Reports; otherwise, all

1 responses received will become publicly
2 available. And Jared's information is given on
3 the slide and his telephone number is 916-651-
4 1462, and his email is
5 Jared.Babula@Energy.Ca.Gov.

6 With that, I would hand it over to Tuan
7 Ngo for the Water Topics presentation. Tuan,
8 please.

9 MR. NGO: Good morning, everybody. Can
10 you guys see me? My name is Tuan Ngo, I'm with
11 the Appliance and Existing Buildings Office. And
12 what I have to say today is to make a
13 presentation on our Staff Report on Water
14 Appliance Efficiency.

15 Let me go real quick into the agenda,
16 what we want to cover today. First, I'd like to
17 quickly mention our progress, then we'll go into
18 the staff reason for going forward with the
19 Standards, then the Environmental, and then the
20 Regulatory settings and the stakeholder
21 proposals. Then I will present the staff
22 proposed Standards, some words on savings and
23 cost analysis, and technical feasibility
24 analysis. And of course, the staff Standards
25 impacts and benefits assessment.

1 Our progress so far, we have done three
2 major activities to today. We've heard and
3 published (ph) an Order Instituting Rulemaking
4 and two workshops, one is an invitation to
5 participate and the other was an invitation to
6 submit proposals for Standards development.

7 This slide is a flow chart depicting our
8 pre-rulemaking and rulemaking process. The
9 highlighted box indicates where we are today.
10 And if everything goes okay today, then staff
11 will get ready to finalize and publish the final
12 staff report to be ready for the rulemaking.

13 But first, why new Standards? Well, we
14 are in a drought which significantly affects our
15 water supply. And on January 17, 2014, Governor
16 Brown proclaimed a State of Emergency and
17 directed State officials to take all necessary
18 measures to prepare for drought conditions.

19 While we acknowledge that this standard
20 would not provide immediate help to relieve the
21 state's dry conditions, they will help prepare
22 for a future hot and dry future for the state.

23 Various (indiscernible) 240 to 350
24 billion gallons of water per year for toilets,
25 urinals, and faucets. Reducing water consumption

1 is a key component of California's overall water
2 and energy conservation effort, thus providing a
3 need to establish Standards for these appliances.
4 But first, what criteria do we use to establish
5 them? Again, Harinder already mentioned earlier
6 CEC staff amended that any (indiscernible) must
7 be technical, feasible, and it must be cost-
8 effective, which means the Standards must not
9 result in additional costs to the consumers.

10 This table presents the CEC staff
11 estimate of water and energy consumption of
12 toilet, urinal and faucets in 2013. Using this
13 information provided by the IOU Case Report and
14 the serious assumptions listed in the Appendix B
15 of the Staff Report, staff estimates that
16 California uses roughly 443 billion gallons of
17 water a year.

18 To get this amount of water to the
19 consumer, approximately 4,500 gigawatts of
20 embedded energy is needed to transport and
21 treating the water. In addition, approximately
22 4,700 gigawatt hours of electric and about 1,100
23 million therms of natural gas are needed to heat
24 that water delivered through the consumer
25 faucets. So from this number, a slight reduction

1 would result in billions of water savings
2 annually. Therefore, staff believes that
3 establishing a standard to restrict the
4 consumption would be beneficial to the state.

5 The next question is, does the current
6 State Standards, Federal Standards, or other
7 Standards achieve the same reduction without the
8 energy staff going to the effort to establish new
9 standards? To do this, staff needs to look at
10 the current regulatory setting to understand this
11 picture.

12 Currently, Title 20 Standards set the
13 maximum flush volume at 1.6 gallons per flush for
14 toilets, one gallon per flush for urinal, and a
15 maximum allowable flow rate for lavatory and
16 kitchen faucets at 2.2 gallons per minute.
17 Before 1970, most toilets consumed six gallons
18 per flush or more, and some faucets you had as
19 much as seven gallons per minute.

20 In the 1980's and the early 1990's,
21 several states including California had
22 established Water Efficiency Standards for
23 toilets and urinals. Congress used the State
24 level standard as a basis to establish water
25 efficiency standard for this appliance. And they

1 passed the Energy Policy Act of 1992. These
2 Standards took effect in 1994 and set the water
3 consumption level at the same as California Title
4 20's standard.

5 In 2007, the California Legislature
6 enacted Assembly Bill 715 which set a schedule
7 for a manufacturer to meet water conservation
8 standards for toilets and urinals, solely
9 installed in the state, such that after January
10 2014, toilets can use no more than 1.28 gallons
11 per flush, and urinals can use no more than .5
12 gallons per flush.

13 In 2009, the California Legislature also
14 enacted Senate Bill 407. This Bill revealed a
15 temporary stop gap to reduce water consumption in
16 appliances in older buildings and will be faded
17 out by the time the appliances will be replaced.

18 Calgreen in 2013 mandated efficiency
19 levels similar to AB 715 for toilets and urinals.
20 It also mandated efficiency requirements for
21 residential lavatory and kitchen faucets. The
22 2013 California Plumbing Code also set the same
23 Efficiency Standard by Calgreen; in addition, it
24 required faucets in common in public use areas in
25 homes for a 3.5 gallon per minute.

1 And lastly, WaterSense, this is like a
2 voluntary basis, WaterSense is a partnership
3 program by the U.S. EPA in collaboration with
4 stakeholders to establish voluntary
5 specifications for high efficiency water
6 consuming appliances, so toilets, urinals, and
7 lavatory faucets. Manufacturers certify and
8 label their products according to standards
9 developed by EPA licensed labs. Third,
10 WaterSense labels make it easy for consumers to
11 find and select water efficient products.

12 As I mentioned earlier, we have a
13 workshop for Request for Proposals and we did
14 receive some proposals for standard development
15 from California investor-owned utilities, IOU for
16 short, the National Resource Defense Council,
17 NRDC for short, the Plumbing Manufacturers
18 International, with a cooperating agency
19 representing various plumbing fixture
20 manufactures, as well as a proposal from
21 FluidMaster, Kohler, and Moen, Inc. We want to
22 thank you for sending the proposals.

23 Staff reviewed the proposals, analyzed
24 them, and finally came up with our
25 recommendations which are presented in this

1 slide. As we can see, the standard for toilet
2 and urinal gallon per flush as mandated by AB
3 715, with staff's proposal of an effective date
4 of July 2015. We also proposed a standard for
5 replacement valves, also in gallons per flush,
6 for toilets and urinals to match SB 47 mandates
7 starting in 2009, as you see for older buildings
8 that you see in the bottom of the slide.

9 And for faucets, staff recommends the
10 flow rate restriction in gallons per minute for
11 different types of faucets, including those that
12 in common public areas.

13 We also recommend a MaP score of 350
14 grams for toilets. For those of you who are not
15 familiar with MaP scores, MaP means Maximum
16 Performance, and what it does is the higher
17 number of MaP, the higher the MaP score, is an
18 indication of how good the toilet will be able to
19 remove the solid particles.

20 In this table, it represents the first
21 year savings. As we can see, the total savings
22 is approximately 8,200 million gallons of water
23 savings alone in the first year, and the savings
24 including natural gas and energy resulting from
25 the staff proposal would be roughly in the \$111

1 million in the first year alone.

2 Stock Change Savings. By the way, when
3 we say "Stock Change," we just mean if all the
4 products available today comply with the proposed
5 standards, then that will result in the savings.
6 So this table represents what we expect to
7 receive in savings if all the appliances meet our
8 proposed standards. And that will result in
9 roughly about 86.6 billion gallons of water per
10 year, 220 million therms of natural gas per year,
11 about 1,700 gigawatt hours of energy, and about
12 \$1.12 billion of savings to the consumer.

13 In the graphic here, it just presents a
14 backdrop to show the water consumption with the
15 regulations, and we can see that we are probably
16 -- my estimate was that we are roughly getting
17 about 20 percent in water consumption with the
18 staff proposed regulations.

19 And in this slide, well, we present the
20 individual appliance savings. By the way, the
21 lifecycle benefit here is the product of the
22 annual savings and the design life; we can see
23 from the table that the incremental cost is zero
24 for all of these appliances. What I meant is
25 that the cost of a compliant product, and the

1 cost of the non-compliant product are not
2 different, therefore consumers can reap the
3 savings immediately after installation. And the
4 savings will continue for the rest of the
5 lifecycle of the appliance.

6 As for technical feasibility, staff
7 looked at different kinds of design, newly
8 designed from manufacturers, for toilets and
9 urinals, and we are looking at better gravity
10 flush-type tank toilets, we're looking at
11 redesigned flush valve, we're looking at pressure
12 assisted flushometer tanks, we are looking at
13 some flapperless gravity flush, vacuum assisted
14 toilets, and dual flush toilets.

15 And then I just want to have a word here
16 about the maximum performance testing, that
17 because of these tests, I believe the earlier
18 problem of toilets not performing correctly have
19 been solved because of the new maximum
20 performance testing. Again, the higher score
21 means the toilets will be able to flush more, to
22 better flush the solid particles. And for
23 faucets, because it is based on the existing
24 technology, so by doing just a smaller hole to
25 smaller hole in the gasket to reduce the flow,

1 and that's not much to say there. But anyway,
2 staff also looked at our database and the
3 WaterSense database, and we see that there are
4 numerous models of appliances currently in use,
5 already met the staff proposed standards.
6 Additionally, manufacturer support of staff
7 proposing standards means that the products are
8 technically feasible and readily available to the
9 consumer.

10 And here, the Impacts and Benefits.
11 Staff will review and analyze the proposal, the
12 staff proposal, and we see no significant
13 incremental impact to the environment. And in
14 addition, I just want to mention that we are
15 going with the proposed staff standard, we are
16 looking at about 1.9 million tons of equivalent
17 greenhouse gas a year savings by the time of
18 stock change.

19 And so what are the next steps? We
20 anticipate, and Harinder already mentioned, we
21 anticipate receiving input from stakeholders and
22 interested parties by June 6, 2014. If the
23 comments received require significant revision to
24 the Staff Report, we will have to re-workshop it;
25 if the comments require minimum non-significant

1 change to the report, then we will go forward
2 with the rulemaking process. In other words, we
3 will finalize the Staff Report and will be ready
4 for the rulemaking.

5 In the meantime, if you have questions or
6 concerns, please contact staff, even after
7 today's workshop. We will be available to
8 discuss possible solutions right away.

9 The next slide is the staff contact
10 information and the docket number for the
11 proceeding. I would like to thank everybody for
12 your patience to listen to my ramble.

13 MR. SINGH: Thank you, Tuan. I just want
14 to make one announcement that if anybody wants to
15 make comments, please fill out the blue cards,
16 and I have a few of them already, and once we go
17 through the blue cards here then we'll open the
18 lines for the people who are on the Web to take
19 their comments. So with that, I have the first
20 card that was submitted to me from Gary Fernstrom
21 from PG&E.

22 MR. FERNSTROM: Thank you. Gary
23 Fernstrom representing PG&E. I have no comment
24 at this time.

25 MR. SINGH: Thank you, Gary. The second

1 card I have is from Fernando. Oh, okay. All
2 right, Jerry Desmond.

3 MR. DESMOND: Thank you. My name is
4 Jerry Desmond, Jr. on behalf of Plumbing
5 Manufacturers International (PMI). You know, PMI
6 appreciates this opportunity to provide our
7 comments to the Energy Commission in this current
8 rulemaking proceeding on water closets, urinals
9 and faucets under Docket 14-AAER-1.

10 You know, PMI is the international U.S.-
11 based trade association representing 90 percent
12 of the U.S. plumbing products sold in the U.S.
13 You know, we have made the promotion of water
14 safety and efficiency a top priority and we have
15 included it in our mission statement. PMI's
16 members are industry leaders in producing safe,
17 reliable and innovative water efficient plumbing
18 technologies, and we have supported the water
19 efficiency legislation and codes in both
20 California and at the federal level, as well as
21 the voluntary U.S. EPA WaterSense Program.

22 PMI acknowledges and appreciates the
23 ultimate goal of this proceeding and rulemaking
24 as set forth in the Order Instituting Rulemaking
25 to reduce excessive energy and water consumption

1 by regulated appliances in the state. PMI and
2 our member companies have participated in each of
3 the preliminary phases of this docket and
4 proceeding that took place in 2013, including the
5 invitation to participate, the invitation to
6 submit proposals, as well as the workshops and
7 Webinars, and we appreciate that chance to have
8 done so. We also appreciate the approach that's
9 been taken by the Energy Commission staff to
10 analyze the approaches that have been proposed by
11 the IOUs and the plumbing industry and to
12 evaluate the comments from stakeholders,
13 approaches taken at the federal level and other
14 states, as well as the cost-effectiveness and
15 technical feasibility of each approach for
16 California consumers.

17 In summary, we support the proceeding and
18 the elements of the proposal moving forward, and
19 we have some suggested revisions to several of
20 the provisions in the docket that we'd like to
21 discuss next, and I will introduce that we have
22 two of the representatives, Fernando Fernandez
23 and Danny Gleiberman, who will if possible
24 follow-up on me to talk about those suggested
25 revisions.

1 MR. SINGH: Yes. I have the next speaker
2 is Fernando, please.

3 MR. FERNANDEZ: Good morning. My name is
4 Fernando Fernandez. I'm with TOTO, USA. I'm
5 also representing Plumbing Manufacturers
6 International. TOTO USA is a member of PMI.

7 In general, TOTO agrees with the staff
8 analysis on the water consumption levels
9 reflected in the Draft Report, but we do have
10 some initial observations we'd also like to make
11 at this time.

12 First of all, on the subject of MaP
13 testing, the Federal OMB Circular A119
14 establishes policies on federal use and
15 development of Voluntary Consensus Standards.
16 One of the goals is the utilization of Consensus
17 Standards that serve national needs and that are
18 formalized through an open and balanced approach
19 with due process and appeals mechanisms. In that
20 respect, we think it's only appropriate for CEC
21 to follow this model in their rulemaking for the
22 proposed changes in Title 20. Therefore, I am
23 requesting to consider that the multiple
24 references to MaP, MaP testing, and MaP score in
25 Sections 1602, 1604, 1605, and Table A3 be

1 replaced with references to the ASME National
2 Consensus Standard, 19.2, 2013 Edition; the
3 extraction test in that same standard; a standard
4 indication of pass or fail instead of a score;
5 and that the definition of MaP be stricken from
6 Section 1602.

7 These changes actually allow for the
8 draft report to retain the same intent it had
9 with the extraction measurement factor in the
10 Draft Report.

11 Second, on the subject of definitions,
12 I've observed several instances where it appears
13 that there are new definitions being created and
14 I'd like to encourage a more effective approach
15 by utilizing the definitions that are in Industry
16 Standards and Consensus Standards.

17 Some examples of new definitions which
18 should revert to those found in the Standards are
19 the definition for Accessories, Dual Flush,
20 Average Flush Volume, Dual Flush Water Closet,
21 Waterless Urinal, and Fixture.

22 With respect to these comments thus far,
23 we will certainly be providing them in writing
24 subsequent to this meeting.

25 On the subject of Section 1605.1(A)(1),

1 this is a request for clarification we will put
2 in writing, but the reference to Table (H)(1)
3 appears to be a typo and looks like it's more
4 appropriate to be labeled as Table (A)(1) instead
5 of (H)(1).

6 Next, the references for showerheads
7 meeting the requirement of the ASME Standard, the
8 1996 version, appears it needs to be replaced
9 with a more updated version of the standard, the
10 2012 edition. As a result of updating it to the
11 2012 edition, the clause also would need to be
12 changed to Section 4.11.1. This coincides with
13 the reference that CEC is incorporating to the
14 Federal 10 CFR requirements for fittings.

15 On the subject of Replacement Accessory
16 as it appears in the Definition 1602 and Table
17 (A)(1), we're seeking a clarification for the new
18 term introduced, "Replacement Accessory." And
19 the simple question we pose in the example of a
20 lavatory faucet, if the Replacement Accessory
21 available in the aftermarket would only be a 1.5
22 gallon per minute aerator. We will also put that
23 in writing subsequent to the meeting.

24 On the subject of Section 1605.1(I)(1),
25 there's new language that is being proposed and

1 we're also seeking some clarification so we can
2 provide comment accordingly. It appears that the
3 intent is to provide an exception in certain
4 applications such as prisons and mental care
5 facilities to allow the use of Blow-Out Toilets,
6 yet the reference to a Blow-Out Toilet in Table
7 (A)(2) is stricken, so we will formalize that in
8 writing to request clarification. Please note
9 that California AB 715 does exempt these Blow-Out
10 Toilets and allows their use; they refer to them
11 as "Institutional Toilets" in the law.

12 Next, on the subject of Table (A)(2),
13 again, there's some definitions that we would
14 like to see updated, the definition of Effective
15 Dual Flush Volume, the retention of 3.5 gallons
16 per flush for Blow-Out, and also a request for
17 clarification and consideration, instead of using
18 the term "Replacement Valve," which is not only
19 in Table (A)(2), but also in the Definitions, to
20 use "Replacement Flushometer Valve" to add more
21 specificity to the product that we're talking
22 about.

23 Other than that, again, I just would like
24 to reiterate, we agree with the analysis on the
25 water consumption levels that we've seen thus

1 far, and we will follow-up in writing with these
2 requests for clarification and observations.
3 Thank you for your time.

4 MR. SINGH: Thank you. Tuan, do you want
5 to mention a few things, or are you fine? Okay,
6 then we have Daniel from Sloan.

