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BEFORE THE

CALIFORNIA ENERGY COMMISSION

In the Matter of:	)	Docket No. 17-AAER-05
	)	
Appliance Pre-Rulemaking	)	Phase 2
Staff Workshop	)	Pre-Rulemaking

Phase II, Pre-Rulemaking Staff Workshop on
Tub Spout Diverters, Spray Sprinkler Bodies, and Irrigation Controllers

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

THURSDAY, JULY 20, 2017
10:06 A.M.

Reported by:
Peter Petty

APPEARANCES

CEC Staff Present
Ryan Nelson
Sean Steffensen
Jessica Lopez
Carlos Baez

Also Present
Stakeholders present for Tub Spout Diverters Discussion
Mary Anderson, Pacific Gas & Electric (PG&E) representing California Investor Owned Utilities (CA IOUs)
Katherine Dayem, Xergy Consulting on behalf of CA IOUs
Frederick Desborough, Flex-Fluss, LP (contractor to PMI)
Jerry Desmond, Desmond & Desmond, LLC, representing Plumbing Manufacturers Intl. (PMI)
Joanna Kind, Eastern Research Group (ERG) (Contractor to U.S. Environmental Protection Agency (EPA) WaterSense Program)
Mark Malatesta, American Standard
Cambria McLeod Kohler
Edward R. Osann, Natural Resources Defense Council (NRDC)
Robert Pickering, ERG (Contractor to EPA WaterSense)
Ed Pike, Energy Solutions, representing CA IOUs
David Silva, California Landscape Contractors Association (CLCA)
Stephanie Tanner, EPA WaterSense Program
Daniela Urigwe, Energy Solutions, representing CA IOUs
Justin "Bo" White, NegaWatt Consulting, representing CA IOUs

Public Comment
None

I N D E X

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P R O C E E D I N G S

JULY 20, 2017 10:06 a.m.

MODERATOR NELSON: My name's Ryan Nelson, with the Appliance Outreach Educational Office here at the Energy Commission. Welcome to the Invitation to Participate Workshops. Today we'll be discussing Tub Spout Diverters, Spray Sprinkler Bodies and Irrigation Controllers.

A couple housekeeping items we need to discuss first. When exiting the building please use the front entrance or exit that you used when you arrived this morning. In case of emergency you're to use either exit, the front or the right here.

The right will sound an alarm in an emergency. Feel free to use that exit. We will gather at the park across the way diagonally to the right from the Commission building. Restrooms are located directly out these doors to the lobby and to your right.

And there's a small cafeteria if you need something, a snack or something to drink throughout the day. So here's the Agenda for the day. The first topic will be Tub Spout Diverters, given by -- a presentation given by Jessica Lopez.

Then we'll take a break for lunch and we'll

resume in the afternoon with Sean and Spray Sprinkler Bodies, and we'll close out the day with Irrigation Controllers. Throughout the presentations today after certain topics are discussed we'll have a stop for discussion.

Please limit your comment to five minutes per comment, not the entire comment period, but if you're making a comment yourself, please limit it to five minutes so we can hear everybody in the room and online.

We'll take comments from the room first, then online. If you're on the WebEx, please use the raise your hand function and we'll call your names out loud to announce that you may make your comment. Announce yourself, your name and your organization when making any comment so the court reporter can get the names correct.

At the end of the day if anything hasn't been covered or you want to make a general comment, we'll have a period for general public comment for items that may not have fit into the specific discussion points of the presentations.

Just a reminder, all comments made today and to the docket are a public comment and part of the public record. If you have information that you feel

is confidential and would like to submit confidential information, please contact anyone of us directly.

The Commission has a process for that and we can start the process and walk you through it. But please be aware that if you submit confidential information that can't be directly used, you will have to aggregate the data or the information somehow so that we can put it into the public form. Any questions before we begin?

Okay. I'm going to hand it over to Sean Steffensen. He's going to discuss where we are in the process and why it's important. Sean.

MR. STEFFENSEN: Hi. Good morning. Sean Steffensen. The flow chart addresses why we request the information and how we plan to use it. The need -- we need the information to define the problem, in this case an inefficiency.

The information provided helps, then, to define the solution. The scope and definitions provide the "what" of what will be included in the standard. How do we know what will and will not be subject to the regulation?

The efficiency metric provides the measure by which we rank the performance of individual products. There can be more than one efficiency metric to

consider. One or more may be chosen to develop a standard.

The test method defines the conditions under which the appliance is tested. Test data identifies the relative performance among products and allows consideration of a standard. Once these items are selected, scope, definition, test method, test data and standard, an analysis must be performed to understand the effect of the proposed regulation.

Does the standard achieve the goals of the significant water and energy savings while being cost-effective and technically feasible? If so, then it's a good standard. If not, then we should reconsider the data and modify the standard to meet the criteria.

MODERATOR NELSON: Thank you, Sean. Okay. This diagram just is to illustrate where we are in the process. We're very early in our rule-making process, as indicated by the blue arrow. Today is a public -- today and tomorrow are the Public Workshops to present information gathered during the ITP process, to take additional comment and, hopefully, to have a discussion in the room and online.

We have -- there's a lot of work ahead and I thank you all for coming today. I have two more things I wanted to mention that I forgot to mention earlier.

If you're in the room and you want to make a comment or speak, there's a microphone in front of you.

There's a button to push that will light up the mic red and that means your microphone is on. So just be aware of that. And then online, if you're having difficulties with the raise your hand function, it could be your phone's not working or your phone connection.

You may try to use the Chatbox and we'll get to those comments after we take comments in the room, oral comments over the phone and then we'll take the Chatbox comments. So if there aren't any other questions, we'll begin with -- and I'll hand it over to Jessica Lopez.

MS. LOPEZ: Thank you, Ryan. Good morning, everyone. My name is Jessica Lopez. I'm an energy analyst here in the Appliances and Outreach and Education Office here at the Energy Commission. I want to welcome everybody here and those who have tuned in.

Today's Workshop will cover information we received for Tub Spout Diverters as part of the Invitation to Participate, which I'll abbreviate as ITP throughout the presentation. So first, I want to lay out the Agenda.

I will discuss the purpose of this Workshop

and then I will briefly walk through the information requested during the ITP by topic, summarize responses we received and ask a few questions to start a discussion.

And then I'll leave it open for comments. And then after discussing the information we received, if there is time available we will leave it open for additional comments. And then at the end we will discuss the next steps following this Workshop.

The Energy Commission is gathering information for Phase 2 products in its Appliance efficiency rule-making. The Invitation to Participate is an opportunity for stakeholders to provide information and data that will help shape the Energy Commission's policy regarding Phase 2 appliances.

The ITP covered various types of appliances known as the Phase 2 appliances shown here. During this Workshop we will discuss the information and data submitted for Tub Spout Diverters. I would like to thank those that responded to the ITP by providing comments to the Docket, Kohler -- sorry -- so not just Kohler; oh, no; there we go -- Lixil Water Technology Americas, Plumbing Manufacturers International and the U.S. EPA WaterSense Program.

The list shown here is the information we

requested during the ITP Webinar. Again, I will review the information we requested, summarize the responses we received and provide some discussion questions and then leave it open for comments.

I will begin with those in the room and then move to those online and on the phone. Please remember to state your name and your organization you are representing so the court reporter can identify you. Also, please keep your comments brief to allow all to respond within the allotted time per topic.

So the first topic that we want to discuss is production definition and scope. During the ITP we asked if California's definitions needed to be updated or improved, and if we should consider WaterSense's proposed definitions.

The responses we received showed there was an agreement that the California definitions should be updated and that the specific subtype definitions should be removed. Also, WaterSense noted in their comments that they intend to revise the definition of tub to shower diverter to instead by a diverter mechanism that is embedded in the plumbing, rather than in the plumbing hidden behind the wall, since tub to shower diverters are not necessarily concealed by the shower wall.

WaterSense also indicated the specification will include diverters such as roman tub faucets and claw foot tub faucets. Respondents also suggested replacing the current California definitions with back and shower diverter to be consistent with the ASME/CSA test procedure.

I want to note the ASME/CSA test procedure mentions the following terms in the test procedure that are relating to Tub Spout Diverter: diverter, bath and shower diverter, Tub Spout Diverter and tub to shower diverters and automatic reset diverter.

Of these terms, the only term diverter is defined. WaterSense has proposed definitions for three of these terms. So here I've listed some questions that we can start a discussion with. Although we received comments to change the terms, we did not receive direction on which definitions we should use, and are there other definitions the Energy Commission should consider?

I will now pause for comments. I'll start with the room. Go ahead --

MR. DESMOND: Me?

MS. LOPEZ: -- you can go ahead.

MR. DESMOND: Okay. Hi. Jerry Desmond, on behalf of Plumbing Manufacturers International, or PMI.

And as stated, you know, PMI submitted a comment letter I think on June 16th or so that addresses the issue as discussed in the previous slides, pointing out that, and so just reiterate, look forward to an updated definition and recommend an updated definition.

You know, we note that the current definitions of lift tight, pull tight, turn tight and push tight aren't defined in the product standards and are not part of common terminology.

And I think in the letter that was submitted by PMI Technical Director Matt Sigler, who I think is trying to participate but is boarding a plane in Chicago -- so he's either listening in, you know, but he's with us in spirit -- that the reference that he suggested and PMI's suggesting is the ASME A112.18.1 diverter.

And I think it's specifically bath and shower diverter. When you look at the definition of diverter that's there, the definition of diverter in that exact reference point we believe covers it and would provide the clarity to the manufacturers and the regulated -- and the stakeholder community.

MS. LOPEZ: Thank you. Anyone else?

MR. WHITE: Hello. I'm Bo White, with NegaWatt Consulting, and we're representing the

Statewide Codes and Standards Enhancement Team. We'll be writing *16:15:05 report, CASE report about the topic.

We think that an extra metric in the database that might be worthwhile would be automatic versus manual reset, since that's a major topic here and might be a good way to have extra information about the diversion database instead of lift, pull, push and turn.

MS. LOPEZ: Just to follow up, in that case we would have to suggest definitions are automatically set and -- reset diverter *16:15:42.

MR. WHITE: Yes.

MS. LOPEZ: Anyone else? Okay.

MR. OSANN: Yeah. My name's Ed Osann. I'm with the Natural Resources Defense Council. First of all, let me say we strongly support the Commission's initiative to *16:16:03 to the current statements, but *16:16:07 statements for Tub Spout Diverters.

With regard to definitions, at this stage of the development of a standard I think we recommend retaining the four categories that the Commission has, lift up, pick up and so on, *16:16:32 (indiscernible)

-- database of products that are disaggregated to those categories. So before casting that aside and

aggregating all diverters into one or two other larger categories, I think we need to be a little bit further along in the preparation -- in the analysis and preparation of the standards.

The other point I'd make is to agree with the points made by Bo that it would be useful to have a definition for automatic reset diverter. The functionality of that product I think bears more examination and may have implications for how the standard gets set in the final analysis.

MS. LOPEZ: Thank you. Do we have anyone online? Does anyone have any more cards? We'll continue onto the next slide.

MS. McLEOD: Cambria McLeod here. We do not find much value in differentiating, as they are currently *16:17:52 missing, and that may *16:17:52 so if I -- the biggest differentiators are, is it on the spout, is it an automatic reset and is it in the wall.

So the lift, pull, turn type push, all that, we find that there really is not actual value in dividing those *16:18:14.

MS. LOPEZ: Thank you. Just to follow up, would it be helpful if we, sort of similar to WaterSense, how they break it down to just a Tub Spout Diverter and then have it so that it's differentiated

with those that are in the balance? Would that help?

