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BEFORE THE

CALIFORNIA AIR RESOURCES BOARD

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9:31 A. M.

Nadine J. Parks
Shorthand Reporter

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I note for the record -- I don't know if the staff has any written comments that need to be made part of this presentation. And I see by a nod that we don't have any written comments.

So, I just would like to close this item and move on to the next item on the agenda, which is Agenda Item No. 94-12-2.

And I again would like to remind those of you in the audience who would like to testify on this item to be sure that you've signed up with our Board Secretary.

And if I might, I'd like to indicate that this is a public hearing to consider the technical status and the proposed revisions to malfunction and diagnostic system requirements for 1994 model year passenger cars, light-duty trucks, and medium-duty vehicles and engines.

The malfunction and diagnostic requirements, known as OBD II, were originally adopted in September of 1989. These requirements became effective with the 1994 model year, the first year of the phase-in that extends to the 1996 model year.

OBD II systems have been approved for more than 35 of the 1994 and 1995 model year engine families so far. Based on the experience gained in this process, amendments have been proposed by the staff to clarify and adjust certain requirements where needed.

Also, the staff has followed manufacturers' progress towards meeting improved monitoring requirements which are to take effect beginning with the 1996 model year.

The status of this progress will be presented by the staff, along with some proposed amendments. And, at this point, I would like to ask Mr. Boyd to introduce the item and begin the staff's presentation.

MR. BOYD: Thank you, Chairwoman Riordan, members of the Board.

OBD, as we affectionately call it, or on-board diagnostics, is a primary example of the kinds of technology advancement and development that has been a major thrust of the action of the Air Resources Board for many, many years.

And fresh from last month's hearing and the discussion of our role in technology advancement and development, it's almost propitious that we talk about this particular item, which has been one of extreme significance to us and to the cause of cleaning up and maintaining clean emissions from automobiles.

We have, as you can take from the title, moved from the initial introduction of on-board diagnostics, Phase I, into the more challenging arena of on-board diagnostics Phase II. And these requirements are very, very comprehensive in many instances, as you will hear today, very technically challenging to us and to the industry.

And, as a result, your staff is returning to the Board to propose some changes. We have twice returned to the Board since the regulation was first adopted to provide you updates on the manufacturers' progress towards meeting the requirements and to make modifications, as they become necessary, which is always a promise and a commitment of this Board to do.

The process to date has worked well because, as you heard from the Chairwoman's introductory remarks, most manufacturers are currently producing models that are equipped with OBD II.

With our proposal today, this process will continue. We will provide you an update on the progress towards meeting the technology challenges of OBD II and we'll propose, as the Chairwoman indicated, a number of modifications that we think will further help OBD II implementation indeed become a reality, while still ensuring that the requirements will provide the maximum possible reduction in emissions.

I should note, for the benefit of all who were involved in this, that this proposal today is a result of a very high degree of cooperation between your staff and the members of the regulated industry.

With that, I'd like to turn the detailed proposal over to Mr. Allen Lyons of our Mobile Source Division, who

will provide both the overview and then to recount the staff's recommendations for change.

Mr. Lyons?

MR. LYONS: Thank you, Mr. Boyd.

MR. BOYD: I should note that we're not in charge of the technological development for slide projectors.

(Laughter.)

MR. BOYD: Well, Madam Chair, I'm embarrassed to say that we've got an incorrect piece of equipment here, and we need a couple of minutes to make a change.

CHAIRWOMAN RIORDAN: Well, this is then perhaps a good time for a break.

(Laughter.)

MR. BOYD: Thank you.

CHAIRWOMAN RIORDAN: Why don't we take a five-minute break. It's about five minutes of 10:00, or thereabouts, by your clock. So, we'll come back at 10:00.

(Thereupon, a short recess was taken.)

CHAIRWOMAN RIORDAN: We are now with the right equipment, so let's come back to order.

Mr. Lyons.

MR. LYONS: Good morning, Chairwoman Riordan and members of the Board. Sorry for the delay. We've worked for standardization with OBD II, but I guess Kodak hasn't standardized their slide trays as yet.

We'll start the staff's presentation by reviewing how OBD systems work, and how they help to reduce in-use emissions from motor vehicles.

Then, we'll look briefly at the history of California's OBD requirements, followed by manufacturers' progress to date in putting OBD II systems into production.

From there, the presentation will segue into the OBD II implementation issues that still remain. The staff's proposed changes to the regulation will be included in this discussion.

Today's vehicles use on-board computers to carry out a number of drivetrain functions such as fuel control, ignition timing, transmission control, and the operation of emission control devices such as exhaust gas recirculation, or EGR, evaporative system purging, and secondary air injection.

The information necessary to carry out these functions is provided to the computer by a number of sensors, such as the engine speed sensor, mass airflow sensor, coolant temperature sensor, exhaust gas oxygen sensor, and others.

These same sensors can be used to evaluate the vehicle's emission control system performance. If a malfunction is detected in a component or system, the on-board computer will illuminate an instrument panel

warning light, and will store diagnostic information for future use by a service technician.

In this way, in-use emissions can be reduced through the prompt detection of malfunctions as they occur, so that repairs will be made more quickly.

Further, the diagnostic information generated by these systems helps in pinpointing the cause of the problem, which helps the service technician to efficiently and effectively repair vehicles.

Requirements for OBD systems were first adopted by the Board in 1985 for 1988 and newer vehicles. The regulation, now known as OBD I, requires functional monitoring -- as distinguished from performance monitoring-- of the EGR valve, the fuel system, and components that provide information to the on-board computer.

California's second generation of OBD requirements, OBD II, was originally adopted in 1989 for 1994 and later model year vehicles.

OBD II improves upon the monitoring requirements of OBD I by requiring that the criteria for determining a malfunction be based on emission performance.

Generally, a malfunction is to be indicted by the time vehicle emissions exceed one-and-a-half times the applicable standards.

OBD II also expands the monitoring requirements to

include other critical emission control components and systems, such as the catalyst and the evaporative system, among others.

In fact, under OBD II, virtually every powertrain component or system that can affect emissions will be monitored.

As I just mentioned, the first year for OBD II implementation was the 1994 model year. Manufacturers are generally required to phase in OBD II systems, such that all models will meet the requirements by the 1996 model year.

The regulation does not contain specific phase-in percentages; however, manufacturers are required to base the phase-in on the capability of the on-board computers used to incorporate OBD II monitoring strategies.

Currently, more than thirty-five 1994 and 1995 model year engine families have been certified to meet the requirements. Some examples are shown here. Vehicles have been certified by American, Asian, and European manufacturers.

However, as the first year of OBD II implementation drew near, some manufacturers expressed concerns about being able to initially meet every OBD II monitoring requirement in time for vehicle production.

Manufacturers had done their best to meet all of the monitoring requirements; however, due to the newness of

some of the monitoring strategies, some fell short of the minimum requirements of the regulation.

In response to a petition by Ford Motor Company, the Board adopted a provision to accept OBD II systems with one or more monitoring system deficiencies for the 1994 model year, provided the manufacturer had demonstrated a good-faith effort to meet the requirements in full.

For the 1995 model year, the same provision is available; however, fines in the amount of $25 to $50 per deficiency per vehicle are specified for the third monitoring deficiency and every deficiency identified thereafter.

While a number of manufacturers have certified vehicles with monitoring system deficiencies, none to date has been required to pay fines.

We'll turn now to OBD II implementation issues and the staff's proposals to address them.

Manufacturers have expressed concerns about meeting the OBD II catalyst monitoring requirements for low-emission vehicle applications. The regulation requires independent monitoring of front catalyst efficiency in order to provide for early detection of catalyst system deterioration within the capabilities of the most promising catalyst monitoring technique, which is the use of dual oxygen sensors.

With oxygen sensors placed before and after the catalyst, the oxygen storage of the catalyst can be measured. This parameter can then be correlated to the hydrocarbon conversion efficiency of the catalyst.

The front sensor signal continually cycles in response to the fuel system. If the catalyst has good oxygen storage, the rear sensor signal will appear relatively flat. As the oxygen storage of the catalyst decreases, the rear sensor's signal begins to look like the front sensor. In this way, the efficiency of the catalyst can be determined.

The concerns that were expressed are related to this relationship between oxygen storage and hydrocarbon conversion efficiency. Manufacturers have stated that, when located close to the engine, a catalyst can lose oxygen storage before any significant decrease and conversion efficiency occurs.

Also, the concern has been expressed that some front catalysts will be too small to have enough oxygen storage for reliable catalyst monitoring. In addition, manufacturers have stated that the front catalyst monitoring requirement does not provide enough flexibility in terms of catalyst system design.

While there are OBD II equipped vehicles that affirm the feasibility of the current requirements, the

staff believes the requirements can be made more flexible and ultimately more effective.

The staff is proposing an amendment to remove the restriction that front catalysts must be evaluated independently from downstream catalysts. In its place, a system-based requirement is proposed that would require manufacturers to correlate catalyst system performance with tailpipe emissions.

Specifically, OBD II systems would be required to indicate a malfunction before the catalyst system has deteriorated to the point that hydrocarbon emissions exceed 1.5 times the vehicle's standards.

The new requirement would allow manufacturers to physically monitor all or only a portion of the catalyst system, provided a reasonable correlation can be obtained with tailpipe emissions. The staff envisions that the most promising method to satisfy the requirement is to monitor the front portion of the catalyst system, whether the front catalyst by itself or in combination with downstream catalysts.

In this way, small tailpipe emission increases can be correlated with relatively larger and more discernible decreases in the performance of the front catalysts.

The staff recognizes that modifications to catalyst system design plans may be necessary in some cases

to make monitoring of the appropriate portion of the catalyst system possible. For example, front and rear catalyst volumes may need to be adjusted to maximize the correlation between the monitored portion of the catalyst system and tailpipe emissions.

Another possible modification could be the placement of an oxygen sensor between the substrates of an existing catalyst.

In order to provide adequate leadtime for manufacturers to make such modifications, the staff proposes to phase in the 1.5 times the standard emission threshold for catalyst monitoring beginning with the 1998 model year, with full compliance required by the 2000 model year.

In the interim, higher emission thresholds are proposed for TLEVs and LEVs that can be met without requiring catalyst system design changes. In this way, the staff's proposal makes near-term compliance with the catalyst monitoring requirements easier for manufacturers than the current adopted requirement, while maximizing the long-term effectiveness of catalyst monitors.

For TLEVs, the interim threshold would be two times the standard plus the emission level of the vehicle with a 4,000 mile catalyst system; and for LEVs, two-and-a-half times the standard, plus the emission level with the 4,000 mile catalyst system.

An interim threshold is not proposed for ULEVs, because it is not expected that any manufacturer will certify a gasoline-powered vehicle to this standard until the 1998 model year at the earliest.

As such, adequate leadtime exists for any necessary catalyst system modifications to be made in time for production. Should certification of a ULEV come sooner than expected, the proposed amendments give the Executive Officer the authority to establish an appropriate interim threshold.

Regarding evaporative system monitoring, the regulation currently requires manufacturers to detect evaporative system leaks that are equal or greater in magnitude than a .04 inch diameter hole. Such systems are to be phased in through the 1998 model year as evaporative systems are designed to meet California's new high temperature evaporative test procedures.