7 MR. GLEIBERMAN: Thank you, Commissioner
8 McAllister, staff. Thank you very much. My name
9 is Daniel Gleiberman with Sloan Valve Company.
10 We're also members of PMI, and my role at Sloan
11 is Manager of Product Compliance and Government
12 Affairs.

13 I just wanted to offer a couple of
14 additional technical comments to follow-up on
15 Fernando. We do support in general staff's
16 recommendations. We do encourage the fact that
17 Title 20 needs to be updated, and we really
18 support the idea that it be consistent with AB
19 715.

20 I did want to just -- because some of us
21 in this room actually worked on AB 715, it's hard
22 to believe that it was already seven years ago,
23 but Fernando mentioned there are definitions in
24 there, and so for the record, and we will be
25 submitting this in more detail, but Institutional

1 Water Closets are defined in AB 715 and our
2 suggestion or comment to staff for this Staff
3 Report and for the recommendation is that those
4 same types of exemptions and the definitions be
5 consistent so that Blow-Out Water Closets and
6 Blow-Out Urinals can still be allowed in those
7 instances where in fact they're needed.

8 So just very quickly, although I can't
9 find it right now, Institutional Water Closet
10 means any water closet fixture with a design not
11 typically found in residential or commercial
12 applications, or that is designed for a
13 specialized application, including but not
14 limited to wall-mounted floor outlet water
15 closets, water closets used in jails or prisons,
16 water closets used in bariatric applications, and
17 child water closets used in day care facilities.

18 And so the comment would be from a
19 technical standpoint, the Legislature has already
20 identified appropriately that there are certain
21 applications where additional water is necessary,
22 and we would hope to see that Title 20 reflects
23 and is kind of cooperative of that and doesn't
24 conflict with that.

25 I will keep my comments very brief

1 because I know we have other speakers, but in
2 general we will follow up in writing per the
3 recommendations of staff before the deadline and,
4 again, we support staff's recommendations for
5 these water use efficiency levels on fixtures.
6 Thank you.

7 MR. SINGH: Thank you, Daniel. I have
8 John Koeller for the next speaker, please. John
9 is from MaP Testing.

10 MR. KOELLER: Thank you. I, too, like
11 those speakers who came before me, although I'm
12 not a member of PMI, although it seems like we
13 have quite a few in the room, we support the
14 staff analysis and recommendations contained in
15 this document, but I'm here to talk about a
16 proposal made in Addendum 1 that was rejected by
17 staff and that needs some clarification.

18 And I want to thank you for allowing me
19 to speak today. My name is John Koeller, I'm a
20 professional engineer licensed in California.
21 I'm also Technical Advisor to the Alliance for
22 Water Efficiency, although I'm not representing
23 AWE here today. I'm the Co-Developer and Co-
24 Owner of Maximum Performance Testing known as MaP
25 Testing.

1 MaP testing reports toilet flush
2 performance and other characteristics on nearly
3 3,000 different tank-type toilet models and 500
4 different flushometer valve and bowl combinations
5 offered for sale in North America and elsewhere.
6 We are not associated with any manufacturer, this
7 is a program that is trademarked, privately
8 owned, copyrighted, and patented. So the
9 procedure that MaP uses for testing in nine
10 different laboratories located in North America
11 and China, that we have contractual relationships
12 with, is a procedure that has been adopted by
13 WaterSense, it's been adopted from WaterSense
14 into the National Standard that the two gentlemen
15 referred to who preceded me, but MaP was
16 developed by 22 water utility-related
17 organizations back in 2003. And I think most
18 manufacturers will agree that MaP testing, again,
19 11 years old, has resulted in significant
20 improvements in flush performance of toilets
21 since that time, but it's just one measure. And
22 the reason I bring that up is because this
23 addendum in the case report, Addendum 1, proposes
24 some things that are basically based on a faulty
25 premise, two faulty premises, and I'm so pleased

1 that the CEC rejected what is proposed in this
2 document. The IOU proposal suggested that, by
3 raising the threshold of performance from 350 to
4 600 grams in terms of a MaP score, or 12 ounces
5 to 21 ounces, that double-flushing of toilets can
6 be eliminated, and nothing could be more wrong.

7 The primary focus of the IOUs' proposal
8 appears to be this topic of double-flushing;
9 unfortunately, the authors and proponents of this
10 proposal only considered that MaP testing was a
11 measure of every element of performance of a
12 toilet. In fact, there are other causes of
13 double-flushing, and I'm not going to get into
14 that now because I don't think some of the folks
15 in the room would want to hear about double-
16 flushing and the reasons for it. But let me say
17 that MaP only measures one element of flush
18 performance. There are other elements measured
19 in the ASME CSA Standard, and those were never
20 considered in this document.

21 So the premise that double-flushing can
22 be eliminated by raising this threshold and
23 somehow achieving better customer satisfaction is
24 seriously flawed. In fact, as I said, our
25 experience has shown us that, by increasing the

1 threshold it will do nothing to reduce water
2 consumption, and therefore will do nothing to
3 reduce energy consumption.

4 The document also bases all of its
5 findings on one medical study, yet we have shown
6 that there are three medical studies that are
7 posted on the website, our website, that
8 substantiate the thresholds that exist now,
9 either in our own work, in the WaterSense work,
10 in the WaterSense threshold, and the ASME CSA
11 Standard. So selectively analyzing just one
12 study to get to a recommendation by these four
13 utilities is to me somewhat intellectually
14 dishonest.

15 Other learned professionals, and those of
16 you who know John Swaffield, Professor Emeritus,
17 School of the Built Environment, Heriot-Watt
18 University in Edinburgh, provided his own data on
19 this topic and evaluated the MaP protocol, the
20 thresholds, and so forth. And he's one of the
21 most heralded professors and experts in the field
22 of water closet performance, drain line
23 performance, waste movement, etc., in the world
24 -- and I should say "the late John Swaffield."
25 But in 2010, he reviewed the MaP thresholds and

1 concurred that they were correct and perhaps even
2 a bit high. So what he's saying is, even 350 is
3 more than is what is required of the normal
4 toilet and normal operations.

5 And the second premise that I think is
6 flawed is that somehow there are thousands of
7 dissatisfied users out there of these new
8 toilets. And, in fact, the WaterSense Program,
9 and its customer satisfaction is well-documented,
10 customers are satisfied, customers of the water
11 utilities of using WaterSense toilet
12 installations, customers of all the
13 manufacturers, the members of Plumbing
14 Manufacturers International, they're producing
15 outstanding product and the customer feedback is
16 also outstanding, so to say that you're going to
17 increase user satisfaction by increasing a score
18 is incorrect. And I'm going to stop there. I'm
19 going to document all of this in written
20 comments, but I think the most egregious thing
21 about this is that the four energy utilities have
22 suggested that the California Energy Commission
23 take over a private enterprise, take over MaP
24 testing, its trademark, and all the elements of
25 it, and turn it over to the CEC so they can do it

1 instead. And I find that to be rather troubling.

2 As one of the owners of MaP testing, I
3 think that perhaps we should all be glad that the
4 staff has rejected such an approach. Thank you.

5 MR. SINGH: Thank you, John. Next is
6 Tony Brunello from Green Technology Leadership
7 Group.

8 MR. BRUNELLO: Thank you. Hi. Tony
9 Brunello with Green Tech Leadership Group.
10 Hello, Mr. McAllister. I actually just had a
11 quick question of whether energy used from
12 sensors and toilets and sinks, etc., were
13 incorporated into this analysis at all?

14 MR. NGO: Yes, it does.

15 MR. BRUNELLO: They were. And were there
16 full home systems, as well?

17 MR. NGO: Most of the time, I did not
18 calculate the ones for in homes, just commercial.

19 MR. BRUNELLO: Okay, great. Thank you.

20 MR. NGO: You're welcome.

21 MR. SINGH: Thank you, Tony. Next is
22 Heidi Hauenstein from IOUs.

23 MS. HAUENSTEIN: Good morning. I'm Heidi
24 Hauenstein representing the Statewide IOU Codes
25 and Standards Team. Thank you for the

1 opportunity to provide input into this
2 rulemaking. I think that there's a slide that
3 I'm going to try and pull up, and I think we're
4 working on that now. But in the meantime, I will
5 get started.

6 So California urgently needs to address
7 water efficiency and water conservation.
8 Addressing these water shortages is an urgent
9 matter. With dangerously low rainfall and
10 snowpack levels in recent years and projections
11 that drought will continue as climate change
12 takes hold, it's important that we increase our
13 water efficiency.

14 As Tuan mentioned, on January 17th,
15 Governor Brown proclaimed a state of emergency
16 and asked all state agencies to take all
17 necessary actions to repair and respond for
18 drought conditions. We commend the Energy
19 Commission for responding to the Governor's
20 directive by prioritizing the updates to the
21 Title 20 Standards for toilets, urinals, and
22 faucets.

23 After completing our own thorough review
24 and reviewing the Energy Commission's proposal,
25 however, we believe that the Energy Commission

1 has left significant savings on the table. We
2 encourage the Energy Commission to embrace this
3 opportunity to establish Water Efficiency
4 Standards that will result in the largest water
5 savings opportunity. Establishing more stringent
6 Water Efficiency Standards is a cost-effective
7 intervention to reduce California's water demand.
8 It may actually be the most cost-effective
9 intervention, particularly when compared to
10 solutions that aim to increase the potable water
11 supply.

12 MR. RIDER: Heidi, would you mind, which
13 --

14 MS. HAUENSTEIN: You had it open for a
15 second.

16 MR. RIDER: Which slide were you -

17 MS. HAUENSTEIN: You can just go to slide
18 1, that's fine. Thank you. I'll ask you to flip
19 them when I'm ready. Thank you. So we believe
20 that California should continue to lead the way
21 on efficiency standards. California can set more
22 stringent standards because it has a more dire
23 water and energy resource constraint problem than
24 the nation as a whole. Water costs and energy
25 costs are higher in California than the national

1 average. We also want to point out that
2 California represents about 10 percent of the
3 national market, so if California sets a
4 standard, then a manufacturer that doesn't want
5 to comply with the California Standards still has
6 the opportunity to sell products in the rest of
7 the country which represents 90 percent of the
8 market.

9 So the Proposed Standards build upon the
10 WaterSense specification. We understand that a
11 lot of time and energy has been spent in
12 developing the WaterSense specification. The
13 WaterSense sets a bar for Water Efficiency
14 Standards for the entire nation, it established a
15 foundation for performance standards, and it
16 helps increase the market share of water
17 efficiency products. WaterSense has done such a
18 good job that the market share has reached at
19 least 50 percent for toilets.

20 Energy Star, which is the energy
21 consuming equivalent to WaterSense, updates their
22 specifications once the market share reaches
23 about 30 percent. WaterSense has not followed
24 suit and they have not updated their Water
25 Efficiency Standards, even as market penetration

1 has reached 50 percent.

2 Given California's dire water situation,
3 we believe that establishing the Title 20
4 Standards that are equivalent to WaterSense
5 levels is not appropriate for California.

6 California is best served to set
7 standards that will result in the largest water
8 savings, provided those standards are cost-
9 effective and justified given the products that
10 are currently available on the market.

11 The IOU Team has presented a number of
12 ways that the Energy Commission can adopt Water
13 Efficiency Standards that will result in higher
14 water savings. I'm going to go into detail on
15 four of the specific proposals today, but our
16 proposal that we submitted to the docket has
17 additional recommendations.

18 So the four ones I want to focus on are,
19 1) establishing a maximum flush volume of 1.28
20 gallons per flush for dual flush toilets, 2)
21 adopting a MaP standard of 600 grams, 3)
22 establishing a 0.125 gallon per flush standard
23 for urinals, and 4) establishing a lavatory
24 faucet standard of one gallon per minute.

25 The first item is encouraging the Energy

1 Commission to establish a maximum flush volume of
2 1.28 gallons per minute for dual flush toilets.
3 If CEC uses the effective flush volume, the full
4 flush volume can exceed 1.28 gallons per minute,
5 it can actually consume as much as 1.6 gallons
6 per minute. We know what dual flush toilets are
7 not achieving the maximum savings because they
8 can use more water in the full volume flush.

9 ASHRAE 189.1 is in the process of
10 eliminating the use of the effective flush volume
11 and we believe that the Energy Commission should
12 follow suit. As of July 2013, 34 percent of
13 WaterSense products are dual flush.

14 The second recommendation is that we
15 recommend that the Energy Commission adopt a 600
16 gram threshold for toilets -- MaP threshold for
17 toilets. Can you flip to the next slide? Thank
18 you.

19 So it's crucially important that we would
20 maintain user satisfaction as water efficiency
21 increases. So solid waste events often exceed
22 350 grams. So if you can look at the slide here,
23 the top slide shows the average flushes per year
24 that exceed 350 grams -- or, let's see, let me
25 explain this better -- so on the top, the bottom

1 shows the MaP score, the Y axis shows the number
2 of flushes that exceed that particular MaP score.
3 So at the CEC proposal, at 350 grams, we estimate
4 that two in 10 men or 20 percent of men are
5 flushing more than 350 grams twice a month. So
6 if you average that out, that's 98 million
7 flushes per year that exceed 350 grams. That is
8 a lot of water, it's not nothing. So if you
9 continue on to the right, if you increase the MaP
10 threshold to 600 grams, we anticipate that nobody
11 is going to be flushing more than 600 grams,
12 which means that the double flush will reduce
13 significantly.

14 On the bottom graph you actually see the
15 percent of products in the MaP database that
16 exceed certain MaP thresholds. So 99 percent of
17 the products in the MaP database exceed the 350
18 gram threshold. If you move to the right, you
19 see that 91 percent of the tank-type toilets
20 exceed 600 grams, so there's eight percent of the
21 products that do not meet the 600 gram threshold,
22 but by moving that MaP threshold up, you're
23 effectively claiming the savings of 98 million
24 double flushes a year.

25 I also wanted to point out that the MaP

1 test procedure doesn't accurately account for
2 toilet paper in their test, they use single ply
3 paper, where we know that it's more common to see
4 double or triple ply paper in residential
5 applications.

6 We know that increasing the performance
7 threshold to 600 grams would not have a
8 detrimental effect on manufacturers. The most
9 toilet manufacturers already have 600 gram toilet
10 models. Can you flip to the next slide, please?
11 So we looked at the brands that have WaterSense
12 products listed in the MaP database, overall
13 there are 106 brands, 27 brands have chosen not
14 to test their products to failure, so to be
15 WaterSense certified, you can test your product
16 at 350 grams and if it passes that test, then you
17 can get your WaterSense certification. So the 27
18 brands have chosen to do that. Those 27 brands
19 represent 167 models, and so those 26 (*sic*)
20 brands are not the major players. Most of the
21 major players have chosen to test their products
22 all the way to failure, or at least to the
23 thousand gram test level. So of those 79 brands
24 that actually tested to failure, we found that 75
25 brands have products that meet the 600 gram

1 threshold, and only four brands do not have
2 products already on the market that meet the 600
3 gram threshold. And of those four brands, those
4 are not major manufacturers. Those four brands
5 only have six unique toilet models listed.

6 The other point is that the IOU proposal
7 would reduce the test burden on manufacturers by
8 eliminating up to three of the repetitions of the
9 MaP test because we would not be testing at 350,
10 400, or 500 grams.

11 We also found that increasing the MaP
12 threshold will have a positive impact on
13 consumers. Consumers will have access to toilets
14 that perform better at no increased cost. And
15 then, finally, toilets that use less than 1.28
16 gallons per flush can meet the 600 gram
17 performance test threshold.

18 MaP has assembled a list of MaP premium
19 toilets that use 20 percent less water, but still
20 meet the 600 gram threshold. There are already
21 104 models that meet this MaP premium level.
22 This illustrates that there is still room for
23 improvement in water efficiency while maintaining
24 the high performance.

25 All right, so the third point I wanted to

1 make was that we encourage the Energy Commission
2 to adopt the 0.125 gallon per flush urinal
3 standard. As discussed in detail in the case
4 report, 0.125 gallon per flush urinals are
5 readily available, 34 percent of the WaterSense
6 certified products already meet the 0.125 gallon
7 per flush standard, and we've done extensive
8 research and we haven't found any examples where
9 the pint urinals cause damage to drain lines.
10 The City of LA has had a 0.125 gallon per flush
11 standard in effect since 2010 and they have not
12 reported any problems with drain lines either.

13 I want to reiterate that we believe that
14 the Energy Commission would miss out on 134
15 million gallons of water savings and 1.3 gigawatt
16 hours of embedded electricity savings by not
17 adopting the more stringent standard. When stock
18 turns over, that savings will be up to 1.7
19 billion gallons of water and 16.8 gigawatt hours
20 of embedded energy.

21 Finally, the IOUs encourage the Energy
22 Commission to adopt the 1.0 gallon per minute
23 lavatory faucet standard.

24 In conclusion, the IOUs encourage the
25 Energy Commission to embrace this opportunity and

1 establish water efficiency standards that will
2 result in the largest water savings possible,
3 provided that those standards are cost-effective
4 and they're justified given the current market
5 situation.

6 There are many recommendations in the IOU
7 proposal. We wanted to reiterate the four most
8 important points. We encourage the Energy
9 Commission to adopt 1.28 gallon per flush
10 standard as the maximum flush volume for dual
11 flush toilets, that the Energy Commission should
12 adopt a 600 gram MaP threshold, a 0.125 gallon
13 per flush urinal standard, and 1.0 gallon per
14 minute lavatory faucet standards. Thank you for
15 the opportunity to provide comments and we'll be
16 submitting written comments.