MR. DESMOND: I don't know if -- Jerry Desmond with PMI. I don't know if WaterSense is on the table, but I think they're going to initiate a study on this subject.

MS. LOPEZ: I meant the definition. So would it help to break it down to separate it to, those are the -- the diverter mechanism being inside the tub stop and then those that are in the valve? Would it help to break it down that way?

MS. McLEOD: It's my understanding that part of that study is going to be investigating that portion.

MS. LOPEZ: Okay. But that it is publicly available?

MS. McLEOD: It is.

MS. LOPEZ: It is. Yeah.

MS. McLEOD: Thank you.

MS. LOPEZ: All right. If there's no more comments we'll go onto the next topic. So for existing standards and standards on the development, California currently regulates the leakage rate for Tub Spout Diverters when new and then after 15,000 cycles of diverting.

In addition, WaterSense had compiled a Notice

of Intent to develop a Draft Specification for Bath and Shower Diverters to reduce the leakage rate. WaterSense anticipates releasing its draft specification for this product category this summer and release its final specification by the end of the year.

For existing test procedures, California references the ASME/CSA 2012 version, version -- Section 5.3.6 and Section 5.6.15 as a test for two different Tub Spout Diverters. During the ITP we asked that the test procedure needed improving.

Respondents indicated no improvements were necessary. We did receive comments noting that the Appliance Efficiency Database contains many Tub Spout Diverters that appear to be zero leakage, but may not be since the test measurements are rounded to the hundredths of a gallon per minute.

And so I wanted to follow up in regards to that comment on how to best accurately represent the test results in a leakage *16:20:23 unit. Here are some of the questions to start the discussion. How is leakage volume collected and how is it measured?

For example, is the leakage volume collected in a catch can, a graduated cylinder, and is it measured in milliliters? And is there a preference to measure the leakage or report the leakage in

milliliters per minute?

And how many significant digits are retained when converting to gallons per minute from milliliters per minute, or any other measurement unit, if different? Now, I'll ask for comments. Go ahead.

MR. DESMOND: Jerry Desmond, at PMI. On a couple of those points of discussion points, the second one, is there a preference to measure or report leakage. What we're finding is that our members, depending on their location, use either metric or English units.

And so we would -- PMI would suggest the continuation of both, because it is a good -- it's a helpful reference point for our members who are located all around; all around. In regards to how many significant digits are retained, we do not know that at this point.

And in regards to the last point of discussion, is .005 gallons per minute considered .000, mostly yes. I believe there are more details in the PMI Comment Letter that was submitted that does state that our member companies do round to the hundredths, generally, in general.

We can't speak for everybody in every instance. So generally, yes, the last point.

MS. LOPEZ: Thank you.

MR. WHITE: Hello. Bo White with NegaWatt Consulting, and we're on behalf of the California Investor Owned Utilities. That would be a more accurate statement. We spoke to a lab and the lab said that a container was the best way to measure the given leakage flow rates, and that mandating instrument accuracy might be a good idea.

The ASME test procedure allows flow meters or containers, and more specific instrumentation and accuracy requirements might help reduce ambiguity in the results across labs and products.

And then another thing we learned is -- from the same test lab -- is that a life cycle test takes about a day and that there is a leakage test at the beginning and then there's at least one leakage test at the end, and that each cycle takes approximately six seconds, which would give a life cycle test length of roughly a day.

And he said that the diverter is connected to water at the appropriate pressure and temperature, but the -- we conclude from all of this that the test doesn't address water quality issues, since the cycles are so short.

MS. LOPEZ: Thank you.

MS. McLEOD: Water quality issues are definitely a large factor and one of the root causes of test tub diverter leakage rates in the field. It's very difficult to represent water across the board in every single situation.

So that's probably why you see variations in where the test lab is. We're required to utilize potable water, and potable water obviously varies from one street to the next, depending on who's providing it and where it's coming from. So we would agree with that.

MS. LOPEZ: Thank you. Do we have anyone online?

MR. BAEZ: Online we have a comment from Robert Pickering. Robert, do you have a comment?

MR. PICKERING: Yeah. This is Robert Pickering with ERG. We're a support contractor to the EPA WaterSense Program. I kind of wanted to just mirror PMI, and I think the company was NegaWatt Energy's comments.

The research that we had done, we had reached out to multiple testing labs to speak with them about sort of what their current methods for measuring the accuracy was. And I agree that they mostly said they use a catch can or a bucket, depending on the size of

the leak, just to collect the water, and then use various graduated cylinders or measurement techniques to determine it.

It sounded like they would measure in milliliters and then convert to gallons, just because when you're talking about such low leak rage, getting down to granularium in the thousandths or hundredths of a gallon per minute was challenging. So it sounds like they converted. So I just wanted to mirror those comments.

MS. LOPEZ: Thank you Robit [sic] -- Robert.

MR. OSANN: Yeah, Ed Osann with Natural Resources Defense Council. I think the questions that are raised here, I think largely illustrate the inadequacies of the current ASME test procedure, where there is very little said about the test setup, very little said about the equipment, the measuring equipment, the accuracy, the cycle time.

These are either omitted entirely or not addressed with any precision. With regard to the issue of water chemistry, we noted the comment from PMI about the importance of water chemistry as a factor in the failure of Tub Spout Diverters.

But the Commission should note that aggressive water chemistry can actually be tested for, and it

should be considered for addition to the test procedure. As an example, we point to ASME 18.3, which is the current consensus industry standard for back flow prevention devices.

There's a very explicit section in that test procedure -- in the test procedure in that standard for durability testing, where samples are placed in water under very specified conditions, both as to temperature and to the chemical makeup of the water.

There's a duration that the products with the -- that the test items, test specimens are specified to, to remain exposed to that, and then put through performance stuff. So that is something that the Commission may want to look at and consider, and the CASE Team also, to look at and to consider as a way of addressing this.

We agree that it's an important point. There should be a way of testing for it.

MS. LOPEZ: Thank you. Are there any additional comments? Anyone online? All right. So let's continue onto the next topic. During the ITP we requested field studies and test lab reports that could provide details on how the test is being conducted and test results for various types of Tub Spout Diverters.

Although no sources of test data were provided

other than those available in WaterSense's NOI, source of the data include the Appliance Efficiency Database and test reports requested by the Energy Commission.

For discussion, are there any other sources of test data available? The Energy Commission is interested in still receiving test data and field studies and all possible comments. Go ahead.

MR. WHITE: Bo White, representing the California Investor-Owned Utilities. We are developing a plan to conduct tests, some of which are similar to those recommended by WaterSense in their recent Testing Research Proposal.

This is under development, but what we're thinking is we would test a few auto reset diverters and a few manual reset diverters that are of different mechanisms, push, pull, turn and lift, and that have different ratings of either zero of .01 GPM leakage rate.

And we would use a container and a scale with a measurement accuracy of a gram or better. This is all under development, but those are some ideas we have, and we're considering to measure leakage before the five-minute measurement period and afterwards to see what happens there.

And we're also considering a test of the

degradation of the products due to water flow.

MS. LOPEZ: Thank you, both. Is there any additional comments? Online? All right. So let's go onto the next topic in regards to product lifetime. We requested information on the product lifetime of Tub Spout Diverters and the various types.

Respondents indicated the product lifetime varies depending on use, water quality and manufacturer. So for discussion, since no definite estimate was provided, WaterSense estimated approximately 22.8 years in its NOI as a product lifetime. Is this value representative of the life span for a Tub Spout Diverter?

MS. McLEOD: Okay. There is also an NAHB report that was put out a few years ago.

MS. LOPEZ: What was that again?

MS. McLEOD: There was an NAHB study that was put out, oh, gosh, a while ago, but it is somewhat in line with that. It estimated just about faucet stream in general, at about three plus year-ish. But that, you know -- water faucet.

MS. LOPEZ: Thank you. We'll look into that study. Are there any additional comments? Online?

MODERATOR NELSON: Jessica.

MS. LOPEZ: Oh, go ahead.

MR. OSANN: Yeah. Ed Osann, from NRDC. At this stage we think consideration should be given to a extended lifetime, probably manifested by the -- an extension of the durability testing. The -- some of the industry comments I thought in the -- well, that were submitted most recently noted that in the industry view that these products are primarily replaced, that they're seldom replaced independently.

At least I assume residential products are seldom replaced independently, and that their typical life span is set by the remodeling of a structure. And if that's the case then there is some share of these products that may well be in use 30, 40, 50 years, and where some level of leakage above the -- what would be above the current California standard would simply be tolerated, because the product is not typically thought of being independently replaceable, although some are.

So all of this suggests to us that a longer product lifetime probably should be considered, and that a longer durability test ought to be evaluated.

MS. LOPEZ: Thank you.

MR. DESMOND: Jerry Desmond, with PMI, would just caution that we're looking at the average of real data on -- of NAHB WaterSense, of what's the average replacement time, to speculate doubling that, just we'd

caution taking that step.

MS. LOPEZ: Thank you. Let's go onto the next topic. Let's go back. We actually have a question online.

MR. BAEZ: Online, Stephanie, I see that your hand's raised. Do you have a comment?

MS. TANNER: Oh, I just -- this is Stephanie Tanner from the EPA WaterSense Program. I mean, I think we have to estimate the life cycle of this product because we didn't have any other data. So you know, we would like to be able to create better data about the life cycle of these products, but you know, we need data from either industry or some other source in order to do that.

So you know, we'd be open to data saying that the life cycle is longer, or data saying that the life cycle is shorter, but I mean, I think then manufacturers sent in comments, too, that the life span of these products could be much longer, and they would be subject to like more harsh water conditions. So you know, we would like to be able to get that information, as well, for our program.

MS. LOPEZ: Thank you. Are there any additional comments? Let's continue onto the next topic. Product Development Trends. During the ITP we

asked if there are any new, upcoming diverter developments.

Respondents indicated product development efforts are proprietary. So for discussion, is there a consumer preference driving manufacturers to develop or redesign a particular type of Tub Spout Diverter? You can go ahead.

MR. DESMOND: Jerry Desmond, on behalf of PMI. I would just point out it's slightly different than, you know, customer preference, but we do note that, as opposed to manual Tub Spout Diverters, automatic reset diverters address a potential public health and safety issue having to do with thermal shock.

And an awareness of that amongst the manufacturers could be identified as a -- one of the driving factors towards movement toward automatic reset diverters. So that's a little off, but I'll throw it in there.

MS. LOPEZ: Thank you, Jerry.

Go ahead, Ed. Go ahead.

MR. OSANN: Yeah. This is Ed Osann. We noted the comments from PMI referencing thermal shock, but we didn't see how they were at all supported. We're not -- it's not clear what the -- how the consumer interface with the shower differs in a way that would either

heighten or reduce the potential for some thermal excursion. So we'd be looking for more information on that.

MS. McLEOD: In response to thermal shock, so when a customer enters a tub shower the expectation we have on automatic reset diverter -- type diverter system setup, the expectation is that the tub turns on first.

And if that does not happen you will be blasted with hot water, cold water. I've had it happen to myself, as well, and it's definitely a hazard for a slip and fall hazard or it could be a slip hazard, depending on how old your *16:36:10 is.

So there are definite potentials when you have that sort of expectation with what the product is supposed to perform. Thanks.

MS. LOPEZ: Thank you. Anyone else? We have someone online?

MR. DESBOROUGH: Oh. *16:36:33 indiscernible. Yeah. Hi, This is Frederick Desborough.

MR. BAEZ: That's thermal shock right there.

(Laughter)

MR. DESBOROUGH: I'm a consultant contractor with PMI, and I support Cambria's comments, basically. *16:36:44 people are thinking *16:36:50 devastating

potential for injury, either hot or cold water *16:36:52 when the water is coming directly out of the showerhead operating the valve serving the shower device.