However, as this slide illustrates, even leaks smaller than .04 inches in diameter can cause very large increases to in-use emissions.

With a leak as small as a .02 inch hole, evaporative emissions can increase to the equivalent of approximately 0.5 grams per mile, or more than six times the LEV hydrocarbon standard and more than ten times the ULEV standard.

Further, evaporative system testing conducted by the ARB indicates that a significant number of vehicles may have evaporative system leaks that are significant, but lesser in magnitude than a .04 inch hole.

Specifically, the testing suggests that approximately 8 percent of the vehicles tested at the ARB's laboratory had leaks corresponding to a hole size between .02 and .04 inches in diameter.

When considering the potential evaporative emissions from such vehicles, it is clear that a significant in-use emission reduction up to approximately 35 tons per day statewide can be obtained from identifying and repairing such vehicles.

To further illustrate, using the 2003 model year fleet average emission level as a baseline, excess evaporative emissions from 8 percent of the fleet could raise the fleet average by over 20 percent, even after considering allowable evaporative and running loss emissions.

As the fleet average drops in future years, the impact of these emissions will increase proportionately.

As a result, the staff plans to phase in -- the staff proposes to phase in a requirement for the detection of evaporative system leaks as small as a hole .02 inches in diameter.

The phase-in of such monitoring strategies would extend from the 1998 model year to the 2000 model year, with phase-in percentages of 50, 75, and 100 percent.

ARB testing indicates that the smaller leaks can be detected reliably using the same basic monitoring hardware used for the detection of .04 inch leaks. Currently designed monitoring strategies create either a vacuum or pressure buildup in the evaporative system.

Once the change in pressure is achieved, the diagnostic system closes off the evaporative system to test if a leak is present. By lengthening this monitoring period, leaks smaller than .04 inches can be detected. More constrained monitoring conditions can be considered as well to reduce variability.

Data recently submitted by General Motors indicate that the emission of small leaks may be significantly reduced on future vehicles as a result of the changes to the evaporative system that are being implemented to meet the new test procedures.

Instead of up to 20 grams per test, the data suggest that diurnal emissions may only increase by approximately three grams per test when a small leak is present.

While this is certainly a positive development, the staff believes it is necessary to work towards the

detection of very small leaks.

From the limited data received by the staff, it appears that the emission impact of a leak is highly dependent on the way in which the evaporative system is designed. There is no guarantee that all systems can be optimized to reduce the impact of leaks so significantly.

Further, even a three gram per test increase corresponds to approximately 0.1 grams per mile tailpipe emissions, or 2.5 times the ULEV hydrocarbon standard. Therefore, a significant emission benefit could still be realized without redesign of the monitoring hardware.

Now we'll turn to misfire detection:

Current OBD II systems are required to detect engine misfire at a minimum during engine operating conditions encountered during an FTP test.

However, the regulation requires -- beginning with the 1997 model year -- that misfire detection systems be active over all positive torque operating conditions; that is, over all engine speeds where the engine load is equal or greater than that with the transmission in neutral.

Misfire detection over a wider range of operating conditions is necessary because the occurrence of misfire during more extreme vehicle operation can, in addition to increasing emissions, case permanent damage to the catalyst in a matter of minutes.

Manufacturers have been working diligently to improve their misfire detection systems to meet the expanded monitoring conditions, but continue to express concerns about meeting this current requirement on all engines, especially 8, 10, and 12 cylinder engines.

As a result of such concerns, the staff proposes to provide additional leadtime for the more difficult engines by phasing in the expanded monitoring conditions from the 1997 model year through the 2000 model year with the following percentages: 50 percent in 1997, 75 percent in 1998, 90 percent in 1999, and 100 percent compliance with the 2000 model year.

In order to further facilitate meeting these requirements, the staff is proposing a small region of engine operation in which misfire detection can be disabled. The region consists of high engine speed operation in combination with low engine loads.

Manufacturers have indicated that this region is the most difficult for reliable misfire detection, and is also a rarely encountered region of operation.

As such, the effectiveness of misfire detection strategies should not be significantly reduced by permitting disablement in the shaded region (remarking on slide depiction).

It should be noted that manufacturers' misfire

detection capabilities have improved greatly over the last few years as they have worked to meet the current all speeds and loads monitoring requirement. As a result, it is now necessary for disablement to occur only during the most extreme engine operating conditions.

When first adopted, the OBD II requirements did not apply to diesel vehicles. However, in 1991, the Board adopted an amendment that requires manufacturers of diesel vehicles and engines to implement OBD II systems.

Additional leadtime up to the 1997 model year was provided. Because some of the OBD II monitoring requirements are not applicable to diesels, the amendment requires diesel manufacturers to submit an OBD II compliance plan to the Executive Officer for approval at least two years prior to production.

However, since the 1991 Board hearing, the staff has met numerous times with diesel manufacturers, and is proposing amendments to the regulation that clarify how the OBD II requirements apply to diesels, making plan submittals unnecessary in the future.

The ARB staff has not identified a feasible monitoring strategy for catalysts on diesel vehicles. Because diesel engines operate with excess air, the technology used to monitor catalysts on gasoline engines cannot be applied. As a result, the staff proposes to

exempt diesel vehicles from the catalyst monitoring requirements.

Regarding misfire detection, because diesels are not spark ignited, they are not subject to many of the causes of misfire that occur in gasoline engines; however, diesels can lose compression in one or more cylinders causing increased hydrocarbon and particulate emissions.

The staff is proposing, therefore, that diesel vehicles be equipped with a monitoring strategy that verifies cylinder combustion. Manufacturers would have until the 1998 model year to develop and implement these strategies.

All of the remaining requirements would apply, to the extent that diesels are equipped with the emission control technologies that are delineated in the regulation.

Turning back to the discussion of monitoring system deficiencies, as previously mentioned, the Board adopted an amendment last year to permit the certification of 1994 and 1995 model year OBD II vehicles even if one or more of the monitoring requirements cannot be met in full, despite a good-faith effort on the part of the manufacturer.

This amendment has been valuable, since a number of manufacturers have encountered unexpected difficulties in meeting some requirements during these first years.

The staff believes that such difficulties will

diminish as manufacturers gain more experience with OBD II implementation. However, with the monitoring requirement revisions proposed today, it is possible that last minute compliance problems may continue to occur occasionally over the next few model years.

As such the staff has proposed an amendment that would carry over the current deficiency provision for the 1995 model year into the 1996 model year. Specifically, manufacturers would be permitted to certify vehicles with up to two deficiencies without penalty, and fines in the amount of 25 or 50 dollars per vehicle per deficiency would apply for the third and subsequent deficiencies.

From the 1997 model year, extending through the 2000 model year, the staff proposes to allow one deficiency per engine family before the fines would apply. There are some additional restrictions. Manufacturers would not be permitted to carry over deficiencies into future model years unless a hardware modification is required to fix the problem. In this case, a one-year carryover would be permitted.

Further, manufacturers would be required to implement some form of monitoring strategy for all requirements, even though one or more of the monitoring strategies may not comply fully with the regulation.

Because of the workload associated with bringing

all gasoline-powered vehicles into compliance with the OBD II regulation by the 1996 model year, manufacturers have indicated that they have not had the resources to develop OBD II systems for alternate fuel vehicles.

They state that additional testing is necessary to ensure that the monitoring strategies will continue to work as intended when using fuels other than gasoline.

Further, projected sales of alternate fuel vehicles are low, which generally makes them a lower priority in terms of OBD II development.

The staff is proposing an amendment that would allow vehicle manufacturers and alternate fuel retrofit system manufacturers to request exemption from monitoring strategies that are likely to be impacted by the use of alternate fuels until the 1999 model year.

This will provide additional leadtime to ensure that, when OBD II is fully implemented on these vehicles, the monitoring strategies will be accurate and reliable. The provision will further ensure that alternate fuel vehicles are not pulled from the marketplace due to the inability of manufacturers to fully comply with the OBD II requirements by 1996.

OBD II systems offer the potential to greatly simply inspection and maintenance testing in California. However, the success of such a program depends on the

integrity of the information provided by these systems.

As a result, the OBD II regulation contains a requirement for the programming in the vehicle's electronic control unit to be resistant to tampering.

The staff is proposing an amendment that would require enhanced tamper resistant measures to be implemented beginning with the 1999 model year for vehicles that can be electronically reprogrammed.

The staff's proposal calls for the use of data incryption and monitoring of vehicle reprogramming activities in the field.

The staff plans to continue discussions with the industry to ensure the on-board computers are secure within practical limits.

In summary, these proposed amendments, along with some more minor amendments presented in the staff's report, will help to maximize the effectiveness of OBD II systems while addressing nearly all of the implementation concerns expressed by manufacturers. The staff believes that the good working relationship with industry over the last five years has been a key factor in getting to this point.

And with the adoption of the amendments, the ARB and manufacturers will be able to turn from discussions regarding the development of the regulation to its successful implementation through the end of the nineties

and beyond.

The staff remains committed to following manufacturers' progress towards meeting the OBD II regulation, and will continue biennial reviews of the program.

Should implementation concerns remain, the staff would bring its proposals to address them to the Board.

This concludes the staff's presentation. Thank you.

CHAIRWOMAN RIORDAN: Thank you very much.

Mr. Boyd, are there any further comments on your part before we have questions from the Board members?

MR. BOYD: Not at this time, Madam Chair. Thank you.

CHAIRWOMAN RIORDAN: Okay. Board members, this is the time when it's appropriate to ask questions of staff. Are there any questions for staff?

MR. LAGARIAS: I have a few.

CHAIRWOMAN RIORDAN: Mr. Lagarias.

MR. LAGARIAS: I have some questions on evaporative system leaks.

But first, you indicated that for the 1994-96 model year, that 35 engine families have been certified, and you gave some examples of the type of vehicles that were certified.

But this doesn't seem to be the more common engine families. So, my question on that is: Roughly, what percent of all the automobiles manufactured are represented by the 35 engine families that are certified? Just a rough figure.

MR. LYONS: My estimate would be around 20 percent, 20, 25 percent right now.

MR. LAGARIAS: All right. That seems a little high to me. But on evaporative emissions, when you talk about leaks equivalent to a .02 or .04 inch hole, are these leaks or are these -- exactly what are we talking about for evaporative emission losses?

Are they diffusion or are they actually physical holes in the system?

MR. LYONS: We're talking about physical holes or cracks in the system.

MR. LAGARIAS: So that, presumably, better manufacturing -- you mean where they seal the welds and that sort of thing? Is it?

MR. ALBU: Yes. That's generally correct. Some of the things we're concerned about are high-mileage vehicles, whereby the aging process tends to cause problems with the sealing of these parts.

For example, there have been also some recalls in the last year -- a Jeep vehicle and a Chevrolet S10 truck --

where they have overtightened a fitting, and it tended to leak after a short while in service. On the Chevrolet truck, they had an improper weld process of the filler neck to the gas tank and, in this case, fuel could leak out as well.

And so, it's these kinds of problems. Plus, on high-mileage vehicles, when they end up in wrecking yards, sometimes people pull components off and they don't do a real good job of being careful.

So, there's all kinds of things can happen in the field to cause these kinds of leaks to occur. And we'd like to catch these as soon as possible

MR. LAGARIAS: All right. And the losses you predict are based on the difference in pressure between the pressure in the gasoline tank and the outer atmosphere?