17 MR. SINGH: Thank you, Heidi. The next
18 card I have is from Tracy Quinn, NRDC.

19 MS. QUINN: Hi, good morning.

20 MR. SINGH: Good morning. Thank you.

21 MS. QUINN: I'd like to start by
22 acknowledging the incredible hard work that the
23 CEC staff put into their report, and so thank you
24 for that effort.

25 Many people this morning have brought up

1 the incredible drought that we're experiencing
2 here in California, and I wanted to mention that,
3 you know, this isn't the first drought we've
4 seen, it certainly won't be the last. And with
5 climate change, droughts are going to get more
6 intense and be more frequent. Meanwhile, the
7 population in the state is continuing to
8 increase, so it's important not just for this
9 drought, but for the sustainability of our state
10 to put forth product standards that will help us
11 to use water as efficiently as possible.

12 I'd like to start briefly just by
13 pointing out the parts of the CEC staff proposal
14 where we support it as written, in general. So
15 we agree with -- we support the CEC staff
16 proposal for toilets, for kitchen faucets, and
17 for public lavatory faucets. There are some
18 areas where we, like the IOU Team, believe that
19 CEC has the opportunity to push forward and go
20 beyond WaterSense, and where it's incredibly not
21 only important and appropriate, but necessary
22 given our current status of water availability in
23 the state.

24 So I'll start with dual flush toilets.
25 As Heidi mentioned, we would like to see the CEC

1 establish a maximum flush volume of 1.28 gallons
2 per flush for valve type dual flush toilets,
3 specifically. We also support the IOU proposal
4 for a urinal standard of 0.125 gallons per flush
5 for many of the reasons that Heidi stated. The
6 1.0 urinals are available now, they're
7 affordable, and they meet consumer expectations
8 in terms of performance and utility. As Heidi
9 mentioned, they've been used, there's been a
10 standard in Los Angeles since 2010, and there are
11 no reported issues with that.

12 I spoke with Los Angeles staff yesterday
13 and they confirmed that, as well. And we also
14 support the IOU proposal for a home lavatory
15 faucet of one gallon per minute flow rate at 60
16 PSI in the .5 gallon per minute at 20 PSI. Like
17 the urinals, these are widely available, they are
18 affordable, and both of the urinals and the home
19 lavatory faucets will result in the optimal water
20 and energy savings for the state. I believe in
21 the addendum that the IOU Team provided to their
22 case report, they showed that the savings between
23 the Staff Report proposal and the IOU Team
24 Proposal were credible for the urinals alone -- I
25 hope I have that number. The first year's

1 savings would be 134 million gallons of water and
2 by 2026, it would be 1.68 billion gallons of
3 water. Given the water situation here in
4 California, I think that we absolutely need to
5 set these standards to the most stringent levels
6 possible. Thank you.

7 MR. SINGH: Thank you, Tracy. And the
8 next card I have is for Jon McHugh from MEC.

9 MR. MCHUGH: Good afternoon, Commissioner
10 McAllister; good afternoon, guests. I thought
11 I'd start off today -- this is Jon McHugh from
12 McHugh Energy Consultants -- and I thought I'd
13 start off with, well, my wife used to be a
14 teacher and in teaching a lot of times to teach
15 about certain topics, they used what they call
16 "manipulables," basically physical objects to
17 help understand the issues at stake here. And I
18 was wondering if you could bring up my slides?
19 I've got a couple things here, one is the half
20 gallon per flush that we're looking at for a
21 urinal and comparing that to the pint, and just
22 to think about some common sense about what does
23 it actually take to actually clean a urinal after
24 flushing -- is that -- why don't you go back to
25 the very beginning? There are only two slides?

1 Oh, okay.

2 MR. RIDER: Sorry. There we go.

3 MR. MCHUGH: Next one, please. So as we
4 all know, there is a water emergency on and
5 potentially this is the beginning of more water
6 emergencies, and the question is, is can the
7 state actually provide policy leadership for the
8 rest of the country in terms of water efficiency
9 and also -- and when I talk about water
10 efficiency, I'm not thinking about what Ronald
11 Reagan called -- how he described conservation,
12 which was being too cold or too hot, and being in
13 the dark. So the idea of efficiency is to
14 actually have the same level of amenity while
15 reducing energy or water consumption. And this
16 is, I think, the point of what we're trying to
17 promote here. Next slide, please.

18 And just to bring it home, you know,
19 there is a water emergency, snow packs, about a
20 third of its historic average is State Water
21 Resources Control Board is looking at a
22 curtailment order, curtailment of water for all
23 the junior owners of these various watersheds and
24 there's a variety of different Water Districts
25 that are looking at curtailment. Next slide,

1 please.

2 And more to come. So this is just a
3 description of global warming and the impact on
4 what we expect to be future amounts of water.
5 And so I'm going to talk briefly about, again,
6 using some common sense.

7 I actually brought what is for the MaP
8 score, what they do is they actually use
9 essentially soybean paste and I've taken the same
10 350 grams of soybean paste and it's not a huge
11 amount of volume. And Mr. Koeller had mentioned
12 that we use a particular study to look at what is
13 the extrapolation from a study that was done, I
14 believe, over 40 years ago, and that particular
15 medical study is the same study that was used as
16 the basis for the WaterSense, their description
17 -- if you go to their website and you look at the
18 description of how they selected 350 grams,
19 you'll find that they use that exact same study,
20 so we're using that study and it has a study that
21 talks about averages and standard deviation. And
22 you know, my daughter thinks I'm kind of crazy,
23 you know, looking into these things, but it's a
24 very simple statistic looking at averages,
25 looking at standard deviations, and these values

1 that are listed here on this graph are related to
2 the averages and standard deviations from that
3 medical study.

4 And the issue is, is that this medical
5 study also looked at women and women in general
6 are smaller than men, and so they are not the
7 basis of designing waste extraction systems. But
8 the men in the household, typically larger, eat
9 more, all those kinds of things, they are the
10 ones that determine when a toilet might fail.
11 And also, counter to what John was just saying
12 earlier, because there might be multiple reasons
13 for a toilet to backup or fail doesn't mean that
14 the particular reason --

15 MR. RIDER: Can you keep at the mic
16 because people online won't be able to hear what
17 you're saying.

18 MR. MCHUGH: Oh, sure. Okay, I was going
19 to stand by the graphic.

20 MR. RIDER: I can point to something.

21 MR. MCHUGH: Okay, yeah, why don't you
22 point to the Y axis there? So the Y axis
23 indicates how many times per year do we expect
24 that the flushing, the very procedure that John
25 uses to identify whether waste is fully extracted

1 from the toilet, how many times per year is the
2 waste not fully extracted. So this is not
3 describing all the other things that, indeed,
4 other things do cause toilets to backup, but what
5 this does indicate is that if the state actually
6 adopted a standard that was based on 350 grams,
7 and there was a significant fraction of the
8 market designed to that level, we could expect
9 that for the top 20 percent of men, that they
10 would experience a failure every two weeks. So
11 the issue is, is this acceptable?

12 Now, John and I have had conversations
13 before about the MaP test and the example that he
14 gave is, you know, setting the score at 600 is
15 like having a car that goes 200 miles per hour,
16 you know, you can't drive 200 miles per hour on
17 the highway, but I actually look at it
18 differently, I look at it that the MaP test,
19 actually what it's doing is that setting the
20 standard at 350 grams is like having a car that
21 is acceptable for the car to stall every two
22 weeks.

23 And so this is really what the issue is,
24 it's about failure as opposed to being able to
25 flush more than you normally would, it's those

1 times when it fails. And what does that do to
2 the market? It basically provides a situation
3 where you have less amenity along with lower flow
4 rates. What we want to do is actually make sure
5 that we have equal or greater amenity for the
6 reduced amount of flow. And if you look at the
7 data in the database, this is very similar to
8 what Heidi has, I actually broke this out by both
9 tank type models and flushometer models, those
10 are the two top lines, what you see is that in
11 both cases, of the products that are listed that
12 list their extraction value, that over 90 percent
13 of the products meet this. And you really have
14 to look at what the market actually has available
15 and also what makes sense. And so if the market
16 only had 10 percent of products, we wouldn't be
17 recommending to set something that knocks out,
18 you know, 90 percent of the market. But the
19 reality is, for reasons that I don't understand
20 why manufacturers would be in opposition to
21 actually potentially removing some of the low
22 quality competitors in the market, because all
23 this really does is it says I should be
24 redesigning my toilet so that it works. And 90
25 percent of the products already work. So what is

1 the value to the industry to actually set a low
2 standard, and potentially having people upset
3 with the quality of low flush toilets? Now, the
4 argument is made that, you know, we're not
5 getting a bunch of complaints, but tell me
6 something --

7 MR. SINGH: Jon, please speak into the
8 mic and also we have a limited time, actually, we
9 have the people on the --

10 MR. MCHUGH: Thank you. When people are
11 experiencing the toilets backed up, are they
12 immediately calling up the manufacturer and
13 saying, "I'm going to find out the model number
14 and I'm going to call up the manufacturer"? No,
15 they just suck it up, they're tired with it, but
16 also what happens is that plumbers and various
17 people start going, "Yeah, you know, you don't
18 want to get the flush and pump toilet, the flush
19 and brush toilet," all the various negative
20 things that can be ascribed to modern toilets.
21 We do not want that. That is not desirable for
22 the manufacturers, it's not desirable for the
23 market, and it's not desirable for the state.
24 And then finally, just going back to
25 urinals, it doesn't make common sense that we

1 really need half a gallon to flush a couple of
2 ounces of urine out of a toilet. Thank you very
3 much for your time.

4 MR. SINGH: Thank you, Jon. I'm sorry
5 that I had to cut you off.

6 MR. MCHUGH: That's all right.

7 MR. SINGH: And the next card is for
8 Eddie Moreno from Sierra Club.

9 MR. MORENO: Good morning, Commissioner
10 McAllister and staff. I'd like to thank you for
11 hosting this very informative workshop and giving
12 Sierra Club the opportunity to participate.
13 Sierra Club would also like to thank you for
14 drawing greater attention to the water and energy
15 nexus with the transportation and treatment of
16 water and disposal of water, and the energy used
17 to heat and consume water account for 20 percent
18 of the total electricity and 30 percent of the
19 demand side natural gas burned in California.
20 Holding household appliances such as toilets,
21 urinals, and faucets to higher standards and
22 water use efficiency saves water in a state
23 plagued by drought, and it yields energy savings
24 while cutting greenhouse gas emissions.

25 The Sierra Club will submit written

1 comments and supports the staff recommendation,
2 but would like to support some of the statements
3 made today, as well. For the toilets, we support
4 the 1.28 gallons per flush maximum for the dual
5 flush toilets, but we'd like to see a MaP score a
6 little higher than 350. We got some excellent
7 information over the last week and today we'd
8 like to sort of review that, but 600 grams might
9 be more appropriate and able to ensure that the
10 products maintain utility while continuing to
11 conserve energy and water. There are products
12 that will not meet these proposed standards, but
13 the majority of the products that are available
14 today already do so. Though there are many
15 factors that contribute to double flushing,
16 increasing the MaP threshold to 600 grams helps
17 cut away the approximate, I guess, 125 million
18 gallons of water wasted due to double flushing.
19 And we believe that it will help prepare the
20 industry for future standards and it will
21 continue to encourage consumers to buy water
22 efficient products. Thank you.

23 MR. SINGH: Thank you, Eddie. I think
24 this was the last card I had, so we'll open the
25 lines for the people who are on the web, so can

1 you please?

2 MR. RIDER: Yeah, folks on the line,
3 we're going to mute. I don't see anyone who has
4 raised their hand. If you'd like to speak, raise
5 your hand, but I have not seen anyone. I'm going
6 to mute these lines, so if you could mute your
7 phone before I do that, so you don't get caught
8 in the middle of a conversation -- oh, I do have
9 one person raising their hand. I'll take the
10 people who raise their hand first, and then move
11 to generally. So again, if you're not planning
12 on saying anything, please mute your line now,
13 otherwise you may say something to the entire
14 Commission. So I have Marianne Di Maseio. I'm
15 going to go ahead and unmute her. You should be
16 unmuted, Marianne.

17 MS. DI MASEIO: Okay, hi. Thank you.
18 Hi, my name is Marianne Di Maseio. I work for
19 the Appliance Standards Awareness Project. We're
20 a nonprofit advocacy organization working to
21 advance appliance lighting and equipment
22 efficiency standards at state and federal level.
23 And we've been doing this work since 1999.
24 Because of our exclusive focus on efficiency
25 standards nationwide, it feels like we're in a

1 unique position to comment on the California
2 Standards, their importance, and their impact on
3 the whole country. We appreciate the work the
4 CEC has done over the many years, and in
5 particular on this docket for water using
6 standards. So thanks for allowing me to speak
7 today. And I don't know if you know, but the
8 hearing falls on the same day that President
9 Obama unveiled an assessment of how climate
10 change has already affected and will continue to
11 affect the U.S.

12 In the report today, you noted that
13 increased incidents of drought in California, the
14 Southwest, and the Midwest, and I know California
15 already knows the danger and the urgency of these
16 drought conditions, and it's great that you have
17 the opportunity to really do something about it
18 with this docket. So I'd like to make three
19 points in my short comments today, 1) that the
20 more stringent standards for the water using
21 products are warranted, 2) that California has
22 led the country in this area and hope they
23 continue to do so, and 3) the timing is right for
24 the strong standards, given the context, the
25 drought and market conditions.

1 So first I would like to thank the CEC
2 for their extensive research and they've really
3 done a lot of outreach to stakeholders in this
4 rulemaking. And while the standard levels that
5 CEC proposed will save water and energy, I
6 believe they fall short of capturing the cost-
7 effective savings, particularly in the context of
8 the drought and the availability of these
9 products in the California market. So I'd like
10 to express our strong support for the more
11 stringent standards levels proposed by the
12 California IOUs, NRDC in the case report. I
13 won't go into detail on the report because Heidi
14 and Tracy have already done that, but I would
15 like to make a couple of points. One is about
16 the performance standards for toilets, I just
17 want to have it be really loud and clear that we
18 do not want any kind of repeats of the earlier
19 toilet standards when poor toilet performance
20 made the headlines.

21 Just a couple years ago, I was listening
22 into a hearing on lighting standards when a
23 prominent U.S. Senator vehemently complained
24 about a poorly performing toilet that he had
25 purchased after the standards went into effect

1 more than 20 years ago, and he was still mad
2 about it 20 years later, talking about it at a
3 hearing. So I think the implications of having
4 something that doesn't work well are really
5 large. So we need to really set the performance
6 standards to prevent this kind of backlash. And
7 I know Heidi was already saying that 91 percent
8 of the toilets in the database already made the
9 MaP threshold that they were looking at, so it's
10 clearly an attainable goal.

11 For urinals and faucets, I won't go into
12 details, but I urge the CEC to go with the more
13 stringent standards proposed in the case report,
14 that are available to the California consumer,
15 they're affordable, they're technically feasible,
16 and they would increase the potential water and
17 energy savings.

18 The second point I wanted to make
19 pertains to California's role in influencing the
20 standards in other states and in the country as a
21 whole; it's really a vital role that CEC plays
22 and I hope you all understand the impact. I talk
23 to state leaders and utilities and people around
24 the country who literally wait for California to
25 act on standards so that they may follow suit.

1 And I know your primary job is to think of what
2 is best for the state and the residents of
3 California, but I really think it's important to
4 think about the impact on the rest of the nation,
5 it's really too big to ignore. You've been a
6 leader in setting efficiency standards,
7 tremendous implications for standards throughout
8 the country from refrigerators back in the '70s
9 and '80s to the TVs and battery chargers more
10 recently, and there's a long list of products in
11 between, and California has taken the lead and
12 other states have followed, and in many cases
13 National Standards. So as you make your
14 decisions, I urge you to also consider the
15 implications for energy and water savings for the
16 entire country and with particular thoughts to
17 also the changing climate and that there are now
18 many other drought stricken regions.

19 And as a non-Californian, we hear about
20 the intense drought in California and think what
21 an opportunity you really have to do this right,
22 to set standards that will really be able to save
23 huge amounts of water, save energy, save
24 residents money. So I know there is pressure to
25 set uniform standards to keep with the

1 WaterSense, but from the specifics presented
2 today and with the industry already moving in the
3 right direction for the more efficient products,
4 it really seems like you're in such a unique
5 moment in time, it's the right time, the right
6 place, the right market to set the more stringent
7 standards, and it's also the right thing to do
8 with this environment. So I urge you to take
9 bold action and go for the greatest impact for
10 both California and for the rest of the country.
11 So thank you for allowing me to speak and we will
12 submit comments.

13 MR. RIDER: Thank you. We don't have a
14 whole lot of time left, so there are a few other
15 people who would like to comment on the phone if
16 you could keep it fairly brief. I've got next
17 George Nesbitt. Just one second, George.

18 COMMISSIONER MCALLISTER: Ken, can I just
19 make a quick comment?

20 MR. RIDER: Yeah, go ahead.

21 COMMISSIONER MCALLISTER: I just want to
22 jump in. So I want to acknowledge all the folks
23 who are talking -- I was remiss in not mentioning
24 the drought in my opening comments, but I think I
25 just want to let everybody know that definitely

1 is on the radar screen, and the Governor has made
2 it a priority, we are clearly in a state of
3 emergency that now covers the whole state. And
4 Chair Weisenmiller here at the Commission has
5 highlighted this on a number of occasions in our
6 release about this rulemaking and in other fora
7 about, you know, we have to keep water and
8 climate at the forefront of our minds when we're
9 making policy in this front. So I want to just
10 reassure in some sense those who are rightly
11 highlighting the drought as a driver of some of
12 the urgency here. And just wanted to note that
13 so that all of you know that that is actually
14 something that we're focusing on. Again, we have
15 to interact with the marketplace, we have to make
16 sure that what we do takes into account all the
17 constraints in a way that makes sense, so the
18 process can hopefully move forward to do that.
19 So thanks for all of your on point comments.

