STAFF WORKSHOP

BEFORE THE

CALIFORNIA ENERGY RESOURCES CONSERVATION

AND DEVELOPMENT COMMISSION

In the Matter of:	)
	) Docket No.
FUEL EFFICIENT TIRE PROGRAM	) 07-FET-1
(AB-844, Statutes of 2003)	)
________________________________	)

CALIFORNIA ENERGY COMMISSION

1516 NINTH STREET

HEARING ROOM A

SACRAMENTO, CALIFORNIA

THURSDAY, FEBRUARY 5, 2009

10:09 A.M.

Reported by:
Peter Petty
Contract No. 150-07-001

STAFF AND CONSULTANTS PRESENT

Ray Tuvell

Bob McBride

John E. Sugar

ALSO PRESENT

John R. Harris (via teleconference)
Transportation Research Center, Inc.

Larry R. Evans (via teleconference)
Transportation Research Center, Inc.

Alan Meier
Lawrence Berkeley National Laboratory

Bruce Lambillotte
Smithers Scientific Services

Daniel M. Guiney
Yokohama Tire Corporation

Xuping Li
University of California Davis

Dennis J. Candido
Bridgestone Firestone North America Tire, LLC

Sim Ford (via teleconference)
Goodyear

Walter H. Waddell
Exxon Mobil Chemical Company

Greg Camarado (via teleconference)
Goodyear

Tracey J. Norberg, Corporate Counsel
Rubber Manufacturers Association

I N D E X

P R O C E E D I N G S

10:09 a.m.

MR. TUVELL: My name is Ray Tuvell and I'm the Manager of the Energy Commission's fuel efficient tire program. I have some basic announcements to make before we get into the program today, necessary housekeeping.

For those of you that are familiar with the building the closest restrooms are right across here, okay. There's a snack bar on the second floor right up here, just walk up the stairs and go straight to it.

In the case of an emergency and the building needs to be evacuated, follow us employees. There's an evacuation route. We go across the street katty-corner to the park, okay. And then we wait over there for directions on re-entering the building, should something come up.

We have a pretty ambitious agenda today, a number of very important subjects. Two of our speakers will be participating via WebEx. And so please bear with us as we go through the technology to make sure to get where we need to go and get them onboard. And if any glitches come up, I certainly want to apologize for that right at the top.

So, the purpose today, this is a staff workshop. The staff is in the final stages of its evaluation of the subjects, issues, components associated with what will ultimately be a fuel efficient tire program, at this stage specifically focused on consumer information.

Later, after we have this program in place, we will also then start pursuing the potential for minimum standards. So today we're still at phase one, consumer information program. And that's the exclusive focus of the workshop today.

We're going to be covering three subjects. They're somewhat interrelated, but all have a certain significance to us, as we have investigated the issues, topics, concerns surrounding what we're going to have to come to grips with here in turning this into a meaningful program.

Now, again, I want to emphasize, this is a staff workshop. We're at the staff investigation stage, okay. And all of these are issues that we want to now lay out to stakeholders and other interested parties, and use this as an opportunity to get feedback. Not only at the meeting today, because we realize that we're going to be covering some maybe complicated and detailed subject matter that this will be your first opportunity to get exposed to.

So, in our workshop notice we indicated that we would like to get written comments following this workshop, any topics covered in this workshop, we would like to get in two weeks. And I would expect and hope that you will take advantage of that opportunity.

And in doing so, let me please ask this. In particular, because we're going to be dealing with some fairly technical and complicated issues, what will benefit us most is if you can provide not only statements of your concerns or your issues, but we would very very much like you to provide supporting documentation that can help lead us to a better understanding of your issues, and possibly the directions we can head to ultimately resolve this, okay. If you're bringing up an issue of significance and concern.

So, please, we dearly need any leads or direct access to supporting documentation on any issues that you would identify of significance.

It will be of limited value for us to say, well, there's a problem there. Well, okay. What is it, and what's the nature of it, and what do you have to back up your claims. And so we would really really appreciate that extra level of detail.

In typical with all the subjects we deal with, I mean these are complex subjects. And we understand that they're complex subjects. And we appreciate the significance and complexity. And we recognize that some misunderstandings can occur in these complex subjects, and so getting each other's perspectives out is going to be very very important to identify and overcome any misunderstandings.

Now, in the agenda today I haven't specified any points at which we would break. And so my attitude is that we'll kind of identify that opportunity, the best opportunity, as we go along. Okay. So if it's flowing real smooth and we can knock this out, let's knock it out. If it turns out that, no, it's going to drag on and it's necessary to have certainly a lunch break or more breaks, then we'll certainly do that, also. Okay.

Want to point out, of course, that we have a court reporter here today who is going to be recording and developing a transcript of the entire proceedings. And so if you have comments or questions I'd like you to come up to the podium and identify yourself. And then please give him a business card for his records to have a more thorough documentation.

I'm going to encourage questions throughout the presentation. Because we are dealing with some fairly technical issues, I think it would be a mistake to hold your questions to the end. And so I'm going to encourage questions throughout the presentations, as well as we'll have a question period at the end.

Obviously we'll need to keep track of the time. And so it may be necessary for me, in some cases, to possibly cut off questions, or if I see questions being repeated. Please bear with me here as I try to run an efficient process, making best use of everybody's time. Okay.

So, unless there's any other questions at this point, my intention would be to begin with our first speakers. And this will be John Harris, followed by Larry Evans.

John and Larry both come from the tire industry with a significant number of years with tire manufacturers here in the United States.

At the present time they're both working as specialists and analysts with the Transportation Research Center under contract to NHTSA at their research center in East Liberty, Ohio.

Both John and Larry have significant experience and indepth knowledge of the subjects we're going to be dealing with today. The presentations that they're going to be providing were initially presented in September at the ITEC meeting, but there may be some slight modifications or additional information you may see here. Okay. And so I don't want to suggest to you if you saw it at ITEC you can take a break now.

And also I think we're going to see, I mean I hope that we're able to have a little bit more discussion of these topics than maybe occurred there. I didn't attend ITEC, so I don't know.

As I mentioned, John and Larry are both in Ohio right now. And that's one of the reasons I put them first on the agenda here. I don't expect either of them to be available throughout the day today because the end of their working day at 5:00 will be 2:00 here. And they have other things to do.

So I really want to encourage you to ask your questions of them during their presentation at the end, because I don't expect to hold them for the entire day. And so if we get to the end of the day and you want to ask John and Larry a question they're not likely to be available. Okay. So I just want to mention that right up.

Let's see, if --

MR. McBRIDE: -- not sharing applications so I can hand over the slide shows down --

MR. TUVELL: Okay.

MR. McBRIDE: -- but I will bring it up.

MR. TUVELL: Okay, John and Larry, are you there on the phone?

MR. HARRIS: Yes, we are.

MR. TUVELL: Great. Outstanding. We may be having a little bit of a technical glitch here, guys, where you will not be able to do the paging of your presentations. And if that's the case we'll do it here.

MR. McBRIDE: Well, I'm loading it in

WebEx --

MR. HARRIS: I figured -- Ray, this is John Harris.

MR. TUVELL: Yeah.

MR. HARRIS: I figured I would just, at the end of each slide I will just say, Ray, or --

MR. TUVELL: Yeah.

MR. HARRIS: -- next slide, and let you flip through it instead of trying to --

MR. TUVELL: Fair enough.

MR. HARRIS: -- control it from here.

MR. TUVELL: Yeah, fair enough. We're going to do one more try here to see if we can hand it over to you. And if not, that's what we'll do. It's worked well before.

(Pause.)

MR. McBRIDE: We have you up.

MR. TUVELL: Yeah. Do you want me to see if they can control now?

MR. McBRIDE: No, they won't be able to.

MR. TUVELL: Oh, okay. So you're going to do it?

MR. McBRIDE: Yeah, I --

MR. TUVELL: Okay, yes, John, we'll proceed now. And we'll have control of the slides, so if you can just tell us when to turn the next page we'll work it that way. I appreciate you accommodating this problem.

MR. HARRIS: Okay. Ray, thank you very much for that introduction. Like you said, this was presented at ITEC. We also -- Larry and I also presented it at ACS technical meetings in Louisville, Kentucky, October 14th.

This will be a shortened version, at least on my part, of my presentation. Hopefully it will be informative enough for everyone to see what we have done in our project.

Next slide, please. The testing conducted, this is an overview of the testing conducted at two laboratories to evaluate the lab --

MR. TUVELL: Okay, I got to ask you to hold one second.

MR. McBRIDE: It's really slow.

MR. TUVELL: We haven't been able to switch pages.

MR. HARRIS: Okay.

(Pause.)

MR. TUVELL: Okay, great. John, you can pick up now, thank you.

MR. HARRIS: Okay. This rolling resistance test program was started by one of the administrators from NHTSA about two and a half years ago. We saw a means that this was going to be coming up, and so we were asked to come up with a test program to evaluate the different test methods and different things associated with that in a proactive thought of what would happen with rulemaking.

To give you a brief overview of what we did was testing was conducted at two laboratories to evaluate the lab variability. We used Smithers Scientific Services in Urbana. And was also involved with Akron -- development labs, and a contracting situation with Standard Testing Labs, or STL. So essentially we used Smithers and STL.

At the time that we started the program there were two SAE test methods on the books, and one ISO method. At the time we started once of the SAE test methods, the J-12-69, was also looking at a single point for having seen reference condition calculations.

And we knew that the ISO was working on a single point test, and we were able to get an advance copy of that. So, in essence, we ended up with three SAE and two ISO methods.

We selected 25 tire models to include in this study. We used 600 tires to complete the testing and we ended up with 815 individual test results. A minimum of 25 tires were bought for each tire group. And we tried to buy all of the same DOT code. That code was evened down, of course, to the week of production. There were a couple of tires that we could not get the full -- or get 25 of the same week, but we got very close.

One of the things that I decided to put into this study was to use the new ASTM 2493-06 standard reference tire. The reason I did this was with the experience that I had had with winter testing and so on, I wanted one tire that I could reference everything else to.

Next slide, please. To go back to the test labs a little bit. Smithers Scientific, you see on the left, is a force machine. This is where the rolling resistance is measured by the attempted displacement of the axle in the carriage. All five test methods were completed in that machine.

The Standard Testing Labs, they have two different machines. They have one which is a forced machine which we used for the 1269 multipoint, single point. The 18164 and ISO-28580, which was in draft form at that time.

The machine you see pictures for STL is a torque machine. And the difference there is you'll see that in the extreme left-hand side of the picture is a torque stop. This measures the amount of torque required to keep the drum turning.

This machine was originally in a tire company and was bought by STL. And I was very familiar with the machine, so I felt comfortable with the results.

Next slide, please. The five test methods. The automotive manufacturers use J-2452 as a method of getting a fuel economy number or calculation so that they can fit it into their modeling of cars. And it's a very complex test. The measurements are taken over a speed range, at 5 points along that speed range, during a coastdown; very labor intensive and technically intensive test.

The J-1269 multipoint, at the time we started, had four or six test conditions depending on whether you're testing passenger or light-truck tires.

At the time we started this program we did not know that the proposed rule from Congress would only include the passenger tires. Therefore we had a lot of tires that were not UTQG. We had a couple of snow tires, I'll get into that in a little bit.

The single-point test was a derivative from that test where we took the SRC, or standard reference condition, that is calculated in the 1269. And we thought if you're going to calculate it based upon four tests, why not just run those conditions and get a comparison.

By doing this we were able to come up with a single number and do some comparisons with that. I think Larry will get into that a little bit later.

The ISO 18164 had been on the books for many years. It's a four- or five-point rolling resistance test based upon, again, four or five conditions. It is essentially the 1269 run in a reverse order. We'll get into that, I think, with the next slide.

The ISO 28580 single-point was in draft at that point. We knew pretty much what the running conditions were going to be. We did not know some of the caveats which would come later in that test. And, again, it runs a single-point test and is relatively efficient in consideration of the other testing.

Next slide, please. Here is an overview of all the different test methods. You can see that with the ISO measurement systems on the first line; they also include a power or D-cell method. The D-cell, the only equipment that I know that does that is possibly in Russia. Most of the testing that I've been familiar with has been either force or torque method. And most of it is on a 1.7 meter drum; however, in the ISO 28580 they are now using a formula to adjust it to a 2 meter drum.

The surface, generally in the United States and most of the work that I've been involved with, we use an 80 grit surface. Europeans tend to use a smooth or bare surface. However, at least in the 28580 they are allowing the caveat to use the textured surface.

Speeds. The coastdown, you can see, is different with the multispeed because it is a coastdown in speed. And the rest of the tests are all 80 kilometers per hour.

Pressures. The multipoints, of course, are all different pressures depending on which point. And as you can see, the J-1269 uses 20 kPa and is regulated, where the ISO 28580 is using 210 or 250 kPa and capped. Now there is a little bit of difference between the two in that the capped, of course the pressure rises during the test. This is actually a little more realistic to what happens in the actual usage of the tire.

Tire loads. Again, they're multipoint and you can see that the ISO and the J-1269 multipoint flip-flop the loads because one uses the heavier load first, and lighter load second.

With our testing we found that we rarely can -- rely on a single-point test, so the important take-away here is that the 1269 uses 70 percent of the sidewall load; the ISO uses 80 percent. This is due to the European vehicles use a little smaller tire, I think, on their cars.

Temperatures, really not a factor. And the other thing is, and I think it's covered up a little bit there by the -- at least on our copy here, the break-in. And the break-in on the ISO 2580 is also a 30-minute break-in. So they're pretty equivalent there.

One thing that's not showing on the screen is the final line of this slide, and that is that none of the four initial tests, the J-2452, 1269 or 18164 have lab alignment procedures. This is one of the things that impressed us with the 28580 is the lab alignment procedures.

One thing we found is that we had our own internal lab alignment procedure by using the SRTP tire as a reference tire. We did then reference everything to that, and used it to align the lab.

Next slide, please. This is an overview of the tires. You can see that we have a three axis system. First axis we picked tires from one manufacturer, multiple sizes, to see what would happen there. To see if there was -- if you pick a particular manufacturer, in this case, Goodyear Integrity, and the way we -- the way we picked these tire manufacturers was literally drawing names out of a hat to prevent any idea that we tried to pick on any company.

But we used Goodyear Integrity in four different sizes. Then on the second axis we picked primarily -- or we picked Bridgestone, and we tried to pick tires of different speed ratings. And we also threw in a couple winter tires to see what they would do. Again, we did not know what the regulation was going to possibly cover.

I just lost my screen here. You'll have to bear with me here.

(Pause.)

MR. HARRIS: Okay, I'm back. Sorry about that. If we don't tickle our computer every so often it goes blank on us.

So, anyway, we selected six tires in the Bridgestone line that we felt would give us a cross-section of tires across a manufacturer, all of the same size.

You can see that we have the ASTM, what we call the M-14 reference tire, which is the new SRTT in the middle. This is part of the reason we picked the P225/60R16 size.

Axis three, we then went across different manufacturers with H rated tires. We picked four of those to try to get a cross-section of tires there.

U3, which is down in the lower left corner is a Dunlop runflat. It was originally in axis 2. It is technically a Goodyear tire. We don't know exactly where to put it, but we wanted to see what happened when we put a runflat into this mix.

So this is the important 16 groups of tires that we used in the test matrix. We also had nine light-truck tires which were designed from a similar matrix. But since we're not talking about doing light-truck tires at this point, we decided to keep them out of this presentation.

Next slide, please. With that in mind we didn't care that much, you know, in some ways about the tires at this point as we did the difference in the test methods. We wanted to treat all the tires pretty much the same, so we're looking at the two different test methods.

And this is a comparison of the 28580 versus the 1269. The main take-away point here is that Europeans allow either the bare or textured surface. 1269 uses the 80 grit.

Reference temperature is a degree apart. Speed's the same. Little bit different in their loading in that the 70 percent for the 1269 versus 80. A little difference in the pressure. Big difference in the fact that the 28580 uses the capped pressure. Again, we felt this is a little more equivalent to the actual usage. You do not have to use a break-in in the 28580. Basically you get a break-in when you're warming the tire up on the machine.

The main thing here is the lab alignment procedure.

Next slide, please. Disadvantages. 2580, we found that the bare surface was a little less accurate at high loads. Here we say it light-truck tire loads. But we are also talking about tires that are P metric that are on Explorers, Suburbans, things like that, in place of light trucks. They tend to slip on the smooth surface. We did some testing on a smooth surface.

And there's not a large database to date. Larry, I think, will get into that a little bit later.

One of the disadvantages of 1269 was the regulated pressure is different from highway use. We know that. Also, the coefficient of variation was 2.3, and that's something I think Larry will get into, also.

Advantages. Harmonization with Europeans. If we can run one test and use it both places, it saves the tire companies money. And let's face it, you know, the way the economy is right now, that's a good idea.

The other advantage of the 28580 is it was the best test between the labs. We had a very low coefficient of variation within the labs. Again, that's a little more into the specifics, which is Larry's venue.

The advantages for the 1269. The tire industry has a pretty good database on this. But one of the things we found is once we know which tests we're calculating back and forth from, it can be done. So the databases can be converted.

So that's why the database from 1269 can be used to calculate the SRC. And we can also calculate 28580 from that if we want to.

Next slide, please. Again, we like the 28580. And part of it is the fact that after we got into doing the testing they come out with their lab alignment procedure, which is going to use two tires, which are called alignment tires, for each tire group. In other words, I think right now they're planning on two tires for passenger light truck, two tires for passenger, two tires for C tires, or light-truck tires, and also two for truck tires, medium range truck, in the future. We're not concerned with those, but those are in that standard.

One of the other things is results corrected to 2 meter drum. The opinion there is do we really need to. That's what they want to report to, but it can be done either way. Depending on, you know, where the data's going to be used.

The main thing is that the control tires will handle the day-to-day, month-to-month variation, or even catch the machine out of calibration.

So therefore we feel at this point that the 2580 is probably the best. It doesn't mean necessarily that that's what's going to be adopted.

Next slide, please. So, in summary, we evaluated two labs. Found that there is some differences. Larry's going to get into that. We evaluated the five test methods. Within the 25 tire models, which we included in the study, and since we're really talking about only passenger here at this point, we'll say 16 tire models, of those 16 the range of data, if you did RRF for force, range from 9.7 to 15.3 pounds in rolling resistance.

And we feel that, you know, that that's a nice way of looking at how the tire is rated because that's what it takes to pull you down the highway. Just look at RRC you can see that they went from 7.3 to 11.6. So that scale is compressed a little bit.

The RRC, of course, is the force divided by the load that the tire was tested at. And it does some things with the data that gives us a little bit of concern.

I think at this point, turn the next presentation of to Larry.

MR. TUVELL: Okay, just a second, Larry, while we load your presentation.

MR. EVANS: No problem. This is a good time if there's any questions.

MR. TUVELL: Yes, please.

(Pause.)

MR. TUVELL: Yes, we have one question. One second.

DR. MEIER: This is Alan Meier, Lawrence Berkeley National Laboratory. I had a question about the tires you selected for testing. You said you tried to choose groups of tires, the same tire that were matched the same week of production, is that correct?

MR. HARRIS: Yes.

DR. MEIER: So do you have any indication of how much variation there would be from one week to another week? Or maybe one week to another month or something like that?

MR. HARRIS: Actually we did not consider that in our study because the main focus of our study was to determine the best test method more than what the variation may be over the tires.

We're also hoping that the tire manufacturers have a good enough handle on their production that the week-to-week and month-to-month variation would not be greater than the variation within the group of tires built in one week.

DR. MEIER: Okay, thank you.

(Pause.)

MR. TUVELL: I appreciate your patience. It's taking us a little more time than we expected to do the switchover.

(Pause.)