MR. ALBU: That's correct. But I think some of the improvements in the newer systems are intended to reduce those pressures to make the impact less of an impact.

MR. LAGARIAS: Well, it seems to me that after the pressure is equilibrated, that the loss would just disappear.

MR. ALBU: Yes, that's true. But those are diurnal during each day where you have hot fuel being handled, the pressure -- the increase during that time would cause hydrocarbon emissions to --

MR. LAGARIAS: So, you're thinking it's the diurnal variations that cause these leaks, and that's how you get the grams per mile?

MR. ALBU: Right. We estimate a certain emission contribution over a certain time period, where we assume about 26 miles per day in average trip length.

MR. LAGARIAS: All right. And then it has nothing to do with trip length. If your car is parked in front of your house, twice a day there'll be leakages coming out.

MR. ALBU: Yeah. It's a way to correlate the estimate of exhaust tailpipe emissions.

MR. LAGARIAS: All right. And you think that by physical manufactured controls or design changes you can reduce these evaporative leaks?

MR. ALBU: Yes, I think that's true. But again, when vehicles get old and people try to fix problems and so forth and remove engines from vehicles, these systems get handled. And, as such, they may not go back together correctly. Some of the components may start to tear, and then we have problems.

And so, it's just -- especially vehicle age, and especially in California, for ozone impacts, we find that older vehicles do leak.

MR. LAGARIAS: Well, I can relate to that. I know that when I'm trying to fix my irrigation system, and to

prevent a leak by tightening it up too much, I create a new leak. Is that what you're saying?

MR. ALBU: Exactly.

MR. LAGARIAS: Thank you.

CHAIRWOMAN RIORDAN: Mr. Parnell, do you have a question?

MR. PARNELL: It was answered. Thank you.

CHAIRWOMAN RIORDAN: All right. Supervisor Vagim.

SUPERVISOR VAGIM: Thank you.

Just to extend on what Mr. Lagarias was saying, I guess this also could be called the fuel cap warning system, right? If you leave the fuel cap off at the service station, a little light will come on and say something's wrong?

MR. ALBU: That's correct. I think some manufacturers are designing secondary seals so that, even if you do leave the fuel cap off, it's still not giving off emissions.

SUPERVISOR VAGIM: So, you'll be able to save yourself in having to go to a hardware store to buy a new cap?

MR. ALBU: Right.

SUPERVISOR VAGIM: The three times and you get a fine across the fleet if a manufacturer has a three-plus deficiency, that's going to be extrapolated across the fleet

that they sell in that market year?

MR. ALBU: Yes. It'll be a fine per vehicle.

SUPERVISOR VAGIM: If they come in with a fix midyear, what happens?

SUPERVISOR VAGIM: The fine would go away.

SUPERVISOR VAGIM: From that point on?

MR. ALBU: Yes.

SUPERVISOR VAGIM: From the vehicles on the showroom floor, the vehicles that are sold, or how is that going to work?

MR. ALBU: Those vehicles with the compliant system would no longer carry the fine.

SUPERVISOR VAGIM: So, it would be at the point of manufacture, then basically.

These systems are going to -- I presume the ones that are in place, the 35 models, with their on-board diagnostic systems now, I presume they have the same size CPU that they're going to need for the regulation that's proposed in today's update?

MR. ALBU: That's probably true.

SUPERVISOR VAGIM: What about -- now, if these were larger CPU systems than were before and needed for monitoring fuel injection systems and that type of thing -- I presume -- what -- what happens with heat?

I mean, heat is a big enemy of these things. And

has anyone gone through a "degrade" test on length of time of these things under the system of heat and --

MR. LYONS: We haven't heard any concerns that they can't handle the heat dissipation from these systems.

MR. CROSS: And they -- yeah, Tom (Cackette) said they've been on cars since 1980, and also --

SUPERVISOR VAGIM: But not this size. Not --

MR. CROSS: But the manufacturers are very aware of the problem, and typically mount the CPUs in places that are subject to severe heat loads, like the interior of the car, for example.

So, even though there are hot parts of the car, the computers don't generally see that.

SUPERVISOR VAGIM: What about loss of power and the regeneration of all the memory and all that type of stuff? Are you going to have backup power to these things? Because I know, if you lose your battery on the current ones, you got to go get the thing reprogrammed and drive it around for a while so it understands what it is, and who it is, and all that stuff.

Same problem here?

MR. LYONS: I believe they do use keyboard memory to some extent. And perhaps, if there is a power loss by disconnecting the battery or whatever, some information may be lost. But that's regenerated as the power is hooked back

up and the vehicle is driven again.

SUPERVISOR VAGIM: But you still have a -- I know for -- from just the vehicle I drive, if I do do that, the thing doesn't know where the fuel injection should be set. And you have to go through all these things.

And the manufacturer, or at least the dealer told me, they've got to drive at various speeds for a certain time. They call it "relearning the computer."

MR. ALBU: Yeah. The systems do go into a default program when that happens. And there is some relearning that takes place.

But it -- that process seems to be speeding up as of late.

SUPERVISOR VAGIM: So, it's not going to be a problem to the driver, though, that --

MR. ALBU: No, I don't expect that.

SUPERVISOR VAGIM: Now, what about this light? You know, we've had lights on vehicles before, and they've always been ignored.

As a matter of fact, they've been ignored to a point where the manufacturers have stopped leaving them on. The seat belt is an example. They used to leave them on. Now, they politely go away.

We're going to leave this on?

And the reason why they politely went away -- the

driver's got mad. "Don't tell me I don't have my seat belt on. I'll tell myself."

So, the manufacturers started just -- the seat belt light went away.

The same way with the 55-mile an hour light some manufacturers put on their cars. And some just put it on their -- if they had an analog speedometer, they would just put a line at 55. Those have all gone away, because people just don't like being told what to do.

Are we going to have that kind of consumer complaint issue here?

MR. ALBU: That's a good point, and it's one that we tried to address with the initial regulation. We think that the reason people got annoyed with the current lights is because they come on and then mysteriously go off, and they're not uniform.

When they come on, they don't stay on. And then, when you go to check out the system, the light's off and the code's gone.

So, what we've done is we've made it -- made sure that there really is a problem before the light comes on, and then we keep it on, unless it really has gone away.

And I think what we're going to find is that the owners will find that these systems confidently predict the problem, and then you're going to be able to find the

problem when the light does come on.

And I think the consumer -- at least, I'm planning on buying a new car, but I won't get one until it has OBD II, because I want this knowledge so that I can repair the car myself, actually.

SUPERVISOR VAGIM: You're not an exemption.

MR. ALBU: Hopefully.

SUPERVISOR VAGIM: But let me ask, though, because I remember when we had those lights that stayed on, particularly with a seat belt, a lot of folk out there dismantled them. It was against the law to do it, but they did it. What's going to stop them from doing this?

MR. ALBU: They could remove the bulb, for example. But what will happen is, with the on-board diagnostic system, when -- for example, if we go through a smog check, the smog check would involve hooking up the computer, not relying on just the light.

And even if they remove the bulb, the fault code would still be present, so --

SUPERVISOR VAGIM: I understand that.

MR. ALBU: But we also have a readiness code, so--

SUPERVISOR VAGIM: So, what's the purpose of the light then?

MR. ALBU: It's to inform the owner that a problem exists and that they should get it taken care of as soon as

possible. I think they might avoid other problems --

SUPERVISOR VAGIM: Wouldn't that be better if maybe at the start of ignition that the light would come on and tell them that they've got a problem versus leaving it on? Because I'm -- I know what happens out there.

You got probably 20 percent of the folks that are going to start dismantling that thing right away, because they don't want to go in when they have a problem if it's running right.

MR. CROSS: This is a little different from the sort of you-forgot-to-fasten-your-seat-belt-light, in the sense that -- that the purpose of the light is to inform the consumer that something is wrong with the car, and that they need to seek service to get it fixed, as opposed to there's a law that says you should buckle up your seat belt and the car's telling you to.

So, it's sort of -- you know, this isn't as severe as an oil pressure light, where the engine's going to fail if you drive it. But, on the other hand, the lights -- the timing of illuminating the light is such that -- that, when it goes on, it's telling you something needs to be fixed.

SUPERVISOR VAGIM: So, you --

MR. CROSS: We want it to be a little bit insistent.

SUPERVISOR VAGIM: I understand that. But as soon

as the -- and the public's not stupid. As soon as they learn that some of these things, when they're going back, is because they're one-and-a-half times over hydrocarbon limits, that's not going to be a sexy thing to want to keep that light on (sic.)

MR. CALHOUN: Well, I think, also, the point that Steve made that is a good one, and that is that the purpose of storing fault codes and new car warranties and all that is to that the -- so that the consumer will have a good experience.

In other words, they go into the dealer or the repair facility. They identify the problem properly the first time. They fix the car. The light is off. And the consumer goes on his or her merry way. As opposed to kind of what we experienced -- have been experiencing in the past, where you go in ten times and you don't know what's wrong.

And I think that this system is -- has to happen, I think, with computer controlled cars for them to really work right in the field.

MR. ALBU: Can I say just one more thing -- is that these systems are highly adaptable. So that, when a problem occurs, there's a lot of adaptation and correction that takes place automatically.

And when that light comes on, there's a pretty

good chance that part's pretty well shot and you probably want to replace it to avoid other problems with the car, and maybe even a problem with keeping it running.

SUPERVISOR VAGIM: So, you're not going to know, as a driver, whether that -- there is something majorly wrong or your hydrocarbon limit's overexceeded, or your misfire's overexceeded?

Of course, if your misfire's really overexceeded, you're going to know it, because you're driving a car --

MR. ALBU: Generally, the owner won't know the reason the light is on or whether it's emissions related or not. But they will -- it definitely will be the case if there's something wrong with the way the car runs. And they should be fixed.

SUPERVISOR VAGIM: When you have -- when the light comes on now, is this going to be taken to your friendly neighborhood, who now is going to have a Cray I computer to talk to the car, or is this going to have to go to a special dealer authorized now with the incryption? A handful of places per community?

MR. ALBU: Yeah, with OBD II, comes a generic scan tool requirement.

And this means that scan tools will be on the market, which a single unit can fix any make of vehicle. So, you do not have to go to a dealership, although most

people would under warranty. But once you're out of warranty, you do not have to go to a dealership.

SUPERVISOR VAGIM: Will this --

MR. ALBU: You will have a generic scan tool to --

SUPERVISOR VAGIM: Will these units be the -- inclusive with the emission tests that will be a part of the I&M?

MR. ALBU: Yes, they --

SUPERVISOR VAGIM: Or will they be --

MR. ALBU: -- they will use these tools to basically to read the codes.

SUPERVISOR VAGIM: They'll be coupled together as one unit --

MR. ALBU: Yes.

SUPERVISOR VAGIM: -- then.

MR. ALBU: Yes.

SUPERVISOR VAGIM: When these folks who want to pursue this, this level of on-board diagnostics as mechanics in the field, will they have to get a license by the manufacturer to be able to talk to the incryption?

How will that work?

MR. ALBU: The incryption would only be needed to reprogram a -- well, the security is in place to prevent tampering with the system.