20 MR. RIDER: Great. So George, I'm going
21 to go ahead and unmute you and you should be able
22 to speak.

23 MR. SINGH: One of the requests I want to
24 make is that please keep the comments short
25 because we plan to finish by 11:00 and we're over

1 the time limit, so we still have a few more
2 speakers here. So if you could keep it up to two
3 minutes, would appreciate. Thank you.

4 MR. RIDER: Go ahead, George.

5 MR. NESBITT: Yes, George Nesbitt. I'm a
6 HERS Rater for Green Rater. First a question,
7 was the 1.28 gallons for toilet a maximum or an
8 average that would allow dual flush 1.6.8
9 toilets?

10 MR. NGO: For dual flush?

11 MR. NESBITT: Yeah.

12 MR. NGO: Dual flush could be a
13 combination of one large flush and two small
14 flush, then when you average it out, it should be
15 1.28 gallons per flush.

16 MR. NESBITT: Okay. So I noted on your
17 chart on energy use, there was no electric use
18 for commercial lavatories. It's not uncommon
19 that you either have an electric instantaneous
20 and/or electric pump recirculating in commercial
21 buildings, and so there is electrical use and
22 savings to be had there. My understanding of
23 Cal Green is that it now includes existing
24 buildings, so when you replace your toilet and
25 your other fixtures, you have to meet the current

1 Cal Green and that there is a deadline for
2 upgrading all those fixtures if they haven't been
3 updated to the 1992 Federal Standards.

4 I have also seen on some new multi-family
5 projects that should have been Cal Green and
6 1.28, and they were 1.6 toilets. So if it's
7 available on the market, it has a way of getting
8 put in. I definitely think we need to ratchet
9 down from the fixture use as much as we can, but
10 I do think we have to be careful with the
11 performance issue and make sure that the products
12 perform and meet people's needs because, as most
13 people pointed out, bad equipment doesn't help
14 us.

15 The other thing is, we have to work on
16 the plumbing code. As we've gone to lower flow
17 fixtures, we're still sizing water distribution
18 systems, as well as flow rates, as well as drain
19 waste and vent, and some of my plumbers tell me
20 that smaller drains actually work better with the
21 lower flow fixtures, rather than large drains.
22 So we need to work on that, too. Thanks.

23 MR. RIDER: Thanks, George. I have Jim
24 Kemper here. I'm going to unmute you, George -
25 or I mean Jim, sorry.

1 MR. KEMPER: Hi, hello. I'm Jim Kemper
2 with the Los Angeles Department of Water and
3 Power. Our organization authored the local
4 ordinance to mandate the one pint urinals for new
5 construction and when fixtures are replaced in
6 existing constructions. And I can confirm that
7 our group has not received any reports of any
8 problems with these since the ordinance went into
9 effect in 2010. Thank you.

10 MR. RIDER: Thank you. So I'm going to
11 just do one of these ugly end mute all's and see
12 if anyone who only called in has anything to say,
13 so bear with me on this. Everyone is currently
14 unmuted, so if you had something to say, speak
15 now. Okay.

16 MR. SINGH: Thank you, Ken. I have PG&E,
17 Gary Fernstrom.

18 MR. FERNSTROM: Thank you. I have a
19 brief closing comment on behalf of PG&E, so
20 Commissioner McAllister, staff, interested
21 parties, I'd just like to say that we're acutely
22 aware that California has a dire water problem.
23 We and several others have shown objectively on
24 the record that we can have appliances offering
25 better performance and less water usage, those

1 are available in the market today, and they are
2 cost-effective. And we encourage the Commission
3 to look at the objective facts presented in the
4 record and act accordingly on behalf of the
5 public and California. The issue seems to be
6 whether to remain consistent with existing
7 standards or again to step forward and exercise
8 state and national leadership, we believe that
9 it's time for the Commission to again step
10 forward and do what's right for the state. Thank
11 you.

12 MR. SINGH: Thank you, Gary. Fernando,
13 do you have some comments?

14 MR. RIDER: I'll take one second here.

15 MR. FERNANDEZ: I'd like to add a few
16 more comments here on this wonderful subject, and
17 sorry to ruin lunch. The IOU proposals are
18 predicated upon a one-dimensional approach to
19 energy savings. You save water, you save energy.
20 In a perfect vacuum, I would agree with that. I
21 think the one thing that's being missed clearly,
22 grossly neglected is this is about a balanced
23 approach and there's something called the
24 plumbing infrastructure, there's waste and
25 drainage that also needs to be taken into

1 account. In front of you, you see the effects of
2 water consumption on a urinal, water consumption
3 using something that we call fuzzy logic, what we
4 were experimenting with as low as one point to
5 one-quarter of a gallon per flush, with about 200
6 uses per day. And if you would actually zoom in
7 on that, the second row, you will see that
8 plumbing fixtures don't work in a vacuum, they
9 work in a system, and therefore you need to
10 realize what the cause and effect will be with
11 this approach. And those pictures speak for
12 themselves.

13 Next, with respect to 1.28 gallons per
14 flush on toilets and 600 grams, the notion that
15 600 grams is going to eradicate double flushing
16 is a misnomer and, again, a gross underestimation
17 of how a product is designed. It's very
18 interesting to see how people here can use
19 statistics for their own suitable purposes, and
20 no one here had actually worked for a plumbing
21 manufacturer. I've worked for a plumbing
22 manufacturer who makes great toilets for 19
23 years, and the fact of the matter is at 350
24 grams, that is an ideal threshold to design a
25 toilet not only to industry standards, not only

1 to EPA WaterSense specifications, but it allows
2 manufacturers the design parameter room to
3 address other flushable wastes. You have
4 floating media, various types of floating media,
5 you have rim wash, and you also have various type
6 of sinking media, including what we have come to
7 know as MaP. TOTO was the creator of this
8 soybean paste media, and so we know very well how
9 it is best utilized, and by promoting a 600 gram
10 approach, you're actually promoting this
11 horserace to go higher and higher and higher, and
12 create an unbalanced approach for toilet design.
13 So that is something that I would like the
14 Commission to take into account. Okay, very
15 good, thank you.

16 MR. SINGH: Thank you.

17 COMMISSIONER MCALLISTER: I had a quick
18 question here actually on that front. Fernando,
19 do you have any observations about the difference
20 between a retrofit applications and new
21 construction in terms of --

22 MR. FERNANDEZ: For example, with
23 urinals, one pint has certain applications where
24 it can be proven very effective. I believe
25 plumbing codes are changing to address those

1 concerns. Where you want to have ideally
2 fixtures that introduce water into the plumbing
3 system just upstream of those one pint urinals,
4 so that you help get the added flows in the drain
5 line. When it is improperly applied, and
6 unfortunately no one can see through walls, no
7 one knows what the plumbing waste line
8 configuration is, or how many fixtures are indeed
9 upstream of one of these very low one pint urinal
10 fixtures. But again, when it is in its proper
11 application, it works. When you don't have water
12 coming upstream to help with the flow, you do
13 have issues like this where you have the struvite
14 formation buildup, it's basically the urine scale
15 that builds up.

16 COMMISSIONER MCALLISTER: I guess the
17 reason I ask is I'm kind of just interested in,
18 you know, there is this system, and a couple of
19 people have pointed out that it is a system issue
20 and not just a fixture issue, and so I think
21 that's something we wrestle with. But those
22 issues are going to play out differently in
23 retrofit applications by and large where you're
24 coming in to a system you don't maybe understand
25 as well versus a new construction where you have

1 control over the system, at least in theory. So
2 I guess it would be interesting if you have any
3 observations on that, you know, it's broader than
4 just Title 20, probably, it also goes to Title
5 24, but in any case it would be good to sort of
6 help us understand that issue.

7 MR. FERNANDEZ: Understood, Commissioner.
8 And TOTO Company is more than willing to help out
9 with additional comments.

10 COMMISSIONER MCALLISTER: I really
11 appreciate your presence. Thanks very much.

12 MR. FERNANDEZ: Thank you.

13 MR. SINGH: Thank you. With that, I
14 think we move to the next topic, Ken. You're
15 next.

16 MR. RIDER: Great. And I want to thank
17 that last gentleman for that presentation because
18 I was really hungry and now I think I've got the
19 fortitude to make it through for the next until
20 we get to lunch. So we're a little bit behind,
21 so I'll try to get through this fairly quickly.

22 I'm Ken Rider. I'm an Electrical
23 Engineer with the California Energy Commission
24 and I'm working on some standards on heat pump
25 water chilling packages. I'm going to talk a

1 little bit about the pre-rulemaking process, the
2 purpose and intention that we have in proposing
3 these regulations, what the regulations include,
4 and what pieces of data we are looking to
5 collect, and also next steps in the process.

6 So we are in the workshop stage of the
7 pre-rulemaking process. We've released a Draft
8 Staff Report which is what this workshop is
9 about, and hopefully the folks here have had the
10 opportunity to review that. That Staff Report
11 contains the Proposed Regulations and the
12 rationale behind the proposals.

13 And so these Water Chilling Packages are
14 an interesting group of equipment where the
15 refrigerants actually directly cool water and
16 some really neat pieces of equipment that combine
17 with water heaters and space heating are being
18 designed today, and some of them are some of the
19 most advanced pieces of equipment that are being
20 looked at for ZNE buildings in the future.

21 COMMISSIONER MCALLISTER: Hey, Ken, can I
22 interrupt just quickly?

23 MR. RIDER: Okay.

24 COMMISSIONER MCALLISTER: I want to
25 manifest that I'm really excited about this group

1 of technologies, that's my own little techy
2 chiming in, so heat pump technology has really
3 come a long way and I think there's a lot of
4 great applications going forward. I have to step
5 out and this is a staff workshop, so I don't
6 actually need to be here, I'm really just here
7 for my own info. But I wanted to point out that
8 my advisor, Pat Saxton, is in the back of the
9 room and he is my eyes and ears on this, as well,
10 so if you have any needs to communicate with my
11 office, you can communicate with me or with him,
12 probably even more effective to communicate
13 directly with him. And I wanted to just say
14 thanks to staff again and the rest of the staff
15 in turn for doing such a great job putting
16 together the workshop and teeing up the issues
17 and on the staff reports that are the source of
18 the conversation. Anyway, have a good rest of
19 the workshop. Thanks.

20 MR. RIDER: Thank you, Commissioner. So
21 one thing that any piece of equipment that is
22 used in California, especially the larger pieces
23 of equipment, is the need to have consistent ways
24 of testing and verifying performance and modeling
25 performance, especially as software becomes more

1 prominent in building designs.

2 Right now in the marketplace, these
3 pieces of equipment don't really have a reliable
4 central place to find performance data. Folks
5 come to the Energy Commission and describe
6 situations where they could not find some of the
7 key measurements of energy efficiency for this
8 equipment despite them being very energy
9 efficient. The Title 24 Building Code includes
10 requirements and aspects for this equipment in
11 Table 110.2-D, and they currently have created a
12 certification process temporarily for these
13 products so that there is a central repository.
14 However, Commission staff proposes to move these
15 requirements and testing standards into Title 20
16 Appliance Standards so that they will be
17 incorporated in our larger appliance efficiency
18 database where other equipment already resides,
19 such as split system air-conditioners, water
20 heaters, all of these common products already are
21 in that database. And we've proposed to make
22 this change in this move on January 1st of 2016.
23 We propose that these products be tested using
24 ANSI AHRI 550 590, the 2011 version, and we
25 propose that all equipment that is covered in

1 110.2(D), well, that also incorporates a heat
2 pump, would be covered and be certified. And
3 I've put the definition here, it's also in the
4 Staff Report, but this is the definition that
5 will determine whether a product meets the scope
6 and whether it would be something that could be
7 certified at the Energy Commission. So I
8 recommend you review and make comment whether
9 this is an adequate definition. It is mostly
10 taken from definitions in AHRI 550 590 to try to
11 align with the industry standards. I just wanted
12 to show you Table 110.2-D in the Building
13 Standards. You can find this, the 2013 Building
14 Standards are available online, and you can find
15 this table within that.

16 I think the majority of equipment that
17 would probably be certified would be some of this
18 top category here, but some others could be
19 certified as well. As you can see in Title 24,
20 they are using the same test procedure, AHRI 550
21 590.

22 So there's several pieces of data that we
23 are looking to have reported to us from
24 manufacturers of this equipment. Some things
25 that aren't listed here that we require for all

1 manufacturers are things like brand name,
2 manufacturer name, model number, but I put here
3 on this slide some of the key pieces of
4 efficiency that we're looking to be reported to
5 us such as the heating and cooling capacity, some
6 of these systems are reversible, can do both
7 heating and cooling. The EER for cooling,
8 integrated part load value of available
9 coefficient of performance for heating, and COPR
10 of heat reclaiming if that's part of the system
11 and the test results. And so the idea would be
12 that manufacturers would provide this information
13 to the Energy Commission through the Appliance
14 Efficiency Certification process and we would put
15 all of these pieces of information online such
16 that building designers and inspectors can use
17 this for verification modeling, etc., and create
18 a kind of even playing field for performance
19 reporting, as well.

20 So next steps, so we're going to take
21 written and oral comment -- oral comment today in
22 the workshop. Written comments will be due by
23 June 6, 2014. And staff will take all these
24 comments on the proposal and change the proposal
25 if it makes sense and, if not, we will move

1 forward into the formal rulemaking process and
2 get these into law.

3 I encourage anyone who has any questions
4 about this proposal, feel free to contact me, my
5 email and my phone number are provided on the
6 slide. In case you can't see it, my email is
7 Ken.Rider@Energy.Ca.Gov, and my phone number is
8 (916) 654-5006. And again, I'm always available
9 to answer questions or to discuss the proposal.

10 MR. SINGH: And I want to mention here,
11 the docket number is 14-AAER-1.

12 MR. RIDER: Yeah, actually, this is the
13 incorrect docket number. Okay, well, I'm just
14 not going to leave this slide up is what I'm
15 going to do because I don't want anyone to get
16 confused about that. So please send it -- use
17 the notice, the announcement of the workshop to
18 get that docket number, it's 14 -- and it's at
19 the end of every other single presentation we
20 have today -- it's 14-AAER-1, not the other
21 number that appeared there. So that concludes my
22 presentation. We'll take comments in the room
23 first and then move to comments on the phone, so,
24 Harinder, do you have any blue cards on this?

25 MR. SINGH: I do. If anybody wants to

1 make comments related to this issue, please bring
2 your blue cards. The first one is from Randall
3 Higa from Southern California Edison.

4 MR. HIGA: Hi. I'm Randall Higa,
5 Southern California Edison. I had a question just
6 on the title, purpose and scope of this measure.
7 It's titled Heat Pump Water Chilling Packages,
8 but in the proposed language, or in the
9 definition, it says it could remove heat from air
10 or water, so if it's removing heat from air, I
11 mean, I don't know, are you considering that a
12 chiller? Because in my mind that's not a
13 chiller, you're not chilling water, you're
14 pulling the heat out of air, so you're cooling
15 air, not water. So --

16 MR. RIDER: I guess the idea is that some
17 of these are reversible and so in some cases they
18 have to be able to chill, but in some cases since
19 it is reversible, you could have instances where
20 you'd have the flipped case because it's a heat
21 pump so you could run it either way in some
22 cases, I think.

23 MR. HIGA: Right, but if you're pulling
24 heat out of air, it's not a chiller, that's all
25 I'm saying.

1 MR. RIDER: But so that heat goes from the
2 air into the water and now it's hot water, right?
3 And so you can use it for -- right, it's not a
4 chiller in that case, that's the definition of
5 the equipment in -- so I'm being consistent with
6 110.2-D, they've labeled this entire table, this
7 is current Title 24, water chilling packages. So
8 it wasn't really a term that I had chosen for it,
9 it's just one that I borrowed from Title 24 to be
10 consistent.

11 MR. HIGA: Because I think the way it's
12 written, it could include heat pump water heaters
13 because -- and is that the intent?

14 MR. RIDER: The sole intent of this is to
15 take pieces of -- because I think heat pump water
16 heaters are already federally regulated and I
17 believe that they are already are certified.

18 MR. HIGA: Right.

19 MR. RIDER: So I don't think we want to
20 duplicate that, and we definitely don't want to
21 cause confusion that they be double-regulated or
22 something like that, so if you think this
23 definition is confusing, and if you think that a
24 heat pump water heater could fall under this
25 where it's already regulated, then if that's not

1 the intent, please provide some comments on how
2 to fix the definitions so that it doesn't do that
3 because that's definitely not the intent.

4 MR. HIGA: Okay, thank you. I think you
5 answered my question and we'll submit comments to
6 that effect. Thank you.

7 MR. RIDER: Thank you.

8 MR. SINGH: Please come to the podium and
9 announce your name.

10 MR. SADLER: Hi, my name is Mark Sadler
11 and I'm with Daikin and we make the Daikin
12 Altherma which is near to a water heat pump
13 system, and maybe I can kind of clear up what
14 that is referencing. It's extracting energy from
15 the outside air in a heating mode, ensuring that
16 with the water circuit. In the cooling cycle,
17 it's taking the energy out of the water in the
18 water circuit and shedding it to the outside air
19 through the heat pump circuit. So the definition
20 seems to be correct in that regard, but the one
21 area that I would like to call a little bit of
22 attention to, and there might be other systems
23 out there that are using the rejected heat off of
24 the condenser to heat water, but that's not the
25 way these systems are designed, they're either

1 producing heated water or chilled water. The
2 heated water is going through an indirect loop in
3 the domestic hot water tank to heat the water in
4 the vessel. So that's how that's happening, but
5 it's just in one mode or the other, so it's
6 chilling water or heating water.