MR. TUVELL: Okay, Larry, you're up.

MR. EVANS: Okay. This is Larry Evans. The first slide after this is just a summary of John's.

If you want to go to slide number three. And when we got the data basically we're looking at what sources of variability there were in the testing, expected sources of variability. And in response to Dr. Meier's question, we're trying to, in this case, take out as much variability as possible from the week-to-week, month-to-month variation and so forth by having tires of the same DOT code, or near the same DOT code.

But we know there's going to be variability with different tire types. We want to know how much variability there is with different tires of the same type. And particularly we're interested because we're evaluating the test. And what happens with the same tire when you repeat it, repeat the testing of it. What happens when you test it in different labs. And what happens when you test the tire on different tests.

So, go to the next slide. We have the five-test protocols. We had 25 tire types, roughly 25 tires of each type. Two labs. We were looking at capped or regulated pressure because the tests differ in that respect. And we only really looked at that, we only studied that on the J-1269 test. But it obviously is a difference on some of the tests.

We're very interested in what happens with the first, second or third test on any individual tire. Does the tire change? We did a side study on different inflation gases which is a separate presentation so I won't deal with that.

The first thing we did is look at the distribution of the tires within our group on the testing for any outliers. And what we found is that the tire, the population of tires was pretty normally distributed, pretty uniform with the exception of one tire.

So, out of the 600-and-some tires there was one tire that was clearly an outlier from the rest of the like tires. We did eliminate that tire from the distribution. So we feel we have a fairly good set of tires to look at the rest of our analysis of variance.

So, going to the next slide, we did an analysis of variance on each test. Looking at the 1269, of course, we have a single-point value.

The 1269 multipoint we calculated the value as a standard reference condition using the regression equation within the test method, itself. That standard reference condition is the same condition as the single-point number. And to jump ahead, if we calculate it from the four points or we measure it, we get exactly the same number, or we get an equivalent number. Obviously nothing's exact.

The 28580 is a single-point test. The 18164 is a multipoint test. Same conditions as the 1269 run in different order. We used the regression method from the 1269, calculated a standard reference condition number. Again, got a number.

The 2452 is reported as -- if you're going to report one number from it -- as the standard mean equivalent rolling force, or the SMERF. Also used the regression equations in the 2452, which are different equations, to calculate an SRC value from that test.

So all of these measures are going to be compared to one another for while we're testing the tires.

Next slide. This is an analysis of variance. This is for the 1269 single-point.

They all look about the same, so I won't bore you with all of them.

If we look at the analysis of variance we see that the F value is huge. In other words, our model is accounting for nearly all of the variance in the data. The mean error is fairly small. And the significant variables are the lab where it was tested, which is significant.

The procedure for inflation, that means capped versus regulated, is statistically significant. That's your probability of F out there at the far right. Anything below .05 is significant.

The order of testing was not statistically significant, whether we tested it first test, second test or third test. In other words, we could repeat the tests on the same tire over and over and get statistically the same number. And, of course, the largest variable is the tire type or tire model, which has the greatest influence, which is what we expect.

So if we then go to the next slide you can see on all the tests you see basically the same thing. The lab is significant for the 18164 test, that significance found in numbers so -- but

I'll just take it on faith that it was significant for the other tests, also for that one.

The values are large. Capped versus regulated was only studied on 1269. The test order was not significant on any test with the exception of the 8164 where it's confounded. And the tire model, of course, is the largest contributing factor.

You go to the next slide, again summarizing just what I said. The values say the tire type is the most significant. Very critical conclusion is that the two labs produce significantly different values when we test the same test for the same tire. So we do not get the same value from each lab. And this was true for all of the tests.

Capped versus regulated is significant, so we have to consider it. First, second or third test was not significant.

Going to the next slide we -- ignored test order. So, in other words, first test, second test or third test, we ignored that as a variable. Looked at coefficient of variations within the lab. Coefficients within the lab are generally very good ,on the order of about 2 percent.

The values were normally distributed within each lab. So in other words, each lab was giving good consistent quality data. But there is a significant difference between labs for all tests.

And if you go to the next slide you can see the difference is linear. This is all the tires, light-truck tires and passenger tires. It's a pretty linear offset but the numbers are slightly different.

And if we go to the next slide it actually has the regression equation for the different labs. And significantly you can see that for most of the tests the A lab produced a slightly lower number than lab B. But for the ISO 12164 test, it actually produced a slightly higher number. And the coefficients, the coefficient of A to translate that to B is slightly different for each test.

Next slide. In look at -- statistically different offset between labs. Through the tests lab B was higher. Lab B was lower. On average it was equal for one test. But for that particular test, the passenger tires were the same, and the light-truck tires were significantly different. In other words it was a fairly nonlinear offset. And from that lab in particular, well, all of them, we get a slightly better equation with a nonlinear regression, but it wasn't really worth spending a lot of time with in dealing with the lab-to-lab variation, which is what we're dealing with here.

If we look at the next slide you'll see an example of the correlation of lab B to lab A for the 1269 multipoint. This is all the different conditions. And you can see that at all the different conditions the lab correlations are pretty good except for condition number one, the capped inflation which doesn't fit the same progression equation or the same offset between the labs.

So there are things within the labs that are apparently slightly different that are showing this offset. Thinking that the point being that somehow we have to take into account this offset between labs if we're going to be testing tires.

The next slide, the variability of the tests. This is taking into account all the data from all the different labs from all the different, you know, repeat testing and so forth.

Again, coefficient of variation of the testing is pretty good, with 2, 2.5 percent. 18164 again has fewer points in it, so it's not as good. But probably the test is no worse.

The next slide is, again, just a repeat of the same thing. Variability of different tires of the same type is the most significant variable. One tire was significantly different. There's no significant effect on repeat testing. There is a significant difference between labs, and that difference varies by what test you're using and what conditions you're testing it under. All the tests have a fairly low variability.

So we then, next slide, what we did is take the data -- the values from lab A. We used the correlation equations to correct them to lab B pseudo values so we could look at all the tires and see do these tests rank order the tires differently.

And we then ran a least-significant difference; 95 percent confidence level data from each test to see how they are rank ordered.

Looking at the next slide you can see visually pretty much what happened here. These are all the different tests, one through five, passenger and truck, which are different tests.

And you can see that the tires seem to group into, you know, a group at the bottom; the next group, the next group, the next group. And then the truck tires being farther up on the line off to the right.

And these tires, the big question is they look like they're groups, are they really groups. And not spending a lot of time.

On the next slide looks at these are the rank order of tires from lowest to highest, is the passenger tires. And the lines dividing them are the different 95 percent confidence interval groups. And you can see that every group contains exactly the same tires. They may order slightly differently within the group, but that's only because of the variability in the data.

So no matter what test you use, if you're going to group tires into a rank order group, it will give you exactly the same groupings.

Next slide is the light-truck tires. And, again, shows exactly the same kind of thing. The groups are the same no matter what test you're using to test them. And, in fact, for the most part the rank order is the same. The ones at the top are at the top even within the group; the ones near the bottom are at or near the bottom within the group. So there was no reversals by any test.

So that led us to select a method, which is what this was all about. All methods produce data with low variation. All methods ranked tires into the same group. Data from any one method could be correlated to data from any other method.

Therefore, there really isn't any particular scientific reason to pick one test over another to rank order tires. If you're only going to rank order tires, the single-point method is obviously the most efficient.

However, no matter what method you select there has to be some sort of procedure to account for lab-to-lab differences if you're going to be trying to rank tires universally across time and different labs and so forth.

So, no matter what method you select you're going to have to have some procedure to account for this.

And the next thing we looked at is the idea of rolling resistance coefficient. It's often used to report the rolling resistance of tires. We did all our work -- not all of our work, but our work mostly in force. That's the unit we get from the machine.

RRC is the rolling resistance force divided by the normal force, or the load at the test. That removes the units from the equation and you get this number which is dimension-less.

And so the question is when comparing tires test at the same load obviously there's no change in the comparison. We're dividing by a constant. It's not going to be any different. It's not going to make any difference.

The question then becomes can RRC be used to compare tires which have different load ratings, or which are operating at different loads. And simplistically you might think that, well, gee, that would work.

This is the grouping of tires when we look at RRC. You can see, first of all, what happens here is we have the passenger tires still down here at the bottom, a couple of groups. And then we have this huge group where the passenger tires and most of the light-truck tires all have statistically the same number for RRC. So it would say that these tires are all equivalent.

Then you have the passenger and light-truck tires going a little further up on the scale. So it takes basically all of these truck tires, which used to be much larger numbers. And divides them by larger numbers and puts them right in the middle of the passengers.

The question, of course, becomes is that good or bad, and so forth. Well, looking at the next slide, just looking at the theory, RRC is dimensionless, but it is not independent of load.

In other words, when you look at the regression equation, this is the 1269, 2452 is even more complex, but the regression for 1269 is the force is regressed to the load plus a constant, plus constant tied to the load, so that's a load square term. And then the load -- or then the constant divided by the pressure.

If we then divide by load, we can then get this equation in load and pressure. We divide the constant pressure, we still have RRC as a function of some constant times the load plus a constant, plus some other function of pressure which now becomes another constant.

So, RRC is still a function of load.

You're not removing the effective load, you're dividing and you're changing it. And what actually happens, if you look at Ray's data, is instead of truck tires being higher than passenger tires, truck tires now, on average, have lower RRC, light-truck tires have lower RRC than passenger tires.

Going to the next slide, this is one tire, tire type D7. And this is the RRC for all the values, all of the load values at which that tire was measured. We measured the tire from around 1100 pounds load up to around 3000 pounds load at different pressures.

And what you see is that the RRC value is not a single number. It's not an intrinsic property of this tire. As a matter of fact, it ranges from 0093 to 0161. And in all the RRC of that particular tire is only slightly less than the range of the average values for every single tire we studied.

In other words, this tire can have an RRC which is equal to the largest RRC of any tire we found in this study, or equal to the smallest RRC of any tire that we found in this study, depending on where you tested and calculate the

RRC.

So, let me repeat. If you're testing the same load it doesn't make a difference. But you cannot use RRC to compare tires automatically between different loads just because you're dividing by load.

Okay, next slide. This predates the ISO 28580 standardization. As John said, he ran the SRTT, standard reference tire, in this data. We looked at referencing to a single tire. And what we see here is that if you reference to that single tire for the passenger tires, basically every value that we had follows, becomes essentially the same number.

So we're taking all of these disparate values and by referencing to a standard reference tire, this is all the data from all the labs, from all the tests. By referencing to a standard reference tire tested in the same lab at the same time we're coming down to essentially a single number, or a single function for these tires.

And, of course, with the two reference tires, the ISO 28580, that is even better for taking care of the lab-to-lab variation.

So, very briefly, the conclusions we

came to in this for the testing are that up to three repeat tests has no significant effect. Testing with capped inflation pressure is going to give you a lower value because you increase the pressure.

Tires of the same model and size produce equivalent rolling resistance plus or minus about 5 percent. Six percent is the far reaches of the data we had. The data is normally distributed. And really only one outlier tire was discovered.

The final slide is the lab-to-lab variation is significant. It is dependent on the conditions of protocol. Any test will produce reliable data. All tests will rank order tires in the same groups.

The values for all tests are approximately linear functions of the values for any other tests. That's significant because we're going from a 1269, where we have lots of experience, to a 28580 where there's currently less experience. You can estimate the 28580 mean value from the 1269 value reliably.

And rolling resistance or rolling resistance coefficient, whichever one you want to use, is only going to describe a tire at the conditions of the test. RRC does not make it independent of load or test conditions.

And that is all I have.

MR. TUVELL: Yes, could I ask if there are any questions at this time. Yes, Dan.

MR. GUINEY: Dan Guiney, Yokohama Tire. Larry, just one question on the testing that you did. In terms of repeating the test, can you explain how that was done? My --

MR. EVANS: Yeah. It's complex, but basically we tested, on every test we tested tires in triplicate. And then we tested other tires which had been tested on other tests previously, -- 164 is different because this was kind of a, this is the same conditions as 1269, just run in different order. That's just kind of thrown in there. But we look at the major test.

We looked at triplicate values and then we looked at other tires tested in another lab or on another test. And then looked at what happened. This is our repeat testing. And that was after looking at the effect of repeat testing, add it in, and so forth.

Since we had so many tires, so many tests, so many labs, you know, if you do the matrix, 5 times 5 time 5 times 2 times 25, is a little more testing that we were going to be able to get done.

MR. HARRIS: Dan, this is John Harris. When we designed this study part of the thing was, our initial thought was we could do it with a lot less tires. People questioned whether or not a tire tested a second or third time, which is what I wanted to do, would work. I knew from pervious life, so to speak, that it would work.

But this is the reason why with 600 tires we have 815 test results. As Larry said, in most tests we tested three tires in the test to check out the test and the tires. And then there were tires which the first test may have been 2452, the second test 18164. The third test was 2580.

There were also tires that the first test was 28580, and maybe the second test was 2452 or some other test. So there was a lot of mixture of that in a controlled fashion so that we could see that if a tire was tested three times, and which we have done since then, -- as a matter of fact we have one tire, I think, was tested about 15 times now.

But one of the things we wanted to see is that as the tire is tested over time, does it change. And we found that from the first test to the third test, to later tests, there's virtually no change in that tire.

MR. GUINEY: Okay. I guess my real question comes down to in the repeats, when you did one, two, three, whether it was the same test or you did a different test each time, was the tire dismounted, cooled down? Did the whole test procedure go into the replication, or was it just an immediate repeat?

MR. HARRIS: The repeat, in many cases when the tire was tested on that test, was then set aside, not dismounted, not deflated, but the pressure maintained, and held for a period of time until the next big block of testing came up. The tire would then be put back on the machine, warmed up and retested.

And I don't know the exact timeframes on the, you know, from one test to another, but it was not sequential in testing on a machine three times in a row.

MR. GUINEY: Okay, so it did include some part of the total test preparation, but it didn't include all of it?

MR. HARRIS: Right. We did not dismount the tires. We did not want to take a chance on damaging a tire, or anything like that during this process.

MR. GUINEY: Okay, thanks for the explanation. The other -- just a comment. In your analysis of RRC as a method. When the customer is buying tires and making a decision, I just want to make it clear, it is a single load. So all of those comments need to be taken in light of the fact of what the customer is doing.

So, one vehicle, one load.

Thank you very much.

MR. HARRIS: Sure.

MR. TUVELL: Are there any other questions? And this obviously includes people participating by the internet.

Okay.

MS. LI: I'm a student, graduate student from UC Davis. My question is you mentioned in the slide that the rolling resistance coefficient described the tire's response as the conditions of test only. I understand this.

My question is does the condition change the ranks from those labs of those tires?

MR. EDWARDS: If you test the same conditions at both labs then the rank order does not change. If you were to compare the coefficient of a tire tested under -- of the same tire, the same two tires -- tested under different conditions then it could change the rank order.

In other words, if you were changing from lab 1 to lab 2, changing the conditions, then the order could change.

MS. LI: Okay. I mean, the reason I'm asking the question, because in real life, traffic conditions can vary very significantly. So I don't know how to solve this issue. So can you explain a little bit?

MR. EVANS: Well, again, this is very complex, as you point out. There's been a number of papers. I know Michelin has published one recently where they give an actual equation to correct the coefficient to a linear system.

What you're really talking about is transforming the coordinates from cartesian coordinates to some coordinate system that makes rolling resistance coefficient, you know, linear with load or better yet, independent of load, if you're trying to compare all tires within, you know, all tires sold in the state of California or whatever it may be.

That's a very elegant, complex type of approach to it.

MS. LI: Okay, thank you.

MR. EVANS: Sure.

MR. TUVELL: Okay, I have a couple of questions, also. And I'm looking at your last slide, Larry, on your conclusions. And in particular, there's two points there that are significant for me, from a take-home perspective in our lab -- in our staff analysis.

And number one is the lab-to-lab variation is significant. And is my understanding correct that the ISO-28580 test protocol is the only test protocol that has a provision to deal with the lab-to-lab variation? And, if so, what's your feeling about the potential for that provision resolving this issue?

MR. EVANS: Yes. It is the only method that has the lab alignment tires from the ISO documents I've seen, and also from our testing, being able to come up with a reasonable lab alignment with one tire.

I'm confident that a lab alignment procedure, based on two standard tires, will correct for lab-to-lab variations with no problems.

MR. TUVELL: Okay, good. And now I also would like to focus on your last bullet. The rolling resistance force versus rolling resistance coefficient.

MR. EVANS: Right.

MR. TUVELL: Now, let met just ask a couple of clarifying points here first. Isn't it correct that if you were to rank order tires based on rolling resistance, take those identical tires and rank order them based on coefficient, that you would get a largely entirely different rank ordering?

MR. EVANS: That's correct.

MR. TUVELL: Okay.

MR. EVANS: Looking at -- if you're looking at the set of tires globally. Now, as has been pointed out, if you're looking at any size of tire then they are going to be exactly the same.

MR. TUVELL: Yeah, --

MR. EVANS: You know, 220, 515, 6015, whatever it might be. Then the -- because you're dividing by a constant.

If you're looking at the set of tires globally, all the tires in California, then, yes, it will actually, to some degree, invert the ranking. And so the tires that have the highest force will have the lowest coefficient. And vice versa.

MR. TUVELL: Okay. So, let me ask you this fundamental question, then. If, in fact, rank ordering -- and by the way, let me clarify and agree with your statement that certainly all tires tested at the same load would have the same rank order in rolling resistance and the same rank order in rolling resistance coefficient. We certainly agree on that.

My question goes to the entire universe of population of passenger tires across all sizes and across all loads.

Now, with that qualification then, if, in fact, a rank ordering based on rolling resistance is different than rank ordering based on coefficient, and if one of our objectives is to inform consumers about rank ordering and saying this tire that appears the lowest is more energy efficient than this tire that appears in the highest.

Doesn't that suggest that these cannot both be correct? In other words, you cannot rank one on rolling resistance and then rank one on -- rank tires on rolling resistance, rank tires on rolling resistance coefficient, get two completely different rank orders. They can't both be correct, is that right?

MR. EVANS: Yeah, sort of. I mean, it's not true to say they're incorrect. But the rolling resistance force is the amount of force it takes to move the tire. And rolling resistance coefficient being lower, it will move more weight, but it will take more force.

So, yeah, globally you're right. If I'm a consumer looking at all the tires in the world, and I'm looking for the best number, rolling resistance coefficient will tell me the largest tire has the best number, even though that tire is going to take more force to move the tire. It's going to invert the global system.

MR. TUVELL: Right. Yes.

MR. HARRIS: Ray, what it kind of does is takes the zero to 10 scale, or zero to 100 scale, and if you use zero to 100 good for RRF, then 100 to 1 is good in RRC. It just reverses the, you know, how you want to say the scaling is, you know,.

In some cases, you know, the score of zero is the best thing in one game, where, you know, the highest number you can score is it in another.

It's like the difference between golf and football.

MR. EVANS: It's just much more complex than that because you're staying with one tire size. RRF will give you the same rank order as RRF globally. But you stay with one tire size and you invert the scale, so the lower is now worse. But within one tire size lower is still better.

So you've now got a scale which goes in two opposite directions. One scale which goes one way for the individual, an individual vehicle. But the global scale, which actually goes in the other direction.

MR. TUVELL: Thank you. Dennis Candido, okay, to the podium with a question.

MR. CANDIDO: Thanks, Ray. I was just going to reiterate what Dan had mentioned earlier regarding consumer choice. Consumers really aren't looking at global tires.

They come in and they only look for one size. So I think the comments relative to rank ordering on a global basis are not really pertinent for a consumer buying a tire. He has one vehicle that takes a given load.

It might be interesting for him to realize that the larger the vehicle he has, therefore the larger the load, the more the rolling resistance. But I think that's taken into account with the fuel efficiency of the larger vehicle.