So there's a very important factor and has been highlighted by PMI. Just wanted to make that comment, clarification.

MS. LOPEZ: Thank you. Is there anyone else? There's someone else.

MR. BAEZ: Online, another comment from Mark. Mark, did you have a comment?

MR. MALATESTA: No. I raised my hand to answer that question from the NRDC, and I think it's been clarified. But yeah, if it wasn't stated, you know, it's not just hot water. It's cold water. It's hot water. It doesn't matter.

If you're in a bathroom and you are surprised by water coming out of a showerhead and now it's wet and now you have hard tile, hard tub, there's definitely a chance for injuries. And if you want to take it the next step, definitely a chance for lawsuits.

MS. LOPEZ: Thank you.

MR. WHITE: Bo White, with the California Investor Owned Utilities. I have a question for

manufacturers and PMI. It sounds like if we're saying that there's an expectation for the water to come out of the tub spout, does -- it seems that the argument is that automatic reset diverters are very common for tub spouts.

Otherwise, the customer wouldn't have that expectation. So can anybody speak to what percentage of diverters that are in tub spouts are automatic, versus manual?

MR. DESMOND: If that's okay to have a quick response and --

MS. LOPEZ: Yeah.

MR. DESMOND: Jerry Desmond, on behalf of PMI. You know, my understanding is we don't have firm numbers, but the vast majority of new Tub Spout Diverters that are manufactured and sold by our members are automatic reset diverters.

You know, so there are, of course, legacy systems. But again, with the new ones the vast majority are automatic.

MS. LOPEZ: Thank you.

MR. DESMOND: I would say at least that.

MS. LOPEZ: There's no additional comments. So we'll continue onto the -- oh, we've got one.

MR. BAEZ: Robert --

MR. PICKERING: Yes. This is Robert Pickering from ERG. We had received a lot of these similar comments during our Notice of Intent period for WaterSense. And one of the questions that we sort of had trouble answering, there's two questions, actually.

One is, if the auto reset function is so important in protecting health and safety, which I -- you know -- I understand the technical validity of the statement, but if it is that important then why is it not required by the ASME Standard?

You know, the ASME Standard only requires that on our reset diverters that out -- that market that those on our reset diverters have that function. So it doesn't necessarily require you to actually function that way.

The other question was, you know, when we tried to answer the question that Bo White just asked about, what percentage of products on the market are auto reset, we found that this feature is not something that is marketed or advertised or anything by manufacturers.

So it seems like if it's that important of a function and that the user is expecting their diverter to function this way, why is it not promoted to the actual end consumer.

MS. LOPEZ: Thank you. Any additional comments? Go ahead, Jerry.

MR. DESMOND: Just one observation on the line the discussion is taking place is that in many instances the automatic reset diverter is not being purchased by a consumer at retail, but it's part of the -- you know -- you aren't looking at that, and it's not a feature that you're necessarily going to see in many situations.

And it's something that's in the new construction or a remodel. So it's not a well-known, like a faucet or a showerhead or a toilet in your home. You're not looking at your -- you know -- a common citizen in California isn't looking at them as a consumer option in many instances.

MS. LOPEZ: Thank you. Go ahead.

MR. OSANN: Yeah. I'd just reiterate the point. I think this scenario is not well-supported. The scenario described by the industry would suggest that a homeowner's diverter is going to be, you know, surreptitiously changed from an auto reset to a manual reset without their knowledge and they're going to step into the tub the next time and get a surprise.

The expectations of the consumer are set by the consumer's own experience, and no adults that I

know will knowingly get into a shower expecting hot water to arrive before the hot water does arrive. And again, this does not seem to be a well-founded assertion that a manual reset is a particular threat to consumer safety.

MS. LOPEZ: Go ahead.

MS. McLEOD: I would also like to continue the comment earlier on this topic. It's not just adults. It's children. You have children; put them into the hot tub, turn the hot tub on and the shower turns on automatically on too many people. So it's not just adults. It's also other people.

This is a situation I've personally encountered and *16:42:59 has encountered and that's why we had included it as part of the *16:43:01, to protect public safety, safety of the *16:43:08.

MS. LOPEZ: Thank you. Do we have comments online?

MR. BAEZ: Online, Mark Malatesta, did you have a comment?

MR. MALATESTA: Yeah. I think -- *16:43:21 comments to Robert's comment. The reason it's not marketed or anything is because in its common entry perception it is user perception. So it's not a feature. It's just something that you need to do for

the safety of humans.

And to Ed's comment, have you ever spent a night in a hotel? You mentioned just residential. Well, we sell products for everywhere. You are in a hotel you don't know exactly how the shower is -- works. I don't.

But when I turn the handle on I expect the water to come out of the tub spout and not the showerhead.

MS. LOPEZ: Thank you. Do we have any additional comments?

MR. MALATESTA: Actually, I shouldn't say "I." I think the industry perception that everyone -- you know -- you can't change it, what's been out there for whatever many years. It is what it is, but I think that is common perception nationally.

I know this is a California topic, but -- today -- but yeah. Anyone who turns on the shower and you go to a hotel, you're expecting the water to come out of that tub spout and not out of the showerhead. And otherwise, like I've said before, it's -- bad things will happen and whatever.

MS. LOPEZ: Thank you, Mark. Do we have one more comment online?

MR. BAEZ: Yeah, another comment from Robert.

Robert, do you have a comment?

MR. PICKERING: Yeah. I want to respond to PMI's I guess response to my questions, and Mark's, as well. For PMI, you said that it's not a feature that's advertised to consumers because the end consumer isn't the one necessarily purchasing the product.

Well, we investigated technical specification sheets and things that would be viewed by plumbers or home designers or home builders, people who do care about that information. So you know, again, I find it hard to believe that that's not shared anywhere.

You know, Mark's explanation I guess would provide a little bit more reasoning why it's not advertised, but if it is, I guess the unofficial standard within the marketplace that lies in -- actually, the standard within the ASME/CSA Standard, is it that important to health and safety that it should be in the National Standard that controls these products.

MS. LOPEZ: Thank you. You have one more comment?

MR. BAEZ: Frederick, do you --

MR. DESBOROUGH: This is Frederick Desborough *16:45:50 indiscernible statement. I think the -- just for clarification -- the risk *16:46:02 tough spot --

specifically *16:46:05 and they do leak on this tub spout type mechanism, but that column of water, which is *16:46:15 that column of water obviously needs to be -- come down hotter for the water to reset back to the tub spout function *16:46:35 end up with what *16:46:37. I just wanted to clarify so that people on the fence could *16:46:41

MS. LOPEZ: Thank you, Frederick. We had trouble hearing you. We couldn't understand most of what you said. If you could provide that in the docket, that'd be great. Are there any additional comments?

So let's move onto the next topic, Maintenance, Operation and Function. We asked about shower durations during the ITP, and WaterSense provided in their comments and also on their NOI that the average duration of a shower is 7.8 minutes, and that the typical number of showers per capita per day is 0.70 showers.

Then we asked for descriptions of various types of diverter mechanisms. Respondents indicated diverter mechanisms varied by diverter type and by manufacturer. We also asked for -- we also asked if there are factors that can cause diverters to leak. Respondents indicated that hard water causes diverters

to leak over time.

So for discussion I've asked, are the shower durations and the use values representative of California, and how does industry define the various types of diverter mechanisms, such as lift gate. I don't know if you guys use that term, positive shutoff.

And are their -- and then are their products tested against other water quality characteristics, other than those in the test procedure. And I'll open it up for comments.

MR. DESMOND: Seems like I go first.

MS. LOPEZ: Go ahead, Jerry.

MR. DESMOND: I wouldn't mind somebody else going first; be find with me. Jerry Desmond, with PMI, on the third discussion item. I think we have confirmed that the only water quality characteristics that we've tested our products to are in ASME/CSA. So we have an answer to that one.

MS. LOPEZ: Thank you. Is there anyone online?

Ms. McLEOD: In addition to water quality, if you have a 0.0 leakage, it actually could accelerate the wear because you're basically keeping that sealant engaged, and it's in that engaged point is they're getting a lot more pressure and it actually could

potentially decrease that product's life span if it's stuck in that engaged cycle *16:48:52 locked situation for longer periods of time.

MS. LOPEZ: Thank you. Anyone else? All right. So let's continue onto the next topic, Water Savings and Efficiency. During the ITP we requested input on the water savings factor mentioned in WaterSense's NOI, and requested studies showing water savings.

WaterSense's NOI provides water savings data and field studies related to leakage. It was noted that a study referenced in the NOI was not available to the public. WaterSense has submitted data in regards to that study in our Commission's docket.

To conduct water savings analysis the Energy Commission would apply a percentage based on households in California compared to households in the U.S. to the data in WaterSense's NOI. So for discussion, can the data be extrapolated to be representative of California savings, and are there other estimates of water savings out there? I'm going to open it up for comments.

Ms. McLEOD: The studies from the EPA only represent about four different areas. So it's not necessarily representative of the nation as a whole, and definitely not representative of California. I

don't believe any of them were in California.

Some of the folks that actually did the studies themselves, you can, you know, dig a little bit deeper and read them. The information is definitely lacking. They're a good start, but they don't really encompass everything that you do need to know to have a relevant study.

But regardless of those studies, you're changing the test. You're not changing what's necessarily happening in the field, and so you need to compare the water savings from your -- right now in your test to what your planned test is going to be.

And so if you do that and then you also take into account some of the other studies had mentioned if you divert the water, if you do the diversion, some percentage of the water will go back to the showerhead.

So if you take that person's one study that said I think it's about 30 percent goes back to the showerhead. So if you do that, compared to a 0.0 now versus a .01, you're going to be saving the equivalent of a two GPM showerhead in California.

It is one-and-a-half second shower, so to spend another second-and-a-half in the shower, that's like what you're saving, but in reality, you're probably not even going to be saving much because the

Tub Spout Diverters, the replacement rate is a tiny percentage of people that are actually replacing them.

And then also, there's a huge increase in tub shower removals to shower only situations. So you're not going to have that one-to-one replacement rate on the savings, as well. So it definitely is a topic that needs to be discussed, and specifically, you know, in California, and a lot of details need to be hashed out before you can actually, truly verify what the test savings will be.

But then, in reality the long-term savings is going to be very different, depending on water quality installation, on what type of diverter is going to be, you know --

MS. LOPEZ: Thank you. Any additional comments? Do we have anyone online? No. Well, let's go onto the next topic in regards to costs. So Staff requested information on cost, such as cost per unit, the cost difference between products and with and without water-saving features, incremental costs to improve the device and water delivery costs.

No comments were received. For discussion: are there sources of cost data, and when considering your proposal as part of the ITSP, please identify the least cost pathway to comply. And I'll pause for

comments.

There's no comments. We'll continue onto the next topic. Market Characteristics. We asked about the current stock, market breakdown and historic and projected sales. No comments were received. Staff assumes the existing install base of one unit per household, which is equivalent to about 8.1 million homes.

Next, WaterSense stated that most lift type diverters and pull type diverters are characterized as automatic reset diverters. Based on this characterization and data from the Appliance Efficiency Database, Staff estimates 70 percent of the market to be automatic reset diverters and the remainder are manual reset diverters.

Staff also assumes new sales are equivalent to newly-built residential homes, retrofits, remodels and replacements. Respondents also indicated a significant increase in replacement of tub/shower combinations with shower only installations.

And during the ITP we also asked how small businesses will be affected, but no comments were received. And so here's a list of the questions that we can start with. So the Energy Commission is interested in receiving additional data on current

installations of Tub Spout Diverters, and are the values reasonable estimates for California.