7 MR. RIDER: Great. Thank you.

8 MR. SINGH: Anybody else in the room who
9 wants to comment on this topic?

10 MR. RIDER: There are a few folks on the
11 phone, if not.

12 MR. SINGH: All right, let's open the
13 phone lines, then.

14 MR. RIDER: Okay, let's see. We've got
15 several. I don't know if folks from the last --
16 if you raised your hand in the past and don't
17 intend to continue, because I see a few people
18 from the last call, go ahead and lower your hand.
19 So I'm going to unmute Pat Splitt. He's written
20 that he would like to speak, and then there are a
21 few others after that. Pat, you should be
22 unmuted.

23 MR. SPLITT: Okay, can you hear me?

24 MR. RIDER: Yes.

25 MR. SPLITT: Okay. One, to respond to

1 the first comment, this initially, this whole
2 thing got started as basically just to get air to
3 water heat pumps added into the Appliance
4 Directory and added into the Table 110.2. In the
5 past, AHRI 555 90 has been a CEC reference
6 standard for years, but in Table 110.2-D, only
7 the cooling side of the equipment was tested
8 because 555 90 didn't initially have a test for
9 heating. Then AHRI developed a test for heating
10 basically because companies were coming up with
11 this equipment and, you know, they needed a test.
12 So now there's an AHRI 555 90, the title of which
13 is now Performance Rating of Water Chilling and
14 Heat Pump Water Heating Packages Using Vapor
15 Compression Cycle. So initially I was just
16 trying to get a place in 110.2-D where we could
17 list the requirements for Air to Water Heat
18 Pumps, and it seems to me in the new standards it
19 should actually, if we're going to put a place in
20 there, it should be in Table 110.2-B, Unitary and
21 Applied Heat Pumps Minimum Efficiency
22 Requirements, and not in Water Chilling Packages.
23 And in 110.2-B, there's actually broken down,
24 they separate the water chilling versus the water
25 heating mode, so it would be entered twice, both

1 referencing 550 90. That would put it into
2 110.2-B as far as the minimums.

3 And right now, the Energy Commission in
4 this section takes their minimum efficiencies
5 from AHRI 90.1, and 90.1 hasn't been updated
6 recently to include a minimum heating efficiency
7 for air to water heat pumps. They just have a
8 minimum cooling EER and IPOB. So initially I'm
9 assuming that if we did put these entries into
10 110.2-B, the minimum heating efficiencies would
11 be listed as a 9.562 EER and 12.5 IPOB, and the
12 minimum cooling efficiency would be listed as
13 zero until such time as the AHRI came up with a
14 number. If the Commission felt that they had to
15 have some other number, you know, I don't know
16 how you would go about this, I would just suggest
17 as a starting point, say a COPO of 2.5, a fairly
18 conservative number that most people should be
19 able to meet.

20 So now once this gets into the Table
21 110.2-D, then there already is a requirement in
22 the Appliance Database that says the database is
23 the directory published by the Commission, will
24 then the meaning of Title 24 CCR Part 6,
25 Subchapter 1, Section 100(h), and 100(h) then

1 refers back to these tables. So there isn't any
2 -- once we get it into the table, there is no
3 other reason to have a rulemaking to put it into
4 the Appliance Director because, by definition,
5 anything in these tables already is in the
6 Appliance Directory. And if you haven't actually
7 physically listed it there, that's just a
8 mechanical problem and the Executive Director has
9 authority in the Appliance Standards to amend
10 those tables, and to amend those databases. So
11 other than getting an entry into Table 110.2-B,
12 that's all that's needed, other than for the
13 Executive Director to go ahead.

14 And then, as far as if you wanted to
15 include everything in this table 110.2-D and move
16 it in the Appliance Database, I'm saying, well,
17 the law already requires it and says this is
18 sufficient. Now, if you don't actually have a
19 space in the database, that's just a tactical
20 problem that somebody hasn't followed your rules.
21 So you don't need a rulemaking to do that,
22 they're already there.

23 And then finally, as far as the listing
24 of information to be put into that database Excel
25 file, all those were taken from these 555 90, but

1 just in regard to air to water heat pumps. The
2 555 90 specifically states in the scope that one
3 of the pieces of equipment that is regulated is
4 air to water heat pumps. They call their
5 equipment air to water heat pumps, everybody that
6 makes this equipment, they call them air to water
7 heat pumps, not this crazy definition that you
8 just grabbed, which is just a definition of a
9 term that's used somewhere in one of the
10 Appendixes to the test. It's not describing any
11 equipment that can be sold, it's describing a
12 particular test in the Standard. And the
13 database information was taken from a section in
14 the Standard 555 90 that specifically in Section
15 6.28 deals with air to water heat pumps. And the
16 data that is in that spreadsheet is the data
17 required in Section 6.28 for air to water heat
18 pumps only, not any of this other equipment. I
19 didn't do any work on that other equipment,
20 there's all kind of other equipment, there's
21 water cooled, air cooled, or back burn cooled,
22 condensers, water cooled heat reclaimed
23 condensers, water to water heat pumps, it goes
24 on. So I don't know that that database
25 information is correct for that equipment. It

1 was only put in there for air to water heat pumps
2 because that's what was required in 550 590 for
3 air to water heat pumps. So as far as I'm
4 concerned, the only thing we're adding is an
5 entry into Table 110.2-B for air to water heat
6 pumps, and a Section in the Appliance Database
7 someplace that people can find when they go
8 looking for it to get the efficiencies they need
9 to plug into the modeling equipment, which now
10 after July is going to include not only the
11 cooling efficiencies, but also heating
12 efficiencies at both 47 and 17 degrees, that's
13 data that's going to be required to do compliance
14 modeling and that's data that is listed to be
15 culled out in this database so people can look at
16 the database and they'll find all the information
17 there they need in one place to model the
18 equipment, which is what the goal is.

19 MR. RIDER: Thanks, Pat. I can't really
20 speak to the changes in Title 24, but we're
21 definitely trying here to set up that spot in the
22 Appliance Database that you were referencing.
23 Title 24 has already set up a certification spot
24 for this equipment, but we want to kind of get it
25 in the Code of Title 20 here so that way we can

1 -- everything else that's in the Appliance
2 Efficiency Database is in the Title 20 Code and
3 Section 1601 through 1608. So we just want to be
4 consistent and include that there.

5 I have a few other people who have -- oh,
6 someone asked online if there will be transcripts
7 and copies of the presentations made available
8 online. Transcripts will be made available and
9 put online, it will probably be a few weeks after
10 this before those will be available. The
11 presentations are already posted online and you
12 can get there through the Commission's website.

13 So I had here also that Mr. Roy would
14 like to speak. Let me see if I can find him.
15 Oh, you unmuted yourself. Well, great. Well you
16 go ahead and speak.

17 MR. ROY: Hi, thank you. I am Annirudh
18 Roy with the Air-Conditioning, Heating and
19 Refrigeration Institute. One issue with respect
20 to requiring this data to be reported is that
21 currently the existing labs that are out there
22 cannot test some of the larger air to water heat
23 pumps and that's going to be a significant issue
24 for the manufacturers to be able to report that
25 data if they're relying on these labs for that

1 information. So what are the CEC's thoughts on
2 that if it just cannot be tested by these third-
3 party labs which the manufacturers are relying
4 on?

5 MR. RIDER: Yeah, so, I mean, if that's
6 true I would ask, if you could, identify some of
7 those labs and we could have a conversation.
8 Also, if you want to submit in comment what the
9 ramp-up time would be. So the Regulations
10 wouldn't become effective, I think, until -- we
11 propose January 1st of 2016. So the question
12 would be, by that time could these labs be ready?
13 If not, why? And once we've got that settled, we
14 can figure out whether it makes sense to set a
15 cap size on the scope of this, or not. So I
16 think my response to that is we would need more
17 information and maybe some discussion to figure
18 what to do about this issue you've raised.

19 MR. ROY: Okay. Would the CEC also be
20 open -- we do intend to submit written comment,
21 but would the CEC also at that point be open to
22 having a discussion with the industry on the
23 several issues that may exist with this
24 reporting?

25 MR. RIDER: We are all available at any

1 point during this comment period into this
2 process to have a discussion like that, so today,
3 tomorrow, you know, until this finally becomes
4 live, we'll be open to that kind of discussion.

5 MR. ROY: Okay. And Ken, for this
6 particular proposal, you are the point of
7 contact, right?

8 MR. RIDER: Correct.

9 MR. ROY: Okay, thanks.

10 MR. RIDER: Thank you. I also have Adam
11 Meddaugh. Let me see if I can find him. Okay,
12 Adam, I am unmuting you. You're unmuted.

13 MR. MEDDAUGH: Yes.

14 MR. RIDER: Okay, go ahead. Adam, are
15 you there?

16 MR. MEDDAUGH: Oh, I'm sorry, I didn't
17 really -- I wasn't really prepared to ask a
18 question, sorry, I stepped away for a second.

19 MR. RIDER: Did you have a question? You
20 wrote that you were wondering if we were going to
21 answer any --

22 MR. MEDDAUGH: Well, initially I wasn't
23 sure if you were going to be taking questions on
24 this subject, and so the presenter was just going
25 to present and then after we were going to submit

1 questions.

2 MR. RIDER: Okay. But you didn't have
3 any questions?

4 MR. MEDDAUGH: No.

5 MR. RIDER: Okay. I'm going to mute you.
6 Oh, Pat would like to speak again. I'm going to
7 unmute Pat. Pat, you are unmuted.

8 MR. SPLITT: Okay, just to clarify that
9 previous comment, the proposal doesn't require
10 that this testing be done at an independent
11 testing lab. The proposal only requires that the
12 equipment can be self-certified by the
13 manufacturer, so they can do that at their own
14 manufacturing and test facilities, they don't
15 have to go, at least at this time, to a certified
16 testing laboratory to get this done. And in the
17 sense that these companies are all claiming they
18 have these efficiencies, I would assume they must
19 have someone testing the equipment.

20 MR. RIDER: Yeah, that's a great point,
21 Pat, and it's absolutely correct; you may do in-
22 house testing, we do require you to certify your
23 own lab if you do that, and that's as simple as
24 basically telling us who you are, where you're
25 located, and attesting that you have the correct

1 equipment to conduct the test. Thanks, Pat. I'm
2 going to re-mute you.

3 So I don't see any other questions or
4 comments. George has got his hand raised,
5 actually, and also Eddie, so let me take George
6 first. George, did you mean to -- I'm going to
7 mute him again. Eddie, I don't see where you --
8 are you one of these call-in users? I don't see
9 audio for you. If you can unmute yourself, go
10 ahead, otherwise I'm going to have to guess which
11 call-in user you might be. I'll just unmute all
12 of the call-in users. Eddie, are you there?

13 MR. RODRIGUEZ: Yes. Can you hear me?

14 MR. RIDER: Yes, you are call-in user 6,
15 yes. Go ahead, continue.

16 MR. RODRIGUEZ: Okay, yes. Hi, this is
17 Eddie Rodriguez with Daikin Applied. As was
18 mentioned earlier, that AHRI 555 90 currently has
19 a testing procedure for reversible cycle heat
20 pumps, so my question is, if a manufacturer likes
21 to certify this product for a first Standard AHRI
22 555 90, will that meet the proposed testing
23 requirements as being asked, or being requested
24 through this program?

25 MR. RIDER: Let me make sure I understand

1 your question correctly. You're saying if a
2 manufacturer tests per the 555 90, per basically
3 the directions, instructions, and just the way
4 it's written, if someone tests per that test
5 procedure, will that satisfy the testing proposed
6 here? Was that the question?

7 MR. RODRIGUEZ: That is correct, the test
8 and certifies the product per AHRI 555 90, will
9 that meet the requirements as being proposed
10 here? Because from our perspective it seems like
11 it would be a lot of unnecessary effort, a waste
12 of resources if we have to test to multiple
13 standards if the ultimate goal is to certify
14 performance as requested through this program.

15 MR. RIDER: Yeah, so the only thing that
16 we're proposing in these Regulations here is to
17 test the 550 590. You would then, after you
18 perform the test, you would need to take that
19 data, the results, and submit it to the Energy
20 Commission through the certification process.
21 There's no cost to that. Basically you enter it
22 into an Excel Spreadsheet and we take that
23 information and we upload it into the publicly
24 available database. So there's an additional
25 step that you have to get the results to us, but

1 that's essentially it.

2 MR. ROY: Okay, thank you.

3 MR. RIDER: Okay. Re-muted. I can try
4 Eddie one more time. Eddie, are you there? Did
5 you want to say something on this? Mr. Roy, did
6 you want to speak again? No? Okay.

7 MR. ROY: No, thank you for the
8 opportunity to submit written comments by June
9 6th, thank you.

10 MR. RIDER: Great. Well, I guess that
11 means we all get to go eat lunch. So thank you
12 to all the stakeholders for taking the time to
13 come here and discuss this proposal. I look
14 forward to talking to you up through the process
15 as we continue to try to get these products into
16 the Appliance Efficiency Database. So thank you
17 very much.

18 MR. SINGH: Thank you, Ken. And we'll be
19 back at 1:00. Thank you.

20 (Recess at 11:44 a.m.)

21 (Reconvene at 1:01 p.m.)

22 MR. SINGH: Good afternoon. We are back
23 again and our next topic is air filter labeling
24 and Josh Butzbaugh is going to present that.
25 Josh, please make your presentation. Thank you.

1 MR. BUTZBAUGH: Thank you, Harinder. My
2 name is Josh Butzbaugh. I'm working with the
3 California Energy Commission on air filter
4 labeling, and today I will go through some of the
5 contents of my staff report, analysis, and the
6 proposed requirements.

7 So first we will start off with a little
8 background on Pre-rulemaking, then background on
9 air filter labeling, the objectives of air filter
10 labeling, regulatory approaches, proposed
11 requirements, the supporting analysis for these
12 requirements, and then finally next steps.

13 So the Commission kicked off the pre-
14 rulemaking with an Order Instituting Rulemaking
15 in March 2012, and then in March 2013 the
16 Commission released an invitation to participate,
17 offering interested parties an opportunity to
18 provide information to the Commission on product,
19 market and industry characteristics. And then
20 the Commission released an invitation to submit
21 proposals, for interested parties to submit
22 proposals on standards, test procedures, labeling
23 requirements, and other measures to improve
24 efficiency for those products that were
25 identified in the OIR.

1 This is a diagram of our rulemaking and
2 pre-rulemaking process. As you can see in the
3 blue box, that's the stage we're in today, we're
4 having a workshop on the Staff Report and the
5 Proposed Regulations.

6 So why air filter labeling? Well, air
7 filters prevent the build-up of particulates and
8 HVAC equipment by capturing these particulates
9 from the airstream before they reach the
10 components and the HVAC equipment. And by doing
11 this, air filters allow the equipment to run
12 efficiently and they prevent damage to the
13 components. However, in doing so, air filters
14 decrease air flow in the HVAC system, and if this
15 decrease, or this resistance is excessive, it can
16 damage HVAC equipment and increase energy use.
17 For example, with brushless permanent magnet
18 motor, if the resistance is excessive, the motor
19 will increase power and that will increase
20 energy.

21 So people need the information on
22 particulate capture and air filter resistance to
23 make rational decisions on air filter selection.

24 So a little background on current
25 labeling. It is focused predominantly on

1 particle efficiency, not pressure drop. Some
2 common ratings you'll see in the market are
3 Minimum Efficiency Reporting Value, or MERV,
4 which indicates a filter's ability to remove
5 particles .3 to 10 microns in size from the
6 airstream. There's also Micro Particle
7 Performance Rating, which is exclusive to 3M air
8 filters, it focuses on small particulates. And
9 then there's filter performance reading, which is
10 exclusive to the home depot, which is our
11 weighted performance rating between small
12 particulates, large particulates, and air filter
13 lifetime.

14 So the California IOUs did a market
15 survey in 2012 and the results indicated that 28
16 percent of air filters on the market had no label
17 and, then, of the rest they had a combination of
18 only MPR, only MERV, and only FPR, or sometimes
19 they had two labels on them.

20 Now I'd like to go through the Title 24
21 air filter requirements. So Title 24 requires
22 air filters to have a MERV 6 or greater, or a
23 particle size efficiency rating equal to or
24 greater than 50 percent in the three to 10 micron
25 range. In addition, Title 24 requires pressure

1 drop to conform to the maximum allowable clean
2 filter pressure drop as determined in some other
3 sections which state the initial pressure drop
4 needs to be .05 inches water column at the design
5 airflow rate, or the air handler unit needs to
6 have efficacy equal to or less than .58 watts per
7 cfm, or cubic feet per meter.

8 The problem is that each vac system
9 designers do not have the information on air
10 filter models to determine pressure drop. So
11 they aren't sure how to comply and design their
12 systems to meet Title 24.

13 Title 24 also requires a label on the
14 return location where the air filter is
15 installed, and this label would include airflow
16 rate and then the initial resistance in inches
17 water column (in. w.c.) at that design airflow
18 rate. And this is an example here on the slide.