So, what would happen is the -- if, for example,

an independent wanted to reprogram a vehicle with a running change that the manufacturer is putting out, then, through our proposal, they would use a seed and key arrangement to go through a host computer, and then they would use a E-PROM, ostensibly, to load in a protected software program into the computer.

It can be done by an independent.

SUPERVISOR VAGIM: Okay. But still, to shake hands with the master computer is going to be controlled by whom?

MR. ALBU: Under our proposal -- and there's still more discussion to go yet -- it would, right now, be with the manufacturer of the vehicle. It's just one way of keeping track and a record of who is entering the system and going into that record -- into those records, if we need to, to make sure there's no tampering going on.

SUPERVISOR VAGIM: Will they have control over who has access?

MR. ALBU: Not really. The access will be granted based on --

SUPERVISOR VAGIM: Well, I mean --

MR. ALBU: -- having a certified mechanic --

SUPERVISOR VAGIM: Okay. The word's "granted." Someone's got to grant.

Now, if there is a -- more than just a level of

expertise -- you're a good mechanic; you're a bad mechanic; you're too many mechanics -- what about that level of granting or not granting?

MR. ALBU: I think, to reprogram a car, it's a fairly straightforward operation. And since the mechanic really wouldn't be involved in that -- in changing anything, it's --

SUPERVISOR VAGIM: I don't mean that. I mean the ability to go in and access the master computer. If the manufacturer or whoever controls that is the grantee, who then is going to make the appeal if they feel they have everything within their power to be a good mechanic and sign on, but someone says, "Nope. You can't sign on."

MR. ALBU: Well, I think the only --

SUPERVISOR VAGIM: Who's going to make that decision?

MR. ALBU: -- grant that would be required is for us to -- is for the program going to the vehicle to be a certified program.

If that's the case --

SUPERVISOR VAGIM: Will that be -- will that be ARB's --

MR. ALBU: Yes.

SUPERVISOR VAGIM: -- position? We will do that?

MR. ALBU: We will decide which programs are the

ones which are acceptable for the computer to be programmed with, yes.

SUPERVISOR VAGIM: Okay. But the person who is in the field, the mechanic -- you understand what I mean -- is now going to be either granted or not granted, based on maybe some other decision. Who will --

MR. ALBU: I think they would be licensed --

SUPERVISOR VAGIM: -- who will be the judge of that?

(Thereupon the reporter requested the speakers to not speak simultaneously.)

SUPERVISOR VAGIM: Sorry.

MR. ALBU: I think they would be licensed mechanics to be able to perform this operation. You know, it's not totally worked out yet, but that would be the likelihood.

SUPERVISOR VAGIM: We have licensed mechanics all over California, and I want to know, if a dealer is not doing as well as --

MR. ALBU: I think --

SUPERVISOR VAGIM: -- he or she should be in the field, and they say there's too many mechanics out there, is it possible that this is one way to say, "Let's get rid of competition"? Don't license as many of those folks out there.

MR. CROSS: I think that the key here is that the reprogramming act is not a high-tech act, if you will. In other words, the mechanics aren't writing software or anything like that. They're just installing a program.

SUPERVISOR VAGIM: But they need to get access to shake hands, to reprogram. And if someone is saying that you can or can't get on, who's going to be the arbitrator of that?

MR. CROSS: Yeah. I guess it's our intent to essentially have anybody who's qualified be able to install the OEM's --

SUPERVISOR VAGIM: So, that'll be our --

MR. CROSS: -- reprogramming.

SUPERVISOR VAGIM: -- call then?

We'll say to the manufacturer, "You've got to hook this guy up," if he appeals and the manufacturers won't let him on?

MR. CROSS: Yeah. I mean, I -- and I guess the -- as Steve said, it's not fully worked out. But we've been -- we've been working with both the service industry and the manufacturers to endeavor to have a situation where the service industry has access to this stuff.

SUPERVISOR VAGIM: I just want to make that a point, though, on record. It could be a problem.

(Thereupon, several staff and Supervisor

Vagim spoke simultaneously, making it impossible for the reporter to capture their statements.)

MR. LYONS: Also, EPA is working on a regulation right now that would require manufacturers to provide access to the independent technicians.

SUPERVISOR VAGIM: Now, let's go to another subject, incryption.

Have you talked to the computer folks of the world to see how secure incryption is, especially of those hackers who can get the whole unit and actually see the code come out, incrypted or not incrypted? Is the CPU going to have a way of an instruction it only understands, and so you're fairly secure that incryption's going to be the master of all things?

You're never going to have somebody hacking into that system, huh?

MR. ALBU: I think that it's fair to say, and as was said in the staff presentation, that we're looking for a practical means or practical level of security.

Obviously, the most intent, capable hacker, probably can still get in.

SUPERVISOR VAGIM: Go ask the Department of Defense, or NASA, or some banks, and those types of things.

MR. ALBU: We understand. We're aware of their --

and we are concerned, and that's why we are going a little bit further with --

SUPERVISOR VAGIM: Yeah. I mean, the question is, because of incryption, are we creating an artificial black market?

MR. LYONS: Yes, also, besides the incryption, our proposal talks about requiring access to a central computer. So that, if there is a person with that expertise out there, if they're doing this reprogramming on a frequent basis, we'll have some way of monitoring that.

SUPERVISOR VAGIM: Well, of course. But, if indeed you -- if you could hack in, you could build your own artificial look-alike central computer and the system won't know.

It's not like you and me talking to each other -- the facial expressions. It just kind of knows black and white and ons and offs.

So, my question is, though, if we create an artificial black market, do we have anything in place to intercept that? Because I'll guarantee you, there'll be an artificial black market. I might get into it myself.

(Laughter.)

SUPERVISOR VAGIM: But, no, I mean --

CHAIRWOMAN RIORDAN: No, you didn't mean that, Supervisor Vagim.

(Laughter.)

SUPERVISOR VAGIM: No, I don't. But I mean, there are -- I'll tell you, there are some kids out there you cannot believe. And they'll spend 24 hours -- they won't sleep until they bust it. It's a challenge to them.

If you create through incryption versus just say, "Look, folks, this is it, and we have a way of testing to see if it's been modified," then you stop the black market.

And I think we're creating a black market with this.

Thank you, Madam Chair.

CHAIRWOMAN RIORDAN: Thank you.

Yes, Mr. Calhoun?

MR. CALHOUN: I guess I'd like to go back to the question Mr. Lagarias asked earlier about the percentage of vehicles that have been certified, I guess within 19-- with the OBD systems. And, Allen, as I recall, you said something about approximately 20 percent?

MR. LAGARIAS: 25.

MR. CALHOUN: 20, 25 percent? That, to me, is an indication of the complexity of the on-board diagnostic regulations. And I happen to believe that these regulations are probably the most complex regulations that the Board has ever adopted. And I am very concerned that we not make things too complex, such that we'd have a lot of unhappy and

irate customers.

And, in particular, the false lights, if that should happen -- and you know what's going to happen. The same thing will happen that happened with the safety belts. People get in an uproar and we'll have a problem on our hands and have to change it.

So, I think we ought to be certain that we are taking the appropriate steps and not making things too stringent, such that we may get some false lights. And I'm sure we'll probably hear some more testimony in that regard later on today.

But let me ask one other question.

Will you identify for the Board those areas where you added stringency?

MR. LYONS: In today's proposal?

MR. CALHOUN: Yes.

MR. LYONS: The only thing I can think of is the enhanced tamper resistance requirements and the evaporative system.

MR. CALHOUN: Okay. So, those are the two added stringency requirements.

MR. LYONS: Right.

MR. CALHOUN: Okay. You also make a point of the need for control of evaporative emissions. But yet, I know that the industry has experienced a lot of difficulty in

meeting a 40 thousandth's requirement.

And we're proposing to phase in something that's more stringent on top of the 40 thousandth something that -- I gather that we're quite certain -- that the industry is going to be able to meet with a lot of ease. We're phasing in a 40 thousandth requirement.

And at the beginning of the -- at the end of the phase-in of the 40 thousandth requirement, we are imposing another more stringent requirement, and I'm very, very concerned about as to whether not the industry will be able to, in fact, comply with that. And I'm sure we'll hear more in that regard later on, also.

Okay. That concludes my questions.

CHAIRWOMAN RIORDAN: All right. Thank you, Mr. Calhoun. Ms. Edgerton.

MS. EDGERTON: Mr. Kenny and legal counsel (Mr. Terris), I guess one of my questions, following on on Supervisor Vagim's, is what sort of intellectual property protections do you expect the manufacturers to claim for their OBD II? And will there be criminal or civil charges?

This may be jumping ahead of everything. I don't want to be -- but it does occur to me that that is an underlying question.

I would be interested as well in knowing who is expected to own the software, who's expected -- this may not

be the forum -- you may not be prepared for all of it. But it wasn't in any of the material -- who's going to own it and what are the protections for ownership? And if they want to have -- is it required that the Chrysler Neon go back to Chrysler when the light goes on?

I mean, will they be able to? It sounds like US EPA's going down a different route, saying that they have to let it go back to any old person who's never seen a computer.

I'm not saying that US EPA's doing that. But, anyway, it was just a question.

MR. KENNY: I'm not prepared to answer it at the moment. We will be discussing it, though, with the manufacturers' representatives to determine essentially what is the most appropriate way to sort of resolve the issue that you're raising.

But I don't have an answer right now.

MS. EDGERTON: Well, good. I'm glad to hear that you're working on it. And I guess my request would be that we get some sort of response on that as quickly as possible. I'm sure it's something that the manufacturers would be interested in.

And I think that it's very important in terms of how this program might relate to I&M generally and to the black market issues. These are issues that the whole

nation's facing with all -- which is your point -- which is with all of the computer software programs, and hackers, and so forth.

So, there's undoubtedly a lot that we can draw in developing our program on that.

I have another sort of line of questions that I wanted to ask about. And this follows up on a couple of other questions about these 35 engines -- engine families.

How many -- again, how many engine families are there in the universe of engine families that we regulate?

MR. LYONS: 150, I guess.

MS. EDGERTON: Pardon?

MR. LYONS: About 150.

MS. EDGERTON: About 150? Sorry?

MR. LAGARIAS: Maybe you better ask how engine families represent 95 percent of the cars produced? Because there are a lot of specialty engine families that are very, very limited in production.

MS. EDGERTON: I'd like to ask --

CHAIRWOMAN RIORDAN: Mr. Lagarias' question?

MS. EDGERTON: -- Mr. Lagarias' question.

(Laughter.)

MR. CROSS: Well, I would --

MR. LAGARIAS: It's an estimate. We recognize that.

MR. CROSS: See if I can bring this thing to light here. The range -- first of all, in response to the first question, it's probably somewhere between 150 and 200 total, depending on how -- where you draw the lines between cars and trucks and various model years and things like that.

And probably two-thirds of that would get you up to 95 percent.

MS. EDGERTON: Two-thirds of the --

MR. CROSS: Of the total number.

MS. EDGERTON: -- 150 is around 100, so ---

MR. CROSS: Yeah. Yeah.

MS. EDGERTON: -- about a hundred?

MR. CROSS: In other words, if you look at it -- remember, when you look at the -- when we did the ZEV regulation, remember, there was -- there were a whole bunch of large volume manufacturers and with large, large engine families. And then there was a large number of sort of intermediate and smaller families, which are still significant in volume.

And then there are tiny ones, like the Ferraris and some of that stuff.