And what is the source of this replacement trend? Is this trend representative of California and do small businesses in California play a role in the manufacturing sale of installation of these products? And I'll pause for comments. Do you have anyone online?

Okay. So we'll continue on to the next topic. During the ITP we asked if there were any features or designs that could prevent Tub Spout Diverters from meeting a maximum leakage rate that is below the current standard.

Respondents indicated that it would be difficult for an automatic reset diverter to achieve a 0.0 gallon minute leakage, since it would prevent automatic reset diverters from resetting to the tub position, which in turn prevents the column of water between the diverter and the showerhead to escape due to no pressure relief. This can lead to potential thermal shock to the next user.

WaterSense indicates that a two decimal point level of precision allowed a small amount of leakage up to 0.005 gallons per minute that can insure the automatic reset function is maintained. And so here

are some discussion questions.

I know we covered most of them in some other breaks, but again, I'll just ask these. How does an automatic reset diverter function? If you could explain the different diverter mechanisms. And explain what a hydraulic block is for the various types.

And is there evidence of thermal shock to users? Is WaterSense's characterization a reasonable assumption and are there products that can achieve zero leakage and that are automatic reset diverters? And now, I'll pause for comments.

Go ahead, Jerry.

MR. DESMOND: Jerry Desmond, on behalf of PMI. And I agree, some of the issues were addressed earlier on and won't repeat those, especially on thermal shock. But however, on the last of the, are there products that can achieve zero leakage rates, are not -- and then are automatic reset diverters -- we could say, we're not aware of any.

But also more importantly, maybe this is the opportunity to bring up -- and I believe I heard that Stephanie Tanner with WaterSense is on the phone, who could speak to it more specifically. We thought this would be the opportunity to bring to the attention the announcement.

And I think it was a week and a half or so ago, by WaterSense that a study is being sought to initiate a discussion, and I mean, Stephanie could talk about it more, but what I see from the announcement or what we see from the announcement is that WaterSense is stating that before moving forward with developing a spec for bath and shower diverters, that WaterSense is seeking to do two things in the study.

One is to determine if a nominal leak rate is necessary for the auto reset diverters to function, and if so, to quantify the minimum leak rate required. And we believe that that study and that look is really important, and that we are engaged at WaterSense, as PMI and our member companies, and that that is the study that should be looked at and the results ought to be brought part into this process, as well.

MS. LOPEZ: Thank you. Are there any additional comments in the room? Go ahead, Bo.

MR. WHITE: Bo with the Investor Owned Utilities, representing them. About hydraulic lock, the way that we look at it is that when you close your shower valve all you're left with in terms of pressure is maybe three or four feet of head from the column of water, and you're open to atmosphere at the showerhead.

So it doesn't seem like there would be an

issue of excessive pressure on a diverter that might be closed. And then related to that, with the diverter being closed and that column of water in the piping, the seal of the gasket is up against the metal.

So it's not as in contact with the water during that period, because part of it -- if it's sealed it's not touching the water. So maybe there might be more degradation when the diverter opens and closes, and is open between showers because then it could dry out and maybe scale could form.

And then the other topic of whether -- related to automatic reset diverters and whether they leak, at least one manufacturer told us that there is often designed a weep hole or passage way in the diverter to make it easier to auto reset at the end of the shower, and that might be causing leakage during the shower.

MS. LOPEZ: Thank you. Are there any additional comments in the room before we move online? Go ahead, Jerry.

MR. DESMOND: Well, maybe on two of the issues that Bo's bringing up. I do -- PMI does recognize and sees the discussion items on those two issues that Bo was addressing, as well in his group, auto reset diverter functions, how those function, as well as the hydraulic lock, and we will get more information to

provide and submit on those more detailed.

We see there's a need for more information and understanding on both of those. So we will be engaged on those.

MS. LOPEZ: Thank you. We would appreciate that.

MR. DESMOND: Yes.

MS. LOPEZ: Is there anyone else in the room? Okay. Let's move to somebody on the phone.

MR. BAEZ: Robert Pickering online, did you have a comment?

MR. PICKERING: Yes. I wanted to speak on behalf of Stephanie EPA WaterSense. So as PMI mentioned, we did post a research proposal on the WaterSense page for bath shower diverter, NOI, that, you know, we don't have any specific partners yet to help get that research conducted, but we're hoping that that research would be able to answer some of these questions that are being asked by CSE, as well.

Harry [sic], was there any other specific questions that you've asked that you'd like me to address? I forget exactly what you had requested clarity on from WaterSense.

MS. LOPEZ: Go ahead.

MR. DESMOND: If it's Jerry, I'm fine. Thank

you.

MR. PICKERING: Hey, Jerry. Sorry about that.

MR. DESMOND: No, that's --

MODERATOR NELSON: Okay. Are there any additional comments? So we have time if you want to discuss any additional topics. So following the ITP Workshop is the invitation to submit proposals, in which the Energy Commission will requests for Tub Spout Diverter efficiency standards.

We will conduct an ITSP Webinar on August 1st to explain the proposal process and the proposal template. Proposals may be submitted until September 1st of this year. Additional comments on this topic may be submitted to the Commission docket.

And here's a diagram showing the Appliance Efficiency Rule-Making Process. The blue box highlights our current position, and again, our next step is the invitation to submit proposals. So here's my contact information.

Please feel free to contact me with any questions, comments or concerns. You can also submit any new comments or submit new information via to the docket. This concludes my presentation and thank you all for your participation and time today.

MR. DESMOND: Thank you.

(Recess at 11:04 a.m., until 1:07 p.m.)

MODERATOR NELSON: So here's today's Agenda. We are -- our next topic, as I stated earlier, are Spray Sprinkler Bodies, and Sean Steffensen will be discussing that topic. To follow, we will have Irrigation Controllers, and then if there are any additional public comments that want to be made, we'll have time for that at the end of the day.

Throughout the presentations today, after a topic is covered we will open it for discussion. We will take comments in the room. You raise your hand or indicate that you want to make a comment. You'll be allowed to do so if you're in the room.

Please push the button on the mic in front of you and it will light up red, indicating that your mic is on. The acoustics within the room are a little difficult sometimes. So please attempt to speak clearly into the mic.

You may have to scoot forward a little bit to make it easier for everybody to understand your comment. Online, please use the raise your hand function and we will call out your name and ask you to state your name again and your organization for the court recorder.

And then if you having difficulties online

raising your hand, feel free to use the Chatbox and we will do our very best to get your written comment in the Chatbox. Okay. Now, I'll turn it over to Sean. He's going to cover the rest of the intro and he will take off right into irrigation -- I'm sorry -- Spray Sprinkler Bodies after that.

Sean.

MR. STEFFENSEN: Good afternoon. I'm Sean Steffensen. The flowchart addresses why we request the information and how we plan to use it. We need the information to define the problem, in this case an inefficiency.

The information provided helps then to define the solution. The scope and definitions provide the "what" of what will be included in the standard. How do we know what will and will not be subject to the regulation?

The Efficiency Metric provides the measure by which we can rank the performance of individual products. There can be more than one Efficiency Metric to consider. One or more may be chosen to develop a standard.

The test method defines the conditions under which the appliance is tested. Test data identifies the relative performance among the products and allows

consideration of the standard. Once these items are selected, scope, definition, test method, test data and standard, an analysis must be performed to understand the effect of the proposed standard.

Does the standard achieve significant water and energy savings while being cost effective and technically feasible? If so, that is a good standard. If not, then we should reconsider the data and modify the standard to meet the criteria.

Is this the right keyboard? Oh. So we're at the beginning of the public participation in this Pre-Rulemaking. We've received your comments and now we're here to vet the information, as I described on the previous slide, and I will be looking forward to participants building off this set of information to submit proposals to us for our consideration. Do you know where the presentations are?

MODERATOR NELSON: It's on here *16:07:55

MR. STEFFENSEN: Okay. Continuing on. This is Sean Steffensen. I'm a mechanical engineer with the Appliance Outreach and Education Office. Today, I will be here to discuss the information we received for the Spray Sprinkler Bodies as part of the Invitation to Participate.

I will discuss the purpose of the Request for

Information and how your responses support the development of proposals for the Appliance Efficiency Standards. At each topic I will present a summary of responses received and allow discussion amongst stakeholders and the Commission. At the end I will present the next steps in this rulemaking process.

On March 14th, 2012, the Commission issued an Order Instituting Rulemaking to consider standards, test procedures and labeling requirements for appliances. Staff held the Invitation to Participate Workshop on May 11th, 2017, to request information that will shape the Commission's Phase 2 standards. Staff will discuss responses to the comment period that closed June 16th, 2017.

The ITP covered a broad range of electrical, mechanical and water appliance that consume a significant quantity of energy and water in California. Today I will focus upon the information received for the Spray Sprinkler Bodies.

Other presentations will review the information received for the other topics. I would like to thank those that responses to the ITP and provided comments to the docket. Those included the California Investor Owned Utilities, the Center for Irrigation Technology, Hunter Industries, the

Irrigation Association, Irrigreen, the Natural Resources Defense Council and the U.S. Environmental Protection Agency.

This list shows the information requested at the ITP Workshop. Today, we will review responses to each topic and allow discussion of the responses or additional comments. So let us begin. Here's the ITP slide on Product Scope and Definition.

What's in, what's out, what products should be considered for a standard. How should the products be classified? What names should be used? What features define such products and are there existing definitions that are relevant?

And I'll just point out here, there are a considerable number and type of sprinkler heads that we may consider today, and this is an essential part of this process, is to identify in your proposals what should and should not be covered with a standard.

Here are the comments received. Respondents noted that the ASABE/ICC 802-2014, the Irrigation Association, Smart Water Technologies and the U.S. EPA WaterSense draft specification on Spray Sprinkler Bodies contain definitions on irrigation equipment.

Respondents also provided comments regarding what should be within and out of the scope of the Spray

Sprinkler Standard. I note that there seems to be a lot of agreement on the scope and definitions. Let's take a moment to review the comments before I turn to the discussion slide.

So again, I think the Spray Sprinkler Body -- or term is widely used, in that there is a lot of -- as far as what should be used to define these products, there's a lot of consistent commenting on that.

I have listed questions here to help our discussion. We can consider one or more questions, and in any order. Please keep your comments brief so as to allow all to respond within the five-minute period. Additional comments may be made in writing to the Commission and are encouraged.

I can also flip back to the previous slide to help with the discussion. So here, I'd like to bring up what it is we think could be within the scope of a proposal, how best to divide up those devices and just open it up to the floor to discuss scope and definitions. So I guess somebody wants to --

MR. PIKE: Hi. My name is Ed Pike, with Energy Solutions, on behalf the California IOU Codes and Standards Team. And I think that you have hit the nail right on the head by the need of Spray Sprinkler Bodies is the place to start for irrigation devices.

I mean, I understand you have a broader scope of authority, so that's not necessarily, you know, the end of the process. But that seems to me where most of the water is used in irrigation. With pressure regulation there's a great opportunity to avoid lots of different mechanisms of wasting water through over-spray, misting, over-application rates.

And the pressure regulation seems to be a very promising opportunity to do that, and my recollection is that the DWR convenes independent technical accounts -- sorry -- Independent Technical Panel had recommended looking at that, as well as also check valves. So definitely we would encourage you to consider both of those two options.

MR. STEFFENSEN: All right. Thank you. We'll continue on with discussion, looking to others.

MR. OSANN: Hi. This is Ed Osann, with the Natural Resource Defense Council. First, let me say that we strongly support the Commission's initiative in this area. We believe this is a very important product category, very promising in terms of potential savings, and probably a priority of the three water-using products that the Commission currently has assigned docket numbers for.

And we also believe that pressure regulation

and low-head check valves are important measures to be encompassed by the standard.