19 And then last, but not least, Title 24
20 requires the system to be provided with an air
21 filter that's labeled to disclose the efficiency
22 and pressure drop readings that demonstrate
23 conformance with the other requirements. And the
24 issue with this is that this requirement only
25 applies to new HVAC installations, it does not

1 address air filter replacements, and the vast
2 majority of air filter purchases are
3 replacements.

4 So for objectives of labeling in general,
5 this is a mission statement, but in summary we
6 want the right air filters to go in the right
7 equipment. And we'll get a little bit more
8 specific with our different actors. First we
9 have consumers: we want consumers to be able to
10 identify the appropriate air filter for their
11 HVAC system, this means having a label at the
12 point of purchase on the air filter itself, as
13 well as a repository of air filter performance
14 information. We want a level playing field for
15 comparing air filter products, and we want the
16 label easy to use and not overwhelming for
17 consumers, so that way they feel comfortable
18 using this label.

19 For HVAC designers, we want them to have
20 a repository of air filter performance
21 information so that way they can identify the
22 filter for HVAC equipment and system design when
23 they are in the process of designing these
24 systems. So this means we want them to have the
25 ability to balance filter airflow resistance with

1 HVAC equipment size, duct work, and other device
2 losses. We want to make it easy for HVAC system
3 designers to comply with Title 24 regulations and
4 we want them to have a level playing field for
5 comparing air filter models.

6 And then last but not least, Building
7 Inspectors, we wanted to make it easy for them to
8 facilitate the enforcement of Title 24
9 Regulations and this means aligning the label
10 with measurements included in the Title 24
11 requirements.

12 So the Commission looked into different
13 regulatory approaches for this labeling
14 initiative. The manufacturer of 3M submitted a
15 proposal recommending the Commission to use PM
16 2.5 as the efficiency metric and to use average
17 lifetime resistance as the pressure drop metric.
18 The California IOUs and NRDC recommended using
19 MERV for particle efficiency, and initial
20 pressure drop in inches water column measured at
21 phase velocities of 300 and 500 feet per minute
22 for pressure drop.

23 The Commission also looked at the AHRI
24 680 Standard Rating. This is the label that's
25 included in the Standard. It includes initial

1 resistance across airflow rates and 400 cfm
2 increments. It also includes final resistance at
3 the maximum rated airflow rate, dust holding
4 capacity and particle size efficiency across
5 three particle size ranges.

6 So after looking at these regulatory
7 approaches, the Proposal's AHRI's Standard 680
8 label, and considering our objectives, we came up
9 with our proposed requirements that I'm going to
10 go through right now. The first part is Data
11 Certification and then the second part is the
12 label itself.

13 So for Data Certification, we are
14 proposing requiring MERV Particle Size Efficiency
15 for 4.3 to 1 micron particle sizes, 1 to 3 micron
16 particle size, and 3 to 10 micron particle size,
17 so the three particle size bins that you see in
18 the test procedures. And then also dust holding
19 capacity. And to align with Title 24, we're
20 providing manufacturers with the ability to
21 choose which standard they would like to use for
22 these metrics, so either AHRI 680, or ASHRAE
23 52.2, whichever one they decide to use, they just
24 need to make sure they declare it.

25 These are other data certification

1 requirements that the Commission has proposed
2 requiring: maximum rated airflow rate and cubic
3 feet per minute, initial resistance at 400 cubic
4 feet per minute, 800 cubic feet per minute, and
5 1,200, 1,600, 2,000, or the maximum rated airflow
6 rate, and these are in inches water column. And
7 then also final resistance at 2,000 cubic feet
8 per minute, or a maximum rated airflow rate in
9 inches water column. And the test procedure
10 we're requiring would be AHRI 680, which also
11 aligns with Title 24.

12 I do want to raise that size was not
13 included in the proposed requirements and I'd
14 like to receive your feedback as to whether or
15 not size should be included. It was something
16 that we happened to miss and something that some
17 folks had voiced that should be included, so I'd
18 like to get your feedback on that.

19 So moving from data certification to the
20 label format, this is an example of the label in
21 our proposed requirements. We would like it
22 printed or labeled on the air filter itself and
23 if the packaging obscures the label, then also
24 print it on the packaging. And the idea is that
25 consumers and retailers can use this label to

1 match a spent air filter with a new replacement
2 air filter, and we'll get to that in our next
3 slide.

4 So this is a hypothetical example. You
5 have a 16" X 24" X 1" air filter, it has a MERV
6 of 10, and then it has these initial resistance
7 metrics across these airflow rates. And in this
8 particular example, I cut off the 1,600 and 2,000
9 bins because the maximum rated airflow rate for
10 this particular hypothetical example is 1,400.
11 And if this seems like the right approach, I'd
12 like to hear feedback as to whether or not the
13 additional bins that are not applicable should be
14 included, or we should cut those out of the
15 label.

16 So a consumer deciding how to replace his
17 or her air filter would first look at an exact
18 match for size, then look at an exact match or
19 less for the pressure drop across the airflow
20 rate or rates, then, last but not least, look for
21 an exact match or greater for MERV. A building
22 inspector would look to see if the MERV is equal
23 to or greater than six and then the initial
24 pressure drop for the design air flow rate is an
25 exact match or less compared to what's on the

1 filter label.

2 So I'm not going to go through my entire
3 analysis since I don't want to bore you to death,
4 but I did include it in this in case anyone has
5 any questions. First, I determined the energy
6 consumption of residential HVAC in California
7 that uses air filters, and then I determined the
8 savings using 50 percent non-compliance and one
9 percent energy savings, these were relatively
10 conservative metrics that I found in my research.
11 Then we determined the cost based on the
12 information submitted into our docket. And then
13 we reached our cost-effectiveness analysis
14 indicating that the net benefit is \$1.20 per year
15 per household, or nearly \$10 million to the
16 state.

17 So for our next steps, we will consider
18 input from today's workshop and written comments.
19 The written comments are due June 6th. We will
20 revise the staff report analysis and proposed
21 requirements as necessary based on feedback. And
22 Commission staff are available at any time to
23 discussion questions or concerns. Please feel
24 free to get a hold of me or Harinder or Ken or
25 Tuan, anyone on the team, and we will address

1 your comments. So with that, this is my contact
2 information and we'd like to open up the mics for
3 verbal comments.

4 MR. SINGH: Thank you, Josh. Anybody in
5 the room wants to make comments, please submit
6 your blue cards.

7 MR. RIDER: Yeah, and also anyone on the
8 phone, if you want to raise your hand to speak as
9 earlier, I will unmute you and I'll call your
10 name, and we're going to do people in the room
11 first.

12 MR. SINGH: Yeah. Jeffrey from
13 California IOUs, please go ahead.

14 MR. STEUBEN: Thank you. Good afternoon,
15 everyone. My name is Jeff and I'm representing
16 the California IOUs. Thank you, Josh, for that
17 great summary of your Staff Report. As you
18 mentioned in the background, that the IOUs had
19 proposed a slightly different label proposition,
20 and in further review of the Title 24 language,
21 and sort of looking at the AHRI 680 test method
22 that was specific in Title 24, we do find that
23 the CEC Staff Report does provide the best
24 possible way to get to Title 24 compliance, so we
25 do support the CEC proposal.

1 I wanted to make sort of two quick other
2 comments. So you raised a question around filter
3 size, so as you mention, a consumer going to buy
4 a filter, that that information is clearly
5 specified on the product because that's sort of
6 the most important information from the consumer
7 perspective, it may be something that you would
8 want to include in the label itself, but I would
9 definitely agree that it should be included in
10 the online data submission so that that
11 information is available in that database, and an
12 HVAC designer can convert cubic feet per minute
13 into phased velocity using the area of the
14 filter.

15 I also just wanted to mention that, you
16 know, there was some discussion around the use of
17 MERV for filter efficiency, as well as the
18 particle efficiency bins. We do think that the
19 MERV is the best possible option for consumers to
20 talk about filter efficiency rather than a series
21 of percentages with the particle efficiency bins,
22 so where possible, we think that MERV should be
23 used instead of particle efficiency.

24 And lastly, just there are some
25 clarifications that we'd like to make in the

1 Title 24 language, which we will provide in our
2 written comment, but since we're talking about
3 Title 20 today, I'm not going to go into great
4 detail there, but we do think that there is some
5 language that we can update to provide sort of
6 better clarification around the way that these
7 two standards would interact. Thank you.

8 MR. SINGH: Thank you. Anybody else in
9 the room? Okay, Ken.

10 MR. RIDER: Yeah, George would like to
11 make a comment, so I'm going to go ahead and
12 unmute him. I think he just wanted to know some
13 information about the size, but I'll let him ask
14 the question. George, are you there?

15 MR. NESBITT: Yeah. George Nesbitt, HERS
16 Rater. Can you hear me?

17 MR. RIDER: Yes.

18 MR. NESBITT: Okay. Yeah, I didn't quite
19 understand what you were saying in reference to
20 size, whether, I mean, I would think you need
21 data that is dependent on the size of the filter,
22 and so that wasn't quite clear.

23 MR. BUTZBAUGH: I agree with what you've
24 just said and it was an omission on our part. I
25 just wanted to hear comments as to whether or not

1 others supported the idea of including size in
2 the data certification and the label. So it
3 sounds like you believe size should be included.

4 MR. NESBITT: Yeah, I mean, I think that
5 if -- I mean, obviously size is relevant. From a
6 consumer standpoint, they're going and looking
7 for a filter of a certain size. I also think
8 probably MERV is the easiest, you know, simple
9 metric for them to figure out one number is
10 easier and in that sense I think because of the
11 new labeling, they do also need the pressure
12 drop, those are really the only things they need.
13 From a designer standpoint, you know, I need to
14 know pressure drop at velocities, that's
15 information that is often hard to find. I may or
16 may not care more about detailed particle sizes.
17 The MERV rating is required, you know, Calgreen,
18 ASHRAE 6222, various other green, you know, so
19 many things are pointing to MERV that that is
20 probably most important. I'm just thinking, and
21 obviously size, and I think giving data for a
22 specific filter or a specific size, so say giving
23 airflow information that wouldn't match that
24 filter, so too many cfm for the size of the
25 filter, that would go beyond, say, a phased

1 velocity of 500, we shouldn't do because I think
2 we partly need to reinforce that proper design
3 requires proper sizing and you can't put too
4 small of a filter on your system and get proper
5 airflow, and that's the whole point. So those
6 are my thoughts.

7 MR. BUTZBAUGH: Thank you, George. Do
8 the airflow rates work for you in 400 increments?
9 Are you saying that those do? Or that those
10 don't work for you?

11 MR. NESBITT: As someone who designs and
12 installs HVAC, yes, that information is just
13 often not available; so, yes, I need to know.
14 And I think perhaps even the consumer -- I'm not
15 sure if the labeling -- the thing is, I think for
16 consumers the labeling requirement is actually
17 not just for new installs, it also applies to
18 Alterations and Changeouts, that section of the
19 Code is part of Alterations and Changeouts. I
20 guess it's specifying a pressure drop, but what
21 they don't necessarily know is the airflow. And
22 so I'm not sure if airflow is part of that label.
23 So a consumer would have to be looking for a
24 MERV, a pressure drop at the airflow their system
25 is designed at. And as a designer, I'm designing

1 for an airflow, I'm looking for a pressure drop.
2 And 400 increments is probably okay because you
3 can always interpret, you know, that or a chart
4 that shows it through the range of airflows. But
5 obviously it's not useful or good to have cfm's
6 that are really not valid for the filter. So,
7 yeah.

8 MR. BUTZBAUGH: Thank you, George.

9 MR. RIDER: Thanks, George. Let's see if
10 we have - I don't know how to say his first name,
11 but last name is Roy. Annirudh, maybe. I think
12 that might have been from earlier.

13 MR. BUTZBAUGH: I think he's delved into
14 this, as well.

15 MR. RIDER: Okay. Well, you can go ahead
16 and speak, then, you're unmuted.

17 MR. ROY: Okay, thank you. So I would
18 just like to state that AHRI, the Air-
19 Conditioning, the Heating and the Refrigeration
20 Institute does represent a significant amount of
21 air filter manufacturers and, although the
22 proposed requirements, you know, they seem to
23 have significant energy savings, we feel that
24 requiring manufacturers to provide this
25 information on the packaging would make it a very

1 California specific and be onerous for
2 manufacturers because they typically tend to make
3 a label that is shipped to several states, and is
4 not region-specific. Also, you know, requiring
5 this information on the air filter label could in
6 some instances because of the amount of
7 information they are requiring, make it illegible
8 and serve no value to the customer over a period
9 of time. So how we feel this could be addressed
10 instead is by requiring this information to be
11 presented in a website and manufacturers,
12 particularly on the packaging, that they provide
13 their website information, as well, on those
14 packages. And that way, you know, that
15 information would be available readily to the
16 consumer. These days consumers can access the
17 Internet from anywhere, and so if they wanted to
18 see that information, they could just scan the QR
19 code or just go to the manufacturer's website and
20 get that information. Also, you know, I've heard
21 that some of the stakeholders over here would
22 prefer to deviate from the requirements in Title
23 24 and we would recommend that CEC consider
24 keeping those requirements consistent, the Title
25 20 requirements consistent with the Title 24

1 requirements, as they are just about to go into
2 effect on July 1st and so it would be very
3 onerous for our manufacturers to try and comply
4 with two separate requirements when it's the same
5 state. It just doesn't make sense for them to
6 make air filters that comply on one hand with
7 Title 24, and then there's a separate set of
8 requirements that they have to comply with for
9 Title 20 just a year and a half later. So I
10 would recommend that you keep that in mind and
11 we'll make sure to submit that in our written
12 comments, as well.

13 MR. RIDER: Yeah, that would be great if
14 you could submit that in written comment because,
15 when we design these requirements, we wanted them
16 to work with the Title 24 requirements. So if
17 you can detail that in your written comment, we'd
18 appreciate it, and so we could take a closer look
19 at what you're getting at.

20 MR. ROY: Okay. Thank you.

21 MR. RIDER: Great. I don't see anyone
22 else with a hand raised, so maybe what I'll do is
23 I'll just go ahead and unmute everyone. If
24 you're not intending to say anything at this time
25 on air filters, just make sure your phone is

1 muted so you don't accidentally say something you
2 regret.

3 MR. BUTZBAUGH: And if you're looking for
4 other ideas for your comment letters, we'd like
5 to hear whether or not the label should be
6 standardized on one edge of the filter or another
7 edge. We'd like to hear about the cfm increments
8 of 400, whether or not those make sense. So if
9 you're looking for ideas, those are two that you
10 can address.

11 MR. RIDER: Okay, I'm going to unmute the
12 lines. If you would like to respond to what Josh
13 just said, or something from earlier on air
14 filters, now would be a great time.

15 MR. NESBITT: This is George Nesbitt.

16 MR. RIDER: Hi George. Go ahead.

17 MR. NESBITT: I think what edge or what
18 surface it's labeled on the filter itself doesn't
19 matter because there is no standard -- I mean, it
20 depends on the filter, location of the filter
21 grill. I mean, I suppose the phase the air
22 enters makes more sense, but if it's a filter
23 that goes into a slot, there's no convention for
24 which edge faces out. So, you know, it may be
25 just on the inlet face is the one that makes the

1 most sense certainly for like a drop-down filter
2 grill.

3 MR. BUTZBAUGH: So in those cases,
4 someone would actually have to take the spent air
5 filter out to see the size dimensions and the
6 label information. Is that what you're saying?

7 MR. NESBITT: Yeah, unless it's on the
8 face that the air enters the filter, but that
9 only works in, say, a drop down filter grill
10 where you can open up the grill and then you're
11 actually looking at that surface; whereas, in a
12 filter slot, which is also common, you're looking
13 at the edge, or you're looking at the short edge
14 or you're looking at the long edge.

15 MR. BUTZBAUGH: Right.

16 MR. NESBITT: Yeah, unless you label it
17 on all edges. But for a consumer, it may be more
18 of a package label. I mean, there could be a
19 package label as well as what's on the filter,
20 and obviously how they package it would affect
21 whether or not you could see the label with it
22 packaged.

23 MR. BUTZBAUGH: All right. Thank you,
24 George.

25 MR. RIDER: Also anyone in the room, I

1 mean, I think if we don't get any further
2 comment, we'll wrap this up.

3 MR. SINGH: Okay, thank you. I don't see
4 anybody with further comments. We have scheduled
5 dimming ballasts at 2:30, so we'll take a short
6 break for an hour -

7 MR. RIDER: Short long break.

8 MR. SINGH: Yes. And then we'll be back
9 at 2:30. So, thank you.

10 (Recess at 1:31 p.m.)

11 (Reconvene at 2:31 p.m.)

12 MR. SINGH: Good afternoon, we are back.
13 And now the next topic is dimming ballasts and
14 Ken Rider will present that. Ken?

15 MR. RIDER: Yeah, hi. I'm Ken Rider, an
16 Electrical Engineer with the Appliance Efficiency
17 Program, and I'm going to be making a
18 presentation on the Dimming Ballasts Staff Report
19 that was released a few weeks ago. I'm going to
20 go into the Pre-rulemaking first, and then some
21 background on dimming ballasts, and then talk a
22 little bit about the efficiency opportunities out
23 there to improve dimming ballasts, discuss some
24 of the regulatory approaches I analyzed in trying
25 to figure out how to write the regulation, then

1 I'll get into what staff did propose in the Staff
2 Report, the cost and savings associated with that
3 proposal, and then next steps.

4 So the Pre-rulemaking process, we started
5 with an Order Instituting Rulemaking back in 2012
6 that identified dimming ballasts as a measure, we
7 then asked for data and an invitation to
8 participate and received data for dimming
9 ballasts, and then we also did an invitation to
10 submit proposals in June of last year and we
11 received proposals to adopt minimum efficiency
12 standards for dimming ballasts.