And so, you, I guess -- in my view, probably two-thirds of it's going to cover the breakpoint of all of the big ones, big families, and most of the intermediate, and the top of the smaller ones.

MR. CACKETTE: Just for your information, the distinguishing characteristic of all the cars that you saw on that list is that they're new models -- Windstar, Mercedes 220, for example, Neon. And the reason for that is that the regulations were purposely designed to have a phase-in that allowed the manufacturers to incorporate OBD, when they were making new models, with new, more powerful computers in it.

So, that's what you see up there in general.

MS. EDGERTON: Uh-huh.

MR. CROSS: And then, those computers are generally applied to other model lines, as time progresses, when they're redone.

MS. EDGERTON: So, I'm trying to get this in context.

So, that's -- so, your point, though, changes the question, because I was going to say 35 is what percentage? Actually, it'd be 35 of 100. So, I was trying to understand the context.

But, actually, since it's based on new models, it's a different --

MR. CROSS: Right.

MS. EDGERTON: -- approach.

I was interested in the deficiencies discussion, because I wondered whether there were particular areas of

those six areas where you find more deficiencies. I mean, is there a pattern of some -- like evap emissions or some of the other components of OBD, the measurements that -- where you find more deficiencies?

I mean, are manufacturers -- are the larger manufacturers having more difficulties with some parts of OBD II than other parts?

MR. LYONS: I don't think there's any one requirement that has provided -- you know, has been a big problem across the whole -- all of the manufacturers.

I think most of these deficiencies have generally been fairly minor mistakes that can be corrected in the next model year. So, they're not major technological problems.

MR. CROSS: It's more a matter of -- excuse me. It's more a matter of almost communication between staff and manufacturers during implementation of the regulation.

In other words, since a lot of these things are relatively new, the manufacturers think they've met the letter of the requirement, and they haven't quite, or they tried and they didn't quite make it for some technical reason.

And the deficiencies essentially let us certify those manufacturers with partially compliant systems to get them through the year, rather than not certify them, and ask them to go tear up systems which are otherwise okay.

So, it's -- but the range of problems is fairly broad.

MS. EDGERTON: Well, I just want to try to get a sense of how this rolls in terms of the deficiencies.

For example, if they can get it -- if Chrysler can get it to work on the Neon, as you have listed here -- I guess, when you say it's certified, that means that the Neon has met all six of the expanded monitoring requirements of OBD II?

Does that -- is that what certification means?

MR. ALBU: The Neon has met all the requirements of the regulations. It has two deficiencies currently; one is for misfire and one is for a purge valve monitor.

MS. EDGERTON: Okay. Now, in your experience, is what happens that, in the 1994, you might have the Neon miss on two, so it gets certified. But then it's fixed in the 1995 model, or is it still there in the 1995 model?

Are the deficiencies still there in the 1995 model?

MR. LYONS: A lot of the problems, in the case of the Neon, a lot of the 1994 problems were corrected in 1995.

MS. EDGERTON: So, your experience is that it's not that the new model that comes in with a couple of deficiencies remains static with those deficiencies, because we are not asking -- because we have an exit, or because we

have an exception, or because we allow a couple of deficiencies -- it's that they do go ahead and fix those deficiencies.

Well, that was the concern -- a concern, because again, the reason of my line of questioning is that we have to put this in the context of the emissions reductions. And you made clear that with each -- each of these areas we are monitoring under OBD II, there are important emissions reductions at issue. And so, it's clear that it's -- achieving this, in staff's view, is technologically feasible. It's clear that it's technologically feasible because in the -- new models the companies are making are achieving it.

Are any of the models a hundred percent compliant?

MR. LYONS: Yes, there are some.

MS. EDGERTON: And on this list, for example, which, can you tell me?

I'd like to, if you --

MR. LYONS: There are obviously a lot of other models that aren't on this list. And I think, for example, there's three or four Nissan engine families that aren't -- have no deficiencies.

MS. EDGERTON: No deficiencies?

MR. LYONS: Right. But I think the Maxima is on the list, and that isn't one of them.

MS. EDGERTON: Uh-huh. Well, that's very good. So, we know that it's technologically feasible for the companies to meet all six of these. That's not a question.

And it's cost feasible for some of the people here, and we need the emissions for clean air. So, that's why I was just checking here to make sure that you're getting a lot of cooperation in terms of removing those deficiencies with respect --

MR. CROSS: The answer is yes. And I think that Joe's point earlier is well taken. The system is a very complicated, far-reaching system that's being asked to do a lot. And the manufacturers are trying to go down a whole lot of technical paths at the same time to develop a good OBD system.

And the idea of the deficiencies was essentially to not be unable to certify them if they run into some problems with this complexity in the first or early go-arounds on it.

But I don't think that the purpose of the deficiency was to say -- was to cover up technological infeasibility. It's more a matter that it's just a very complicated engineering task to accomplish.

MS. EDGERTON: Thank you.

MR. CALHOUN: I guess I'd like to add something--

CHAIRWOMAN RIORDAN: Mr. Calhoun.

MR. CALHOUN: -- something to that.

If there is a deficiency, I don't think it necessarily means that you can --it could be fixed. But this also may mean, in a very expensive process, may mean tearing up something.

And so, I don't think it's sort of as simple as it sounds -- that you see something that's there this year, and it's automatically going to be fixed the next year.

The manufacturer will fix it, but I think that to insist that it be fixed the following year is going to be -- is going to require -- it could, in many cases, require some kind of expensive redo of an engine or something else. And I think they would like to sort of work this out themselves, so as to minimize the cost. They'll get fixed. I don't think there's any question about that.

MR. CACKETTE: I just want to comment. That's one of the reasons why we let some carryover in deficiencies, because you might design a system that turns out to be -- expected to meet a hundred percent of the requirement and it meets 90, and it turns out that you have to change the system to get that last 10 percent.

That lets you have a -- by not eliminating -- allowing some carryover, that helps in that situation.

But, when going back to the Neon example, I just wanted to make sure that the Board understood that having a

deficiency does not mean that the system in general, at least the critical systems, are inoperative or absent from the vehicle.

What it usually means is that, in the case of misfire, they weren't able to detect all of the misfire under all of the operating conditions, but only under most of them.

So, these cars still, even with deficiencies, provide the mechanic a way of diagnosing most of the problems and warn the owner appropriately that there's a misfire before their catalyst dies.

CHAIRWOMAN RIORDAN: All right. Any other questions?

Then, I'd like to go now to the witness list. And let me begin with Barbara Wendling, representing the American Automobile Manufacturers Association.

If you'd come forward, please, to the podium?

MS. WENDLING: I'm Barbara Wendling. I'm with the American Automobile Manufacturers Association.

AAMA filed written comments earlier in the week, which detailed the issues, which I will just briefly discuss here.

AAMA appreciates the staff's efforts to understand and to address concerns our member companies have raised regarding OBD II regulations.

Many of the major issues will be resolved if the proposed revisions are approved. This will improve a manufacturer's ability to -- to meet the requirements.

Given the extremely technology-forcing nature of OBD II requirements, this is a significant achievement, which couldn't have been realized without substantial cooperation between the staff and manufacturers.

However, a few outstanding concerns merit further discussion. Regarding LEV catalyst monitoring requirements, AAMA appreciates the staff's willingness to switch from an efficiency monitor to one tied to the applicable standards as well as the allowance for a three-year phase-in.

However, manufacturers are still investigating the viability of monitoring small catalyst volumes, which involve substantial redesign of catalysts and exhaust systems.

It remains unclear at this time whether this method will work across all model lines and under all in-use conditions. Given the difficulty and uncertainty of meeting this requirement, AAMA recommends that the applicable phase-in standards -- percentages for the first two model years be reduced to 30 percent in the first year and 60 percent in the second year.

This allowance would relieve the burden of compliance somewhat in the short run, while still preserving

the full implementation date.

In addition, AAMA requests that a workshop be held in 1996 to assess manufacturers' progress in meeting this requirement.

Regarding evaporative system monitoring requirements, AAMA continues to question the feasibility of meeting a 20 thousandth's inch leak detection criterion using current monitor -- current hardware and strategies.

Our members companies that use vacuum-based monitors believe that major hardware and software changes may be needed to detect smaller leaks, while still avoiding an unacceptable risk of false MIL illumination.

Such modifications will require additional leadtime beyond the model year 1998. AAMA recommends that the workshop requested for calendar year 1996 also assess manufacturers' progress in meeting this requirement.

Regarding misfire monitoring requirements, AAMA appreciates the staff's willingness to work with manufacturers on this issue and the allowance for a phase-in. The propose changes increase flexibility as well as the likelihood that manufacturers will eventually be able to comply with the requirement.

However, AAMA member companies are still concerned about a few of the most difficult engines. In view of these concerns, AAMA again recommends that the workshop requested

for calendar year 1996, also assess manufacturers' progress in meeting these requirements in the phase-in percentages.

Regarding diesels, the staff has proposed that monitoring requirements be implemented in model year 1998. Manufacturers are especially concerned about misfire for diesels. Diesels vibrate much more than gasoline vehicles and manufacturers aren't sure that the current monitoring techniques will enable the OBD system to sort misfire from normal engine operation.

Because of this uncertainty, AAMA recommends that the workshop in 1996 also evaluate manufacturers' progress in this area.

Regarding comprehensive component monitoring, AAMA member companies continue to be concerned with the current wording of the requirement, which seems to entail enormous liability for manufacturers.

AAMA does not object to the apparent intent of the requirement, and agrees that some components not included in the systems required to be monitored by the OBD system should be monitored. But the wording of the current requirement makes manufacturers responsible for monitoring every component which could have any impact on emissions under all driving conditions.

AAMA recommends that the requirement be limited to electronic components that have a significant adverse impact

on emissions over the current FTP driving cycle.

Regarding proposed revisions to the antitampering provisions, AAMA recommends that this issue be deferred to a future rulemaking following publication of the EPA rule on final -- final rule on OBD service information.

Without knowing the scope of these pending requirements, it's impossible to assess the risk of tampering and to make appropriate recommendations. There is great incentive for manufacturers to prevent in-use tampering. And should the need arise, manufacturers will work cooperatively with the Air Resources Board and the Society of Automotive Engineers to develop appropriate standards.

However, if the Air Resources Board believes that the antitampering provisions must be strengthened now, then AAMA recommends that incryption or control of the software through a host computer by the -- maintained by the manufacturer be required rather than both simultaneously.

AAMA member companies are not currently planning on redundant antitampering measures.

Regarding statistical MIL illumination protocols, AAMA member companies have developed and refined monitoring strategies based on the use of exponentially weighted moving averages -- otherwise called EWMA. This is a statistical protocol that allows manufacturers to optimize monitoring

logic in order to minimize false MIL illumination while maximizing true and rapid MIL illumination.

The current regulations limit the degree to which manufacturers can optimize with EWMA by restricting the average run length to six trips. AAMA has recommended that the limit be raised to a maximum of ten instead. This allowance is expected to be especially critical for the LEV catalyst and evaporative system monitors, which are particularly difficult to implement.

Finally, regarding in-use recall provisions, AAMA continues to believe that the punitive use of recall for OBD is inappropriate, especially in the early years of implementation.

OBD II is an extremely challenging requirement from a technical standpoint, and has required manufacturers to implement complicated designs for which they have no in-use experience.