MR. STEFFENSEN: Are there people online? Well, thank you for the comments. One thing I would like to note in contrasting some of the definitions in some of the areas out there is what we would pass in California would be a regulation that would provide mandatory requirements for certain types of equipment, those that are within the scope, to contrast that with the WaterSense Program, a good program, that provides voluntary standards for those that choose to select and then bear the WaterSense label.

So we do want to -- I want to emphasize that there will be a lot of care on the Commission's part to try and define what exactly we will regulate and to try to very clearly define what we will not regulate, to define what is ready and what is not ready.

And so I would -- for those in the room, and I apologize to those online, I mean, I'll hold up a couple sprinkler heads and ask what are these Spray Sprinkler Bodies. I mean, it's a very -- and I'll flip -- maybe I'll flip back to the other slide.

So that's -- so I'm holding up a sprinkler head that's on the very upper left-hand side, and I think this clearly meets the definition of what a Spray

Sprinkler Body is per the ASABE test procedure.

It appears to be an Irritrol I-Pro series sprinkler head. And I believe it does contain the typical devices, such as a retraction spring, a riser, a body itself and a means to attach to a plumbing system.

So those are items -- and some of those terms I threw out there are not within the definition of the ASABE test procedure, you know. So if in a proposal those stakeholders that are considering proposing, we would want to know how to define what is in versus -- and I'll hold up another sprinkler head.

This is one that I don't think WaterSense has considered. It's -- is there a picture up there? It's the brass body sprinkler head. It does not have the retraction springs. It's made almost entirely of brass.

And as I would read the definition of the ASABE test procedure and the definitions for Spray Sprinkler Body, I would tend to conclude that if we adopted that definition in whole, that this would be included.

So again, just to point this out and make a comment myself on this part of this proceeding that we want to carefully consider what will be in and what

will be out, and what definitions we will use. So again, if anyone would like to comment further upon this, this is I think a very essential area to this rule-making.

And of course, there are various other ones, shrub sprinkler adapters that would go onto the end of a sprinkler riser to just -- so a nozzle can be threaded on. That could potentially be another area where we want further clarification, request further clarification of what may be in or out.

Okay. I'll continue on. We're now on slide 10. We requested information on test procedures, and I will share your comments on the next slide. Respondents identified a number of test procedures. Pressure regulation can be tested by four test methods.

The ASABE/ICC 802-2014, a modified ASABE/ICC 802-2014 that was modified by WaterSense per their draft specification. The Irrigation Association stability test and the Irrigation Association SWAT Pressure Regulating Sprinkler test.

Commenters noted that some test procedure may be improved and suggested modifications. In the discussion I would like to explore some of the respondents' reasons for noting these modifications. The California IOUs identified anti-burst capability as

a major quality.

Staff reviewed Rain Bird and Hunter websites and found additional test procedures that these manufacturers used internally to develop products and measure their products' performance versus competitive products.

These tests include durability, burst, surge, wind drift, pressure, coverage and cap leak. This information suggests additional Efficiency Metrics may be available to evaluate the water efficiency of these devices.

I would like to discuss and receive comments. I have also included some discussion points here, as well as, as you see in the middle of the slide, manufacturer internal product development tests. I have some end notes at the end of this presentation as to when I refer to these manufacturer development tests, where you could find those for more information.

I'd like to open up -- the floor up to discussion of test procedures. Okay, Ed.

MR. OSANN: Ed Osann, with NRDC. We noted that in the record created here that the water sense program submitted a recommendation, largely, primarily around the desire to maintain consistency or compatibility of test procedures.

That's a recommendation that we share, recognizing that the differences between the programs, the voluntary nature of WaterSense and the regulatory nature of the CEC Program notwithstanding, there really will be advantages I think for the industry from having -- and I'm choosing words here -- I would say compatible test procedures, if not identical test procedures.

And I'd say that to point out the difference in that while if they were identical that would be great, but they probably don't have to be identical as long as they are reasonably compatible. And as an example, as a for instance, if one test procedure calls for measuring -- for three measurement points and another -- and the other test procedure calls for five measurement points, those aren't particularly incompatible.

More significant difference would be one test procedure calling for flow measurement through a needle valve and another test procedure requiring flow measurement through a sprinkler nozzle, in which case the results of one test would not be -- would really not be representative or acceptable under the other.

So I think it's those major forks in the road that need to be resolved early on, and that

compatibility be the major goal here. I think there are a few details that are still sort of outstanding with regard to the test procedures.

From our perspective, we believe that WaterSense made a great deal of progress with this product, and in trying to make advances in the test procedure they have shifted the basis of the performance metric from pressure to flow.

We've reviewed the reasons that they stated for doing that and we find those to be acceptable. They have modified the ASABE test procedure to use a needle valve to regulate flow. We understand their pros and cons, but we reviewed WaterSense rationale for that and find that to be acceptable.

And we think they did a great, great job in sorting through some of these issues that has resulted in a test procedure that is generally replicable. There are some remaining questions relating to the final resolution of the WaterSense specification, but I think they'll probably come up in some of the other slides that we've got here beyond this point.

MR. PIKE: Hi. Ed Pike speaking. And I just wanted to follow up on Ed Osann's comments about the metric, the pressure versus the flow, and I would agree that, you know, either one should be capable of

providing indication of the product performance.

And one thing I want to note is, when measuring flow versus pressure it's harder to measure flow and the variability of flow will be less than the variability in pressure. So you're looking for probably a narrower tolerance.

So the EPA Test Lab used instrumentation that had a very good level of precision that was tighter than the IA procedure, which I think EPA had initially proposed to follow in terms of accuracy and resolution. So I think with the measure both of flow that's a level of precision accuracy that the University of Florida achieved in their testing for U.S. EPA is a good benchmark to aim for.

MR. STEFFENSEN: Is there anyone online that would like to make a comment? No. Thank you for your comments. Moving on, now, to sources of test data. We asked for various sources of test data to explore the differences between different models and products, and also, case studies showing before and after the implementation of water saving features.

Comments are shown on the next slide. Thank you for providing these sources of data and discussion of other sources of data. On the next slide I note case studies showing reduction in water use after

irrigation retrofit with various SSBs.

There are quite a number of various studies, some sponsored by manufacturers, others by utilities looking for water savings. These all show significant water savings using various techniques. Staff would request additional case studies to show the various water saving capabilities and features.

And I've put the end notes in to indicate where these studies can be viewed for further information. So I'd open it up now to, are there additional sources of test data which show the relative performance of these products and water saving features?

I don't see any comments in the room. Any comments online? Okay. No. Okay. We'll move on. This is an essential part of the rulemaking, is to show what the savings will be. It goes into our cost-effectiveness and technical feasibility and LOCs, as well as noting that there will be products available by the time of the effective date.

I think we do have some good sources of data, but we always enjoy and like to see more. So Staff requested information on existing and developing standards for Spray Sprinkler Bodies. These are some of the comments.

The U.S. EPA and the California IOUs listed the WaterSense draft specification on Spray Sprinkler Bodies. That's a standard in development. The U.S. EPA provided an update for the specification and it's in the process of being finalized and they expect products labeled with their WaterSense label to appear by the end of 2017.

The U.S. EPA is also working with the ASABE to update the 802 Standard. The California Model Water Efficiency Landscape Ordinance, another standard that's out there that has to do with what must be installed at the time of new landscaping.

It requires SSBs to comply with the 802 Standard as well as have drain check valves. The IAPMO Green Code and the International Green Code construction require matched precipitation rates and other requirements.

So Staff would like to discuss if there are other relevant standards for SSBs. And again, these standards do show a variety of approaches to water savings. Open it up to the floor.

MR. PIKE: Hi. Actually, I'm not sure if this fits under this slide or a previous one, but you're probably already aware of this, but there's also the Irrigation Association Protocols for check valves.

MR. STEFFENSEN: Oh, as far as the standards. Okay. Well, we note that. Thank you. There any other comments in the room? Other comments online? Okay. Staff requested information on product lifetimes. Staff received no comments.

Staff estimates product lifetimes as 10 years, based upon a doubling of the warranty period for SSBs. I've noted in the end notes the two manufacturer websites that show warranty periods. I open it up to comments upon what would be a reasonable product lifetime.

This would go into studies of cost-effectiveness. Any comments online? So moving on, we received a comment -- oh. We received a comment regarding a sprinkler head that's -- so we're looking at product development trends.

So we received a comment regarding a sprinkler head that had a digitally controlled head with embedded software. Staff found other product trends for review of manufacturer literature. Manufacturers claim to improve the durability and water seal of the wiper seal, also, enhancements to extend the durability and product lifetime that could lead to water savings.

New nozzle designs, larger droplet size to discourage evaporation and wind drift and provide more

even distribution of water, spray patterns to reduce over-spray in square and narrow landscape areas are other examples of product development trends.

Another product development trend is to match precipitation rate nozzles to improve water distribution and reduce runoff and over-spray. So I'd like to open it up here to any other product development trends that people would like to comment upon. Seeing no comments in the room, are there comments online? Oh, good, we did get a comment.

MR. BAEZ: Online is Stephanie Tanner. Do you have a comment, Stephanie?

MS. TANNER: Yes. This is Stephanie Tanner from the EPA and WaterSense Program. Are you considering including criteria for nozzles at all as part of the Spray Sprinkler Bodies or just criteria for the Spray Sprinkler Bodies?

And I see lots of comments in your presentation about nozzles and things that are controlled by a nozzle and other kinds of tests. And I just -- just for clarity's sake, are you -- you know -- would all of those be included in your criteria, or just things that control or are just related to the bodies, and to the nozzle itself? Or you don't know yet?

MR. STEFFENSEN: Thank you, Stephanie. That's a good question. Where we are at, at a very early stage of this Pre-Rulemaking. We're trying to gather as much information as we can to look for as many opportunities that there are with this line of products.

We know that in the definitions of ASABE there are not nozzles included; they're specifically excluded from the Spray Sprinkler Body as far as part of that mechanism. So if we were to strictly keep with just Spray Sprinkler Bodies the nozzle would not be considered. So but yeah, we're --

MS. TANNER: Okay.

MR. STEFFENSEN: -- we're gathering information. We're seeing what's out there for either a rulemaking that could occur next or after in a subsequent rulemaking. So we're -- as we gather all of the spray --

MS. TANNER: Okay.

MR. STEFFENSEN: -- group of stakeholders together we're just casting as wide a net as we can.

MS. TANNER: Okay.

MR. STEFFENSEN: Thank you. Any additional comments?

MR. OSANN: Sean?

MR. STEFFENSEN: Yes.

MR. OSANN: Ed Osann, with NRDC. I think that nozzles is a component that would be good to come back to when a bit more work has been done with the product and with the test procedures. I think the Commission would be wise to focus on Spray Sprinkler Bodies, per se, and the performance and attributes of Spray Sprinkler Bodies that can improve efficiency, such as pressure regulation and low head check valves.

So I think the upshot is that high efficiency nozzles would be addressed at some point in the future in separate rulemaking.

MR. STEFFENSEN: Thank you. It does seem that the devices are treated separately in the test procedures than what's out there, and they are somewhat studied differently as two separate efforts that we can see from the U.S. EPA's work on these devices. Thank you for that comment, Ed.

MR. STEFFENSEN: Staff requested information on how Spray Sprinkler Bodies are used. This information we use to estimate water savings, as well as evaluate cost-effectiveness. Staff notes the information received from the commenters.

Staff notes that there are two methods to estimate the duty cycles methods to be used. The first

method is to calculate the duty cycle based upon the climate and the plants' water needs. How much water does a plant need? How long should the device run?

That would indicate how much total water would flow through the device. The other is to measure and observe how people manage their irrigation systems. What do they actually do per what they would know?