So I think it's important to keep in mind that this comparison is really not that meaningful to an individual consumer looking at a single tire purchase for a given vehicle. And that the both of them will rank order exactly.

MR. TUVELL: Let me, if you don't mind, try to take a shot at that, or why it's an issue with me. And then, John and Larry, I hope you will jump in, also.

And, in fact, I'll use my own personal case as an example. I recall purchasing a car, getting to the point that I needed to replace the tires. And it had an 80 series tire on it.

And I really liked the looks of this wide aspect tires. And I wanted to find out, well, is there a 60 series tire that will fit my vehicle. And, of course, there was. And I ended up purchasing that.

Now, in this example, of course, the load index of the 80 series tire and the load index of the 40 series tire significantly differ. Which means that they were both tested at different loads. Which means, based on the results of the work that you have done, Larry and John, their RRCs could not easily be compared, in my case, as a consumer.

And I can't say the extent to which this happens, you know, at Costco or whoever is buying tires. But it is a real-world example, and it's one that we are concerned about addressing when we consider developing a consumer information program. Dennis.

MR. CANDIDO: Okay, if you're replacing, for example, an 80 series tire with a 60 series tire, which is obviously lower, you will purchase a much wider tire. And in the standard procedure in the market is to insure that the load-carrying capacity is the same for those two tires. And it's done by the aspect ratio change.

The volume of air inside the tire is essentially the same. There may be very slight differences. But your example is really not going to be occurring very often. I know a lot of people will exchange a tire for a wider one. But being wider carries more air, even though it's a 60 series. And the load-carrying capacities are about the same.

So the situation where there is such a thing as upsizing that you may have heard of in the marketplace, where people come in and they want to put a 18-inch tire -- yeah, and they change the rim and everything.

But in order to keep the OD of the tire the same, for odometer control and such things, they put a much wider tire on. The load-carrying capacity ends up being about the same.

MR. TUVELL: But we do agree, though, that the case where, in fact, a consumer is comparing the purchase of tires that have different loading -- if all they had available to them was RRC, this would not be a comparable way to judge the energy efficiency of a tire.

MR. CANDIDO: Well, I guess I'd have to

ask Larry the question where he saw this differential, difference in rank ordering between coefficient and rolling resistance based on load, how large load differences are you talking about.

Because in the cases, I think Ray's referring to, there may be an index of one or two load index differences. We're not going to see much larger than that.

MR. EVANS: Well, again, what my comments are geared toward is the system. At point of sale. If I'm a consumer going in to buy a tire, four tires, whatever it may, it actually isn't going to matter to me whether it's RRF, RRC or any other, because it's going to give me pretty much the same number, within some looking at, you know, outside -- you might change by three or four units. And to some degree you can get -- you can't compare exactly, but it's pretty close.

But from a global system, using other things that we do normally, for instance refrigerators, you know, the label on refrigerators doesn't divide by the cubic feet capacity of the refrigerator.

And when I buy a refrigerator I'm concerned about the effect on my utility bill and so forth. But if I'm looking at a global system of rating them, you don't divide by the cubic feet sort of thing.

So, you're looking at how you would get -- and if you did, what you're buying is that the 29 cubic foot super whatever refrigerator would actually have the lowest energy coefficient sort of thing.

And giving the consumer a global system that somehow gives the best ranking to the 29 cubic foot refrigerator, is the thing that I'm arguing that RRC does with tires.

At point of purchase it makes no difference.

MR. CANDIDO: And I think that's what we're talking about. I mean people, when they go to buy a refrigerator, they might want to have an 18 cubic foot, they may want a 25 or a 30. You don't have that situation in purchasing a tire. You don't go in and buy, I want a small tire or large tire. You go for a tire that's suited for your vehicle.

So, I don't think the situation of load difference is a factor here in the purchase of the tire and the difference between coefficient and force.

MR. HARRIS: But, Dennis, if you're driving a Prius and you went to the tire dealer and you're purchasing your tires for your Prius. And the rating system told you that if was less efficient than the tire that is sitting, you know, three tires over for a Ford Expedition, --

(Parties speaking simultaneously.)

MR. CANDIDO: Would you buy a Ford Expedition?

MR. HARRIS: Yeah, wouldn't you have some concern on how does this rating system really work. That that Expedition tire is more efficient than my Prius tire.

MR. CANDIDO: I think that's a valid --

(Parties speaking simultaneously.)

MR. CANDIDO: I think that's a valid point, yes.

MR. HARRIS: -- there's something wrong with this rating system if this tire for this humongous vehicle is more efficient than the tire for my Prius that's supposed to be the most fuel efficient.

MR. CANDIDO: I understand your point, John. I think that's an aspect of it that is there. But the reality is that consumer isn't going to buy the Expedition tire. He can't. It won't fit on --

MR. HARRIS: No, but again the perception that the system is broken --

MR. TUVELL: Yeah, and I think this is an important point, and it's definitely worth this additional time we're spending on it.

In any case, we're going to find ourselves introducing into the marketplace a new concept called rolling resistance or energy efficiency, to help them -- intended to help them to make purchases or consideration of that factor in the purchase of their tires.

So there's going to be system education that's going to have to go on in addition to everything else here. Way before the customer shows up in there, we're going to have to go out and try to educate the consumers, the public, the car tire retailers, everyone, here's the system and here's how it works.

And so there are going to be, if we do this properly, lots of people seeing the entire system. And the question that -- and the point that Larry's making and John is making is if you're seeing this system based on RRC that says these big huge tires appear to be the most fuel efficient, it's counterintuitive.

We're dealing -- it's not entirely clear to me how I could take a system like that and educate consumers how to come to grips with that.

Beyond the fact that once you start raising that question, it also starts raising the more fundamental question of does, in fact, RRC represent the fuel efficiency of a tire.

In other words, if you end up ranking them on fuel efficiency, if we were to say this is theoretical, folks, bear with me. Theoretically let's dismiss the question of will it fit on my Prius.

If I, in fact, put a 15-inch tire on my Prius that has an RRC of say 9. And on the other hand I have this 17-inch monster of a tire that has an RRC that's 7.5. And I put it on my Prius.

Drive down the road. Which one's going to get me the better fuel economy?

MR. CANDIDO: Well, first of all, the other one won't fit, but --

MR. TUVELL: Well, no, I understood that, that was my condition. But what RRC is trying to tell us is the lower the RRC the more fuel efficient.

In that example, I would think theoretically we would all say, can't possibly be.

MR. CANDIDO: But look at it this way. If you compare, we're talking about a Prius tire with an Expedition tire. The force, rolling resistance force on that Expedition tire is probably going to be double the force of the --

MR. TUVELL: Yes.

MR. CANDIDO: -- of the Prius tire. So if the consumer comes in and finds that I have an Expedition, and every tire I see out there that I can purchase, the different brands and types, which is the purpose of this whole rating system, is consumer information to select the lowest rolling resistance tire, what are they going to look at? A number? Are they going to look at a symbol?

Every one of those tires is going to be rated very very poorly. Every one of those large tires compared to the Prius tire. Only because it's a big tire. For that reason only.

MR. TUVELL: Well, not --

MR. CANDIDO: The discrimination within

that is going to be very hard to establish.

MR. TUVELL: Well, but that's not what the data shows us when you rank it on RRC. I mean those Expedition tires look fabulous.

MR. CANDIDO: Well, I realize that. No, I realize that. But, --

MR. TUVELL: Okay.

MR. CANDIDO: -- again the consumer has an Expedition. He can only put that tire on anyway.

MR. TUVELL: Oh, no, no, --

MR. CANDIDO: And he may -- and you make a valid point that as he walks into the store and notices that those large tires there, that Prius tire actually is ranked no better than this large Expedition tire.

That may give them the impression, as John was mentioning, that maybe the system isn't very logical.

But I don't know of any other way for the consumer to deal with this issue. He has no choice. He's only going to be looking at a given size; it has the same load. And he might be looking at three or four different tire choices.

MR. HARRIS: But, Dennis, it is giving

the consumer a choice because he may start thinking, maybe I don't need to be driving that Expedition, and look for a more fuel efficient vehicle.

MR. CANDIDO: Well, that's a whole other issue. I mean that's --

MR. HARRIS: Well, but -- well, it's a whole issue --

MR. CANDIDO: What is -- yeah, what is --

MR. HARRIS: The whole issue is trying to save fuel and carbon and so on and so forth in the environment, right?

MR. CANDIDO: Yeah, but that's what vehicle fleet -- vehicle fuel efficiency is all about. We're trying to get tires to dictate the purchase of a vehicle? I mean vehicles have fuel efficiency ratings on them, so that's what's going to dictate that, not the tires.

MR. TUVELL: Yeah, but --

MR. CANDIDO: It's like the tail wagging the dog.

MR. TUVELL: Sure. And I guess the point that we're trying to suggest here is that it's becoming apparent to us that RRC has with it some baggage that we need to figure out a way to come to grips with.

It is not the apparent elegant simple solution that it appeared to be initially.

MR. CANDIDO: I mean you raise a point. That with RRC the issue of someone looking at global situation might be confused a little bit about why is that big tire rated so low against a little tire that goes on a Prius.

But from the consumer choice point of view, and keep in mind, I mean, the Europeans are moving ahead with the information system, a rating system. It's all coefficient based, totally coefficient based. And, you know, --

MR. TUVELL: No, I know that. And let me just mention one thing on that regard. I've been in contact with the Europeans. And I asked them specifically, did you have before you both RRC data and RRF data when you made that decision. And they -- analysis.

I talked to the analytical people who worked on it. And the answer they told me was absolutely not. The only thing we had before us was RRC. We're not familiar at all with this potential issue of RRC versus RRF.

MR. CANDIDO: And the reason is that the industry historically has worked with RRC. The automobile manufacturers make requests for --

MR. TUVELL: Yes.

MR. CANDIDO: -- rolling resistance from the manufacturers of tires on the basis of RRC. That's what's driven it. We're very familiar with it. We're comfortable with it.

This information that Larry's raising that there is a difference in rank ordering, when you look at significantly different loads -- and I think that's the key point, isn't it, Larry? You got to look at -- you can't look at one or two indices, you got to look at different significant loads. You may see a different rank ordering.

Does that mean it's wrong to use the RRC? I question that choice.

MR. TUVELL: Let me just ask you, though, a couple things, because I'm glad you brought it up that there's a history behind RRC.

I think that one thing that would be extremely helpful for us is if you can help us reconstruct that history. I would hope that you would be able to help us find somewhere at some point in time, maybe a SAE paper, or paper that's been peer-reviewed, where this concept was introduced.

Here's the concept of RRC. And it went through some rigorous analysis, and talked about this is what it does, this is what it doesn't do, this is the appropriate use, this is the inappropriate use. I think that may be a very revealing --

MR. CANDIDO: Okay.

MR. TUVELL: But at this point I want to make sure that you understand, at least from our perspective, we're starting to see great anxiety with RRC. There's some great anxiety here with RRC.

And now, Larry and John, I'm sorry I was doing most of the talking. I want to make sure you get an opportunity to finish your points, also.

MR. CANDIDO: Well, Ray, just a -- see if we can find the information historically on that concept --

MR. TUVELL: Yes, I think it's going to be helpful to all --

MR. CANDIDO: Yeah, sure. Go ahead, Dan.

MR. GUINEY: Dan Guiney, again, Yokohama. I also want to say that this is the first time we've had a really good debate on a good substance of subjects. So these workshops are really important. But it's the first time I've had this opportunity.

The second thing is when you proposed the question of a larger tire, lower RRC on the Prius, the fact is at steady state it would be more energy efficient. Starting and stopping is a different question. But to directly answer your question, Ray, the larger tire, lower RRC on that vehicle at the same load, steady state, better fuel economy.

MR. HARRIS: Not necessarily always.

MR. GUINEY: But typically in the case he was citing it would be.

MR. EVANS: Well, we'd like to see that data.

MR. TUVELL: Yeah, this is -- so let me just mention this one again. I mentioned at the very top of the presentation is that I knew that we were going to bring up some provocative issues here.

What we are all going to benefit most

from is bringing forward some documentation, some substance that you believe either helps your position or whatever, to shed some light on this.

Because I do think we're treading on new territory here in that some of these issues, some of these technical considerations may not have been addressed in this depth in any other forums. Because there was not significance riding on them.

And it's going to be of value to all of us to get ahold collectively of whatever information is out there of a more detailed technical nature that could shed some light on this.

Alan Meier's at the podium now.

DR. MEIER: I have a question for the NHTSA folks. Where exactly do you get the load index from? Do you derive it, yourself? Or do you take it from the manufacturers?

MR. HARRIS: It's the tire sidewall stamping or the load index.

DR. MEIER: Do you have any sense of how the manufacturers derive that? I mean I understand there's a procedure, but do you know whether they actually do the calculation for that tire? Or is it a number that may have some either uncertainty or arbitrary aspect to it?

MR. HARRIS: Okay, Tire and Rim has three formulas which are used based upon the aspect ratio of the tire that have been derived over the years. And are used to calculate the volume of the air and the (inaudible) and various things. Dennis Candido probably can explain it better than any of us.

But it's them lumped into different load indexes based upon the European system. And I think the European, the ENTRTO design manual also has very similar calculations to come up with the load-carrying index for the tires.

DR. MEIER: So, --

MR. HARRIS: And then the manufacturers voluntarily say, okay, a 225 60R16 will either be a 97 in load index and a -- or 98 in load index and a P-225 60R16 will be a 97 load index.

So there is an agreement within the Tire and Rim association on what the load-carrying capacity of the size tire is.

Dennis, you can probably elaborate on that a little more, too.

DR. MEIER: Okay, he's right here. But I'm just trying to understand whether -- how consistent that number is, how specific it is truly to that tire. Whether there are any individual -- whether we're sure there's a precise measurement for that specific tire.

Because we're using that number in the denominator and obviously if there is some sort of uncertainty in there, or differences in approaches by different manufacturers, that, too, can create some sort of nonlinearity or changes of sequence of the ratings.

MR. CANDIDO: Okay, thank you. Just to clarify this issue, as John was mentioning, Tire and Rim establishes tire standards. And part of the tire standards are the load-carrying capacities of tires by size. And it's based on a formula.

And as John was explaining, it's a dimensional formula based on contained air volume. And essentially it's based on a concept of constant deflection, certain constant deflection, so that the same tire would deflect the same percentage depending on its size by varying the load. And that's the formula.

So, if you look for a given tire size it will always have the same load on that size.

There are differences between what Europe has done and the USA has done. But we've now harmonized that. So any new tire sizes that are developed in the world will have the same.

It used to be, as John was pointing out, you may have a P-type tire which has one or two load indices different than a non-P. That's a historical thing. In the future they will not have that difference. But there is a very precise formula. It's a historically developed one. It started empirically and was evolved over a period of time into a constant deflection concept. And we can actually give you that formula.

(Parties speaking simultaneously.)

MR. SPEAKER: Is it measuring for each tire?

MR. CANDIDO: It's measuring for each time.

MR. HARRIS: In the Tire and Rim engineering data we found three formulas. And Larry did a little bit of work looking at them, so I'll turn it over to Larry.

MR. EVANS: Well, I was just going to point out that the formulas are, they're pretty precise. They're also very nonlinear with respect to tire factors based on its load capacity and so forth, which tends to help explain why the rolling resistance is not linear with load.

MR. CANDIDO: That's correct. They are nonlinear, but again, many tires have been out there for a long period of time, and we're grandfathering them in the sense that we're not going to change those load indices because that would cause a lot of marketing confusion. But because of that historical basis the curve is not perfectly linear.

And I think what you're pointing out, Larry, is that that's probably the reason why this issue of RRC and load rank ordering occurs, correct?

MR. EVANS: Right.

MR. CANDIDO: Yeah.

MR. HARRIS: Dennis, do you know is there any SAE papers or anything describing how those formulas were derived?

MR. CANDIDO: Well, Joe Pacuit at Tire and Rim has issued in the past a very clear whitepaper on that whole issue. And so we certainly can make that available.

MR. TUVELL: Yes, can I ask, are there

any further questions for our first two presenters? And, again, I want to remind everyone that they will not be available for the entire workshop today, so I would encourage you, if you feel like asking questions now. Obviously you can follow up in your written comments and we'll make sure to get any of those questions to them.

But any more questions for our first two presenters? Yes. Walter Waddell is coming to the podium.

MR. FORD: Ray, this is Sim Ford in Goodyear in Akron. After Walter is finished I'd like to ask a question.

MR. TUVELL: Sure, Sim.

DR. WADDELL: Okay, I want to put one realistic question to John and Larry. If I have a P-26570 R17 tire I can also buy that same tire in LT. If I use RRF or RRC what's the ranking of the fuel economy of those tires? Would they invert?

It's the identical size tire but one's a P metric, one's an LT metric.

MR. EVANS: As a matter of fact they would be drastically inverted because the LT tire would be tested at the higher pressure.

We've done some calculations from our

work from the multipoint, trying to look at what's the effect on, and again I'm basing my comment on the fact that I believe that the fuel economy of the vehicle is directly proportional to the force at the load on the vehicle. So I used an F10 pickup truck because I see those around here with anything from 14-inch tires to, you know, 20-inch mud tires.

But look at, in that case the numbers would invert. The LT tire would have a much lower RRC, but in fact, if you ran them at the same inflation pressure, the light-truck tire would have a much higher force.

And even if you ran them at the rated inflation pressure, the light-truck tire would at best be about the same.

DR. WADDELL: So, if I were a consumer at point of sale I can make the wrong decision with RRC?

MR. HARRIS: It is possible.

MR. TUVELL: Okay, Sim, go ahead.

MR. FORD: Yeah, Ray. Something similar to what Walter was just talking about, but looking at it from the other direction.

You know, suppose I have an F150 pickup

truck and I come into a dealer, a tire dealer, and I find that that Prius tire has a much, you know, lower force, rolling resistance force on it than the rolling resistance force that came on my F150.

You know, you have the same situation in the opposite direction. You're going to put that smaller tire on that F150 truck because it has a lower force. You're actually, you know, obviously you're creating a very unsafe condition because you have a tire that does not carry the loads that are required to, you know, to be on that vehicle.

MR. TUVELL: Yeah, I understand that point. And here is the way I tended to look at this. And I'm certainly interested in other people's opinion.

It's my understanding even in the marketplace today, even if we weren't dealing with the question of rolling resistance force or anything of the sort, that if a customer went in, a consumer went in to purchase a tire for his vehicle, it is the seller's obligation to insure that they do not sell them a tire with a load rating any less than what is required for his vehicle.

And that, in fact, exists now. And we

would never expect that to change. Even though it may be some consumers' desire to say, well, give me this super small tire for their vehicle, their F150. I would imagine that any retailer who sold them that is opening themselves up to incredible liability. And that that circumstance seems highly unrealistic to me.

MR. HARRIS: Sim?

MR. FORD: Yeah.

MR. HARRIS: Do you think a Goodyear store would put a 78 or 79 load index tire on an F150 that requires a 105?

MR. FORD: Well, by the same token I don't believe a consumer will buy an 85 load index. They're not going to pay the significantly additional amount of money for a larger load rated tire that they don't need for their vehicle. It goes both ways.

MR. HARRIS: Well, I don't know. I've seen an awful lot of 24-inch tires on some Caprices that require a lot less load index than a 24-inch tire has.

MR. FORD: Well, you know, again, that's a separate issue.

MR. TUVELL: Well, --

MR. HARRIS: But the thing is that one of the things we're concerned about is that if you scale the index, so to speak, that these big tires look like they're more fuel efficient than the smaller tires, the consumer will get the impression that the system is broken. And, you know, much like some of the other rating systems that are on the tires already.