Under the circumstances, it will be surprising if there aren't problems that crop up in-use in spite of manufacturers' best efforts to avoid them.

Therefore, AAMA recommends that there be a moratorium on OBD II system recalls for model years 1994 through 1996. However, if CARB considers the moratorium too extreme, AAMA recommends that the recall criterion of two times the applicable standard for model years 1994 and 1995

be extended to 1996, in recognition of the fact that 1996 is the first year of full OBD II implementation.

AAMA also recommends that OBD recall liability be limited to cases where the failure of the OBD system involves failure to detect a faulty or deteriorated component which, in fact, caused the vehicle to exceed one or more emission standards.

Thank you. I'd be happy to answer any questions.

CHAIRWOMAN RIORDAN: Ms. Wendling, thank you very much. Let me ask staff, perhaps before the Board members respond, there's been some -- a number of suggestions, and would you have any comments at this point about some of the suggestions from the American Automobile Manufacturers Association?

MR. CROSS: Yeah, we can -- we'll go back and forth on this. There were so many suggested changes that I think I'll hit a few, and then we'll go from there.

On the change on the phase-in, the 30 and 60 percent, the staff thinks that's okay. There were a number of items for which the manufacturers asked for a workshop in '96 to evaluate progress, and the staff was planning on doing that anyway, and thinks it's a good idea to periodically evaluate progress.

And, in fact, Steve and Allen are, I would say, continuously evaluating progress. They're overworked

because of evaluating progress, in terms of meeting with manufacturers to make sure that we're really up to date on it.

So, that suggestion I think we're planning on.

On the -- let's see, there were a couple here at the end. Antitampering, we're opposed to that. And we're opposed to deferring that until EPA acts. We think our proposal's a reasonably good one, but also I would suggest that we have a lot of witnesses that are going to talk about those portions of the regulation, I think, later on today.

So, maybe we can defer that discussion till then.

EWMA, the staff has had extensive -- that's the statistical monitoring.

The staff has had extensive exchanges with industry on this, and we believe that it's -- statistical monitoring is an excellent way to identify defects. But we're very opposed to raising the threshold from six to ten. We think that six is enough.

When you get into evaluating the performance of these systems, you can get -- you can get into a situation where you can't determine whether or not the systems works very well or not if the time to turn the light on gets to be excessive. And we felt and have felt that six is sufficient.

The staff has done an awful lot of statistical

analysis on its own of this, and I think that if this suggestion turns out to be of interest to the Board, I think GM, in its comments, will probably talk about it again, and we can pursue it further at that time.

On the recall, that one was one that I wasn't as sure about. Do you want to -- you can rewind on a couple, too.

MR. ALBU: I guess, regarding comprehensive component monitoring, I -- you know, they're raising a concern here about wanting to circumscribe the requirements.

I think that it's worrying about -- a lot of worrying about something that's not that big of an issue, because we've already met with industry. And all of these models that are being certified right now, we've already gone down the list of components that we think affect emissions. And we've had discussions about which ones have a measurable impact.

And I think we've come to a pretty good consensus about what those components are. And so, I don't think that, based on the fact they've given us data, we've agreed to the monitoring of that component, I don't think there's a real issue here that's real significant.

I'm not sure exactly why it's so important.

In terms of the recall provisions, you know, it's not our intent in these first years to really come down hard

on manufacturers. We've shown that by the fact we keep revising things.

And, in fact, our language is written in the recall part of the regulation a bit loosely so that a legal person couldn't just order a recall without a lot of difficulty, actually, in these first few years.

In other words, the recall will be based on looking at a number of factors like good-faith effort, how far above the standard were you when a part failed and there was no light on, this kind of thing.

What they're asking for here in particular in the last part of the response is to extend the recall liability of two times the standard for 1994 models and '95 models through '96 models, since those will be mostly -- most models will be phased in in 1996.

This only applies to Tier 1 vehicles, the current .25 hydrocarbon vehicles. And those thresholds are already very large. And I have no evidence so far that this is a real problem, these thresholds are a problem on these kinds of vehicles.

And we've had two years of experience already. So, I'm not sure that there's a real need for Tier 1 vehicles in 1996 to have additional relief.

It's just something that I guess the Board could decide. But I don't feel real strongly about it. But I

just don't see the need for it either.

CHAIRWOMAN RIORDAN: Thank you. Have Board members questions? Mr. Calhoun.

MR. CALHOUN: Yes. May I? Let me just expand a little bit. What the AAMA is asking is that the recall threshold be extended to -- from 1994-95 to just one model year. And we're kind of operating in the area of "unknown." We're not quite certain what's going to happen.

So, I can understand the request that's being made and why it's being made, because this is -- as I said earlier -- is a very, very difficult requirement that has to be met. So, I'm not so sure that that's an unreasonable request, especially as you start looking at the LEV and the ULEV level. I'm really concerned about when we start dropping down to those levels.

MR. ALBU: Again, these are Tier 1 vehicles where the thresholds are very wide. By the way, for -- well, like I say, I don't have a big problem if the Board wishes to give that a further allowance. That's, you know, I defer to the Board's discretion.

MR. CALHOUN: Another question I'd like to ask --

MR. ALBU: You could have an increase effectively up to .5 grams per mile on a .25 car. That's a lot of leeway.

These systems adapt a great deal before you even

have a problem. And once a component gets to that point, it's so bad that it's going to be easy to find. So, I really don't think there's a big risk here.

And I think it's, again, it's worrying about things that really aren't as big an issue as you might think. It sounds bad, but it isn't that bad.

MR. CALHOUN: Well, I think we're going to hear from the member companies.

But let me ask one other question that -- I guess, Bob, you commented on the EWMA statistical methodology. The whole purpose in that, as I understand it, is to sort of minimize the probability of having false lights, and how comfortable are you that that won't be a problem if the run is restricted to just six?

MR. CROSS: Well, I think, first of all, we -- the original OBD regulations limited it to two trips, and there was no, essentially, consideration of the -- how can I say it -- the statistics of having the system evaluate itself over, and over, and over again throughout the life of the vehicle.

And our original two-trip requirement was tied to basically just looking at what you had to identify and whether or not there was a reasonable chance you would identify it without false indications virtually all the time.

And the regulations were adopted with that, and I think that it was a -- it was a view which the staff was strongly in favor of, because it was easy to enforce.

In other words, you could bring a car in and test it twice. And either the light was on saying there was a problem or it wasn't.

And GM has rightly, I think, brought up the issue of when things move around, as the cars age, statistics come into play. In other words, you're doing the tests over, and over, and over, and over again, many, many thousands or hundreds of thousands of times, depending on what the -- what the component is.

And they were concerned about the possibility of having a situation where a light would be falsely illuminated and left on. The consumer would go in and seek repair, and then -- and have nothing really wrong with the car.

And so, we gave us on this, after extensive interaction with both GM and the statistical efforts -- experts who developed the EWMA, to essentially, in our view, minimize the risk of false MILs, and yet at the same time minimize the risk of having a system which is -- how can I say it -- hard to -- hard to evaluate, from a regulator's perspective, to determine whether or not it's working right.

And I think, also, another sort of philosophical

discussion that has gone through an awful lot of the exchange about the use of statistics, is that statistics can also be used to lower the cost or quality, if you will, of the monitor itself. In other words, the sensor.

You can use a less high-quality sensor if you use statistics to evaluate the less-good signal coming from the sensor to determine whether or not you had a problem.

And I think the original OBD view was use the best sensor you can. I think that our current view is still use the best sensor you can within reasonable cost limits. And the monitoring criteria, which we've established or proposing, basically are tied to the view of using the -- you know, a very good sensor and a very good evaluation algorithm which will involve statistics, and EWMA in GM's case.

But we don't believe that broadening the number of trips at this point, after all the exchange -- and there have been multiple workshops on this issue -- will produce a significant benefit for anyone in terms of -- it may reduce false MILs a little bit, but we think it also makes it much, much harder to evaluate whether or not the system is properly working.

None of the other manufacturers have asked for this kind of allowance that I'm aware of. Maybe staff can correct me on that.

MR. ALBU: I think some may use some portion -- in some portions, their systems may use this in the future. But none are really coming -- asking for this requirement as much as GM is.

MR. CROSS: In terms of -- no, what I'm saying specifically is, has anyone else asked for the six trips to be increased to some other number and, if so, what was it and why?

MR. LYONS: I think Steve's right. It's primarily GM that's asking for the extension to ten trips.

I guess one the things, too, is that when we say six trips, that's six trips on average. And one of the things we're concerned about is the variability there. And six trips on average could mean for some vehicles that the light doesn't come on till ten or twelve trips.

And when you go to ten trips on average, the variability increases even more. And so, there may be 20 trips before a light is on.

CHAIRWOMAN RIORDAN: Ms. Wendling, did you wish to comment?

MS. WENDLING: Yes, just briefly. I'm not a statistical expert, but it is my understanding that EWMA protocols will always light the MIL sooner for a real failure and will have fewer false failures than any other technique out there.

And, as you know, AAMA represents all three American automobile manufacturers, not just General Motors. So, Ford and Chrysler are behind this request as well.

The only case in which EWMA would not light the lights sooner than other protocols that are being used is if there was a step function change to the standard. And then, it would take longer for the MIL to light.

But that's a very rare, you know, condition.

MR. CROSS: It happens, though. The wires --

MS. WENDLING: We have step function changes to the standard?

MR. CROSS: No.

CHAIRWOMAN RIORDAN: One at a time, please, for --

MR. CROSS: I think that --

CHAIRWOMAN RIORDAN: -- recorder.

MR. CROSS: -- the point is, is that EWMA is looking at a continuous -- essentially continuous trend. But wires fall off, for example, and diaphragms break, and hoses break, and things like that. And that is --

MS. WENDLING: Those usually cause a catastrophic increase, in which case, you know, the EWMA as well as any other protocol out there will turn on the light.

MR. CROSS: We're --

MS. WENDLING: EWMA is to maximize, you know, true illumination and to minimize false illumination, and to also

detect gradual deterioration.

MR. CROSS: There's no -- the staff has absolutely no opposition to EWMA or any other statistical algorithm. We agree that statistics are a good way to evaluate components and minimize false MILs.

I guess we believe that the six trip limit, on average, represents a good compromise, though, between good statistics, good sensor design, and early consumer informing. And I think it's something that we may -- that we've workshopped extensively with the manufacturers and feel fairly strongly about.

MS. WENDLING: Okay. I think you're right. GM will probably touch on that in more detail. You know, if you noticed, too, we were particularly concerned about the LEV catalyst monitor and the evap monitor.

MR. CROSS: Which is in GM's testimony.

CHAIRWOMAN RIORDAN: And also, in the interest of getting to some of that other testimony, let me bring it back to the Board to ask if there are any further questions of this witness. And, if not, we'll move on to the next -- yes, Ms. Edgerton?

MS. EDGERTON: I'd just like to ask Ms. Wendling, turning to page 4 of your written testimony at the bottom of the page, with respect to in-use recall testing protocol, and you say, "AAMA thanks the staff for clarifying that

manufacturers will not be held responsible for failing to detect tampering or abuse that cannot reasonably detected. AAMA also appreciates the options of extended warranty or service campaign in lieu of recall for false MILs. However, AAMA still considers the recall provisions to be overly broad and stringent."