13 Those steps are shown here and you can
14 see that the box we're in right now is to host
15 the workshop, and this is that workshop. The
16 goal is to discuss the content of the Staff
17 Report that hopefully everyone has had the chance
18 to read and digest a little bit. And then the
19 next step will be to receive comments.

20 So what is a dimming ballast? A dimming
21 ballast, and specifically a fluorescent dimming
22 ballast, is a ballast designed to operate a
23 fluorescent lamp at less than 100 percent output.
24 And today we're specifically talking about
25 dimming ballasts that can dim to 50 percent or

1 less of the lamp's full output. And these are
2 the types of fluorescent ballasts that are
3 currently not regulated by the U.S. DOE. Other
4 ones are fixed-output and dimming ballasts that
5 dim, but not below 50 percent or currently
6 regulated by the U.S. Department of Energy.

7 There's a few different kinds of dimmable
8 ballasts. There are dimmable ballasts that can
9 dim in continuous ranges, there are ones that can
10 do discrete steps like full, and then 30 percent,
11 and that's it. And there are also kinds that
12 switch a certain number of connected lamps on or
13 off, so you might imagine a four lamp ballast
14 that can just turn off two of those lamps that
15 would be like a 50 percent dimming ballast.

16 There are also a number of different
17 control mechanisms for setting the dimming
18 levels, some examples of those include low
19 voltage DC, usually zero to 10 volts, phase
20 chopping and digital communications.

21 Historically, dimming ballasts have
22 represented a fairly small fraction of all
23 ballast shipments. DOE's analysis back in 2005
24 showed about one percent of all fluorescent
25 ballasts or dimming ballasts by shipments.

1 However, California's Title 24 Building
2 Efficiency Regulations that will come into effect
3 in July of this year will cause a market shift
4 toward a greater number of those dimming
5 ballasts.

6 Dimming ballasts themselves are an energy
7 saving technology, an opportunity. They allow
8 light tuning, they allow daylight adjustments,
9 and just all sorts of different dimming
10 opportunities where full light output is not
11 necessary. However, dimming ballasts in certain
12 situations can cause energy consumption increase
13 where they're put into fixtures that do not need
14 dimming, or cannot be dimmed because full light
15 output is necessary.

16 This is just a section of Title 24 that
17 requires the use of dimming ballasts and I just
18 thought I would include that. You can see that
19 it requires that those dimming ballasts have the
20 ability to dim below 50 percent, so, again, not
21 only does it encourage dimming ballasts, but it
22 specifically encourages the type of dimming
23 ballasts that do not have standards for them.

24 The California IOUs, I learned this
25 number is incorrect, it's 34, but the IOUs show

1 test data for 34 continuous dimming ballasts, and
2 those ballasts were tested across the entire
3 dimming range at five percent increments of input
4 power. And the data revealed significant
5 efficiency variation and opportunities. For
6 example, dimming ballasts can be as much as 10
7 percent less efficient, one versus the other, and
8 also when compared to fixed-output lamps.

9 So what I've got here are two -- these
10 are two three lamp products that were tested,
11 they have similar functionality. You can see
12 that the Y axis here is input power that is power
13 coming into the ballasts, the X axis is arc
14 power, so that would be power leaving the
15 ballasts going into the lamp. You can see that
16 this top line here is far less efficient than the
17 bottom line across the board, so one that shows
18 an opportunity to be more efficient at any
19 dimming range, but also this particular product
20 has Cathode Cut-out which you can see this odd
21 bend right here is actually Cathode Cut-out, and
22 I think I'll discuss that a little bit later in
23 this presentation.

24 There is also some opportunity in standby
25 power, you can see there are a few of the

1 different lighting technologies here, and LVDC is
2 just shorthand for Low Voltage DC. You can see
3 that the technology type used to control the
4 ballasts correlates with the amount of standby
5 power, so the Y axis is the Standby Power, the X
6 axis is Max Arc Power, and so these are more
7 powerful lamps and less powerful lamps. But you
8 can see even within kind of the technology with
9 the highest standby power quite a bit of
10 variation and, you know, the ability to use as
11 little as it looks like about 0.4 watts, whereas
12 some are almost near 2.0 watts, so you can see
13 there's quite a number of different power levels
14 there and opportunity.

15 This is a plot of energy use versus max
16 arc power. This is in kilowatt hours here on the
17 Y axis and this is in watts on the X axis. And
18 so the dots represent the test data that I
19 mentioned, the 34 test points, and the red line
20 represents what staff is proposing in the staff
21 proposal. And then you'll notice that the blue
22 dots have different sizes, the larger the dot,
23 the more expensive the ballast is, the smaller
24 the dot, the least expensive. So this would be
25 around \$25.00, \$30.00, whereas like this dot, or

1 this dot, or this dot might be like more than
2 \$110.00 or \$100.00. So what this graph kind of
3 shows is that there's not -- it's not the more
4 expensive products that use less energy, in fact,
5 it looks like it's a mish mash, there's expensive
6 cheap products on both sides of this line, so it
7 didn't really seem like there was a lot of
8 correlation between price and energy use.

9 So the opportunities again, just to
10 summarize, Improved BLE -- BLE is short for
11 basically ballast efficiency and you can get
12 better efficiency using better components, better
13 designs of the ballast. Cathode Cut-out is an
14 opportunity and what that is is essentially these
15 lamps have a heater that allow the lamps to
16 operate at dim states without getting a lot of
17 flicker or failure. And that's necessary at
18 certain levels of dimness, but in other parts of
19 the dimming curve, it's not necessary and so some
20 ballasts go ahead and turn that heating off when
21 it's not necessary, others don't. And so there's
22 an opportunity to improve efficiency by turning
23 off this heat when it's not necessary. And
24 lastly, there's an opportunity to increase the
25 standby power, and because a lot of the high

1 standby power ballast were digitally controlled,
2 the opportunities are to introduce sleep modes
3 and enhance software protocols and communication
4 protocols.

5 So with that data, the Energy Commission
6 investigated several different methods of
7 regulating or trying to compel increased energy
8 efficiency in these products. We looked at just
9 expanding what's currently required for fixed
10 output ballasts, just expanding that requirement
11 to dimming ballasts with only full output. The
12 IOUs submitted a proposal to regulate BLE at 180
13 and 50 percent. It says "output," I think that's
14 actually a mistake, I think it was on "input
15 power." They recommended a separate standby mode
16 power limit and also requirements to minimize
17 flicker.

18 I also investigated and staff
19 investigated a design standard that would just
20 require Cathode Cut-out, and we also looked at an
21 annual energy use performance standard, which was
22 on a few slides back, and that would aggregate
23 the BLE efficiency at 180 and 50 percent dimming
24 points, along with the standby power.

25 And in considering these alternatives, we

1 looked at how much energy each of these
2 approaches would save and also how many of the --
3 and again, this should be 34 -- products
4 complied, and found that the annual energy use
5 performance standard saved the most amount of
6 energy and that's why we decided to select it.
7 It also happened to have the largest number of
8 products in that test data that complied.

9 So the scope of the standard would
10 include, as I said in the beginning, all dimming
11 ballasts that dim to 50 percent or below, and
12 they would have to meet -- their annual energy
13 use would have to be less than or equal to this
14 formula here.

15 And so how is annual energy use
16 calculated? So the annual energy use is
17 calculated by taking the input power measurements
18 from the test procedure and multiplying them by
19 time constants. And so this equation here shows
20 how that could be done. P_{100} stands for the power
21 at 100 percent, like full light output, P_{80} would
22 be like the power consumption at 80 percent
23 dimming, and so forth, and then P_0 is the standby
24 power. And then all these t_s are the amount of
25 time expected to be spent at each one of these

1 power levels. And in the Proposed Standards, you
2 don't measure the t values, they're provided in a
3 table in the Proposed Regulations. And this is
4 that table. This table also -- not all dimming
5 ballasts that dim below 50 percent will be able
6 to dim 80 percent and 50 percent, and so there's
7 some adjustments here if for some reason that
8 ballast doesn't have that functionality.

9 The test procedure proposed is the
10 current DOE test procedure for fixed output
11 ballasts, it's found in 10 C.F.R. 430.23(q), but
12 staff proposes some modifications to that and
13 I'll actually get into it in a lot more detail
14 about those in the next slides.

15 So one is the selection of appropriate
16 control for the dimming ballasts. The proposed
17 standards set an order of preference on which
18 lighting control to select first, and the highest
19 priority is a lighting control made by the same
20 manufacturer as the ballast. If the manufacturer
21 does not make a lighting control, then a lighting
22 control recommended by the manufacturer should be
23 selected. And if the manufacturer of the ballast
24 neither makes nor recommends a lighting control,
25 then a lab technician should select an

1 appropriate control. And that control should be
2 compatible with all of the features of the
3 ballast, which should have the minimum amount of
4 additional features outside of what the ballast
5 can do.

6 The DOE test procedure only tests at full
7 output, so staff is proposing to amend that and
8 also take measurements at 80 percent and 50
9 percent of maximum arc power, and that is to be
10 achieved using the controls, the selected
11 controls. For dimming ballasts that cannot be
12 tuned to those levels, the idea here is that you
13 would use the next closest level, so at 80
14 percent, if your dimming ballast could dim to 82
15 percent, but not 80, then you would test at 82
16 percent. And the Proposed Regulations define a
17 tolerance range, and so if your dimming ballast
18 can dim to 80 percent, then the next closest
19 value between 65 and 90 percent should be used
20 for that test point. And for the 50 percent
21 testing point, the range is 35 percent to 65
22 percent.

23 The staff also expanded on standby mode
24 testing, which is I believe in the DOE test
25 method. It describes how to set the controls to

1 achieve the standby mode, it also requires a 90-
2 minute waiting period before measuring the
3 standby mode and really the idea behind that is
4 to allow digital communication and smart
5 controllers to go to sleep. It also sets a
6 minimum sampling rate and test period to
7 determine the average standby mode power.

8 The proposal would also require
9 manufacturers to submit data to the Energy
10 Commission, report it, to be included in the
11 Appliance Efficiency Database. There's some
12 basic information not shown in this slide that
13 would be required, like manufacturer name and
14 model number, and things like voltage, and just
15 some background information on the ballasts. And
16 we would also require that the power be reported
17 and information necessary to show that the
18 ballast complies with the Regulations. And we
19 also propose to require power factor be reported
20 at full output.

21 And was shown in that graph with the red
22 line and the different sized blue dots, the
23 market information and analysis did not show any
24 correlation between cost and efficiency. And
25 staff also looked into potential costs by looking

1 to other sources. We looked at the DOE analysis
2 on Cathode Cut-out and improved efficiency for
3 Program Start ballasts, and the DOE did
4 characterize some costs for those. Specifically,
5 they characterized a \$.89 incremental cost for
6 program start ballasts to incorporate Cathode
7 Cut-out and to improve their BLE. And so that
8 DOE data was for a two-amp ballast and was \$.89,
9 and to adjust for three, four and one lamp
10 ballasts, we assumed a \$.10 differential by the
11 number of lamps just because more powerful
12 components usually are more expensive components.

13 So the lifecycle analysis shows that the
14 Proposed Regulations are very cost-effective.
15 You can see that for four lamp ballasts, the
16 improvements from a non-compliant product to a
17 compliant product saves on average over the
18 lifetime -- and note, these are not discounted
19 numbers, so with a grain of salt, but it's \$34.58
20 of savings for four lamp ballasts that moves from
21 non-compliance to just complying, with annual
22 savings of \$2.66. So you can see the payback is
23 quick and many-fold, the incremental costs.

24 When scaled up to the entire state, you
25 can see that -- and this was in a previous slide

1 -- that the energy savings would be 388 gigawatt
2 hours a year. This is assuming some pretty high
3 number of shipments and, again, this isn't
4 consistent with historical shipments, this is
5 assuming quite a number of new ballasts being
6 dimming ballasts because of the Title 24
7 Regulations, Building Standards.

8 So with that, the next steps in this
9 process are to take input from today's workshop
10 and from written comments received by or before
11 June 6, 2014, and we will take all that input on
12 our proposals and our analysis and update them
13 accordingly. And then we'll go to the next step
14 in the process, which was shown in that earlier
15 slide.

16 And I also want to emphasize that staff
17 is always available to discuss the proposal, any
18 questions, any concerns, anything you want to
19 discuss about it, please contact me, I'm the Lead
20 on this product, I've put my email and my phone
21 number on this slide. Just below that is the
22 emails address to the Docket to submit written
23 comment, and also the Docket number, be sure to
24 include that Docket number in the subject line.
25 And we look forward to receiving your comments

1 both today and in writing. With that, that
2 concludes my presentation, so Harinder, did you
3 get any blue cards?

4 MR. SINGH: Thank you, Ken. Yes, I have
5 Stephen Irving from Lutron Electronics.

6 MR. IRVING: Thank you. My name is Steve
7 Irving. I'm representing Lutron Electronics.
8 And on behalf of Lutron, I thank you for the
9 opportunity to provide comments on the draft
10 proposed regulations for fluorescent dimming
11 ballasts.

12 In these brief comments, I will identify
13 key areas where the proposal may actually work
14 against California's goal of lowering overall
15 energy consumption. In addition to these
16 comments, we intend to provide specific written
17 comments before the June 6th deadline.

18 First, proposed annual energy usage
19 limits do not properly account for different
20 applications of fluorescent lighting systems,
21 namely ballasts that can operate more than one
22 lamp, often referred to as multi-lamped ballasts.
23 A common three lamp fixture using one three lamp
24 ballast will always use less power than the same
25 fixture using three single lamp ballasts of the

1 same efficiency. However, the proposed standards
2 strongly favors single lamped ballasts which will
3 result in a higher overall energy usage. This
4 can be seen in the CEC data as the total wattage
5 increases beyond one lamp configurations, the
6 percentage of compliant ballasts decrease
7 significantly. Although there were fewer samples
8 tested, it still appears that the common
9 configuration of three lamp 32 watt ballasts only
10 has a single sample which complies. We need to
11 ensure that there are multiple models at every
12 application which meet the proposed standard,
13 otherwise multiple ballasts may be installed,
14 increasing overall energy usage.

15 Second, the proposed annual energy usage
16 formula discourages the use of digital dimming
17 ballasts. These ballasts have a number of energy
18 saving advantages, including the ability to
19 program occupancy sensed and daylight zones, and
20 to implement demand response functions. These
21 ballasts do have an on-state power consumption,
22 and therefore would need to have an even higher
23 operating efficiency to comply, compared with
24 their analog counterparts. These ballasts should
25 not be punished for their expanded utility, as

1 the effect will be to lose these advantages and
2 all associated energy savings.

3 Working through NEMA, Lutron is
4 collaborating with Energy Solutions to continue
5 to make improvements in the proposal. We are
6 also happy to work directly with the CEC to
7 discuss this topic. Thank you for the
8 opportunity to make comments today.

9 MR. RIDER: Of course, thank you.

10 MR. SINGH: Thank you, Stephen. Next is
11 Daniel Young from IOUs.

12 MR. YOUNG: Hi. I'm Daniel Young
13 representing the California Investor-Owned
14 Utilities, Statewide Codes and Standards Team.
15 So first I wanted to just commend the CEC on
16 their efforts in developing the analysis that was
17 presented today and for proposing highly cost-
18 effective stringent standards that we believe
19 will make a big difference on energy use in
20 California.

21 And so, before I start with some of my
22 more detailed comments, I wanted to kind of
23 reaffirm some of the assumptions that Ken has
24 laid out here and, you know, namely that with new
25 revisions to Title 24 California Building Codes,

1 starting July 1st of this year we expect to see a
2 very significant increase in dimming ballast
3 shipments in the State of California, and without
4 a standard in place in the State of California,
5 these are otherwise unregulated products and
6 savings from the Title 24 Standard may actually
7 fall well short of expectations because, when
8 operating at full output, these products are not
9 more efficient than fixed output ballasts,
10 particularly with no standard to enforce.

11 The other thing I wanted to mention is
12 the significant opportunity for energy savings
13 through better control of Cathode heating which
14 Ken also has already mentioned, but, actually, do
15 you mind flipping to slide 9? So this is the
16 graph of two example ballasts that came from the
17 SCE test data that shows, again, the red ballast
18 less efficient than the green ballast here, and
19 that wedge that Ken described as Cathode heating
20 up at around 60 watts of arc power and above. It
21 shows a pretty significant opportunity there for
22 improvement. And so this opportunity is actually
23 fairly well documented in a NEMA document, LL9,
24 which we'll reference in comments that we'll
25 submit for this rulemaking. But basically that

1 document shows about a 5.6 watt per lamp gap in
2 what is required versus what could be used to
3 operate a lamp when it's above 155 milliamps, so
4 basically anywhere from 100 percent down to it
5 could be from, you know, 60 percent to 70 percent
6 of full output. In that whole zone, there is a
7 5.6 watt per lamp buffer that you either could
8 use, or you don't have to use, and so that in and
9 of itself is a significant energy savings
10 opportunity. When you're looking at one lamp
11 valves, that's 5.6 watts, but when you're looking
12 at four lamp ballasts, that's over 20 watts just
13 right there. And that's just through better
14 control of cathode heating and that speaks
15 nothing to just the general efficiency gains that
16 you're seeing in this example, below 60 watts of
17 arc power where the green line is just clearly
18 below the red line everywhere. So I wanted to
19 just emphasize that point.