MR. FORD: Let me just make one more comment. You know, using force in the description that you've given this afternoon, I think is a perfectly valid thing to use if you're talking about buying a new vehicle, and choosing between different vehicles.

If the rolling resistance force of the tires was posted on them already labeled on the vehicle, you could compare that difference between different vehicles of different makes and models and SUVs and compact pickups and fuel efficient vehicles and the like. I mean you could compare that number and that would be valid for that case.

What we're talking about is allowing, giving the consumer information to choose tires for the vehicle that he already has. So that's why we believe that, you know, that the rolling resistance coefficient is a simpler, more consumer-friendly way to choose between different tires for his vehicle.

MR. TUVELL: Yeah. And don't get me wrong, Sim, I mean we understand, we believe that perspective. What we're suggesting is, and hopefully we're able to get people to recognize, is there's many more perspectives than just that perspective that's being brought to bear in what we're trying to accomplish here.

There is the system, as a whole, and how does that system look to anybody, and does it make sense. So that the lowest ranked tire, or the lowest rolling resistance tire is, in fact, the most efficient tire.

There is --

MR. FORD: Ray, if a customer comes in and is looking for these 22-inch tires to go on his, you know, tricked-out Escalade or something, with the coefficient he would still be able to compare different 24-inch tires and the rolling resistance coefficient between those, you know, 24-inch tires.

MR. TUVELL: Oh, yeah, see, don't get me wrong. We are certainly in agreement, everybody's in agreement that all tires tested at the same load you could compare RRF or RRC, no difference, agreed.

But what we're saying is we have to step back and look at this concept from more perspectives than just that. And it's the broader perspective. When you start looking at a ranking system based on RRC is when you start seeing things that start appearing to become counterintuitive when you look at the broad range of passenger car tires.

And then you have to take it a step further. Once it becomes apparent that it's counterintuitive, then it raises the obvious question of is there something wrong here. Is there some underlying factor here that's causing this to look this way that, in fact, helps us define why this may be an unreliable metric for ranking of tires.

And that's what I think that Larry was trying to point out in his presentation, in particular, today, and going into it in much more detail.

MR. FORD: Yeah, and I agree with, you know, what Larry's presented. I mean that difference in ranking is there when you change diameters. There's no doubt about that.

However, look at the situation when a consumer comes into a store with an LP sized tire on his pickup truck, and that's what the manufacturer put on it because of the load-carrying capacity of that vehicle.

If that consumer sees a P metric size tire with a lower road resistance force and he wants to put that tire on his truck, there again you do not have the load-carrying capacity. It is a safety problem for that consumer to put that -- even though he might get better fuel efficiency if he puts the lower coefficient, or the lower load rolling resistance force tire on. He's actually creating a very unsafe condition for his vehicle.

MR. TUVELL: Okay, --

MR. HARRIS: First of all, one of the things you have to remember is that the wide truck tire is not going to have a rolling resistance value put on it. But -- in California, okay -- but, once again is that dealer going to say to him, okay, yeah, I'll put this 105 load index tire on your vehicle that's supposed to have 120.

And then that becomes the point of the

education of the dealer to provide the proper tire for that person's vehicle.

MR. FORD: John, that's a significant legal problem. The dealers are not going to do that from a legal aspect. They're not going to put a load index tire on a vehicle that has a placard, they're not going to put a 105 tire on a vehicle that has a 120 load index on the placard.

MR. HARRIS: So then there's no problem.

MR. FORD: There's no problem for what?

MR. HARRIS: With the guy coming in with the load range -- tire and saying he wants a C metric in place of it.

MR. CAMARADO: This is Greg Camarado from Goodyear. But it's the same question that was brought up before. If someone's coming in and looking purely at scores what you're doing is you're introducing a decisionmaking process. You guys (inaudible), you're introducing a decisionmaking process for a consumer that today they don't make and don't want to make, because it's already taken care of for them in terms of the way the tires are -- and loaded. Okay.

And when you put a force out there which could lead them to want to do something different on their vehicle, I don't care if plus size or down size, if you're doing something outside the recommended size for that vehicle by placard, okay, you're bringing in a variable that shouldn't exist because they shouldn't be making that decision in the first place.

People who want to upsize to 22s and 24s, trick these vehicles out and so on, they're doing a lot more than that. They're changing wheels, they're changing -- there's all kinds of other things involved. And fuel efficiency from their original tires is not one of the decisionmaking points. It could only be if they wanted to compare brand A and brand B.

MR. EVANS: Well, I think that's absolutely true. And I think a lot of these things are really red herrings when you talk about, you know, changing sizes and so forth.

The real question in my mind was the entire global system and how it looks. In other words, do I believe it. And as we said a hundred times, make it 101, for any consumer buying tires or any buying the correct tires for a vehicle, it doesn't matter which system they're using to rank order the efficiency of tires in the slightest.

MR. TUVELL: If they're comparing tires tested at the same load index.
MR. EVANS: If they're comparing tires tested at the same load, that's correct.
MR. TUVELL: Yeah.
MR. FORD: And if they're the same size tires they will be tested. They're all tested at the same load.
MR. TUVELL: Yeah. Let me suggest here then how I would prefer to wrap this subject up. Many of the points that were brought up in the discussion and the different analogies and the different contrasts are exactly the same questions and issues that we've been grappling with ourselves.
And we've gone round and round and round on those, and still not satisfied with where we end up. We need a technically supportable answer to this question.
And that's why I asked the tire industry, the tire manufacturers, can you help us trace back the history of RRC. Is there a technical document that supports this. And any other test data that you may have that compares and contrasts this to show the different outcomes.

Because despite all the different analogies and all the different theoretical discussions, I'm convinced that there's an issue here of broader significance that we're just not going to be able to talk ourselves around. And we have to come to grips with it. We have to come to grips with it.

So, please, I encourage everyone to address this in more depth in your written comments. This is an absolutely significant issue; depending on the outcome it's a game changer. It's a game changer.

Now, it is noon here, and I'm going to suggest probably it's going to be best if we take a lunch break now. Hold on a second.

MR. McBRIDE: Yeah, for the purpose of recording, one of the commenters on the phone, Greg Alexander? Okay, never mind.

MR. TUVELL: Okay.

MR. CAMARADO: Yeah, did you get it? It's Greg Camarado.

MR. TUVELL: Okay. Were you commenting during that period? I'm sorry.

MR. CAMARADO: Yeah, I was -- Goodyear, Greg Camarado.

MR. TUVELL: Oh, okay, excellent. Thank you very much, I missed that. We're just getting it down for the record, Greg, sorry.

DR. MEIER: Is there time for a quick question?

MR. TUVELL: Yeah, one final quick question from Alan Meier.

DR. MEIER: Again, this is for Larry and John. I'm still a little bit concerned because I don't really know the uncertainty that is created in the rolling resistant coefficient, because you're taking the rolling resistance force divided by the load index.

Have you ever taken a number of different measurements of load index or something like that, or let's just say the load of the -- from different manufacturers or had different procedures?

Because I just don't know the uncertainty in that part of your calculation. You have very good estimates of the uncertainty and the variation in the numerator, but the denominator is taken from someplace else. And it may be the two tires have essentially the same rolling resistance force, but because the manufacturers have slightly different procedures in calculating the load index that you could get a very different rolling resistance coefficient.

MR. FORD: Yeah, Alan, this is Sim Ford at Goodyear. Let me answer that very quickly for you.

DR. MEIER: Thank you.

MR. FORD: NHTSA has a federal motor vehicle safety standard. And in that standard they require manufacturers to follow, for consumer tires, they have to follow the Tire and Rim tables.

There is no variation that tire manufacturers can use. So, all tire manufacturers, if they are certified to DOT standards, must use the exact same loads for each specific sized tire.

Does that answer the question you were asking?

DR. MEIER: Very clearly, thank you.

MR. EVANS: Let me add one more thing. This is Larry Evans. I think what you're asking, too, is about the data, itself. And there's a misunderstanding. I didn't make it clear.

The divisor in this case is the load at

which the tire is tested. And that's not a measured value, it's a prescribed load. So there may be some variability in the machine. And John will tell you in a second what that is because he's familiar with it.

But we're dividing by a constant number. So we're not introducing any variability to our data or to the data by going from RRF to RRC.

MR. HARRIS: In the case of these tires, the load between the P metric and the metric tires, one tire was a 97 index, the other's a 98. There was a less than 40-pound difference in the loads of the actual testing.

Now, the thing is the load is prescribed in the test method. And, again, I don't want to, you know, I don't have any information directly in front of me, but if the tire was to be tested at 1182 pounds, it would be tested somewhere between probably 1180 to 1184. Maybe at the outside of 1175 to 1187. And that's the accuracy of the machines that are being used.

So, we then divide by the load which it was supposed to be tested at. You're still, you know, pretty accurate basis. You have to remember that, you know, there is variance in the testing, but again, once you, you know, divide out by a load that is specified at what it was supposed to be tested at.

So, you know, again you're -- when you really get down to it, the accuracy of the equipment and the actual loads and pressures that were used, you know, it's all pretty much within 1 percent.

DR. MEIER: All right, thank you. I'm very -- completely reassured about that.

MR. TUVELL: Okay. Very good, then. John and Larry, I want to thank you very much for taking time out of your busy day to participate here on the most critical of issues here that I know are not only impacting us out here in California as we proceed, but also with you NHTSA folks.

And solution yet to be found, but one that benefitted from the time we spent on it today.

I'm going to now suggest that we go ahead and take a lunch break of an hour and 15 minutes. Be back at 1:30, please, for resumption at that time.

And our speaker will be Dr. Alan Meier.

Thank you very much.

(Whereupon, at 12:07 p.m., the workshop was adjourned, to reconvene at 1:30 p.m., this same day.)

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AFTERNOON SESSION

1:34 p.m.

MR. TUVELL: Normally I would wait just a little bit longer, but I have every expectation that the two topics that we're going to be having this afternoon is going to push late into the afternoon. So, I'd like to go ahead and get started. I apologize to everybody who weren't able to get back by just 1:30 as I had originally requested.

This next speaker is Dr. Alan Meier. Dr. Meier has a PhD in energy resources from the University of California Berkeley. Has significant past experience and work in the appliance-related fields of energy efficiency and buildings-related field of energy efficiency, which we're finding to be an invaluable asset to us in the tire world because of the great parallels in terms of approaching this from an energy efficiency perspective. And the way we've done it in the past and very successfully here at the California Energy Commission.

Plus Alan also chaired the November 2005 meeting in Europe on low rolling resistance tires and fuel efficient tires.

So, let me introduce then Dr. Alan Meier. Thank you.

DR. MEIER: Thank you very much. I'm going to talk about the one step that the Energy Commission will have to take at some point, and that's translating the rolling resistance measurements into what we would call declared or representative values.

And so the goal that we have with this whole concept of measuring rolling resistance is that we want to insure that the rolling resistance value that consumers see is both a fair and accurate representation for a given tire. And it's really important, I think, to know what that, what fair and accurate means.

Accurate, I believe, is a situation where it's suitable for calculations of fuel savings. And fair is perhaps a little more complicated because we have to balance some of the value of the data to the consumer and to other groups with the costs to the manufacturers of measurement and disclosure.

So, the problem, however, is that you can't just measure a single tire because there are variations in manufacturing. And those variations which were described to some extent this morning, those lead to variations in the -- or an uncertainty in the estimate of rolling resistance. That's at both the manufacturing, and then the uncertainty in the laboratory measurements, themselves, which were dealt with in much more detail in the morning. Those are the uncertainties in the manufacturers' laboratory.

But also from another perspective you have to worry about the third party laboratories that might be used later on either to compare one tire against another, or for verification that this tire is meeting its claimed value.

So there may be as many as three different groups who have to be able to have the ability to compare or verify that energy use.

One, of course, is the regulator. Another is something like consumer reports. But there may be other kinds of groups that will be curious about it that are NGOs.

And finally there will be some other groups that like other manufacturers or auto manufacturers that would be curious to see how that tire stacks up against other ones.

So we have to explore some of the

variability. A lot of this has already been done, however, or described this morning, so I can run through it.

Here's just a slightly different display of some data for rolling resistance for one tire, ten measurements of that tire. And these are just two different tires. Here just happens to be rolling resistance coefficient. But it could be anything.

Indeed there is some variation from tire to tire, and so we need to be able to make sure that the claim of value of rolling resistance for a tire is -- adequately represents this variation or uncertainty.

The next slide shows there are lots of tests that have been done. And so we can get some idea of how much variation there is. So, that's good. And has NHTSA pointed out in their presentation, the covariance of multiple measurements is not that large. It's about 2.5 percent is what they found, less than 2.5 percent in the groups of tires. Same tires ,but -- same model tire but just measured one after another.

Next slide. There's also some same tire measurement uncertainty which is the same as saying you know we have one tire; we're going to measure it a few times. Does it give us a different answer. And that was one of the most reassuring things we saw this morning, is that NHTSA found that's not a real problem. That that was what they called their first, second and third tests of the same tire.

And the implication was at least in the laboratories that NHTSA used, the measurement equipment reliably obtained the same results.

I think the more recent question that is coming up especially because of ISO 28580 is how do different laboratories compare, and how do you reconcile those results. And that's very important if we're going to do these comparisons.

We know that there's a technical committee within ISO in 28550 and I believe they have done some inter-laboratory comparisons. And maybe the manufacturers can provide us some more information.

We saw one study which was of synthetic data that said if the differences are this much, this is what will happen. But we didn't actually see any results that, at least I couldn't find. So it would be useful to know what situations in more laboratories, especially the manufacturers' labs.

Because the only thing that we have to rely on right now are the comparison that NHTSA reported between Smithers and STL, which showed that there were -- it would be pretty easy to reconcile the two laboratories. There's both an offset and certain kinds of variable errors, but to some extent we could certainly deal with that, the offset problem.

The uncertainty and some of the non-linearity in those differences still need to be dealt with. And add one level of uncertainty in the comparisons.

So the question becomes how do you represent the efficiency of a tire that was going to have a certain chain of variations in its rolling resistance.

And so generally what you do is you want to have a manufacturer declare the rolling resistance based on measurements of several tires.

And the idea of testing multiple products or many tires to come up with a number that represents the whole group of tires is, I think, fairly familiar inside the auto industry.

From our inquiries we found that the automobile manufacturers typically require five measurements of tires. And one manufacturer, PSA, apparently requires ten measurements to get a mean rolling resistance. Ford requires four, I'm told.

But we don't have the details of how these measurements are made, what kind of confidences around it, and sampling and so on. So we're not quite sure how that's done.

Now, I wanted to show, as an example of a way that it could be done, how the U.S. Department of Energy requires sampling for other consumer products which are related to energy consumption. It has some similarities, but not everything is similar to tires.

In the area of consumer appliances the DOE requires energy tests for a whole range of appliances. I mentioned refrigerators here for a couple reasons. First of all, I just -- I went and counted how many refrigerators are in the database. And there are at least, in 2008, there were over 3000 refrigerators listed with energy consumption measurements.

So, you know, is a refrigerator more complicated than a tire? Probably they are both complicated in different ways. And so that's something we have to take into account.

However, the reason I'm raising the approach that DOE is already using is that it is proven, manufacturers have learned to live with it, it's accepted, and it's a known methodology. So, at least it should be thrown out there and proposed as something to see can we find something better than this. Is there something wrong with it? What makes tires different from other kinds of products?

So, this slide shows, in a kind of an edited form, DOE's sampling procedure for consumer products. And what I did here was, if you'll note at the bottom, I tried to simplify the text. And everyplace you see three dots I have removed text. But if you want to see the whole text, go to the end of my presentation. I just wanted to simplify what the rules were. And I think that's -- I haven't distorted the meaning of the sampling procedure.

It says basically that the sample should be selected of representative production units. And they have to meet the following criteria. That if you're going to measure, if you're using a measure of energy consumption for which the consumers want a lower value, that means to say a low value like rolling force or rolling resistance coefficient, if a low value is preferable to consumers, then this is the way in which you would do the sampling.

You would take the higher of two alternatives. One is you can just take the mean of a sample. Or the upper 95 percent confidence limit of the true mean divided by 1.10.

Now, I think you know what a mean is, so that's pretty simple. That would be a sample -- well, you'll find out how many tires, but it's going to be really only about four or five tires probably.

What is the upper 95 percent confidence limit of the true mean divided by 1.1 mean. Let's see, if you'd go to the next slide. In this case the declared value equals this formula here, x bar plus t times s over the root of n, all divided by 1.1.

And where x bar is the mean of the sample of the tires that you have measured. And then you have to calculate the standard deviation. And t is the t statistic for 95 percent confidence limit. And then n is going to equal the sample size.

Now, if you use some of the data that we've seen already before, that's been taken by Smithers and NHTSA, generally four tires will give you the necessary confidence. And you can have a declared value. And it will result in a declared value that may actually be a little bit lower than the mean. So it's actually worth going out and -- well, that's the way you would want to have it set up.

Now, the thing is, this is not a fixed kind of formula. You may, in the end -- there are a couple numbers that are up for negotiation.

So, for example, should it be the 95 percent confidence level. It turns out that in different kinds of appliances the rules use a different number.

And what is that 1.1. That, again, is something up for negotiation. So that is an area where the manufacturers and the Department of Energy have negotiated to come up with these kinds of adjustments and lead to a situation where the manufacturers and Department of Energy and consumer groups have come to kind of an understanding that they've balanced the needs for fairness and accuracy such that I described earlier.

The one aspect that isn't explicitly described here are the inter-laboratory adjustments. That's the alignment. In principle, you should be able to include in the measurements of individual tires an adjustment for the bias, for the offset from one laboratory to another. But we still have to worry about some of the uncertainty that will be introduced by that.

But I think that in those adjustments you want to encourage, design it so that there is an incentive for the laboratories, the manufacturers' laboratories, to be as accurate as possible, because that reduces the standard deviation and reduces the number of tires that they, themselves, need to test.

I'm sure there are other approaches. I presented this one just simply because it has been used for over, I think, about 15 years. It's been proven on both sides. It's been proven by the manufacturers; it's been proven by some of the users and regulators for verifications.

Like I said, there are other approaches

with using the trimmed mean or some sort of stratified sampling, or some sort of samples of convenience. But those strategies haven't actually been well defined yet. And so we have to work on it.

However, whatever the approach we have to keep in mind that the goals are avoiding testing more tires than are necessary, because that's expensive. And, as I said before, we have to insure that a third party can duplicate or replicate the test procedure in such a way so that they can compare the results with whatever the manufacturer claims. And be able to make sure they are comparing the same thing.

One of the aspects, of course, that is important is being able to see the results and the declared results of the manufacturers. So I wanted to call your attention to two other points.

If you go to the Federal Trade Commission site, they display the energy consumption of all refrigerators and all the other appliances, too. This is just a fragment of those 3000 refrigerators I just pulled off. Where you can see for every refrigerator tested, there's something about the type of refrigerator, its brand name. And then what is its energy consumption in this case. And it's updated fairly regularly. The FTC knows how to do that.

And, next slide. Likewise, EnergyStar, which is a voluntary program, also requires the manufacturers to submit data. And it displays all of it.

However, in this case I couldn't make the page wide enough, so the columns continue for another, oh, about the same distance. So you're only seeing about half the number of columns that are actually in the data.

But, once again, this is a situation where for computers, for example, there were over 1400 desktop computers alone. And the EnergyStar keeps that up to date. Manufacturers are responsible for entering the data and removing obsolete machines. And so it's a fairly live document and a useful source, which the manufacturers, themselves, use to benchmark their machines' performance to their competitors.

So this is just a simple -- the full text of what I showed you way back at the beginning. Can you go back just to -- keep going, keep going.