I'm sorry. (Speaking of microphone being off.) I guess people could hear, because you're looking like you --

"The phrase, 'including, but not limited to,' is too broad for determining recall and, as currently worded, the proposed regulation could result in vehicles being recalled without having failed the applicable emission standards."

With reference to that, I turned to the actual proposed regulatory change that is in our documents that were sent -- sent out. And I reviewed the paragraph you're referencing.

It's difficult to have this kind of conversation, technical conversation, right here, but I do want to respond to it. In looking at it, here's what the actual language proposed says.

"A decision to recall the OBD system for recalibration or repair will depend on factors, including, but not limited to, level of emissions above applicable standards, presence of identifiable faulty or deteriorated

components which affect emissions with no MIL illumination, and systematic, erroneous activation of the MIL.

"For 1994 and 1995 model years, on-board diagnostic system recall shall not be considered for excessive emissions without MIL illumination, if required, and fault code storage until emissions exceed two times any of the applicable standards in those instances where the malfunction criteria is (sic) based on exceeding 1.5 times any of the applicable standards."

Now, to me -- that's just two sentences. To me, sentence two says there's no recall unless the standards are violated.

MS. WENDLING: For '94 and '95.

MS. EDGERTON: '94 and '95. And so -- but in your testimony, you say, "The phrase, 'included, but not limited to,' is too broad for determining recall," because the regulation could result in vehicles being recalled without having failed the applicable emission standards.

MS. WENDLING: But beyond '95, it could. If you go back to the first sentence there, it says, "including, but not limited to," and then it lists several items.

The second of those two things you mentioned is a case where you could have a failure that doesn't actually result in a failure of the emission standards. Because it's a component-based -- these are component-based monitors.

And sometimes you might have a combination of -- it would take a combination of failures to actually put the vehicle over the standard.

MS. EDGERTON: Well, we're going to have to go over this a little bit more. I don't quite get it.

MS. WENDLING: We'll get more detail from the member companies when they testify.

MS. EDGERTON: All right. Well, I -- it looked -- so, you're saying that -- where is the disconnect here?

MS. WENDLING: The disconnect is in the --

MS. EDGERTON: Is the model years?

MS. WENDLING: -- sentence, which says, you know, "including, but not limited to," and then it lists a series of conditions.

MS. EDGERTON: Uh-huh.

MS. WENDLING: And then, the second sentence addresses only model year 1994 and 1995.

We've requested an extension of that second sentence to apply to '96 in addition. That's the only comment I would make there.

MS. EDGERTON: So, that's the change you want.

MS. WENDLING: Yes. Well, I mean, we asked for a moratorium, but it doesn't appear that the staff is really willing to consider that.

So, in lieu of that, we would ask for an extension

of the two times the standard to model year 1996.

And the difference is, in 1996, you've got full implementation across the entire product line. And some of those engine families are more difficult to do than others. And, you know, manufacturers simply want a little bit more time to refine those, those engine families, those difficult--

MS. EDGERTON: So, essentially -- I'm just trying to understand what you're asking for.

You're asking for this -- you're saying that the proposed change that is in the staff proposal is -- that there wouldn't be a recall unless you went over this two times, any of the standards where the malfunction criteria is based on exceeding one-and-a-half times the applicable standards.

So, you wouldn't want a recall for 94-95 or '96; that would -- that's the thrust of what you're saying? It should be 1996 to -- except where it could be shown --

MS. WENDLING: I apologize. I think there are two things here. One is that the statement, "including, but limited to," is too broad, and that would like that clarified so that -- to make clear that a manufacturer couldn't be recalled if the vehicle didn't exceed the standards.

Second would be that, for 1996, specifically, an

extension of the two times the standard for recall. So, I guess it's really two things.

MS. EDGERTON: Okay. So, if I understand you right, one is you don't like "but not limited to." You want to have just a list of just exactly what it is that could be considered.

MS. WENDLING: Clear language that indicates that it would be -- that only a significant increase in -- you know, an increase of the standards would trigger recall. That a failure -- a recallable failure of the OBD system would have to involve failure of a component that actually caused the vehicle to exceed the standards.

Right now, we don't have that with the way it's written.

MS. EDGERTON: Okay. So, if I understand, you actually -- you're -- because you say paragraph -- you say sentence two doesn't -- even if we put that to including '96-- doesn't adequately modify --

MS. WENDLING: Right, because --

MS. EDGERTON: -- sentence one to make sure that you don't --

MS. WENDLING: Beyond '95 and '96 --

MS. EDGERTON: -- wind up with a recall --

MS. WENDLING: -- yeah. I mean that --

MS. EDGERTON: -- unless you --

MS. WENDLING: -- assumes one applies forever. Sentence two applies to '94 and '95.

(Thereupon, the reporter requested the speakers to speak one at a time.)

MS. WENDLING: I'm sorry.

MS. EDGERTON: Just a minute. I'm trying to understand.

Mr. Kenny, do you have a comment? I mean, it seems to me -- just before we go into this, and I understand there's going to be more testimony on this. But it seems to me that sentence one modifies sentence two, I mean if it were extended to '96. It would make it clear that the recall would only occur if the aggregate standards were violated.

Is that your opinion, sir?

MR. KENNY: Let me try to answer your question, but I might answer, actually, probably a little bit of a different question at the same time.

It seems to me that what the witness is requesting is essentially a redefinition in sentence one, in such a way that a violation of the OBD requirements is not, in effect, a violation because of the fact that there has to be something else besides an OBD violation. In addition to an OBD problem, essentially, which she wants, is that the OBD problem would have to also be combined with a violation of

the emission standard.

And the way that sentence one is currently written is it talks about a situation in which the OBD regulations could be violated, that could result in a recall. And in part, that would result if you have an identifiable faulty or deteriorated component which affects emissions.

Now, the effect on emissions might be such that it does not result in a violation of the standard, because it is less than that.

But you still have an effect on the emissions. And that still, it seems, presents a problem, because you've now get a faulty component which is affecting the emissions of the particular vehicle.

I'm not sure I'm answering your question. But --

MS. EDGERTON: Well, we've got to get to the bottom of it by the end of the morning. So --

MR. ALBU: Maybe I can help you. It is a difficult issue. But this is the basic things we're trying to get at.

In the OBD requirements, we're asking that components be monitored for a measurable increase in emissions even if the failure of a single component doesn't cause exceedance of emission standard.

And the reason we do that is because, when a vehicle gets fairly old, most components have deteriorated.

What we usually see combinations of deterioration.

And while one component alone may not cause a problem, when you get three or more that are deteriorated in concert, they can cause the vehicle to exceed the standards.

So, what we're trying to get with this requirement is that if we find a vehicle in-use that should be monitoring a component that isn't doing it properly and there is a measurable emission increase -- but it doesn't exceed the standard -- we want the option of deciding whether or not to recall that vehicle because they haven't been monitoring a component.

And AAMA doesn't want us to recall a vehicle unless you exceed the standard, but we need to look at the combination of components. Now, the provisions are written fairly loosely for their protection, really, and the staff could look at the good-faith efforts involved and look at the reasonableness of the monitoring versus basically all the data that is present, and that it should have worked but didn't. We take all that into account.

And certainly, we want to be careful to not overburden industry in the first few years. And that's really what this is about. And I think that we've got some legal people overly excited for nothing.

MR. CROSS: I might add to that --

CHAIRWOMAN RIORDAN: Mr. Cross, let's pause while we change the tape.

Mr. Cross?

MR. CROSS: Okay. It'll be short.

During the original development of OBD, there was a debate about whether or not to certification test combinations of failed components to get at the synergism effect that Steve is talking about. Because, basically, what we're worried about is will the standards be violated if three or four components are all at their limits where they just almost turn on the light at the same time.

And the decision was made -- I think with agreement by the manufacturers -- that that becomes an unwieldy process at best. In other words, you're trying to figure out all the different combinations of components, which you might evaluate and combinations of failures and tying that to failing the standard. And that just obviously got to be something that was unmanageable.

So, we limited it to evaluating to one component at a time. But that means that, in some cases, the component will turn on the light before it alone fails -- causes the vehicle to fail the standard with a properly functioning OBD system.

MS. EDGERTON: So, a light can come on when you're not violating emission standards. A light can come on if

you're evaluating one of these six components of OBD II.

MR. CROSS: What it means is that the component no longer performs as it should. In other words, if you -- when a car's designed, the component is supposed to -- supposed to measure something between X and Y, or hold some function of fuel delivery, or ignition timing, or whatever, or EGR flow or whatever, within certain limits.

And when the car's -- when it's within the limits, the manufacturer's comfortable that the vehicle's working as designed. When it's outside those limits, the manufacturer isn't so comfortable about.

And, basically, they turn on the OBD light when it's outside of those designed limits.

Now, in some cases, that wouldn't cause the vehicle to immediately exceed the standard. But if you combined a couple of those parts that were just against the limit, it would likely the vehicle to exceed the standard.

And as the vehicle got older and the catalyst became more deteriorated, your odds of exceeding the standard with these kinds of problems occurring increases. So, it's sort of you turn the light on when you're outside the design limits.

MR. ALBU: There's another aspect to this as well. What happens on older vehicles when they come into a repair shop -- and it's the problem with the current I&M program --

you have a vehicle -- generally it's deteriorated, because there's been very little maintenance performed on it, because nobody knew there was anything wrong with the vehicle.

So, what you end up with in the smog check station is the vehicle has a lot of deteriorated parts, none of which stands out necessarily, but it's over the emissions standard, and you have to try to fix it.

One of the reasons we require comprehensive component monitoring like this is so that trouble codes are present for every part that is defective. And this provides the mechanic with half a chance of fixing these vehicles, which are very complex.

If you only have half the story, you can't fix these cars.

CHAIRWOMAN RIORDAN: Okay. In deference to our time and the number of speakers that we have before us -- and I think what I'd like to do is ask if there are any other questions at this time of this witness, and then thank this witness very much for her testimony, and indicate the following: that Ford, General Motors, and Chrysler Corporation are going to testify in that order. You have heard the staff response to some of the requests made by the manufacturers association, and you've heard -- if they are in the affirmative, I'd rather not have that repeated in the

witness testimony, but to address those items that are still at issue from the perspective of those that you represent.

What I'm trying to do is cut down the amount of testimony, as best I can, to accomplish the completion of this hearing in a fairly reasonable time.

So, let me invite Mr. -- and I'm going to just, I'm sure, murder this name -- but Mr. John Trajnowski from Ford Motor Company. If you would come forward, please.

MR. TRAJNOWSKI: Thank you. My statement is really short, so I apologize if there's any overlap.

My name is John Trajnowski. I am a principal engineer in Ford Motor Company's Automotive Emissions and Fuel Economy Office.

Ford appreciates this opportunity to comment on these proposed changes to the OBD II regulation. Our written comments have previously been submitted to the Board members and the CARB staff, and we would like them to be included for the record.

Ford also supports the comments provided by AAMA. Overall, Ford is very pleased with the changes proposed by CARB staff. We commend the staff for working with us and other manufacturers in addressing many of our concerns with the OBD II requirements.

We believe that this cooperative approach has been beneficial to both Ford and CARB staff and has advanced the

state of the art.