20 The other comment we wanted to make was
21 about a proposal for a weighted or integrated BLE
22 metric for consideration, and that takes us away
23 from the annual energy use metric, which we
24 believe is less useful for kind of integrating
25 with the Title 24 requirement and the modeling

1 that's required of system designers for meeting
2 those requirements, and so we believe that a
3 weighted BLE with a separate standby mode
4 component is a better metric for evaluating the
5 efficiency of these products.

6 A couple other things here, so power
7 factor, CCS proposed that power factor should be
8 tested and listed, we would actually like to see
9 that as a requirement of 0.9 power factor at
10 basically all three operating mode measurement
11 points, so 100 percent, 80 percent and 50
12 percent, and we would like the requirement to be
13 0.9 power factor which, according to our test
14 data, none of the products that were tested
15 should have any issues with meeting that
16 requirement; all of them were well above that.
17 But the goal here is, again, just to ensure that
18 new products also maintain that level of
19 performance and so there's no drop-off.

20 We also would like to add a flicker
21 requirement to the standard, so during testing we
22 did observe flicker in the very low dimming
23 ranges, so basically for every single ballast we
24 measured the power consumption, we measured the
25 efficiency until we dimmed it to where the lamp

1 started flickering and, so, it was assumed to not
2 be able to dim any further. And so that suggests
3 that not only is the lamp flickering when it's at
4 its very lowest operating point, but also
5 somewhere above that there might also be some
6 "non-perceptible flicker" that may still have
7 negative impacts and is something that we would
8 certainly want to address because, if flicker is
9 a problem with these systems, then people will
10 not be dimming them when they're installed. And
11 then they're not generating the energy savings
12 that they're designed to generate.

13 And so the IOUs are going to continue to
14 work on this very important issue and will be
15 starting flicker testing on fluorescent ballasts
16 later this month. And so for the time being, we
17 would recommend that the flicker specification
18 proposed in the case report, which was matching
19 the previous Title 24 requirement and the current
20 Title 20 controls requirement of 30 percent
21 maximum amplitude modulation for frequencies
22 under 200 Hz, be adopted as part of the standard
23 and, as I said, once that testing is completed
24 we'll submit that to the CEC for consideration
25 and we can work on how that will be implemented.

1 Finally, I think the last thing here we
2 wanted to just be careful a little bit that we
3 make sure that the actual standard levels being
4 proposed by CEC are achieving the desired
5 efficiency and stringency. And as an example, I
6 think it's Slide 20 here, if you don't mind, the
7 very bottom bullet here, there's a window of 65
8 percent to 90 percent for a ballast that can only
9 dim to 80 percent, and likewise for ballasts that
10 dimmed to 50 percent, there's a window from 35
11 percent to 65 percent, and I think there might be
12 a slight issue here where that range actually
13 advantages or disadvantages certain ballasts that
14 can only hit either on the high or the low end of
15 that range, it makes it either easier or harder
16 for them to meet the standard. And so there's
17 small things like that that, again, they're
18 certainly solvable, but need to be carefully
19 vetted before the Standard is finalized.

20 With that, again, I'd just like to thank
21 CEC for the opportunity to provide comment today
22 and for the hard work that went into the proposal
23 and the great energy savings that are sure to be
24 achieved through this Standard. Thanks.

25 MR. RIDER: Thank you, Dan. Anyone else

1 in the room? Okay, Pierre.

2 MR. SINGH: Pierre.

3 MR. DELFORGE: Pierre Delforge, NRDC. I
4 would like to thank the Energy Commission for
5 developing this proposal and for the opportunity
6 for stakeholders and for NRDC to participate in
7 the process.

8 As previous speakers have commented, this
9 is a fast growing market with a Title 24
10 requirement that's coming into force very soon,
11 and given that there is a clear difference
12 between products, in terms of efficiency, these
13 products are a great candidate for standards and
14 this is the right time to set the standards.

15 We are in general support of the CEC
16 proposal and we encourage CEC to move forward
17 rapidly on this proposal. I would just like to
18 make a few specific points.

19 On power factor and flicker requirements,
20 we support your comments on setting requirements
21 for these two points. You know, power factor is
22 an important way to save energy and there is no
23 reason, especially given the test data that was
24 shown, that we wouldn't put a .9 requirement on
25 those. Light quality requirement is also very

1 important for customer satisfaction and for the
2 success of standards, and we also very much
3 support this requirement.

4 My last point is talking about standby
5 power and, while we appreciate the additional
6 functionality of digital dimming ballasts, this
7 should not be at the expense of low power
8 standby. There are technologies today available
9 to have very low power standby and we think it's
10 important, given the growing standby power in
11 homes and businesses today that everything is
12 done to minimize this, especially in new
13 standards. Thank you.

14 MR. RIDER: Thank you.

15 MR. SINGH: Thank you, Pierre. Jon
16 McHugh.

17 MR. MCHUGH: Thank you. First off, I'd
18 like to voice my support of the Standards. I was
19 involved in the 2013 Title 24 development and the
20 requirements for essentially dimming ballasts in
21 all locations is one of the largest measures that
22 was in the 2013 standards. And this Title 20
23 Standard actually helps us secure those energy
24 savings, so I want to acknowledge all the effort
25 and all the potential savings associated with

1 this standard.

2 I've also been involved over the years in
3 the requirements for daylighting controls in both
4 Title 24 and the ASHRAE Standards, so this is
5 something I've worked on for years, actually
6 going back to -- I was in graduate school working
7 on my thesis on daylighting, so a long history
8 associated with this. And as part of this, I've
9 done a number of research on the issues that make
10 for successful and unsuccessful daylighting
11 systems. And the two primary issues associated
12 with successful daylighting systems, at least in
13 terms of the controls, has to do with the
14 placement of the control and the adjustment of
15 the control. The third one is the issue of
16 flicker. A number of very well engineered,
17 nicely designed systems that basically took a lot
18 of thought, a lot of additional expense, I don't
19 know if you know this story about, you know, for
20 a lack of a nail, the horse's shoe was lost, the
21 issue associated with flickering fluorescent
22 systems has been the downfall of a number of
23 daylighting systems where essentially the
24 controls were disabled due to flickering of lamps
25 when the dimming was below a certain level. So

1 my recommendation is that flicker be part of the
2 standard, that it be at the very least a test and
3 list standard at different dimming levels, and
4 similar to what Energy Star has, which they're
5 collecting this information, but I would say the
6 difference is that I'd like to see that we not
7 only collect information in terms of amplitude
8 modulation, but amplitude modulation filtered at
9 different frequencies because, as was mentioned
10 earlier by Dan, the current definition of low
11 flicker operation is amplitude modulation, which
12 some people would call percent flicker, at
13 frequencies less than 200 Hz. So if we could be
14 collecting the information, potentially
15 unfiltered data, and the California Lighting
16 Technology Center has worked with us in terms of
17 developing a public domain, filtering software
18 that would take the time varying lighting
19 information and then filtering that by frequency,
20 then would be available to all users and would be
21 filtered identically for all people submitting
22 data. So I'm recommending that, in addition, I
23 think this idea of an integrated ballast luminous
24 efficiency is desirable so that we have a metric
25 that is roughly equivalent, regardless of the

1 number of lamps being used. And this actually
2 has a history that is actually fairly similar to
3 what was in the Title 24 Standards, which they
4 called relative system efficacy, that wasn't at
5 different dimming levels, but it's still the same
6 idea that you're normalizing the result so that
7 you can use this across ballasts that are serving
8 a different number of lamps. Thank you very
9 much.

10 MR. SINGH: Thank you, Jon. Gary
11 Fernstrom from PG&E.

12 MR. FERNSTROM: Thank you. Gary
13 Fernstrom representing PG&E. I'd like to
14 emphasize some of the points that Daniel, Pierre
15 and Jon raised with respect to the Utilities'
16 interest in fully understanding the performance
17 of these products and accurately being able to
18 estimate for rebate program purposes the savings
19 associated with them.

20 So the use of BLE facilitates comparing
21 one ballast to another and that metric would be
22 useful to us. Secondly, having the power factor
23 reported at different levels of lighting output
24 is also an important metric for determining
25 energy savings from our point of view. Thank

1 you.

2 MR. SINGH: Thank you, Gary. Anybody
3 else in the audience who wants to make a comment?

4 MR. RIDER: I would just like to point
5 out on that BLE, so the current proposal for data
6 collection does not include directly that BLE be
7 submitted, however, because it does require input
8 power and arc power be reported, we can calculate
9 BLE from those numbers. So we're not having it
10 directly reported currently, and you may submit
11 comments that you think it ought to be, I just
12 want to bring up the point that you can get there
13 from what we are proposing to collect.

14 MR. SINGH: Ken --

15 MR. RIDER: There are people on the
16 phone.

17 MR. SINGH: Okay.

18 MR. RIDER: Let's see, earlier Alex
19 Boesenberg with NEMA typed in a comment and asked
20 me to read it when we got to this point, and I
21 will read it exactly as he has written it: "We
22 have identified two key concerns regarding the
23 proposal and have been working with the IOU
24 consultants and SCE employees who developed it:
25 1) we are concerned that the very high frequency

1 and very low power levels being measured have
2 inherent potential for substantial inaccuracies,
3 potentially as much as 100 percent. This
4 represents a concern for reporting,
5 repeatability, and enforcement; 2) Cathode Cut-
6 out is central to the proposal and is a matter
7 intertwined with intellectual property claims.
8 Were the proposals to be adopted as is, there is
9 potential that CEC would end up favoring a single
10 manufacturer/patent. We are working within NEMA
11 and with the SCE Proposal Team to see if we can
12 reach a compromise." And he also said that both
13 of these issues will be expanded on in greater
14 detail in their written comment. And let's see,
15 I've also got some other folks who want to speak.
16 Richard Haring, I believe. Let me see if I can
17 find you and unmute you. It looks like you're a
18 call-in user, hold on a second. All right,
19 Richard, if you're there?

20 MR. HARING: Hello.

21 MR. RIDER: Hello, we can hear you.

22 MR. HARING: Hi, I'd like to thank the
23 CEC for the opportunity to participate in the
24 rulemaking process.

25 MR. RIDER: Richard, could you introduce

1 yourself and your affiliation real quick?

2 MR. HARING: My name is Richard Haring
3 and I'm working with Philips Lighting.

4 MR. RIDER: Great, go ahead.

5 MR. HARING: I would just like to echo
6 the comments made by Alex. We have been working
7 with the consultants and we have some concerns
8 about the accuracy of some of the measurements
9 given the high frequency and low currents
10 involved. As Alex indicated, we will be
11 providing written comments to address those
12 concerns and we would appreciate some feedback on
13 that once we submit them.

14 MR. RIDER: Great, and thanks for taking
15 the call, thanks for your comments and for your
16 time. So anyone else on the phone, if you could
17 raise your hand if you'd like to make a comment,
18 I will unmute you. If I don't see anyone in the
19 next minute or two, I will unmute all the lines
20 and see if we miss anyone. And while I wait for
21 folks to raise their hands, I just want to say
22 that I look forward to seeing your written
23 comments and please include a complete rationale
24 behind the proposals, for example, flicker, or
25 moving the annual energy use to a different

1 metric, you know, the next step is literally for
2 us to take all that and figure out what the best
3 thing to do is for California. And the more data
4 and the more information, the better rationalized
5 it is, the better that I think staff will be able
6 to realize that that's true and we will make
7 those changes. The goal here is to save energy
8 and so, as long as we're doing that, I think then
9 we are open to alternative approaches.

10 So I don't see anyone else with raised
11 hands, I want to unmute all the lines. So
12 everyone is unmuted. If you couldn't raise your
13 hand and wanted to say something, now would be
14 your chance. Okay, not hearing anything, it
15 looks like we have one more comment in the room.
16 And so, Jon, if you would care to?

17 MR. MCHUGH: Hi. This is Jon McHugh. We
18 heard two commenters describing the concerns
19 about measurement accuracy with the issues
20 associated with high frequency and low currents.
21 I'd like to encourage folks to share their
22 measurements, you know, essentially do a Round-
23 robin and identify if indeed there is that
24 discrepancy, and if they share basically their
25 measurement method, the equipment they're using,

1 etc., then we could actually hopefully narrow in
2 on a solution. So I thought I'd throw that out
3 there.

4 MR. RIDER: Yeah, that's a good idea.
5 And again, that is just exactly what I was trying
6 to get at, which is if you have a comment, or you
7 want to contest the analysis or the data, or the
8 savings, or the costs, or any other aspect of the
9 proposal, it always is better to include either
10 an alternative proposal or data to show why that
11 is correct, or a study, or something like that,
12 because at the end of the day, when we
13 rationalize and we put potentially this into law,
14 we need to show exactly what the basis of all the
15 decision points were. So the better
16 substantiated it is, the more likely that we will
17 make the change that is requested in the comment.
18 Yes, Dan.

19 MR. YOUNG: Daniel Young representing the
20 California Investor-Owned Utilities. And just to
21 tag onto Jon's comment there, we would also like
22 to know kind of the exact threshold of where the
23 last two commenters suspect that measurement and
24 accuracy may be an issue, so our understanding is
25 that we're measuring incrementally higher

1 frequencies than what we're measuring at full
2 output; likewise, marginally lower lamp currents
3 than we would be measuring at full output. So
4 it's not we're not jumping orders of magnitude in
5 either direction for those two measurements. So
6 it would be nice to know exactly where those
7 concerns are and what our opportunities are to
8 mitigate those.

9 MR. RIDER: And I would like to also
10 point out, I've graphically represented here the
11 input versus arc power in the test data, and you
12 can see there's not a lot of weird wiggles or
13 anything odd that you would expect to see if
14 frequency, you know, when you increase arc power,
15 with that increased frequency, you're not seeing
16 any bending here in the data at all, so it
17 doesn't look like that would be -- the test
18 results certainly do not seem to support that
19 there is this large variation. And also, you
20 know, products didn't vary -- while there is a
21 gap here, there wasn't a large amount of
22 variance, you know, between similar products from
23 similar manufacturers. So I would encourage
24 everyone to take a look at the dataset online, as
25 well as generate more data. But I think the

1 dataset that we have right now doesn't seem to
2 suggest wide variability, especially not at the
3 50 and 80 percent points - and 100 percent point.
4 Okay, again, thank you everyone for your time and
5 for those of you who took the time to travel, I
6 especially thank you for being here in person.
7 Oh, there's one more comment, I'm sorry. Richard
8 Haring. Go ahead. Oh, I have to unmute you. I
9 think you were 27, I'm going to guess. Okay, go
10 ahead.

11 MR. MENDOZA: This is Alberto Mendoza
12 with Philips.

13 MR. RIDER: Oh --

14 MR. MENDOZA: This certainly is a very
15 interesting opportunity to look very close to
16 this fascinating topic, very interesting for
17 engineers and scientists. I'm just curious, when
18 I look through the --

19 MR. RIDER: Would you mind speaking a
20 little bit more directly into the speaker? I'm
21 having difficulty hearing you.

22 MR. MENDOZA: I'm sorry. It is a very
23 interesting topic to look closer. It's a very
24 interesting topic for scientists and engineers to
25 understand the fundamentals for dimming even

1 deeper. I really appreciate the opportunity.
2 When I'm looking at the chart on the screen
3 between the red and the green, I wondered if one
4 of the differences we can find when looking at
5 the data will be the running at different
6 frequencies. We will be doing, as you suggested,
7 some research in terms of that, and it will be an
8 interesting opportunity to look at how
9 frequencies are affecting these measurements.

10 MR. RIDER: You mean sequences like
11 testing from 100 percent down versus starting at
12 zero and going up?

13 MR. MENDOZA: When I look, for instance,
14 you are saying data at 20 percent of 20 watts, if
15 the two ballasts are running 20 watts, but one
16 may be running to, say, a number of 80 Hz and the
17 other one is running at 70 Hz, so I wondered if
18 that's what you see this difference is, what --
19 it would be an interesting thing when we have
20 data to compare different testing from different
21 ballasts.

22 MR. RIDER: Yeah, it sounds like
23 something that could be proven scientifically, so
24 as an issue, so I don't know if you have access
25 to a lab or anything, but a point could be made,

1 I think, without a great deal of cost or time in
2 testing this. So I look forward to hopefully
3 getting some more information on this in the
4 written comments that are due on June 6th.

5 MR. MENDOZA: Absolutely. Thank you very
6 much.

7 MR. RIDER: Thank you.

8 MR. SINGH: Thank you very much. Ken, if
9 you could put the slide where the Docket address
10 is?

11 MR. RIDER: Yep. I did, the docket
12 number is there. Are you thinking about some
13 different slide?

14 MR. SINGH: Yes. Well, that's fine, I
15 guess. Thank you. We recommend that you submit
16 comments to us by June 6th and, you know, our
17 transcripts for today's workshop will be
18 available in a week or two, we'll try to get it
19 as soon as possible so that if somebody wants to
20 look at what was said in the workshop, so it's
21 going to be available soon, and so that can be
22 used to make comments if necessary.

23 So we want to thank you and we are always
24 going to be available to answer any questions or
25 clarifications, so we want to thank you for

1 participating and looking forward to your
2 comments. Thank you and have a nice time back
3 home. Thanks.

4 (Whereupon, at 3:24 p.m., the workshop was
5 adjourned.)

6 --oOo--

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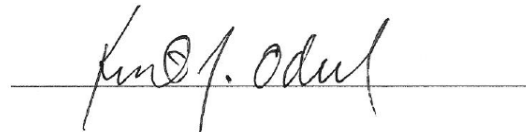
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A handwritten signature in cursive script, appearing to read "Kent Odell", is written over a horizontal line.

Kent Odell
CER**00548

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