Yes. So that's the full text of this. And, again, it's not necessarily the only way to do this, but it's been used and proven and accepted by some manufacturers. And so now the question is what kinds of changes would be needed to make this accommodate the unique aspects of tires.

So that's all I have to say. Thank you.

MR. TUVELL: Are there any questions? Let me point out, if it isn't already apparent, the significance to us from a programmatic respect, why this issue needs attention.

It's both -- we perceive a need both in the original declaration or the original representation of what is this tire, from an energy efficiency perspective, or a rolling resistance perspective, or something.

Somehow a consumer has to be able to rely on a piece of information relative to that individual product. And therefore we need to come up with not only a system to represent that, but an accurate methodology to do it.

And so once it becomes obvious that we're dealing with products that have, in fact, some inherent variability among them, then the sample-size issue jumps right out at you.

Now, of course, our program originated around the concept of dealing with this from a replacement tire perspective. But it is our belief, and it is our general knowledge, and we've been informed that this is not uncommon at all. And has been handled with on the original equipment side of the tire business.

Where manufacturers of new vehicles, when they go to a tire manufacturer and negotiate a business agreement to buy their tires, will, in fact, specify a detailed criteria specific to what they expect that tire to meet. And then impose on the tire manufacturers a sampling methodology by which they determine whether or not those tires, in fact, do meet those specifications.

So, it is our belief that what we're finding a need to deal with here in the replacement tire marketplace is not at all uncommon with what has been faced by the original equipment tire side of the business and resolved. And resolved.

Now, on the other hand, it's not that easy for me to get inside GM or Ford or Toyota or Honda and say, hey, show me your spec sheet. How do you guys go about doing this.

We have been given anecdotal information that we have some confidence in. But, quite frankly, I would love for the tire manufacturers to come forward and say, hey, no problem, this is not any kind of proprietary document. Here's the document Ford gives me. Here's the spec sheet. Here's the testing -- here's the sampling methodology.

If there's something there that we can look at, that the industry is happy with, been dealing with for years and years, please, bring it forward. Please bring it forward.

You will have, I believe, you must have access to this, or it's in your laps anyway because of those of you that are in the business. Bring it forward. Let's look at it. It's something you're happy with. Let's see if it can meet our needs.

But it is a fundamental issue. Needs to be dealt with, in any case. And as you can see, it's not specific to tires. It's specific to the issue of trying to develop energy efficiency programs and represent the qualities of these different products in a consumer information world.

Any questions, comments? Yes, Dennis.

MR. CAMARADO: Ray, this is Greg Camarado at Goodyear. Just one comment, and this is really just a comment. Just want to make sure you understand when we supply data to an OEM for a specific tire that they're purchasing from us, understand that the rolling resistance information that they request is only for one specific vehicle. Just so you, you know, know that's clear.

MR. TUVELL: Do you mean to make a distinction between one specific tire, or one specific vehicle?

MR. CANDIDO: Both.

MR. TUVELL: Both.

MR. CANDIDO: One specific tire is applied to one specific vehicle for an OEM.

MR. TUVELL: Okay, but --

MR. CANDIDO: My point is that if you put that tire on a different vehicle you end fuel consumption is going to be different.

MR. TUVELL: Oh, yeah, I understand. I understand the point.

Yeah, --

MR. CANDIDO: So, to characterize a tire for -- the same tire for many different vehicles, you know, we don't do that.

MR. TUVELL: Yeah. Help me with that, Sim. I hope I wasn't trying to give that indication here. Basically what I was -- the point that Alan's presentation, and the point of what we're trying to get to here, is the representation of the tire. Not the vehicle that it is going to go on.

So, doesn't matter, RRF, RRC, what is the appropriate way to determine that RRF or that RRC for that tire, and then represent it in the public domain.

And since we know that there's variabilities, our tests show that, in any product line, then this raises the question of what is the methodology to do it. Is the sample size approach? And then the mathematical process by which you reduce it to one number.

That was simply what I was trying to do. Also, though, you're correct, I did go the next step and say we believe that's fundamentally what's going on in the OE marketplace anyway. We'd like to bring something very similar into the replacement tire marketplace.

Yes, Dennis.

MR. CANDIDO: Dennis Candido again from Bridgestone. If I can just comment on that. The current procedures that are used for OEM vehicles involve the 2452 coastdown method because they have a more rigorous method for determining vehicle fuel consumption, and we have to do that test, which is a coastdown-type of test.

What I wouldn't mind sharing with you, if I could, relating to Dr. Meier's presentation, there was a page, I think, in which he showed the data on the tires.

MR. TUVELL: Yeah, let's bring it back up.

MR. CANDIDO: -- page that back?

MR. TUVELL: Sure. Yeah, back towards the beginning. The ten-by-ten?

MR. CANDIDO: Yes. Yes, the ten-by-ten.

MR. TUVELL: Yeah, right there. Sure. Thank you.

MR. CANDIDO: I just thought it might be of interest to everyone. But you can see the data of standard deviations that run across the bottom. Those are coefficients, correct?

DR. MEIER: Yes.

MR. TUVELL: Right.

MR. CANDIDO: Yes. And you can see the range of the data. And I thought it would be of interest to let you know that in the current stage of 28580, which has the lab alignment procedure involved, that document now is in its final draft international standard phase, and it's being prepared for final balloting.

But within that document, I can share this much, regarding a candidate lab, that is to say any lab in the world that wants to get certified, if that's what a regulatory body chooses to do, to be compliant with 28580, that candidate lab must maintain their equipment to a standard deviation of .075. So.

MR. TUVELL: Okay.

MR. CANDIDO: That's right in the documents being circulated. I just thought I would share that with you, and you can see in this case there are some that do and some that don't. And I thought that might be of interest.

So, it's a very -- my point was that 28580 is going to be a very rigorous standard for lab alignment.

MR. TUVELL: Yes.

MR. CANDIDO: Not only is there in the procedure that you have a reference lab and you have tires that are measured at the reference lab to very rigid numbers, --

MR. TUVELL: Yeah.

MR. CANDIDO: -- and that tire then goes to the candidate lab. And they have to align, and whatever their offset is they have to adjust for it. That lab must always, that's the candidate lab, throughout its duration maintain a standard deviation of 075.

MR. TUVELL: I'm glad you brought this up. I mean, if you don't mind, it's slightly off topic but this is of great interest to us also. It's my understanding that Bridgestone is making the alignment tires.

MR. CANDIDO: Yes.

MR. TUVELL: And it's my understanding that that process has reached the final stage, also. And that those tires are currently available, is that correct?

MR. CANDIDO: We have made those tires. And the participating companies in 28580 were given samples of those tires to run to insure that they ran appropriately and they were satisfied with the tires.

MR. TUVELL: Okay. Okay, good. So, then let me --

MR. CANDIDO: That was a roundrobin test that was part of the standard development -- the development of the standard.

MR. TUVELL: Okay. Let me just finish one second, Bruce, and I see you have a question, also. Let me take it just a couple steps further, then.

So now then I'm pursuing the 28580 machine alignment question here. And that is, what is your understanding then of the laboratory that's going to run the reference machine? What's going on there in that process to get that implemented?

MR. CANDIDO: That reference lab has a different standard deviation compliance.

MR. TUVELL: Okay.

MR. CANDIDO: It must operate to .05, not 075.

MR. TUVELL: Okay.

MR. CANDIDO: That's one of its requirements. It must also be maintained in calibration on a regular basis like any other machine. And be compliant with the different ISO standards for quality.

MR. TUVELL: Okay. And can you tell me, are you aware of whether or not a laboratory has been selected yet to run the reference machine?

MR. CANDIDO: At this stage I don't have that. I don't know of any reference lab that's been certified and picked as the reference lab.

MR. TUVELL: Okay. And do you know if there is a process that is going to be implemented for that to happen in the schedule for that?

MR. CANDIDO: Obviously in the development of 28580 we will not be specifying those reference labs.

MR. TUVELL: Sure.

MR. CANDIDO: We will only define what the reference lab must do.

MR. TUVELL: Yes, absolutely. I can understand that.

MR. CANDIDO: That's not within the scope of ISO.

MR. TUVELL: Got'cha.

MR. CANDIDO: For the process of developing the standard we did assign reference labs.

MR. TUVELL: Sure.

MR. CANDIDO: And that was for the development. One was in Bridgestone Japan; the other was Goodyear Europe.

MR. TUVELL: Right.

MR. CANDIDO: And that was just for the development of the standard.

MR. TUVELL: Sure, sure. Yeah, I understood that, also, and that there's a dividing line there. So, I guess my question may be going beyond that.

So who, then, is going to now take on that responsibility of developing the -- or developing the reference lab and the administrative process and the logistics to get all of the other candidate labs certified?

MR. CANDIDO: Well, I guess it depends on what regulatory body implements a requirement. California, federal government, Europe, once they assign that this is a regulatory requirement, then obviously they will then be seeking candidates to come forth to be a reference lab.

Obviously there'll be a business decision as to just how much tires will be charged

to be run on them, and so forth.
MR. TUVELL: Okay.
MR. CANDIDO: That's how I see the process.
MR. TUVELL: Yeah. So, in the development of the 28580 then was it -- that part of it, was it discussed in any detail?
MR. CANDIDO: No.
MR. TUVELL: And there hasn't been anybody raise their hand yet that's --
MR. CANDIDO: I don't know --
MR. TUVELL: Okay, good. Good.
MR. CANDIDO: Yeah. We selected reference labs for our work.
MR. TUVELL: Sure, I understood that. Yeah. And I'd want to make that distinction, too.
Bruce, you had a question?
MR. LAMBILLOTTE: I just want to make a point that I believe, correct me if I'm wrong, Dennis, but --
MR. TUVELL: Oh, wait, Bruce. You should probably come up to the podium.
MR. LAMBILLOTTE: When you refer to .07 I'm assuming you're talking about the variability --

MR. TUVELL: Wait, wait, wait.

MR. LAMBILLOTTE: -- the variability around repeated tests of the same tire.

MR. CANDIDO: Exactly.

MR. LAMBILLOTTE: These are different tires. This is a population of ten different tires. So what you have is a variability complex not only by normal variability of the test, but also by the fact that we have normal production variabilities --

(Parties speaking simultaneously.)

MR. CANDIDO: -- under column A that would be all the same tire.

MR. LAMBILLOTTE: Right. No, no, these are -- it's ten tests of ten tires up here. It's individual tests. One test each of one tire. And those are ten-tire populations.

MR. CANDIDO: Maybe I misunderstand, but like for column A wouldn't that be the same tire measure ten times?

MR. LAMBILLOTTE: No. No, it's not.

MR. TUVELL: No, it's in ten separate samples of the same tire.

MR. CANDIDO: Oh, ten separate samples, not the same tire. Okay.

MR. LAMBILLOTTE: I just wanted to correct that.

DR. MEIER: Yeah, I'm sorry that wasn't --

MR. CANDIDO: I misunderstood that.

DR. MEIER: I should have made that clearer.

MR. LAMBILLOTTE: But in the 28580 it's 075 for the same tire measured a number of times to get a standard deviation.

MR. TUVELL: And in the data, also, Dan, I know that you and Dennis have, that I provided you in our broader studies, you see more variability in the five test samples. In some cases, not in -- you know, I don't want to broadbrush this, okay. I mean in some cases nice timing fit.

But once you start seeing some of those outliers and some of that variability, and again, I mean I'm not saying with your product or your product, but products on the marketplace, it then poses this problem for us how do we, you know, come up with a sample sizing and narrowing down process to get a number that's representative.

Yeah, Alan and then Dan.

DR. MEIER: I just wanted clarification on there. Just to give you a sense of proportion, you said the standard deviation for interlab alignment, you're going to require less than .075.

MR. CANDIDO: Not for interlab, for a given candidate lab.

DR. MEIER: For a given candidate lab, .075 ,so --

MR. CANDIDO: Yeah, it must maintain --

DR. MEIER: So, yeah, so which is -- which just turns out in some cases here, if you look at tire -- oh, I'm looking for a good one -- tire H for example.

You see the standard deviation is .06, which is -- now, you can see that the variation in tires there is in ten different tires of that model is about the same level of variation as in the interlab --

MR. CANDIDO: Yes.

DR. MEIER: -- or of that lab --

MR. CANDIDO: And that's just a single standard deviation. Keep in mind that --

MR. TUVELL: Right.

MR. CANDIDO: -- if a regulatory requirement evolves into some kind of a band, tires within a band, a certain width, will be graded A, B, C or 1, 2, 3, whatever, you have to take into account this kind of variability that is state of the art. And also measurement variability to make sure that, you know, you're not going to take any tire that continually pops from one to the other simply by test variability.

MR. TUVELL: Dan.

MR. GUINEY: Yeah, Dan Guiney, Yokohama Tire. Just two questions. In citing examples there's also many examples with NHTSA of self-certification approaches rather than prescribing detailed methodology of sampling. And at some future workshop we would certainly like to be able to present that.

The other is a question I have is the title is translating rolling resistance measurement into declared values. And I didn't know if we'd gotten already to a point where that declared value is a rolling resistance number. It could be simply a rating.

It doesn't necessarily, I don't know if you've already gotten there and said that this has to be a rolling resistance value. You've cited that example.

MR. TUVELL: Oh, yeah. No, the implication here is right back to the beginning. Here we have a rolling resistance test, ISO 28580. Stop right there, okay.

Since we know if we have ten separate samples of a tire there will be variation in each. Then if we were to ask the question, what is the representative number of the rolling resistance of this tire. Just stop right there.

And we say we need to come up with a methodology to represent that. So that we're not trying to carry through ten numbers or 15 numbers or 20 numbers. We want one number to be representative of that tire make, model, size. That specific one, okay.

MR. GUINEY: Okay, I guess the point we would like to make at some future point is that it could be for consumer choice what declared value or grade are you going to apply to this tire so I can make a choice and avoid the question of all the prescription of all of this upfront.

That there are ample cases in NHTSA where we identify tires in certain ways for performance characteristics that are ratings, as the law states to build.

So, at some future point we probably want to make that presentation of another example of how it can be accomplished without all of this difficulty.

MR. TUVELL: Sure. No, no, and I appreciate that. And so specific to this presentation and this subject, from our perspective, we've outlined and tried to illustrate the way we see this.

And, you know, this may be an important point here, and so let me take a minute just to digress. One of the things that I thought was very important that Alan brought out in his presentation is this perspective of the energy efficiency world, which is largely where we're coming from here at the California Energy Commission relative to this subject.

He talked about the standards associated with refrigerators and other product lines, which that's our history in how we've operated, and how we've ended up developing very effective programs, methodologies, representations in the past.

Now, Dan, you had mentioned in contrast to this, and that's NHTSA. Who, as we know, has a substantially different approach in terms of how they've operated historically in representing information and requirements on the industry.

And we see that very different, you know, perspective, okay. And that's one thing that collectively we both need to recognize, okay. I mean I fully appreciate that that's the world that you've largely been, you know, living with, you know, in the past.

And I hope you can appreciate that this is the world we've largely lived with and found successful in the past here, okay. And obviously having a great deal of experience in coming at it the way we have in the past, we see confidence in trying to turn around and apply that to this product as we have product after product after product, as we've taken them on here at the Energy Commission.

So I think it's very important to use this as an opportunity to explain that distinction. I see it. I mean, your world is different where you're coming from. We're coming from this world. We need to appreciate each other's differences.

Any other questions?

MS. NORBERG: Hi. I'm Tracey Norberg

with the Rubber Manufacturers Association. I just wanted to address the point, and we appreciate the recognition that the tire industry is used to a different regulatory structure than I think is the Energy Commission's experience.

And I think it would be helpful in a future workshop that we are able to talk about that in a little more depth, because I think the important thing that we all want to keep in mind is that fuel economy and energy efficiency are the goal. And that it's important to look at the different ways that we might be able to accomplish that without any other environmental negative consequences by looking at it a different way. And looking at, particularly, costs to the industry.

And I think it would be helpful, too, in looking at the kinds of products that we're talking about here that have been the Energy Commission's experience. I think it would be helpful, too, to look at what the experience has been in the transportation sector.

And not only at NHTSA and looking at CAFE, but also at ARB and looking at tailpipe emissions and that kind of thing where we're talking about environmental information provided to consumers and to regulators.

And I think there the practice has been much more along the lines of self-certification. And that is the transportation sector, which we are a part of.

And so I think in terms of analyzing all the various systems that have been used in the regulatory world, it's important to also look at the transportation sector and consider that model, as well.

MR. TUVELL: No, absolutely. I agree completely. But I think there's one thing that is going to be very very important that we all come to grips with, and that is the very broad definition that seems to go around the term self-certification. Or the multiple definitions that seem to go around the word self-certification.

And I'll just mention a few examples. I mean, there's some people use this term self-certification as being, well, the industry does it themselves, period. Nobody else, you can't go to an independent lab, you can't go to anybody else, that they do it.

I've heard other people say self-certification, no, you have to go to an independent lab. Industry can't do it, okay.

And then I've heard self-certification, and I think the way that NHTSA does it is, I mean it's just really broad. It's kind of like you don't have to declare how you did the number. You don't have to actually use a test procedure. You don't even have to produce a number. In some cases it's just a letter, and all you have to do is sign on the dotted --

And so, what I'm finding is the use of the term self-certification seems to have some consistent meaning to some people, but others who are not familiar with the term go, wait a second, it has many, many meanings. Exactly what do you mean when you use it. Exactly what do I mean when I use it. And then what are the ramifications of that.

MS. NORBERG: And I understand that, you know, people, different people have different interpretations of the single concept. And I think that would be important to have some workshop discussion time on that.

And we would really welcome the opportunity to prepare and be able to present our perspective on that. And I assure you the tire industry really takes very seriously its self-certification responsibilities.

And I think we would really appreciate the opportunity to be able to explain that in considerable depth, and present that in other workshops.

MR. TUVELL: Well, you did know back in June Keith Brewer did present to me the whitepaper that you folks had promised on self-certification. And we'd certainly welcome more beyond that if you have it.

MS. NORBERG: Yeah, and like I said, --

MR. TUVELL: I had the impression that that was the --

MS. NORBERG: -- when you're at the point of developing the next workshop we'd really welcome the opportunity to be able to give a presentation and have a full dialogue with other stakeholders. This has been very valuable this morning and this afternoon to hear everyone's perspectives. And we'd really appreciate that opportunity.

MR. TUVELL: Okay, thank you.

Anyone else with -- actually we're

moving along very well here. I'm going to move to the next item on the agenda. And this is the subject of tire manufacturer testing and reporting.

The presenter will be Bruce Lambillotte from Smithers Scientific. Bruce, as with many people I have found in the tire business, has made a career in the tire business. I keep asking people, what is it about the tire business that once you get in you can't get out.

(Laughter.)

MR. TUVELL: That isn't necessarily a bad thing, it just kind of stands out.

Bruce is the General Manager now of Smithers Scientific Services in Akron, one of the few independent laboratories in the United States that provides detailed work on the subject of tires, and specifically one of only two that we're aware of that does rolling resistance testing.

And Bruce does have over 34 years of technical experience in the tire industry. Numerous presentations before scientific panels and peer groups in his field.

And has been a valuable, valuable contributor to the work we're doing here, and we're so happy to have it available under contract to us. Bruce.

MR. LAMBILLOTTE: Thanks, Ray.

(Pause.)

MR. LAMBILLOTTE: People tend sometimes to question consultants. And sometimes the word consultant, itself, has a questionable connotation. I hate to come up here and show you a presentation that's sideways all the way through as a result of it.

Smithers, if you're not aware, and I think we've already touched on that, is an independent testing and consulting company. We've been involved in the rubber industry, specifically we've been involved with the tire industry since 1925.