So it's taking a somewhat theoretical approach to an observational approach. And we would be open to understanding if there are other ways in which to study how people use Spray Sprinkler Bodies, with the ultimate goal of then understanding how much water flows through a device.

Staff requests additional studies to provide data as to the duty cycle SSBs. I would open it up to the floor as to how we could estimate the water usage. Okay. So I don't see any comments in the room. Are there any comments online?

MODERATOR NELSON: Sean?

MR. STEFFENSEN: Oh, sorry.

MR. OSANN: This question is soliciting information simply on irrigation, water use in California. I believe that the Department of Water Resources has made some estimates of total outdoor water use.

I believe some of those estimates were reflected in the report of the Independent Technical Panel that was filed last May, May in 2016. So that could be a reference.

MR. STEFFENSEN: Great. Thanks for the comment. Are there additional comments in the room or online? Okay. Moving on, the U.S. EPA and Cal IOUs provided estimates of the performance of pressure regulated SSB versus non-pressure regulated SSB.

The U.S. EPA estimates savings of about 11 percent. The project PRS, Pressure Regulation Study, provided savings of up to 22 percent, depending upon the input water pressure. Are there other estimates of water savings due to water efficiency features? We'll pause now to provide comment upon this item.

MR. PIKE: Hi. This is Ed Pike, with Energy Solutions. And this is --

MS. LOPEZ: From the California IOUs?

MR. PIKE: -- representing the California IOUs. And so we've been looking into that question and it seems like the U.S. EPA WaterSense test data is a really valuable source of information on how much the flow rate does change with changes in inlet pressure.

And we've also been looking into the typical inlet pressure in the State of California, and thank

CLCA for their cooperation in that endeavor. And I think that'll help provide a picture for California that's more specific to our state where we're likely going to find that the inlet water pressure is higher than the national average estimated by U.S. EPA WaterSense, and that the potential water savings are greater also.

MR. STEFFENSEN: Ed.

MR. OSANN: I'd just note that we provided for the record a review of the information filed by California urban water suppliers with the Department of Water Resources that included average system pressure, and we've provided to the Commission a citation to that database, as well as a summary of the population-weighted average system water pressure for the water suppliers in California.

MR. STEFFENSEN: Great. Thank you, Ed, for providing that. Are there any comments online? Staff seeks information as to the cost of SSBs and how costs may vary with the incorporation of water-saving features.

Staff received no comments. Staff performed research on SSB pricing and found an incremental cost of between $2 and $6 per SSB when pressure regulation and/or check values are included over those SSBs

without these features.

Staff seeks further information regarding the incremental cost of pressure regulation and drain check values, and other water-saving features. I'll open it up to comments. Are there any comments online?

MR. STEFFENSEN: Staff requested information as to the market penetration of water-saving features. The U.S. EPA estimates less than 10 percent of irrigation systems have pressure-regulated SSB. Staff requests additional estimates of water penetration and water-saving features. Other comments?

I guess just anecdotally, we're running an informal survey upstairs, calling various contractors. And one thing we're hearing is that as contractors learn about pressure regulation and drain check valves it seems that they are beginning to use those.

I don't know if that may fit better within a trend, but that's something that's coming back from some of the people that have contacted and participated in our survey. So again, just looking for an estimate of when we think a water-saving feature may be incorporated into and installed in a irrigation system.

Any comments? Moving on. Staff received comments identifying the manufacturers of Spray Sprinkler Bodies, as well as information regarding the

specialties of some manufacturers. Are there other manufacturers of Spray Sprinkler Bodies besides those listed?

Are there other characteristics Staff should consider in developing a standard regarding these manufacturers or the way the market may be organized? Just open up to comments. No comments online? Slide 26.

The California IOUs commented that the supply chain length of -- what is the length of time from when an order is placed until delivery to a retailer, and it's believed to be several months. This would be important in setting an effective date as to how quickly stock could be updated to meet a proposed standard.

So we would look for comments upon this. The distribution of Spray Sprinkler Bodies also varies, depending upon if the SSB goes to a homeowner, to a product distributor, to retail sales or to irrigation contractors.

Are there other supply chain characteristics Staff should consider in developing a standard? Comments online? No. Small business are defined by government code. Small businesses mean a business activity that is both the following: independently

owned and operated, not dominate in a field of operation, and there are some other characteristics and details that I won't go into here.

But what we're looking for is who in a sense could be affected by a regulation on Spray Sprinkler Bodies, and how. So we did receive some comments that irrigation distributors and retailers may be small businesses.

Small business may also purchase irrigation equipment. So we would seek comment as to what additional types of small businesses may be affected by a regulation regarding Spray Sprinkler Bodies. No comments?

Staff seeks information to estimate the sales of SSBs in California. No comments were received. Staff estimates 21 million SSBs are sold per year in California based upon a 10-year lifetime and 210 million installed base.

The estimation methodology and sources of assumption are shown on the next slide, where I would like to discuss and get feedback. So these assumptions, very basically, are there's a study from the CPUC that says that 72 percent of homes have an automatic irrigation system.

Department of Finance, California Department

of Finance says there's about 8.1 million single family homes in California. And looking at roughly the square footage and trying to make assumption of how many SSBs would be used to cover the average size irrigated area per home, maybe 36 SSBs.

So again, very rough numbers to get a very rough estimate of perhaps how many SSBs are in California. So we take those numbers and multiply them all together. We -- it yields about 210 million SSBs. And this number's important because, of course, we want to try to predict the sales.

We have to run an economic analysis. We have to run an analysis on what the water savings would be. So we look for comments as to how this estimate, either the methodology, I mean, should I consider something else in addition to those three numbers I just rolled off?

Perhaps they should -- the calculations should be done in a different way. So we're looking for those kind of feedback to further refine the estimate. And of course, the 10-year design life comes into play because we want to estimate about how often somebody would replace a spray sprinkler head. So that allows us an estimate of the yearly sales.

Ed?

MR. OSANN: Ed Osann. And when you see these estimates on this slide, this is slide 30, actually, it's 30 on the handout and 29 on the screen in the room, I take it these are for single-family homes?

MR. STEFFENSEN: Yes.

MR. OSANN: So multi-family and commercial applications would be in addition to those?

MR. STEFFENSEN: Yeah. That would be something -- notice, that we're not limiting the scope of the regulation to a residential application, but to try to bound or provide a rough number or a magnitude estimate of Spray Sprinkler Bodies.

That was what this effort went to. That's a good point, to say that there probably are more than --

MR. OSANN: More.

MR. STEFFENSEN: -- more than these, yes.

MR. OSANN: More, for sure.

MR. STEFFENSEN: Yes. Any comments online? So now, I'd like to open it up to any additional discussion topics. We are running somewhat ahead of schedule. I mean, I would say we could probably open up to as much as five minutes or, I mean, as long as you may need, perhaps. Anyone would like to make some general comments?

MS. ANDERSON: So Mary Anderson, representing

the California IOUs. The California IOUs proudly support the Energy Commission Staff efforts to develop Title 20 Standards for Spray Sprinkler Bodies consistent with the direction provided by the California legislation.

We have been collaborating with the Energy Commission to evaluate potential options for Spray Sprinkler Bodies since 2015, and we look forward to finalizing this role-making and enacting a standard for California.

MR. STEFFENSEN: Thank you. Yes.

MR. OSANN: This is Ed Osann and NRDC. Just a few comments regarding what might be considered open questions yet that remain with regard to the WaterSense specification, and how that might be reflected on or distinguished from what we're doing here, what the Commission is intending to do here with this regulation.

In the WaterSense draft specification the level of variation between the flow at recommended pressure and the flow at maximum pressure is proposed to be 15 percent. We think that may be a little bit higher than necessary.

We think a little bit lower number might be a better fit with the test data that was actually

obtained by WaterSense. Perhaps 12 percent would be a better fit. We also would draw attention to the somewhat counterintuitive phenomenon that the maximum flow was not always found to be at the maximum test pressure.

And so a performance criteria that lists the greatest amount of permissible variation should probably be directed to any test of pressure, rather than simply the maximum test of pressure, which was stated in the draft.

There's also a question about the flow rates at which the tests are to be conducted with WaterSense proposing a flow rate of 1.5 gallons per minute as the base flows. The Commission has sought two flow rates, two additional flow rates, and others who commented on the WaterSense specification supported at least one additional flow rate, in addition to 1.5 GPM.

We think that probably does make sense, to test an additional flow rate, probably a lower flow rate. And there is I think still an open question about the required accuracy and the documentation of calibration of testing equipment, as per the University of Florida, who think that greater accuracy in testing is both possible and desirable with this flow-based performance criteria that has been outlined by

WaterSense.

So I think these are all considerations for the Commission here, and some of these will be probably finalized by WaterSense in the months ahead, and the Commission can consider -- should carefully consider these matters, as well.

MR. STEFFENSEN: Anymore comments? Comments online? Oh, hi.

MR. PIKE: Hi. Ed Pike, in our positions representing California IOUs and -- okay, switching my microphone. So I just wanted to point out that it's -- I think it's great that you're undertaking this process.

Obviously, you're kind of at the beginning of the process. One thing that really is beneficial here is that I think there is a good amount of data to show that these standards, potential standards that you're considering are cost-effective.

They are feasible. They save significant amounts of water based on the testing done by U.S. EPA; other sorts of studies. So I think that definitely does show that you are headed in the right direction, and in looking at the market it seems like the major manufacturers all offer a product with this feature.

So you know, it should be very practical to

achieve the potential savings from this product category. So again, it definitely seems like CEC's headed in the right direction here.

MR. STEFFENSEN: Thank you. Comments online? Okay. So we'll go over some next steps. The Commission will request proposals for SSBs for Efficiency Standards, tell us what's in scope, what the test procedure ought to be, what the standard ought to be. Provide reasons and rationale.

There'll be an invitation to submit proposals, a webinar on August 1st, 2017, and that'll explain the process and the template. The proposals may be submitted until September 1st, 2017, and you may address comments to me, Sean Steffensen.

Additional comments on this topic may be submitted to the Commission Docket 17-AAER-08. And again, a reminder as to where we're at in the process. We're early. We're here to listen to stakeholders, to gather all the best ideas and proposals to make a water-saving regulation in California.

I'll end here with my contact information, and then, again, there are end notes here that show the various studies and other items I relied upon in developing the slides, as well as the estimates, very -- more detailed map, presentation, or the estimate I've

tried to make for sprinklers in California.

So I'll end here and invite Ryan back to the podium. Thank you for your time today.

MODERATOR NELSON: Thank you, Sean. We'll take a 10-minute break, come back and serve up Irrigation Controllers.

(Recess at 2:00 p.m., until 2:14 p.m.)

MODERATOR NELSON: Okay. This is our last session of the days. For those just joining us, we're going to go through the introduction again. This last session will be on the Irrigation Controllers.

I don't think we have anybody new in the room, but just in case we do, we're going to cover it. Use the front exit of the building that you -- entrance that you came in through today for normal egress.

If there's an emergency use either one, the right or the left. If you use the right, other than that the alarm will sound. If there is an emergency we'll meet at the park across the way. Restrooms are located out in the lobby directly to your right, and if you need a snack there is a cafeteria upstairs on the second floor, just at the top of the stairs.

Throughout the presentation this afternoon after each topic we'll have a discussion period. Please limit your comments to five minutes per person.

If you're in the room, again, please push the button on the mic.

The mic will light up red, indicating that it is on. If you're online, use the raise your hand function and your name will be called. Please, everybody, please say your name and the organization you're with so that we can document your comments.

If you're having difficulties online, please use the Chatbox and we will attempt to get to your comment the best we can. One other thing, if -- everything said today is in the public record. If you want to submit something that's confidential, please contact Staff directly.