We have been commissioned -- and this is the second contract we've participated with the Energy Commission in -- we've been commissioned to look into a variety of things and provide some independent consulting work for them. And what we're going to show you is some preliminary results from the latest contract from the first work authorization of that recent contract.

And specifically we've been asked to

look into four things. And these are really the objectives, as you'll see, that we're going to be talking about.

First is to assess, get a rough working idea of how many stock-keeping units are out there. How many are we talking about. Are we talking about 1000, 10,000, 100,000? Just how many are there?

There's no easy references for this. We had to do this by research completely. And you'll also have to see, as we go through this, that our definition of stock-keeping units is very specific, and it does differ from the definition of an SKU that the tire industry, itself, might use.

We were asked to go on by the Energy Commission and look at estimates of test capacities. And we'll do that on a by-machine basis, by-day basis, by-year basis and by a global capacity basis.

We were asked to go on and say if capacity has to be increased on a unit basis, what's involved in increasing test capacity.

And finally, the last item here is about half of the body of work, and it's about half of this presentation, and that's to look at the cost, logistics and feasibility of doing this kind of work.

I'm sure you know that this body of work originally came from AB-844, the California legislation that among other objectives has resulted in the desire for the fuel efficient tire program, and the tool to implement that program has been the California Energy Commission. They are the ones that have been commissioned to be in charge of implementing it on a practical basis.

As I mentioned, this is just the first work authorization, the latest contract. And you're seeing preliminary results. And these results, I would tell you, are just that. They're preliminary results.

Our final report hasn't been created yet. We hold the right, we may be changing some numbers because we're still getting some information in. And there's one or two areas, and I'll point that out, that we've gotten recent information in.

Go ahead. Would it be any chance of me doing it better up here?

MR. McBRIDE: No, it's -- what we will

do is do it as a share application --

(Pause.)

MR. McBRIDE: We've got the presentation on file here, go ahead.

MR. LAMBILLOTTE: I'm pretty much going on with the objectives. Again, find the SKUs; look at test capacities; determine what it takes if you have to increase test capacity. And then get to the very specific objective of cost, logistics and feasibility.

Go ahead. So, let's start with number one, assessing the stock-keeping units. This was a very large research project on our part.

Go ahead. Our specific definition here for the purpose of the model, as you're going to see, is that it is a specific brand in the marketplace, a specific design, and a specific size combination.

Now, that differs from what the tire industry will use. The tire industry will use these same criteria for determining an SKU, but they will also add additional factors. Things like sidewall, you know, is it a black sidewall, is it a white sidewall, raised white-letter sidewall, outlined white-letter.

And there may be other commercial issues that come into play to further refine SKUs. So it's important here to understand that this is our definition, as how we're accumulating these numbers.

What's included here, what was done as far as resources for doing this research are listed here at the bottom. We used a variety of websites. The manufacturers, we used some private brand names on the internet.

We went to specific dealers. We were able to obtain some price lists. Certainly the tire data books that some manufacturers offer, whether in digital fashion or in hardcopy, were useful sources.

But these are the kind of items that we were using to conduct this research to find out just how many different tires are we talking about.

This estimate includes passenger and light-truck tires. It does not include, it is not intended to include winter tires, very deep-tread-depth tires, temporary spares, very small tires, low-production-volume tires, ST tires. ST tires are special trailer-type tires. And finally, bigger tires and nonpassenger non-light-truck tires. None of that is intended to be included here.

We already talked about the fact that there's some special issues, and I want to touch briefly, at least just verbally on what those are. I've already touched on the fact that our definition does differ some from the tire industry's definition of an SKU.

Second, there are factors in reality that would increase the size of this population. There are other factors that would decrease the size of this population if you had perfect information.

Certainly we can't claim to find every single SKU out there, even by our own definition. We certainly can't claim that. Nor can we understand this phenomenon that's called common green tires.

By common green tires I mean the tires may be manufactured by a producer that are identical to the point of they're ready to go into the mold for vulcanization, and yet after vulcanization they may, for example, have different tread patterns, different sidewalls, different letterings, or some combination of those features.

Those tires are not likely to have differences in rolling resistance of consequence. But we can't determine, looking at these various resource sources, which ones are common with respect to this common green tire. So in that respect, to an extent, we may have over-counted in some cases.

The challenge of addressing replacement versus original equipment tires is a difficult one. Certainly these days many dealers are selling OE tires. When I say dealers I mean vehicle dealers are selling OE tires. They have OE SKUs on them. Those tires are claimed, by the manufacturers, to be identical to the ones that are going on the products. And if they are showing up in these various reference sources, they are included in this counting.

Low-volume SKUs, I'd love to tell you that was an easy thing to eliminate. It was not. We feel that quite a few of the tires that we could not capture in the smaller low-volume brands in the marketplace do, indeed, fall in this category.

Finally, regionally marketed tires, we're talking about the state of California. But if we look at the realities of the US marketplace we find that virtually any tire that's sold anywhere in the country could be sold in California. And so we are largely looking from a national standpoint.

An obvious exception is winter tires, but winter tires are not intended to be included in the scope of this.

Let me go on, now we'll talk about what we found from doing this research. I'm going to split the market into brand categories. These are not my definitions. These are taken from the secondary literature.

We'll look at the market shares. We'll show you the counting of the SKUs that we accumulated. And then we'll look at some specific brand examples.

Now, again, please note, as I go on, we're going to be talking about brand and manufacturer. We'll be talking about a tier one brand and a tier one manufacturer. They're not the same thing.

We start off, it's much easier to find

brand information from the marketplace. We start off strictly talking about brands. When we say a brand, we say a brand and refer to something like Hankook, what we will only define as a tier two tire manufacturer. In other words, that grouping of seven tire manufacturers, this is the second largest grouping.

A specific entry there, for example, Cumho Hankook, we can talk about the brand, tires in the marketplace that say Cumho right on the sidewall. That's the brand I'm talking about.

Or we can talk about the manufacturer of Cumho, the company that's making those Cumho brand tires, and may be making other house brand tires, private brand tires. Please distinguish as I continue on between brands and manufacturers.

We're going to start off talking about brands. This terminology, primary brands and other brands that we're working with here. That's not Smithers' definition, this is from Tire Review. The advantage of using Tire Review's information is that they're sourcing it -- they claim that they're sourcing it largely from RMA sources. And it was a fairly recent publication; it's only dated September, albeit most of the data is representing year 2007 research.

That list of primary brands, 31 passenger tire brands in the marketplace; 27 light trucks in the marketplace. It leaves others vague. It defines the percent. The percentages are shown here, 12.4 percent for the passenger tires fell into this other brands category. Again, this other brands is the definition used in Tire Review. 8.8 percent of the light-truck tire shares.

This is where we came into play. They did not identify these companies. We went on and identified a number of the key major ones based on our own internal databases. We certainly are not covering all of them, but we're probably covering in the neighborhood of about half of them. So, we're covering about half of this share of the marketplace.

How many tires are we talking about when we talk about these two categories of brands. That's listed here. Again, these are based on calculations of the numbers that are provided specifically in terms of 240 -- 204 million P metric passenger tires; 34.1 million light-truck tires for the year 2007. And you can see here in terms of numbers of tires and percentages.

This is the results of the research, how many SKUs are we talking about. In a nutshell, using our definition, it's right here. A tremendous amount of research went into this to summarize all this in one very small table. But in total we're talking a little over 2000 -- 24,000 SKU total; 20,700-plus of that passenger tires. And nearly 3300 light-truck tires.

These next two images are only intended to provide you some specific examples. Again, when you look at this first column on the left you are not looking at a list of manufacturers. You're looking at a list of tire brands in the marketplace. And this gives you an idea of the shares of a dozen or so at the very top of the list. What are the biggest shares in the marketplace; what are those brands in the marketplace. This is obviously from the primary list.

And then you can see in that last, that third column, where our accounting of the SKUs is in the marketplace.

It's important to note that not all these are separate individual manufacturers.

These brands, some of them correlate to a manufacturer, as would the first two. Firestone is no longer an independent manufacturer. Firestone is owned by Bridgestone. Goodrich, Uniroyal are manufactured, are owned by Michelin, names owned by Michelin. Still individually named and present in the marketplace. General is a name of Continental. So, again, we are looking at brands here. These are passenger examples.

Light-truck examples are shown here. This is just to give you a flavor of the number of SKUs, the top dozen or so entries in the list.

So, basically that's the counting of the SKUs. That was the first mission; that was the first objective, is to try to get some kind of reasonable order of magnitude and on how many SKUs are we dealing with here.

Because there was no single, consolidated list available for us to find this. And, again, whether we were talking 1000, 10,000, 100,000, just wasn't known before the research.

Second objective was to develop some estimates of test capacities. You'll find that for us to do that we will have created models. We will do that by showing you models and the premises that were created for those models.

As you look at these, please understand what you're looking at. It's intended to be a working model; it's intended to be a model that is ultimately refined, and perhaps utilized by individuals that can enter more accurate data down the road.

And I'll refer specifically to some specific premises that we have drawn to explain why we have done that.

The procedures here, we're going to talk about how we determined what the populations of machines available out there are. You know, I'd love to be able to tell you if there's 100 or 200 of these machines out there worldwide, available and ready to go for conducting compliance testing.

You're going to find that we believe it's probably more in the neighborhood of about 45 worldwide. Relatively small number.

We included all the manufacturers, we attempted to create a model that includes all of the tire manufacturers and all of the independent testing companies. We did not include any rolling resistance machines in the facilities of machine manufacturers or at vehicle manufacturers.

We will go on and extrapolate the number of machines with their capacities, their capabilities of conducting testing. There are a number of premises that we have to lay out. And, certainly, again these are arbitrary levels, and are intended to be reasonably realistic levels. Certainly they do not necessarily represent the capacity availabilities of any one single company.

Test protocol was given for us. We were assigned ISO 28580 by the CEC as a protocol that would be pursued. So that is used as the premise for all the subsequent work and modeling that you're going to see in this work.

We then had to set some of our own premises to make this model work. And they include things like the capacity availability. If you have a machine, if you are in a tire company or if you're an independent, how much of that machine time is available if you have to start doing compliance testing.

We picked two levels. Again, you can easily argue with these levels. Again, they're not intended to represent any individual company. The levels selected is 25 and 50 percent.

We must recognize that these pieces of

equipment exist for very good reasons at facilities. They are used and needed for tire development testing and for original equipment qualification work.

But this range, based on our research, appears to be a reasonable range of capacity that is available, that can be made available.

So we have to go on and talk about how our capacity is extrapolated. How long is a workday. How many days are in a workyear. And so we had to start off with some rational level of premises.

Now, for test days, we looked at an eight-hour, single eight-hour shift. And we looked also at around-the-clock test shift. So we're looking at eight- and 24-hour test facilities.

How long is a workyear? We have employed here 50-week years, presuming approximately a two-week shutdown. And we look at five-day-a-week and we look at seven-day-a-week workyears. So we're looking at 250-day years and 350-day. Again, please appreciate the primary mission here is to create a functionable model. A model that can have different inputs put in, perhaps down the road more realistic inputs put in, if we can obtain better numbers and still grind out rationable, usable data as predictors down the road.

Go ahead. So, let me go through these findings. Some of them are based on our own internal research and some were based on the outcomes of these models we have created.

Go ahead. I mentioned earlier we believe that there's in the neighborhood of about 45 test machines available worldwide. And it's not -- this is information of what does a tire company have as far as test machines. Not only is it not published, it tends to be proprietary. And it's not -- it wasn't our intent to try to ferret out of any company or any individual how many test machines does any certain company have.

We were simply looking at trying to find out roughly worldwide how many machines there are. And if we look and split the world market, and I will define this a little bit later, into these categories: Tier one, tier two, tier three tire manufacturers, based on how big they are and how much of the marketplace they have, how many machines roughly they have.

And the answer here was we think that the four largest tire companies have somewhere crudely in the neighborhood of about 16 machines. And so we're simply going to model those four tire manufacturers with four machines. No argument none of those tire manufacturers may have exactly four machines. That's not my point. My point here is to try to create a functionable model.

Number two, tier two tire manufacturers, and these tiers are as defined by Smithers Scientific. This is terminology that we used just to get a handle and use a term on the size of the company. That includes the second seven largest tire manufacturers. We believe they have in the neighborhood of about 14 machines roughly. So they are modeled here with about two machines each.

Tier three tire manufacturers, there are many many tier three companies. We're looking at about 64 companies here worldwide. They range from relatively large companies, companies that are so big they're knocking on the door of tier two. Ten years from now some of those tier threes will be tier twos.

But this is a body of many many tire

companies that don't have very much testing capacity as far as we can tell. So we believe that among that large population of smaller companies there's only about seven test machines out there.

Contract testing. If we look roughly at about four companies globally, we believe, on average, they have about two machines. I'd love to sit up here and tell you the independents have 75 percent of the rolling resistance machines out there; will be happy to do all testing if there's any required. Just the opposite is the case.

Certainly the tire industry possesses the vast majority of rolling resistance machines. As we get to the end of this discussion where you'll see we've modeled scenarios for actual test capabilities, I haven't included the independents. It's largely based on captive testing.

Let's go on. To start looking at capacity, the very first question you have to ask is how long does one tire take to test. And you have to look individually at passenger tires and light-truck tires.

Now, these are all the discrete steps that are involved in conducting a test using ISO

28580. And, again, this morning we heard that that was in draft status. At the time that NHTSA did all their work it was in draft status. It is still in draft status. I mean I think the thinking is it will be finalized this year. And it remains in draft status.

But there's enough detail out there in the draft protocol. We can define it, subdivide it into these categories of activities. Not all of them are rate determining. Some of them are separated from the rate determining functions.

And the ones that have not been included in this tally at the time required our asterisk here, they are separate; they are not really determining the rate of turnover of tires on a productivity basis.

But we're looking at about an 80-minute test for a passenger tire; and a 100-minute test for a light-truck tire. And the length of these tests is very key because you'll find that if we look at something like 25 percent capacity availability, in an eight-hour shift you can only get one tire done. It's as simple as that.

So, certainly if there's limited capacity in that fashion, with tests of this duration, this is single-point testing I want to point out, not multipoint testing, you really have to increase the capabilities to be able to bite off the challenge here.

Go on.

We talked about testing one tire. How many tires can you test in a day. And now you can see we start partitioning the data according to our premises.

Our premises here are that we may be looking at an eight-hour test day, one shift, or we may be looking at testing around the clock, 24 hours.

We have premises here that you may be looking at 25 percent availability of the equipment to conduct compliance testing. You may be having a 50 percent availability. How many tires can you test per day.

And you also, as we said, must look individually at passenger and light-truck tires because they don't take exactly the same amount of time. Light truck takes about 25 percent more time to test.

So, here you can see how many tires can be conducted in a day. And we're looking at as few as one tire, up to nine tires availability. If you have 50 percent availability, you're testing passenger tires 24 hours, you can test about nine tires.

Go ahead. Okay, so we would define a day, if you extrapolate this on out to a 250-day workyear, and we're using the same model and saying how many tires can you test, now you can see numbers like this. You're looking at a 250-day workyear, single machine. We're looking at about 250 tires if there's only 25 percent availability. And we're looking at about 2250 passenger tires if you're testing around the clock. You have 50 percent availability.

This slide is identical to the prior one except that we've changed one premise. In the prior image we were looking at a 250-day workyear. Here we're looking at a 350-day workyear. Now you can see the number of tires that can be tested. Again, this is one machine.

So the next question is if we extrapolate that out using a model we've created here to 45 test machines, what kind of global capability do we have.

Again, before I go on, let me explain

that this has nothing to do with the reality, the logistics of an individual company conducting testing. That we get into at the very end.

This is simply trying to get a rough idea, a very rough cut at the top of how much testing capacity is out there. It does not acknowledge the realistics of the marketplace for an individual company that has to conduct testing.

If we look at global capacity and we look first at a 250-workday year we're looking at volume capabilities of as little as a little over 11,000 tires to a little over 100,000 tires for passenger tires. This is based on a 250-workday year.

Go ahead. A 350-workday year as few as 15,750 tires up to a little over 140,000 passenger tires.

Go ahead. So this was the area that we created the model. When we get to objective number four we'll grind the model; we'll try to make it work. We'll use it to look at the brands and then we'll reshuffle the deck so that we're no longer dealing with brands and we start dealing with individual tire manufacturers. And we'll grind the model again and show you what some typical outcomes are.

Using the example sample premises that we've selected for the purpose of this study to this point.

Before I go on, and this is a very brief area, we were asked by the Energy Commission what would it take to increase capacity. What is the cost, crudely, in model form, what would it cost, how long does it take. And the unit increases in capacity here is one machine, by our definition, it's one single-position machine. So that's what we're going to look at. This is only three or four images. Referring briefly, what does it take, expenditure-wise and timewise.

Our premises here are that one, you can even do it at all. Second, that it's going to be, as I mentioned, a single-position. Third, that it includes everything except building. Presumes that it goes in an existing building. It assumes you're going to need some services, especially HVAC and wiring to be added to this new installation in an existing building.

It's going to require additional mounting equipment capability. It's going to require its own stock of wheels for servicing the machine. It's going to require training. And specifically, it's going to require calibrations.

And we're also assuming here, as we look at global capacity that it's a rational number; that it's fairly realistic. And that it can be used both for the independents and the tire companies. Again, it's a rough functioning model.

I can't tell you that a tire company couldn't do it for as little as 30 percent less. It's feasible. I could also tell you that in Europe an independent might pay 25, 30 percent more to have it done.

Go ahead. But this is our rough model. I could have put a range on these, but based on my best information this is crudely the average is what we came up with. We're only trying to get a ballpark idea of what it costs. But the answer to the question is that if you have to increase capacity with one single-position machine, what's it cost. It costs crudely in the area of about 650,000. And this gives you a rough idea of what the individual line items are going into that cost estimate.

Now, I would also point out that not everybody has single-position machines.

Everything that we're talking about this afternoon in this presentation is speaking in terms of single-position machine equivalence.

Not everybody uses a single-position machine. Many companies do. Smithers has a twin-position machine. But we're speaking in terms of single-position rigs.

Go ahead. How long does it take. What are we talking about. Can we increase capacity in 60 days. Can we do it in 30 days.

We believe that these are fairly realistic numbers for this point in time. We believe down the road it may be a shorter turnaround time, and not only down the road may it be shorter, historically in the past it may have been shorter.

Right now it's not a very short period of time. It takes in the neighborhood of about 14 to 18 months if you have to add test capacity right now. And the key issues in getting to this point are the equipment delivery, which is obviously the most time demanding. And then the installation and the calibration. Again, these are our estimates. These should only be considered as rough estimates. But somewhere in the neighborhood probably of about 14 to 18 months.

This is only about half of this presentation. The other half is all getting into the specifics here, the costs, logistics and feasibility. Before I go on, are there any questions to this point?

MR. CANDIDO: Yeah, Bruce. Just to clarify, the SKUs were determined as SKUs in the United States?

MR. LAMBILLOTTE: Yes.

MR. CANDIDO: And the equipment availability of the equipment list is global?

MR. LAMBILLOTTE: Yes. Now, when I said in the United States, it's tires sold in the United States.

MR. CANDIDO: Yes.

MR. LAMBILLOTTE: And you're probably a lot more familiar with your RMA database than I am.

MR. CANDIDO: Yeah.

MR. LAMBILLOTTE: But that is the database source for this.

MR. CANDIDO: So the --

MR. LAMBILLOTTE: That was Tire Review's

database source.

MR. CANDIDO: Yes. The SKU side is USA market tires sold in market?

MR. LAMBILLOTTE: Correct.

MR. CANDIDO: But the testing availability is based on --

MR. LAMBILLOTTE: Global.

MR. CANDIDO: -- equipment global.

MR. LAMBILLOTTE: Right.

MR. CANDIDO: So that --

MR. LAMBILLOTTE: Absolutely.