We have a process here at the Energy Commission for confidential information. Please be aware that anything supporting the rulemaking process and developing a standard would need to be in the public record. So we would have to aggregate that data or information in some way that we could make it publicly available.

But again, if you have confidential information, please contact us directly and we will start the process for working with you. Thank you. Sean, you want to come take the -- I'll hand it over to Sean to cover this flow chart once again.

MR. STEFFENSEN: Hello. Sean Steffensen, Energy Commission. The flow chart addresses why we request the information and how we plan to use it. We need the information to define the problem, in this case an inefficiency.

The information provided helps us then to define a solution. The scope and definitions provide the "what" of what will be included in the standard. How do we know what will and will not be subject to the regulation?

The Efficiency Metric provides the measure by which we can rank the performance of the individual products. There could be more than one efficiency metric to consider. One or more may be chosen to develop the standard.

The test method defines the conditions under which the appliance is tested. Test data identifies the relative performance among products and allows consideration of a standard. Once these items are selected, scope, definition, test method, test data and standard, then analysis must be performed to understand the effect of the proposed standard.

Does the standard achieve the goals of significant water and energy savings, while being cost-effective and technically feasible? If so, then it is

a good standard. If not, then we should reconsider the data and modify the standard to meet the criteria. Thank you.

MODERATOR NELSON: Thank you, Sean. The next slide shows a diagram of the Public Participation and Rulemaking Process. We're currently where the blue arrow is indicating, vetting information collected during the invitation to participate, and I thank you all for joining us and hopefully staying for the rest of this process.

Good afternoon. My name is Ryan Nelson. I'm an engineer with the Appliance Outreach and Education Office here at the Energy Commission. This afternoon I will be discussing the results of the invitation to participate for Irrigation Controllers as Phase 2 of the Pre-Rulemaking Process.

I encourage your comments and questions to further the conversation. There may be some questions that require additional time to answer appropriately, but please feel free to speak freely and comment throughout the presentation of the discussion points.

Today's Agenda will discuss the purpose, what information was requested as part of the ITP responses to the Request for Information. We'll have a time for general comments and then we'll cover the next steps in

the rulemaking process.

On March 14th, 2012, the Energy Commission issued an Order Instituting Rulemaking to consider standards, test procedures and labeling requirements for appliances. Staff held the Invitation to Participate Workshop on May 11th, 2017, to request information that will shape the Commission's Phase 2 Standards.

Today, we will discuss responses submitted during the comment period that closed on June 16th, 2017. Even though the comment period has ended, if you have additional information that you would like to submit, please feel free to do so today or to the Docket and we will do our best to consider that information.

During the Invitation to Participate we requested information on the following topics, and we will be discussing the one highlighted in blue below, Irrigation Controllers. I'd like to thank everyone who did respond to the Invitation to Participate, the California Investor Owned Utilities Codes and Standards Enhancement Team, or California CASE Team, the U.S. Environmental Protection Agency, or USEPA, Hunter Industries and the Irrigation Association Smart Water Application Technologies, or IA SWAT for short.

Below is a list of information that -- topics that we requested information on and we will be covering hopefully each of these today throughout the presentation. Okay. Product definition and scope, information requested.

How should products be defined or differentiated? What would be the scope for a water efficiency standard and what would the scope of a energy efficient -- what'd be the scope of a energy efficiency standard?

Definitions received were for weather-based irrigation controllers, soil moisture sensor-based irrigation controllers, traditional irrigation controllers, time clock, add-on ring, shutoff sensors and battery-operated controllers, which are similar to traditional time clock controllers. They just operate on batteries.

Discussion. Are there any other references that define irrigation controllers, other than those previously listed? What irrigation controllers should be included in the scope of a possible standard? How should a standard be structured or implemented? Any -- and time for additional comments, and I'll open it up for discussion.

Anybody like to make a comment? Okay.

Nothing in the room. Anything online, Carlos?

MS. URIGWE: Hi.

MODERATOR NELSON: Yeah, Daniela Urigwe, from Energy Solutions, on behalf of the California IOUs Team. So we think that -- think the Irrigation Controllers are a good product for standards of the Energy Commission, and we think that they could potentially be regulated in two stages.

So the first phase could include requirements for traditional Irrigation Controllers, those that don't currently have water-saving features, such as the traditional time clock. And the requirement could be to package those with a rain shutoff sensor and other features, such as being capable of accommodating water restrictions and meeting standby power limits.

And then once appropriate test procedures are available, second phase could require weather-based or soil moisture sensor-based Irrigation Controllers to be tested and meet performance standards based on those procedures and also meet standby power limits.

And then after that point, controllers without these water-saving features would not be included in allowable products.

MODERATOR NELSON: Thank you. Is there anybody else in the room or online?

MR. OSANN: Yeah.

MODERATOR NELSON: Ed, go ahead.

MR. OSANN: Yeah. Ed Osann, NRDC. We support the adoption of both energy and water efficiency standards for Irrigation Controllers, and appreciate the initiation of this rulemaking by the Commission.

Standby power consumption is fairly significant for this product. It may represent a large fraction of total power consumption, and for smart controllers there are likely to be several operational modes to be considered, somewhat like a set top box where there's actually a range between full functionality and completely off, but one or more interim operation modes to be considered.

In our view, a two-stage standard could possibly work if the first phase is confined to timer-based controllers, which are still probably the majority of sales in California. Timer-based controller -- a timer-based controller standard could address rain shutoff requirements, water restriction settings so that the operation of the controllers are more compatible with local irrigation requirements, and as noted, the standup, standby power requirement.

But phasing alone may not resolve the barriers to setting standards for smart controllers, and we can

talk more about that a little bit further through your presentation.

MODERATOR NELSON: Thank you. The next topic we requested information on pertains to existing test procedures and test procedures under development. Our questions there, existing test procedures submitted for the IA SWAT Turf and Landscape Irrigation System Smart Controllers, Climatologically-Based Controllers Eighth Testing Protocol, September 2008. Okay. Got through that one.

IA SWAT Turf Landscape Irrigation Equipment Rainfall Shutoff Devices, Testing Protocol Version 3.0, October 2008; the IA SWAT Turf Grass Landscape Irrigation System Smart Controllers Soil Moisture Sensor-Based Controllers, Laboratory and Operational Tests, Version 3.0, August 2011, and the USEPA WaterSense Specification for Water-Based Controllers, Version 1.0.

Under development, the Irrigation Association -- American Association -- Sorry -- the ASABE -- is that it -- American Society of Agricultural and Biological Engineers, ASABE, S627 is a new test procedure under development for weather-based and rain sensor shutoff controllers.

This is supposed to be a little more stringer

test procedure, and the IA ASABE is currently working on a new soil moisture sensor test procedure, and my understanding is as submitted it is currently in the beta testing.

On the Irrigation Association SWAT website product test results listed, two for rain sensors, nine for soil moisture sensors, Phase 1, and six weather-based sensors. Okay. So we're going to open it up for discussion.

I'm curious, the Energy Commission's curious if there are any test results available for the new IA ASABE S627 test procedure, and if there are, please submit those if possible. Are there test results available for new soil moisture sensor test procedure?

Are there any test procedures in development to measure standby active and standby passive power consumption for Irrigation Controllers? And then we would open it up for additional comments at the end. Take comments from the room first. Ed?

MR. OSANN: Could you go back two slides where you have the two test procedures under development? Yeah. Just to keep these straight, the first one relating to upgrading the test procedure originally developed by SWAT and large incorporated into the WaterSense climate-based controller specification, that

work is really well underway and I believe that test sites have been identified and contracted for to do field-testing, beginning even later this month.

So results are expected early in the fall, and I believe this final text of this standard is expected to be available before the end of the year.

MODERATOR NELSON: And you're referring to the S627?

MR. OSANN: Yes, the -- yes, the new test procedure for weather-based controllers, which is being proposed as a -- through the ANSI -- as an ANSI Standard. So good progress there, very good progress there, I think, to report.

With regard to the test procedure for measuring soil moisture-based sensors, I'd just observe that this has been underway for some time. The process has been marked by slow progress and predicted completion dates that have not been realized.

I believe there is going to be a published report of some sort available this summer. Whether that is for a -- at a clear junction of completed testing or simply the end of financing that carried on the current, you know, round of work, I'm not sure.

I think this is a case where the Commission, with its statutory mandate under AB 1929, really would

be well-served to engage all the participants and interested parties to develop a work plan, time line and associated resource needs for the timely publication of a test method for soil moisture sensor-based controllers that will allow the Commission to meet its statutory target.

Our recommendation would be for the Commission to be proactive here, really engage the stakeholders and to identify the resources that will be needed to complete this work. Those working in the field believe that the test procedure that has been identified tentatively is a relatively good one, and those who work in the field are quite optimistic about the role and functionality generally of soil moisture-based controllers.

But clearly, we can't move forward towards a standard without a published test procedure. So this is the knot that has to be untied here and we recommend that the Commission be proactive in addressing it.

MODERATOR NELSON: Thank you. I believe we have a comment online.

MR. BAEZ: Yeah. Online we have a hand raised from Katharine Dayem. Did you have a comment, Katharine.

MS. DAYEM: Yes. Can you hear me?

MR. BAEZ: Yeah, we can hear you.

MS. DAYEM: Okay. Great. So this is Katharine Dayem, of Xergy Consulting, on behalf of the California IOUs. This is just a comment about a test procedure for Xergy. There is a procedure to measure standby power. It's the IGU Basic *17:16:58 seven.

And we find that the test procedure is sufficient for measuring standby power, once a device is actually setup and ready to be tested. What we find lacking in this test procedure is setup instructions for things like network connections or sensors.

So we see the need to develop those instructions so that all the Irrigation Controllers are tested under the same conditions. As far as active mode test procedures, we don't know that these -- Irrigation Controllers.

MODERATOR NELSON: Thank you. I believe we have one more online, Carlos?

MR. BAEZ: Yeah, another hand raised from Joanna Kind. Do you have a comment, Joanna?

MS. KIND: Yes, I do. My name is Joanna Kind. I work with the Eastern Research Group as a contractor to WaterSense, and I just wanted to address the IA ASFE *17:18:07 electric test procedure. I agree it has been a very long process.

I am currently involved in and am sitting in with that group while they're working toward a test method. I did want to let everyone know, in the room and online, that I think it's very close to being a complete test method.

I still think there's a little bit more work to do. Quite a few products have been tested using that test method. So I think it's close. It is not quite there, but it has been a couple years since the group has gotten together, but they have made a lot of progress.

MODERATOR NELSON: Great. Thank you. Nobody else in the room or online? Great. Thank you for all your comments. This is very helpful. All the information collected is vital to our rulemaking process, as Sean pointed out earlier in the flowchart to collecting the data and coming up, eventually, hopefully with a standard.

We're going to move back several slide. No other comments on existing test procedures. We move on to product lifetime. California IOU Case Team submitted an estimate of effective useful life, or EUL for Irrigation Controllers is 11 years.

That's the only comment that we received regarding EUL. So we're going to open it up for

discussion. Is 11 years reasonable for the EUL of a controller? What is the EUL for the soil moisture sensor?

What is the EUL for a rain shutoff sensor and what is the EUL for onsite weather stations, all components of these types of systems that we're discussing today. I'll take comments from the room first, and then online.

Okay. Nothing from the room. Carlos, anything online? No? So this information, if there is information available please submit it. EUL lifetime goes into our cost-effectiveness calculations and determination. So it's very vital that we receive information regarding this topic.

Product development trends and operations. Question asked, in the ITP are there new technologies coming to market. Examples given were wireless soil sensors and new -- or new types of controllers, possibly combinations of some of the existing types that we've discussed already.

The general comment made during the process is that Irrigation Controllers are advancing technologically by utilizing weather data, onsite soil moisture data and rain shutoff sensors. Staff has found online, new wireless soil moisture sensors are

coming to market.

We would be interested in additional information regarding wireless technologies or anything in general in new product trends. So we're going to open it up for discussion on this topic. Are there product developments that would increase water savings?

Are there product developments that would increase energy savings? And are there test results and research available for the new wireless soil moisture sensors that are coming to market? I'll open it up to the room first. Okay. And Carlos, nobody?

Our next topic, energy-consuming features and energy-saving features and technologies. Information requested, what features or options consume the most energy, low power mode and standby mode, for example, or active power mode consumption.

Are there any other energy-saving features or technologies? The California IOU CASE Team submitted information stating that reviewed studies showed standby power range from anywhere from one watt to eight watts.

A Staff observation is that there are many consumer products on the market that have a standby power draw of one watt or less. Just observations that they're getting that there may be room to move in this

direction. Any comment -- let's see here.

So we're going to open it up for discussion. What are the opportunities for reducing standby energy consumption for Irrigation Controllers, or any other topic regarding energy-consuming features? Nothing from the room. Or online, Carlos?

MR. BAEZ: We're moving right along.

MODERATOR NELSON: Market characteristics. What are the yearly shipments to California? How many small businesses are involved in the manufacturing, sale or installation of these products? This is information that was requested during the ITP.

California IOU CASE Team submitted information regarding market characteristics. They stated that there are 18 weather-based controller manufacturers as of the time that they submitted information.

Currently, the WaterSense specification for 2011 has resulted, as you can see throughout the years, in over 400 labeled products as of 2017. This is according to their website currently. The USEPA WaterSense estimated 13.5 million residential law irrigation systems in the U.S. from 2005.

And industry estimates 10 percent use weather-based controllers to schedule irrigation. That was from 2011. In comparison, the Staff's stock

calculation, similar to the information that Sean presented earlier, the California Department of Finance shows that there are roughly 8 million homes.

Assuming from CAL MAC that that 72 percent included automatic irrigation, that would be 5.8 million roughly homes in California using automatic irrigation. So in comparison to the 13.5 million nationwide from WaterSense, we're looking for information on what number is more accurate or could be more valuable in this process.

Effects on small business in California. California IOU CASE Team. In addition to large manufacturers and distributors, small irrigation contractor businesses also play a role in the market, as these companies often provide the product end-use consumers.

We're going to be looking for information regarding small businesses and how any possible WaterSense -- water efficiency or energy efficiency standard could affect these products in those small businesses. Is that clicking getting worse?

MS. ANDERSON: It goes -- gets better and worse, I think.

MODERATOR NELSON: Okay. So we're going to open it up for discussion, then. WaterSense had

submitted a supplemental -- their summary statement supporting their process of 13.5 million systems nationwide. Would it be reasonable for California to assume, based on population, 12 percent of those systems are based in California?

And does the Staff calculation of approximately 5.8 million irrigation systems installed in California a reasonable value? We'll open it up for discussion. We'll take comments from the room first.

MR. PIKE: Hi. Ed Pike, with Energy Solutions, on behalf of California IOU CASE Team. And so the numbers that you're showing in the slide are based on data for a national survey that was done a number of years ago.

And we also saw this number and we wanted to know why that number seemed so different for the national survey, compared to the value you showed previously for California. So we obtained the micro data and we found that the picture for California is vastly different than any regions in the country.

It's broken down into tiers of I think 10 regions. When we looked at them it had less than -- they were like single-digit percentage of homes had an automatic irrigation system. And in California our initial estimate is it was somewhere upwards of half of

homes did have irrigation systems.

And further looking into how the question was structured, our understanding is the question was only asked of detached, single-family homes. So if you answered that you were not in that type of housing, you were not even asked the question.

And so but 13.5 million nationwide would not include all systems, but only those of households asked, and I think it was 2005 for single-family. So the national number will increase due to population growth, and looking at those others types of housing.

So it seems like there is an explanation for the difference between this value and the value that you had previously that's more specific to California.

MODERATOR NELSON: Thank you, Ed. And yeah, to reiterate, that was the number I showed as a Staff calculation was based on the Department of Finance single-family homes in California. So it doesn't include any other automatic irrigation systems throughout the state. So that number may be higher.

We would look forward to some one submitting information or commenting in that regard. We have one question and one comment online.

MR. BAEZ: Joanna, did you want to comment?

MS. KIND: Yes. Yes. This is Joanna again

with ERG and EPA and WaterSense Program. I was just going to say exactly what Ed said, in that that survey was conducted in 2005. It was from the Residential Energy Consumption Survey.

So that number is dated and I think that does explain a lot of the discrepancy that you're seeing there.

MODERATOR NELSON: Great. Thank you. Any other comments? Initial discussion topics for market characteristics, if possible, if you have information, what is a reasonable estimate for current installations of each type of irrigation controllers or timers.

So total installations in California; how much of each type are sold in California each year? For weather-based, soil moisture sensor, time clock, rain, automatic rain shutoff. Any comments regarding that in the room or online? I'll give it a second. No? Okay.

Costs. Our next topic we'll be covering costs. During the *17:29:28 we requested information, what -- regarding what are the retail costs per unit, and how do costs vary and what are the incremental differences.

For example, number of zones controlled, sensor inputs, number of sensors included with the controller, add-on sensors, weather stations, power

supplies and communication, wifi, Ethernet, radio or cellular.

Information submitted. The USEPA WaterSense Program in their information submitted to the Docket costs totaling $240 per unit. That data is from 2011. Staff research just recently has shown that there are WaterSense labeled controllers for as low as $36 on the market.

We'll open it up for discussion. Staff is interested in reliable cost data for Irrigation Controllers.

MR. SILVA: Hi. David Silva, from the California Landscape Contractors Association. I have a question. Has any of this information been submitted by the manufacturers of the Irrigation Controllers?

MODERATOR NELSON: No, not to date. Those who responded were, we've mentioned earlier, previously, was the California IOU CASE Team, Irrigation Association. Let me go back to that slide so I don't miss anybody.

Well, it's all the way at the beginning. Here we go. The only industry representative that did submit to the Docket were Hunter Industries and it did not regard cost. They submitted looking at the IA SWAT test procedures as a starting point for test procedures

and standards.

MR. SILVA: Okay. Thank you.

MODERATOR NELSON: Thank you. So no comments regarding costs of the Irrigation Controllers in the room or online. Okay. That concludes the presentation. I'll open it up to general comments if anybody would like to make a general comment regarding Irrigation Controllers.

We'll take comments from the room first and then we'll go online. We have one online right now. So we'll take that comment.

MS. KIND: Hi, there. This is Joanna again with ERG, contractor for WaterSense. I just -- I wanted to comment on the cost section. You had on your slide the prices have gone down significantly. Those were data that we gathered in development of the specification, which I think was 2011.

So the costs were prior to that, and since then many more products have come on the market, and several of them are much more inexpensive. So I think what we are seeing there, I don't think $36 is common, but it does exist. And I think there are a lot of controllers for around $100 now.

MODERATOR NELSON: Great. Thank you. That's why I put $36. That was the least expensive one that I

did find, but hopefully, it will develop more discussion or submission of information regarding cost. Any other comments in the room? Mary?

MS. ANDERSON: Yes. This is Mary Anderson, from the California IOUs. We strongly support the Energy Commission's efforts to develop standards for Irrigation Controllers. We've been working on this for the last few years and believe this is an important component to be able to deal with potential water shortages that the state has faced and could continue to face, and we look forward to working with the Energy Commission on this measure.

MODERATOR NELSON: Thank you, Mary. And one more from the room.

MS. URIGWE: Hi. This is Daniela Urigwe, on behalf of the California IOUs again. We didn't touch on savings too much in this presentation, but I just wanted to call out a study done by LBNL in 2014, where they looked at -- they took a little *17:33:50 review of the different savings estimates available for Irrigation Controllers and found that Irrigation Controllers with water-saving features, such as weather-based sensors or soil moisture sensors or *17:34:07 sensors has been estimate to reduce irrigation water use by between 15 and 35 percent.

So usually there is a significant water savings opportunity with this product, and we support pairing that with the standby power standard to offset any energy use by these water-saving features.

MODERATOR NELSON: Thank you. If there aren't any other -- oh, one more. Ed.

MR. OSANN: Yeah. Ed Osann with NRDC. I notice that in the presentation on Spray Sprinkler Bodies the Commission -- the Staff concluded with a invitation to submit proposals by a date certain.

MODERATOR NELSON: Yes.

MR. OSANN: If the -- point out that if the Commission Staff finds the staged approach to setting a standard for this product to be attractive, might we see a request for proposals for a standard confined to timer-based controllers in a time frame that would be at all predictable, like later this fall or?

MODERATOR NELSON: Yes.

MR. OSANN: Any thoughts about that?

MODERATOR NELSON: The next step is the Invitation to Submit Proposals, as you mentioned. Just stepping back, Ed, the proposals will be due by September 1st. That being said, we would accept all proposals regarding this topic and evaluate them under various energy savings and water savings.

So yes, the answer to your question is, we would accept any proposal for evaluation and review. And we encourage proposals regarding this topic. So that leads us into the next steps. We've already covered most of that.

The next step is the Invitation to Submit Proposals. On August 1st we will have the webinar for the ITSP, as we're calling it, and then proposals would be due after that by September 1st, 5:00 p.m. The template proposal can be found at this link, if you've downloaded the presentation, which should all be online at this time.

This is an updated proposal template. So if you've used the one prior, please download the new template and familiarize yourself with the template. We will be covering that, and also a couple other items on the August 1st presentation.

So again, we showed this slide earlier. This is a diagram of the rulemaking process. We're currently at the public workshop stage for the ITP, the invitation to submit -- or Invitation to Participate, excuse me, and next, we will invite you to submit proposals and that'll be the next stage.

And I thank you for your attendance and your comments. My information's here if you'd like to

contact me. The Docket for Irrigation Controllers is 17-AAER-10, and that will conclude our Workshops. I welcome everybody back tomorrow. We have another workshop. Oh, Ed has another comment. We will take another comment.

MR. OSANN: Question. Are these presentations now up on the website for these individual Dockets?

MODERATOR NELSON: Yes. All -- even tomorrow's topics were docketed this morning, and I put the request in to have them listed on the website. If you don't see them on the website yet, please go to the docket, and each presentation's in the docket. Physically, you can find it in the docket. There's a link to the presentation.

MR. STEFFENSEN: They're in the -5 docket *17:38:00 --

MODERATOR NELSON: Yes. So that's a good point. Thank you, Sean. There are many docket numbers. Each topic or product has its own docket number to submit your comments to. The main docket number for this pre-rulemaking process where the CEC or the Energy Commission is submitting or docketing information is 17-AAER-05.

So if you're looking for information that we're providing, look at the 05 docket. If you're

submitting information, all of the docket numbers are listed on the website for each individual product to help organize the comments and information provided. Thank you.

And we look forward to seeing you here tomorrow for Low Power and *17:38:42 Power Factors, Set Top Boxes, Solar Inverters and GSL Lighting. That concludes today's Workshop. Thank you.

(Off the Record at 2:55 p.m.)

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I do hereby certify that the testimony in the foregoing hearing was taken at the time and place therein stated; that the testimony of said witnesses were reported by me, a certified electronic court reporter and a disinterested person, and was under my supervision thereafter transcribed into typewriting.

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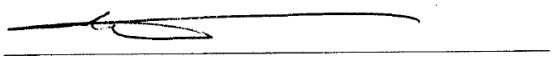

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