MR. CANDIDO: -- that would involve having to ship some tires from the United States, perhaps, to remote locations to be tested.

MR. LAMBILLOTTE: Possibly, but from a global standpoint as far as tires imported in North America it's presumed that if it's a tier one or tier two company, that they have standing test capacity. And can test onsite for tires representing the North American marketplace.

MR. CANDIDO: I just wanted to confirm that the --

MR. LAMBILLOTTE: Yes.

MR. CANDIDO: -- the one was just USA --

MR. LAMBILLOTTE: Yes.

MR. CANDIDO: -- SKUs, and the other was global.

MR. LAMBILLOTTE: Yes.

MR. CANDIDO: Okay.

MR. LAMBILLOTTE: Absolutely.

MS. NORBERG: Hi, Bruce. Tracey Norberg, RMA. I just wanted to clarify when you refer to an RMA database what you're talking about?

MR. LAMBILLOTTE: I can only say that Tire Review refers to an RMA database for their sourcing.

MS. NORBERG: Okay. Maybe we need to get together on that offline --

MR. LAMBILLOTTE: Oh, absolutely, we'd love to.

MS. NORBERG: -- because we don't --

MR. LAMBILLOTTE: I mean --

MS. NORBERG: -- we don't --

MR. LAMBILLOTTE: -- I'd love to grind this model with accurate numbers.

MS. NORBERG: Yeah, I mean we don't provide any company-specific data publicly.

MR. LAMBILLOTTE: Okay.

MS. NORBERG: And so, I mean that may

be --

MR. LAMBILLOTTE: Well they, for years, have referred to a data --

MS. NORBERG: Yeah, and I'm not sure --

MR. LAMBILLOTTE: -- a data board basis with a --

MS. NORBERG: Yeah, maybe we can figure out the source of that. We provide aggregate industry numbers only. And really are constrained by antitrust from providing anything more detailed. So I'm just --

MR. LAMBILLOTTE: Well, you know, it may be that they have multiple sources and the only one they're highlighting is you. I have no idea.

MS. NORBERG: Yeah, I mean I think that what --

MR. LAMBILLOTTE: Their numbers do crudely correlate to others that are available from other secondary sources, I would say that.

MS. NORBERG: Yeah. We don't have any data available that speaks to market share. All of our data are aggregate for tire shipments --

MR. LAMBILLOTTE: Okay, well, maybe --

MS. NORBERG: -- for the industry, so --

MR. LAMBILLOTTE: -- they're largely referring to the numbers of tires and their brand information is coming from a dealer organization.

MS. NORBERG: Yeah, that may be it, because we --

MR. LAMBILLOTTE: That may be it.

MS. NORBERG: -- just don't collect information on brands.

MR. LAMBILLOTTE: I'm not arguing that.

MS. NORBERG: No, I know, I just was kind of curious. I wanted to understand that better. Okay.

MR. LAMBILLOTTE: Yeah.

MS. NORBERG: Great, thank you.

MR. LAMBILLOTTE: Sure.

MR. CANDIDO: Bruce, if I could just ask another question.

MR. LAMBILLOTTE: Sure.

MR. CANDIDO: I'd like a comment, maybe a little more clarification or background. The numbers that have got me really surprised in looking at your assumption is the 25 and 50 percent --

MR. LAMBILLOTTE: Yeah.

MR. CANDIDO: -- availability.

MR. LAMBILLOTTE: Yeah.

MR. CANDIDO: As you know, an industry that, you know, is not profit-rich like some, --

MR. LAMBILLOTTE: Sure.

MR. CANDIDO: -- we don't spend money if we don't have needs --

MR. LAMBILLOTTE: No.

MR. CANDIDO: -- on capital equipment. And I'm surprised, how did you come up with as much as 50 percent availability?

MR. LAMBILLOTTE: Well, we kind of looked at the extremes of the information that we could get. I mean, it's not -- there's no intent of revealing any proprietary information here. We were not really seeking proprietary information here.

But roughly, based on internal discussion with equipment and industry, knowledgeable people, that was the kind of range we came up with.

No arguing. You may represent a company that uses their equipment 97 percent. Not arguing that in the least.

MR. GUINEY: Dan Guiney, Yokohama. Just a couple other questions. In the marketshare numbers you were referring to SKU share. You're not referring to tire marketshare?

MR. LAMBILLOTTE: We showed brand marketshare. And then we also showed --

MR. GUINEY: Is that share of SKU --

MR. LAMBILLOTTE: -- the listing by each of those line items, the number of SKUs that we, in our research, had counted. The brand marketshare information is from Tire Review, September 2008 Tire Review.

MR. GUINEY: Okay.

MR. LAMBILLOTTE: The SKU is our count for those brand names in the marketplace.

MR. GUINEY: Okay. Then in terms of the cost model, you're not including energy consumption for HVAC, energy consumption for the machine?

MR. LAMBILLOTTE: No. This was all installation costs.

MR. GUINEY: So there's no operating costs?

MR. LAMBILLOTTE: No.

MR. GUINEY: Okay.

MR. LAMBILLOTTE: No, it was just -- the question was how much does it cost to increase capacity, add a machine.

MR. GUINEY: Okay.

MR. LAMBILLOTTE: Add a new single-position machine, and strictly from a capital standpoint.

MR. GUINEY: Okay, thank you.

Any other questions?

MR. FORD: Yeah, Bruce, this is Sim Ford at Goodyear. Just one question on your SKUs again.

You mentioned that you excluded SKUs that have less than 15,000 tires annually?

MR. LAMBILLOTTE: I mentioned that the Energy Commission wanted us to do that, but we could not find accurate counts.

MR. FORD: So are they included or not?

MR. LAMBILLOTTE: We believe largely that they are not because we did not attempt -- when we got to the other category, the lesser markets, we did not attempt to find every name we could in the marketplace.

We believe we may have only covered about half of the names in that other category, which are those brands less than the 31 majors in passenger tires.

And so we believe that's largely the
area where the small production volumes are.
Is it possible we included some? Yes,
it is.
MR. FORD: So, if you -- let me make
sure I understand what you're saying. If you
believe you only got half of the brands --
MR. LAMBILLOTTE: Of the other -- of
what is in the other category brand. The brands
that are -- represent about 12 percent of
passenger tires, and I think it was about 9
percent or so of light-truck tires, that's the
others category. And that's, again, the
terminology of Tire Review.
MR. FORD: So would it be safe to assume
that the other brands would typically have smaller
volumes, but yet they would have a high number of
SKUs?
What I'm getting at, is your number of
SKUs half of what it really should be?
MR. LAMBILLOTTE: No. No. No,
certainly not. We think it could be -- we may
have failed, based on our best thinking, to
capture probably in the neighborhood of about
maybe 6 percent or so of the market, of those

lesser brand volume passenger tires. And maybe in the neighborhood of between 4 and 5 percent of those lesser name brand light-truck tires.

MR. FORD: Is that 6 percent of SKUs, or 6 percent of volume?

MR. LAMBILLOTTE: Six percent of marketshare.

MR. FORD: So that's volume?

MR. LAMBILLOTTE: That's volume.

MR. FORD: But that's what I'm getting to. If it's volume of tires with very small quantities, then your number of SKUs is probably much higher than what you have projected there.

MR. LAMBILLOTTE: Yeah, it can be in that area. But, again, one of the premises that was given to us by the CEC was that we not be looking at tires with less than 15,000 units per year average.

Ray, do you want to voice in on this issue or --

MR. TUVELL: Yeah, I'm not exactly sure what you're trying to get at, Sim. But, no, Bruce has stated it correctly.

As you know -- well, maybe you don't know, but clearly the task we gave Bruce to pursue here was specific to our legislative authority in this subject area. And it's very clear in our legislative authority says that we do not have authority over any volume, single volume of tires that are 15,000 or less.

And so I told Bruce those are the limitations. Do the best you can to try to account for them.

But I well knew, going in, and he's basically confirmed that it's, I don't know where you find those cuts, frankly. But that's certainly our intention and our recognition, to exempt that.

MR. FORD: Okay. I was just trying to understand the comment that Bruce had in there about 50 percent. I just didn't understand how that fit into this.

MR. LAMBILLOTTE: I think the big answer to your question is, yeah, that cut can eliminate a lot of SKUs. But they fall under the radar. Their production volumes are small enough to fall under the radar of consideration here.

MR. CANDIDO: Bruce, one last question. Earlier I understood you to say that you did not separate blackwall tires from raised outlined white letters. You included them as a single unit in an SKU.

MR. LAMBILLOTTE: It was not a consideration in the definition of SKUs for this study, that's correct.

MR. CANDIDO: Depending upon the discrimination of rolling resistance level, --

MR. LAMBILLOTTE: Yes.

MR. CANDIDO: -- there could be a difference --

MR. LAMBILLOTTE: Yes.

MR. CANDIDO: -- between a raised outlined white letter tire version and a blackwall version.

MR. LAMBILLOTTE: As a tire chemist I recognize that very clearly.

MR. CANDIDO: So why wouldn't that be a separate SKU?

MR. LAMBILLOTTE: It may become a separate SKU, but that eventually falls to a question that was not asked within the realm of the study. And that is does that have to be a consideration for an individual manufacturer design/size combination.

MR. CANDIDO: But from the point of view

of determining whether you will or not have to measure that tire to determine its rolling resistance, --

MR. LAMBILLOTTE: Yes.

MR. CANDIDO: -- depending on whatever turns out to be the discriminating levels which you'll have to measure --

MR. LAMBILLOTTE: Correct.

MR. CANDIDO: -- it may very well be part of the mix.

MR. LAMBILLOTTE: It may well be. And I can't answer that question.

MR. CANDIDO: Okay.

MR. LAMBILLOTTE: That has to come here.

DR. MEIER: It's Alan Meier. I may have stepped out when you answered this question, but in ISO 28580 how much time do you imagine will be required to do the laboratory alignment?

MR. LAMBILLOTTE: I don't think we know the answer to that yet. We know so little about the alignment plan to date. I can't answer that question.

DR. MEIER: So maybe it would be worthwhile putting in a slot, a placeholder, for the time required for --

MR. LAMBILLOTTE: Absolutely.

DR. MEIER: -- for laboratory alignment?

MR. LAMBILLOTTE: An adjustment, yeah.

DR. MEIER: Yeah.

MR. LAMBILLOTTE: No argument.

MR. TUVELL: Well, in fact, I mean, Bruce, beyond that, even if there wasn't an 28580 lab alignment, there are requirements to maintain and upkeep their machines. And so, I mean let's not dismiss that.

It's not like this machine is going to run forever, just keep -- you don't have to worry about lubricating it and testing it, aligning it, so.

MR. HARRIS: Ray? This is John Harris.

MR. TUVELL: Yeah, John.

MR. HARRIS: Having operated a laboratory with several rolling resistance machines in it, you're exactly right. In that time that is allotted for the testing there is a certain amount of time allotted each quarter or whatever, for calibration.

And so therefore, you know, it's kind of hidden in there. But you have to maintain your equipment. So it really, the calibration procedure should not have an effect on the amount of hours that Bruce is talking about. That's something that has to be done anyway.

MR. LAMBILLOTTE: Any other questions?

Do you want a break or shall I go on?

MR. TUVELL: No.

MR. LAMBILLOTTE: Let's go on to objective four. Here we get into the costs and logistics of conducting tire rolling resistance testing.

So basically we've created a model. Certainly you can argue any of the inputs going into the model. We're just trying to create a functionable model.

Now, we have to use a price. The price we're using here are prices that are strictly pertinent to high volumes of testing. 180 per tire.

We need to keep a couple key things in mind. One, these are numbers for high volumes of tires. We're going to use these numbers for our models regardless of whether we're talking independents or captive tire testing facilities within the tire industry.

A little bit more expensive for the

light-truck tire, $200. We're also assuming a three-tire test. Alan just spoke a few minutes ago about a four-tire test. We had a premise when we started this work that we would be dealing with three tires. Certainly that may be one of the inputs that change down the road. Right now everything you're going to see is based on three-tire testing.

And as I said, this 180 and 200 are strictly high-volume prices. This is an area I mentioned that we still have data we're researching. We had information that we got just before we came for this visit indicating that testing in Europe, some testing in Europe is significantly more expensive than these. And perhaps even at high volumes.

But again, we're talking about testing in the hundreds of tires to come to number like these. This is not going into any testing facility anywhere and saying, oh, I want to test two tires, you know, these are representative of a two-tire test. They are certainly not. They're half of what a two-tire test would be. These are high volume test numbers.

We're going to go on and extrapolate

this out to first-time testing costs. We're going to be using the SKU numbers that we've tallied up. We are ultimately going on beyond brand, and we're going to reallocate these numbers of tires to manufacturers. So that we convert from talking about brands and start talking about manufacturers. Albeit that we're applying nothing more than a functioning model to these manufacturers.

I've already touched on the other two premises here. Costs of tests, 180 per passenger tire, 200 for light truck for this model. And, again, the three-tire test.

MR. TUVELL: Bruce, I just wanted to ask you a question at this point. I think if Dan, I don't know if it was you or Dennis brought it up. Back in his initial cost estimates on the capital cost, I believe one of you asked did that include electricity usage.

And here's where, Bruce, that would come in. This would be your actual operating costs reflected here, is that correct, Bruce?

MR. LAMBILLOTTE: Yes. Again, before I go on, let me reiterate that ISO 28580, albeit in its draft status, is a single-point test. We're not talking a full four different test condition J-1269, or J-2452. Here we're talking a single-point test.

Go ahead. So we're going to start off still talking about brands. We'll talk about first on a test cost to cover these brands. And we'll talk about the test costs extrapolated, the whole brand category. And by that I mean the primary brands, the cluster of primary brands, that 88 percent or so of passenger tires; 91 percent or so of light-truck tires. And we'll continue on that way.

After that we're going to go on and we'll talk about reallocating these numbers of tires in the marketplace to the manufacturers.

Go ahead. So, still talking about brands. Please keep in mind, you look here in the left-hand column, you see Goodyear, Michelin, Firestone, Bridgestone. And we see market shares. We're not talking about the manufacturer. We're just talking about that name on tires in the marketplace.

We've showing you shares, we've already shown you SKUs. If we extrapolate this out based on $180 per tire, because on this page we're talking about passenger tires, and if we extrapolate that out for a three-tire test, albeit it could be a four-tire test down the road, but grinding this model we come up with these kinds of numbers. Numbers in the hundreds of thousands of dollars for individual line item brands in the marketplace.

And, again, this is just a very small sampling. It's meant to provide some examples of what this top six, this top half-dozen names in the marketplace would cost to cover these names in the marketplace.

And, again, these numbers are totally the product of grinding the particular premises that we've already talked about. Certainly they're not intended to be premises that apply to any specific brand or tire manufacturer.

Also, big issue here before I go on. This does not include tire costs. Tire costs are going to substantially increase this. We may be looking at increase of 20 percent or more than 20 percent of these costs depending on how we cost the tires.

How do you cost a tire that you test? You cost it on the basis of actual cost to manufacture the tire. If you look at a fully loaded cost, if you look at the cost of the tire as retailed in the marketplace, that hasn't been defined yet. I'm not trying to get into that at this point in this stage of conducting the project for the CEC. We are not including test -- tire costs in this. This is strictly the test cost.

Go ahead. That was the passenger tire examples. Here you see a half dozen of the light-truck brand. Example numbers ground through using the model again. And now we're looking at the tens of thousands of dollars of testing based on these models, based on these premises, to cover these brand, top brand, top half dozen brand names in the marketplace.

Go ahead. So I've shown you examples of the top half dozen brand names passenger and light truck in the marketplace. Let's capture the whole categories as defined by Tire Review. What they call the primary brands, what they call the other brands. Our accounting here of SKUs, again using this number of about 24,000 or so SKUs.

Going to require testing of about 72,000 tires. Test these, a little over 13 million. Does not include the cost of the tires. Again, subject to the premises that are listed.

Primary operating premise here, three operating premises here. Three-tire test; $180 for a passenger tire; $200 for a light truck.

Go ahead. I mentioned tiers. We're going to make the transition. We're going to stop finally talking about brands. We will reallocate on a calculated basis of what these convert into for the tire manufacturers, using our SKUs, knowing who manufactures the SKUs, we have reallocated these numbers to manufacturers.

This is a very crude way to get at these numbers, no question. On the other hand, the numbers are not otherwise available in the marketplace.

So we've used the indirect route that is available to try to get at how many tires are being manufactured. You'll see very precise numbers that are actually probably very inaccurate. I've not attempted to round any numbers.

The numbers have been achieved by calculation based on the brands in the marketplace where we have brand-share data, reallocated to manufacturers.

Before I get too far into that, I'll go over, again, the definition of tiers. I mentioned it once. I'll go over it again.

We'll look briefly at some example manufacturers of brands. We'll look at the SKUs that have to be tested. Again, this time not by brands, but by manufacturers. We'll look at test expenses to manufacturers.

Again, this is nothing more than the product of the model that's been ground out. This is intended to be a working model that can be refined down the road with more realistic numbers.

We'll look at allocation to test these. We were asked by the CEC to see what that translates into. What does that mean on a per-tire basis if we look at a year's worth of production of tires?

And finally, we will use our scenarios and create some logistics of testing. And what we're trying to really get at here in this last exercise is saying how many test years does it take. How many years, based on these premises, does it take individual companies, based on our calculations, based on our model, based on our premises, how long does it take to conduct a testing? That's what this last line item refers to.

Go ahead. I mentioned, this is nothing more than Smithers' definition. It's just a rough working definition of the size of companies. I went over this briefly before.

The largest tier one tire manufacturers we say are four companies. Three of them are about the same size, the first three you see listed here. Continental's a distant fourth as a member of the tier one top four tire manufacturers.

Top seven of the tier twos are listed here. They're listed in order, based on the latest information we have available. Size of production in the marketplace. So we see these seven tires.

And much of the rest of the tire manufacturing world is making tires that are included in our studies here, are in the next 64. I'm certainly not implying that tier three is all the rest of the world's tire manufacturers. It's not.

There's a tier four that's a couple hundred companies, but they're making things like wheelbarrow tires and all drawn-vehicle tires, aircraft tires. They're not in this tier three. Tier three is big. They don't have a lot of rolling resistance capacity, as we mentioned. We think there's only about seven machines in tier three.

Go ahead. So, here we are still making the transition from brands. You see this marketshare data. All I'm showing here is who actually makes these tires.

We talked briefly earlier about some brands being made by other manufacturers. Certainly the farther you go down this list the more names you come to that you really have to ferret out who's actually making the tires.

In many cases multiple companies are making tires. And that's a special challenge in looking at a model like this.

Go ahead. That was an example for passenger tires. Similar example for truck tires shown here. Again, even in the top dozen or so names in the marketplace, a couple of them have multiple manufacturers.

Go ahead. Let's look at splitting the marketplace into tier one and tier two tire manufacturers. They are listed in order of size here. Had a line item for tier three, it's not real meaningful here, at the bottom. Because this is obviously many manufacturers, little rolling resistance test capacity. I would emphasize here that you really don't want to pay much attention to tier three. It's just there for information purposes.

The ones before it are based on our allocation of manufacturing so that we can look at these manufacturers. We've allocated the brands. And you can see here the number of brands that we calculate based on our SKU counts that are primary brands. The numbers that are other brands are attributable to these manufacturers. What the sum of these SKUs are.

Again, I've made no effort to address tier three. There are many many tire manufacturers in tier three. Very little information available.

But what this translates into in the last column is how many tires. Because we're going to grind our model based on capacity, we need to know how many tires of the manufacturers need to be tested.

There's some numbers that stand out in here. We see some of the mid-size tier two manufacturers with a lot of SKUs to test. One very notable one that has a very high number of SKUs, they manufacture a significant number of private brands in the marketplace.

The last image was pertinent to passenger tires. This is a like image pertinent to light-truck tires. Again, a counting of the SKUs. We've reallocated it to tire manufacturers. Specifically we've looked at tier one and tier two -- address the SKUs.

The other brands, again, as asked originally by Sim Ford, the question of how much of the other brands did we capture. We think we got about half in that category.

Size of that category, again about 12 percent of passenger tires. Roughly in the neighborhood of maybe 9 percent or so of the light trucks.

And here, again, we're working our way to how many tires have to be tested. And we see nearly 10,000 light-truck tires need to be tested, based strictly on our models to this point.

Go ahead. What kind of cost do we have

here? This is just looking at the tier one. This is just tire cost. This does not include the cost of the tires, themselves, just testing costs.

So, we're looking at about a little over $1 million for the tier one, largest three of the four tier one manufacturers, based on our reallocation of the SKUs to the manufacturers.

Go ahead. The next one is tier two. This includes both passenger and light truck. And, again, we're looking at numbers probably roughly in the neighborhood of maybe, I don't know what an average there is, maybe 700,000 or so. Total expenses testing only using these high-volume per-tire costs, three-tire test, those volume costs 180 per passenger tire, 200 for a light-truck tire.

What does all this boil down to? From a cost statement it's here. Here's the point we're at to look and say, what is this costing the tire industry. And this cost is strictly based on testing, again. No tire costs in here.

Little over $13 million of expenses. Costing is based on high-volume testing. So we're looking at a little over $13 million. And, again, we're testing roughly in the neighborhood of about

72,000 tires.

California Energy requested that we looked at allocating these calculations using this model, annualized for a single year, and force fitting all of the costs of one-time testing, it's one year of production, what is this cost per tire.

And you'll see that in these next two images. The first one is passenger tires. And we can see cost allocations here of anywhere from 3 cents a tire up to about 21 cents per tire, depending on the manufacturer.

Obviously heavily influenced by the number of SKUs they have in the marketplace and their production volumes.

Same thing for light-truck tires. We're showing the tier one, tier two manufacturers here. We've allocated test costs here, so we're looking here. We believe using the model, using its premises, in the neighborhood of about 2 cents a tire up to as high as 29 cents a tire.

Go on. We're coming down the home stretch here. The last few images I want to show you, I think we've got about a half a dozen images or so after this.

We're using our model here, and we're going to create, go back and revisit our premises of capacity availability. We'll look at two levels of work days per year. We'll look at percent capacity available, arbitrarily assign 25 and 50 percent availabilities to that.

And finally, how long of a test day is there. Is it one shift, or is it testing around the clock.

We're going to grind our model to these eight scenarios. I'm not going to show you the output of all eight. I'll show you the output of half of them.

I'll show you the output of numbers 1, 2, 7 and 8. So if you look at that for a second, you can see the kinds of premises that are in those four. I'll show you the outcomes.

Of the number of test years we anticipate is required for individual companies grinding this model and using these kinds of premises. Obviously down the road if you want to apply your own models pertinent to your own company, and you want to, you know, apply some realistic data to this.

Go ahead. Let's look at scenario one.

Scenario one says that it's a single, eight-hour shift in a day's time. There's only 25 percent machine availability. It is a five-day workweek. This is the smallest of the availabilities.

You can see it would take a very long time with today's estimated standing capacity of rolling resistance testing availability to conduct the work required to accommodate the one-tire testing that's needed for this compliance work.

That time requirement -- and I will show you a summary of these numbers at the end -- but it's a very long time. It could take one company as much as 20 years if this was all the test capacity that was available to do this one-time testing work.

Go ahead. Scenario number two. When I get to the last image -- I think we've got something like 51, 52 images here -- when I get to the last image I'm going to summarize the outcome of all eight of these scenarios and we'll reshuffle them from highest to lowest so you can see the scenarios that offer the shortest test years, demanded to accommodate the job, based on these premises.

Here we're looking at a 24-hour shift.

Again, only 25 percent machine time availability. Again, a short year, 250-day year, five-day workweek. This is scenario number two.

So now we're down to somewhere averaging probably in the neighborhood of two-plus years to accommodate the testing. But one manufacturer that has an extremely high number of SKUs could have as much as still almost seven years of testing required without the additional capacity or the use of an independent to conduct testing, or partnering with another manufacturer.

Go ahead. We're jumping ahead now, we're jumping over some of these scenarios. I don't want to go through each individual one. What's important is going to be the last image I show you where we consolidate this and just show the highlights of these eight scenarios.

This is scenario seven. This is an eight-hour shift, 50 percent machine time availability. This is a heavy workyear, 350-day workyear, accommodating only a two-week shutdown in the workyear's time.

Again, we're looking at relatively modest numbers now, again, at this point, averaging less than two years, two equivalent years of test time to conduct the necessary testing. With one very obvious exception there of one company that would require more than double that.

Go ahead. Last scenario I wanted to show you was the most productive of these scenarios. This is a 24-hour workshift, high availability of the machines, and this is a 350-day workyear.

This is, for the purposes of these various candidate premises, this is the most productive candidate. Now we're looking at an average of less than one test year required to conduct all of the testing, with one exception that's virtually double that.

So, if we look at all eight of these scenarios -- go ahead -- if we look at all eight of these scenarios and we say, okay, let's resort this deck from highest to lowest. And we want to look at what is the most productive way to get at this if we want to have the minimum period of time required to implement the testing.

And that is going to require some very demanding efforts as far as providing availability of test time.

We're looking at scenario eight, which we just touched on. A long workyear, 350-day workyear. I'm not implying in any way that these are realistic premises. They are simply to show candidate capabilities.

We're looking at 50 percent availability of test machine time. This is around-the-clock testing. Would require, on average, about .7 years. And looking at any individual company that's in that next-to-the-last column of how many years would be required, for that one company that has the most SKUs to test it would be nearly two years of test time. That's without using an independent, without partnering with another tire company.

So, this is the point that I wanted to bring you through. This is not the kind of presentation that you finally get to the last overhead and the answer is 41.357. This was an information study. The objective was to create a functioning model. The premises of the model need to be used by any company or anybody that wants to input these kind of candidate premises, or any different premises.

And certainly, for a tire manufacturer,

they have the opportunity to use models like this and introduce real-world numbers.

And that was my objective as far as giving you information today on what we're looking into with the request of the CEC.

And at this point I'll answer any more questions.

MR. CANDIDO: Again, Dennis Candido. This whole study was based on first-time testing.

MR. LAMBILLOTTE: Yes.

MR. CANDIDO: It doesn't deal at all with monitored testing that we're being required by companies to stay in compliance, if you will. And as you know, we don't, especially replacement products aren't static. They're changing frequently due to material changes, various other reasons, design changes and so forth.

So, none of these costs reflect that.

MR. LAMBILLOTTE: No.

MR. CANDIDO: Just to give --

MR. LAMBILLOTTE: No, this was the mission that we were given to pursue.

MR. CANDIDO: Okay. All right. I just wanted to clarify --

MR. LAMBILLOTTE: As far as some

periodic compliance revisitation with additional testing, or testing that would be conducted as a result of making changes of consequence that might influence rolling resistance, only Ray can respond to that. I can't respond to that at this point.

MR. CANDIDO: Or even -- I'm more or less paralleling it with the current NHTSA requirements that we have for regulatory testing. It's self-certification, and I know all companies, in order to stay compliant, test periodically their product.

And when they make changes or move them to different factories they continue to do additional testing to insure that even though the product is moved from factory A to B, you're getting the same number; you're getting a compliant number.

So, in looking at the total cost to the industry, these things must be looked into, as well, besides just the first.

MR. LAMBILLOTTE: Agreed.

MR. TUVELL: Yeah, let me make sure to clarify, that was not a task that we gave to Bruce. We didn't ask. But I find this a very very interesting question, okay.

Where do we then get information on how frequently you change products in their compounding or in any factor that would result in an expected change in rolling resistance, okay?

So, -- and, again, I'm going to parallel this or contrast it with the OE industry, okay. Where the OE will say, look, here's my specs; here's this product; meet it.

And I would expect that to be a fairly, you know, there's consistency there. They expect the consistency, they want the consistency, okay.

What I don't know and what I can't find answers to is, so what happens in the replacement. How frequently do they change their products.

But more importantly, segue into what we're trying to accomplish here, keep consumers informed, how does the consumer even know, even now? Even now when your product, you know, Bridgestone model XYZ. How would a consumer know right now that the one they bought two years ago is substantially different than the one that's on the market right now? Because of frequency of changes in your product.

And this provides a very interesting question that needs to be confronted in terms of the goals of the consumer information program.

And so, understanding more knowledge about the perspective of the tire industry relative to, I think it's specific to replacement markets, definitely not OE. So what's going on here?

You know, how would any -- what's going on now? How is it defined? How does anybody -- how does the consumer know now? What's the implications of that?

MS. NORBERG: Tracey Norberg again from the Rubber Manufacturers Association.

I think that all these questions are really very interesting and something that we'd love to be able to explore in a future workshop and have the opportunity to prepare.

So, one thing I would suggest is it sounds like the study that you've undertaken, Bruce has really a very detailed set of work and something we'd really appreciate the opportunity to review, once you've completed the report.

And I'm wondering if that might be an appropriate time, then, once everyone, all the stakeholders have had an opportunity to review that report, to then have another workshop so that we can all discuss it, look at other future needs that we might be able to provide.

We'd look forward to that opportunity and really would like to be able to do that.

MR. TUVELL: Oh, absolutely. I mean I think that's a great idea. But let me just mention something here, and this is critically important. I mean why did I turn around and have Bruce do this?

Well, I mean, this is necessary information for us to have in order to advise policymakers ultimate to decisions that are going to be made down the road.

But, if you recall over a year ago I asked the tire industry to provide this information to me. Please give me a count of your SKUs by manufacturer. Please give me identification of the test capacity by manufacturer.

And you responded back it's forthcoming. And we asked again in May of last year, those exact same questions. And got no response. And so here we --

MS. NORBERG: Well, I think the response, Ray, that you did get --

MR. TUVELL: -- we are --
MS. NORBERG: -- was that we requested a public meeting where we could have an opportunity to present industry information and data. And we would love to have that opportunity.
I think it's critically important that all stakeholders are able to share their views and their data and discuss it in an open forum. And we would love that opportunity.
MR. TUVELL: I understand. And what my hope is that you would be forthcoming with the information for us, as we originally requested.
MS. NORBERG: Schedule the meeting; give us adequate notice and we'll be there.
MR. TUVELL: Well, I mean, yeah, that's one way of doing it. But also we had this request before, can you just give it to us?
MS. NORBERG: I'm sorry, you know, I don't know how to be any more clear. We're stakeholders, we'd like to participate. We're asking -- what am I missing?
MR. SUGAR: Well, that's okay. I'm John Sugar with the Energy Commission. When we have the public meeting will the information be available ahead of time?

MS. NORBERG: Well, I think it's important that we all talk about when this public meeting is going to be scheduled, what the agenda is. And so that everybody has an equal opportunity.

I mean we found out about this meeting, you know, --

MR. SUGAR: I -- I --

MS. NORBERG: -- you know, the agenda was available three days before. There was no --

MR. SUGAR: I understand --

MS. NORBERG: -- for anybody to participate.

MR. SUGAR: I understand that. And my question is predicated on us having a future workshop with significant notice, more notice than we may normally give for workshops in this sort of a process.

And if we are able to provide the work from Smithers, that information, will RMA have the information that Ray requested available in advance of the workshop?

MS. NORBERG: I think we'll be --

MR. SUGAR: Or will it arrive at the workshop?

MS. NORBERG: Oh, I'm sorry. I think we would like to be held to the same standard everyone else is. We didn't get these presentations in advance. And I think if we're going to have a meaningful process with every stakeholder participating we need to see everything in advance.

And if everybody's held to that, we'd be happy to --

MR. SUGAR: Thank you.

MS. NORBERG: Sure.

MR. TUVELL: Yeah, just another thing, of course, and it's -- the request has been outstanding for over a year, Tracey. So let's get that on the record.

MS. NORBERG: Well, and -- I mean in all likelihood -- in all, you know, fairness, Ray, the request for a public meeting has also been outstanding. In our workshop that we had back in December of 2007 we were promised several workshops in 2008, and that didn't happen.

We also provided substantive comments at the end of that workshop that haven't been responded to.

So, I mean, we could play this game.

But I think ultimately the more effective thing is for all of us to figure out how we can do the public process right and work together.

MR. TUVELL: And so in that regard let me say that here today we've provided a significant amount of detailed information and the substantiation behind it, okay.

And what we would hope to get from you is your critique of this information, areas where it can be improved. But, please, where it's going to be most helpful and productive is give us some substantiation behind it.

MS. NORBERG: Right, and I think --

MR. TUVELL: It would not be helpful to me, say, this number is an 8, that should be a 5. Sorry.

You know, we want to narrow these issues down, define them and move forward. And do it expeditiously, which unfortunately hasn't been happening to this point.

MS. NORBERG: I think that we would request that there's equal consideration for the industry proposal of self-certification consistent with how the tire industry is regulated throughout the world. In terms of providing this kind of information.

And so I think, you know, the kind of information you're seeking is truly looking at another kind of approach. And we appreciate that. But I think we would like to have the opportunity to fully explore the self-certification option, and some of these issues become a cost to the industry under the scenarios. And we'd like to be able to look at that.

MR. TUVELL: Yes, and all I ask is that please be forthcoming with that information. I have been led to believe that the whitepaper you provided me in June was that. If there's more, please get it to us and get it to us in writing as soon as possible.

Our objective here is to, of course, develop all of this information in sufficient detail to take to our Commissioners for them to make a decision, okay.

The areas that we brought to the workshop today are the ones where we did significant digging and grinding so that they will have a broader perspective, and a number of things to look at. We're not excluding anything at this point. Don't get me wrong, okay. But we are finding ourselves having to do this almost independently without the assistance that we had hoped we were getting.

And so here we are.

MS. NORBERG: Okay, we would like to schedule -- the next time we do have a public workshop scheduled, it would be great if we could work together on setting a date for that so that we could all prepare and be the most productive in the meeting.

And we'd also request some time on the agenda to share the information that we've developed and our perspective on it. I mean I think it's critical here to notice that this a regulation that would affect one industry, not several industries. And we're asking to have a voice at the table.

MR. TUVELL: And then let me just conclude, if there's no other questions or comments, to remind everybody, as specified in the notice, that we, for the material that's presented today, we are accepting written comments up to two weeks from now.

Please make those as detailed as you can, accompanied by substantiation. Otherwise it's of little value to us.

We're interested in progressing on these issues. If we can't get better substantiation than what we have now, we're going to have no choice but to move forward with the numbers we have now.

So, please, recognize what we have done here. Recognize the level of detail. And please respond with that same level of detail in order to make this a productive process moving forward.

MS. NORBERG: I think, Ray, we appreciate all the work that's been done in these presentations, and realize that several weeks, if not months, of work have gone into these.

And we want to give them thorough review and consideration. And I would suggest that two weeks may not be sufficient time in order to respond to very very technical kinds of data analysis and recommendations.

And so we would add to that initially that we look at a time that's more fitting, and really more respectful of the kind of work that's gone into the presentations here.

And then, also, if we can get the original data, or at least the background so that we can provide a similar level of analysis, that would be able to move the process forward.

MR. TUVELL: Yeah. Let me just mention a couple things in that regard. What I -- and this is specific direction that I gave to Smithers -- is this is a draft presentation, waiting for input from you folks, that we could then look at and determine how best could we use that information to refine this.

And so ultimately he is charged with producing a final product including a written document with all the substantiation behind this. So there's nothing hidden here, okay.

But I was waiting to get information before we charge him with going final. And that's when you'll get everything, absolutely everything, okay. All this --

MS. NORBERG: And will there be an opportunity for review after that's been provided?

MR. TUVELL: Excuse me?

MS. NORBERG: Will there be an opportunity for --

MR. TUVELL: Oh, yeah, absolutely.

MS. NORBERG: -- review and comment on the final report, as well?

MR. TUVELL: I mean it's going to be out in the public -- I mean this is the government -- public domain, everything's going to be out there.

MS. NORBERG: I mean before for comment?

MR. TUVELL: Oh, yeah. Okay. And so, I mean if, again if you could come forward with better SKU numbers, please. Been looking for them for a year.

If you can come forward with better numbers on test machines, please. Been looking for them for a year, okay. Or any of these other variables that we have in here.

And let me reemphasize that. I mean I hope you picked up on this. This is a model. We can change variables, we can change inputs. You'll get different results. That's why we built it this way.

These were assumptions to give us a frame of reference here on where this is all going, okay, so we could bracket the problem. And turn around and give advice to policymakers. It has flexibility built into it.

And so if you've got better numbers that we can use and plug into it, bring them forward, please, with some substantiation behind it. Just as we have substantiation behind our initial numbers here.

MS. NORBERG: And then would a schedule and moving-forward plan be available in terms of developing the rating system? I mean because ultimately looking at the statute it requires that reporting be based on a rating system.

MR. TUVELL: Yes. I mean let me -- yeah, and let me make clear here, because I don't want there to be any confusion about this. You're absolutely right. There is that relationship.

What we're attempting to do at the staff analysis phase is look at all components that we can foresee out there in all different versions of it. And get those analyses together so that when we ultimately move forward to the Commissioners, we can say, here's the different options; here's the different impacts; here's the different costs; here's the different logistics, okay.

And so we're not looking at any one of these things in isolation. We're not looking -- here's the reporting requirement, that's it. No, we're not saying that. We're saying under a reporting requirement that requires this, here's what it's looking like, okay. Under different reporting requirements there will be different here's what it's looking likes, okay.

As to the rating system, let me simply mention this, okay. Please take a much more detailed look at RRC. The issues that came up with RRC today, we think, significantly question its validity as a tool to meet what needs to be done here, valid mechanism to inform consumers about the fuel efficiency of tires, which wasn't the case.

It certainly does appear to present an elegant solution if it worked. But think for a minute, what if it doesn't work, now what. And what are the implications in terms of coming up with a rating system, okay.

We're grappling with that. I would really value from you spending some time seriously considering that scenario, also. Because I have a sense that on further examination of RRC, if it doesn't have legs, if it isn't able to stand on its self, that is likely where we're going to be finding ourselves. Reassessing --

MS. NORBERG: And I think, like I said earlier, I think that would be a great topic for some technical discussion at the next workshop.

That'd be great. We'll come prepared to be able to discuss that in more detail.

MR. TUVELL: Okay. Any other questions or comments at this point?

Then I want to thank everybody for participating today. As I mentioned, we will be having a transcript made of this, which will be posted on our website. All of the presentations today will be posted on our website.

I want to also take this opportunity to apologize to everyone who didn't get the notice from the listserver. We have no explanation why that could have happened the way it did. And so, as a result, don't know what to do to keep that from happening again in the future. Not that I'm saying that it could, but I would encourage you to do more frequent views of our website if you have to, to stay on top of this.

And, I mean, we'll continue to dig into why this could have happened. We don't know. We simply don't know. There's no explanation.

I, independently, when it happened made random calls to people on the listserver and found nobody in a similar situation than the group that I heard about. I don't know. The operator of our website doesn't know. And so all I can do is offer you my apologies for that. And we'll do the best we can to try to determine what happened there and never allow that to happen again.

Thank you very much.

(Whereupon, at 3:41 p.m., the staff workshop was adjourned.)

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CERTIFICATE OF REPORTER

I, PETER PETTY, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Energy Commission Staff Workshop; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said workshop, nor in any way interested in outcome of said workshop.

IN WITNESS WHEREOF, I have hereunto set my hand this 10th day of February, 2009.