We also believe that these proposed revisions come a long way to improve our ability to meet these requirements while maintaining the intended purposes of the OBD II regulation.

Certainly, the proposed requirements for LEV catalyst monitoring, expanded misfire monitoring, and 20 thousandths inch diameter evaporative leak detection are technology forcing and present some risk for Ford and other manufacturers in fully complying with the requirement.

However, Ford will make every effort in trying to meet these requirements in the time frame proposed by CARB staff. In fact, we've already initiated plans to meet the proposed phase-in percentages, and have begun to address the many remaining technical issues associated with these requirements which still need to be resolved.

These issues are discussed in detail in Ford's written comments.

In the hearing notice, CARB staff has proposed phase-in percentages of 40, 70, and 100 percent of sales volume beginning in '98 for meeting the LEV catalyst monitoring requirements.

Ford supports the basic concept for the phase-in for this requirement. However, in order for Ford to meet these percentages, we would have to modify existing catalyst

configurations and containers on some vehicles in order to isolate a small volume catalyst to facilitate monitoring.

We estimate the incremental cost of these modifications to existing vehicle designs would be approximately $12 million in facilities, tooling, and engineering costs.

These incremental costs could be avoided if CARB were to adopt lower phase-in percentages of 30, 60 and 100 percent, with the phase-in still beginning in 1998.

We have previously reviewed this concern with CARB staff, and we believe that they could support these lower phase-in percentages in light of the significant cost implications.

As a result, Ford requests that the Board adopt these lower phase-in percentages. This action will allow Ford to plan necessary vehicle and exhaust system modifications during the normal design process and avoid the incremental costs associated with modifying existing designs.

Also, because these requirements are technology forcing and represent a risk for manufacturers in complying, Ford believes that it is essential that CARB hold a workshop in calendar year '96, to assess manufacturers' progress and, if necessary, revise these requirements based on this review.

The status check is especially critical for the 20 thousandths inch evaporative leak detection requirement. If we find that our current monitoring strategy will not be capable of detecting these small leaks, major hardware and software revisions will be required, and that's going to require additional leadtime well beyond 1998, in order for us to develop, and prove out, and implement into production the new hardware.

That's all I have. Thank you for this opportunity to testify. I'll be glad to answer any questions that you may have.

CHAIRWOMAN RIORDAN: Are there any questions?

Mr. Lagarias.

MR. LAGARIAS: Madam Chair, I think we should acknowledge the contribution that Ford Motor Company has made to the University of California, Riverside, Engineering School for automotive emission control. I think it was $10 million?

And please pass on to your organization our appreciation of this gesture.

MR. TRAJNOWSKI: I will do that.

MR. LAGARIAS: No questions.

CHAIRWOMAN RIORDAN: And are there any other questions? Just send money.

(Laughter.)

MR. TRAJNOWSKI: Okay.

CHAIRWOMAN RIORDAN: Are there any other questions for this witness?

MR. CALHOUN: Let me just clarify one thing regarding the 20 thousandths orifice for the leak detection.

My understanding from you is that you would anticipate this would require hardware and software changes; is that correct?

MR. TRAJNOWSKI: We are -- we have some major concerns with the ability of our current system, which we developed to detect a 40 thousandths inch leak, to be able to detect a 20 thousandths inch leak.

We're going to try and resolve the many issues in trying to detect a 20 thousandths inch leak using our hardware that we've developed; that we're going to have in production in '96. but we have some concerns about its ability. There's a significant risk it won't be able to do it.

Then, we're going to have to -- if that's the case, we're going to have to change our monitoring strategy completely. And right now, we use a vacuum type system. We put a vacuum on the fuel tank and evaporative system. If that vacuum-type system will not be capable of detecting a 20 thousandths inch leak, we'll mostly likely have to change to a different type of monitoring system. Perhaps one

possibility would be to install a pressure pump and blow air into the fuel tank to build up pressure. And that's a major change.

MR. ALBU: Could I make a comment to that?

CHAIRWOMAN RIORDAN: Yes.

MR. ALBU: I would just like to add that we support what is being said by John. If we find, indeed, that it's going to require hardware changes that are significant, then we will change the phase-in. That we've already agreed to.

What we've done, though, in our own testing, is determined that we do not expect there to be hardware changes. I spent, about a month and a half ago, some time with Ford experts on this matter. I went to Dearborn to talk with them about it.

And I think the consensus of that meeting was that we had a good chance of meeting this requirement with the current system. There was still some issues to resolve, and we want to work with them to do that.

And I think all we're saying is let's try and see if we can do it. If we don't make it, we will come back to the Board and ask for a change in the phase-in.

MR. CALHOUN: I guess the main concern that I have is that the way the regulations are currently proposed, the manufacturers will not have an opportunity to learn from

their experiences with the 40 thousandths, because you immediately start the phase-in at the beginning of the year, I believe, at the beginning of the phase-in.

MR. ALBU: Yeah, they will start doing the 40 thousandths monitors in 1996 (sic) and --

I'm sorry. What did I -- Okay. 40 thousandths monitor in 1996. And so, they will have two years' experience before they have to commit to the 20 thousandths by '98.

And, as I say, by '96, we will already know whether or not we want to make a change in the phase-in so there will not be any undue risk come 1998, between 20 thousandths.

Clearly, we don't want false lights on either. I mean, we are protecting ourselves as best we know how against that while trying to find the right balance of moving forward at a reasonable rate.

We understand your concerns, and we -- and I think industry does, too, and that's why the AAMA statement didn't go further.

What they said in the AAMA statement, and what Ford is echoing again, is we will give it a try. If it doesn't work, we'll come back and ask for a change in the phase-in from the 1998 to some later date. And we don't have any problem with that.

CHAIRWOMAN RIORDAN: Okay.

MR. CALHOUN: No further questions.

CHAIRWOMAN RIORDAN: And does that answer your question, Mr. Calhoun? Okay.

And thank you very much. We appreciate all the testimony. And following then, Mr. Ferris from General Motors?

MR. FERRIS: Good morning. My name is David Ferris. I'm a Senior Project Engineer, here representing General Motors Environmental and Energy Staff.

General Motors appreciates this opportunity to comment on the proposed revisions to the on-board diagnostic requirements contained in CARB mail-out No. 94-38.

GM also supports the comments of the American Automobile Manufacturers Association presented at the hearing.

GM appreciates the efforts that the CARB has made this past year to understand our concerns, and we also appreciate the revisions that are being proposed to address them.

I'd like to emphasize that I think that the staff did an excellent in this mail-out, and that we realize that the CARB has an extremely difficult job, and that we are willing to work very hard toward improving California's air quality.

However, we believe that some of the staff's technology forcing proposals are still overly aggressive. An overly aggressive strategy can be detrimental to air quality, because it increases the risk of false illumination of the malfunction indicator light, which may cause drivers to ignore it.

We understand that the staff's proposal has allowed for some OBD system deficiencies, and that the Board may review some of the more technology forcing requirements and make further revisions in 1996.

However, when the Board makes such late changes to the requirements, it forces us to make late changes to hardware and software without allowing adequate time for development and validation.

Late changes reduce produce reliability, customer satisfaction, and air quality benefits.

And, as Supervisor Vagim and Mr. Calhoun suggested, concerns about how consumers are going to react to the MIL, and especially false illumination of the MIL are foremost in our mind.

We believe that the Board should require more evidence of real world technical feasibility before adopting new requirements, and that the Board should allow more leadtime and longer phase-ins for such technology forcing requirements.

Since our written requirements (sic) are rather lengthy and technical, I will try to summarize them and focus on the most important areas -- in particular, the issue of increasing stringency, we've heard already about the 20 thousandths evap orifice. It's our perception that the LEV catalyst monitoring requirements to 1.5 times the standards also represents a significant reduction in stringency from the previous 60 to 80 percent efficiency kind of threshold.

So, that would be my first subject -- is the catalyst monitoring requirements for low-emission vehicles. We've already heard about the phase-in percentages. I won't go over that.

GM is concerned that it may not be feasible to meet 1.5 times the standard diagnostic threshold, particularly for LEVs and ULEVs, using the current dual oxygen sensor method without a high risk of illuminating the MIL when emissions are still below the standards.

Our data suggests that there is little chance of meeting the 1.5 times the standards threshold with our current and projected LEV configurations.

To attempt to meet this requirement is likely that major changes would have to be made too many configurations, including major hardware changes, which would result in great expense and could compromise emission performance and

drivability.

We would have to essentially redesign the entire catalyst system to be to be optimized for monitoring. This includes changing catalyst volumes and washcoats, and also changing both catalyst and oxygen sensor locations as you've heard earlier.

For many applications, existing space constraints caused by, for example, the floor pan, would prevent the use of optimum catalyst volumes or locations and, therefore, it may be necessary to modify floor pans to meet these requirements.

Changing hardware such as floor pans for every configuration would cost general motors hundreds of millions of dollars. It would be prohibitively expensive to make such modifications until new models are introduced. And model lives typically range form five years to ten years or more for some applications, such as trucks and vans.

After making all these modifications, it still may not be feasible to meet both the LEV emission standards and the one-and-a-half times the standards diagnostic threshold with all configurations.

It has not been demonstrated, for example, that it's feasible to simultaneously meet the LEV emission standards, the new Bag 4 requirements, which are still not yet finalized, and the proposed one-and-a-half times the

standard diagnostic threshold, and also avoid illuminating the MIL when emissions are below the standards.

Because of these concerns, we will continue our efforts to find a catalyst monitoring technology which is superior to the dual oxygen sensor method. Even if it ultimately turns out to be feasible to meet the one-and-a-half times the standard thresholds in all configurations, it is unlikely to be cost-effective unless phased in over many years, since changing hardware -- such as floor pans -- is so expensive.

In addition, balancing diagnostic and emissions performance will be a costly and time-consuming iterative process, which will have to be performed on each configuration.

We're also likely to incur the cost of generating new emission deterioration factors for certification after making substantial catalyst changes for diagnostics. Such major changes would be prohibitively expensive unless they are phased in with the introduction of new models over a period of many years.

Because of these concerns, the Board should seriously reconsider the proposal to implement a one-and-a-half times the standard threshold for LEVs and ULEVs. GM recommends that -- and I see I have a typo here -- that 2.5 times the plus 4,000 mile baseline threshold be extended

until it has been demonstrated that it is feasible to meet a one-and-a-half times the standard threshold on LEVs and ULEVs.

This still presents a major challenge, and the feasibility of this requirement should be discussed in a future workshop.

If a aa one-and-a-half times the standard threshold is ultimately demonstrated to be feasible, it should then be phased in gradually over a period of many years to avoid prohibitive expense.

Next, I'd like to move on to the 20 thousandths evaporative emission monitoring requirement. The staff adopted this requirement based on emissions reduction conclusions based in part upon data generated by General Motors using a 1990 Buick Regal.

GM believes that the staff is overestimating the significance of the contribution of leaks between 20 thousandths and 40 thousandths of an inch to in-use emissions for many reasons.

First, after analyzing the in-use data, which has been collected by CARB, EPA, and GM, we have concluded that the percent of in-use vehicles with leaks between 20 thousandths and 40 thousandths of an inch is much lower than the CARB staff's estimate of -- they used 8 percent here today; 7.8 percent was the number in the mail-out.

Furthermore, GM and the rest of industry are implementing revolutionary changes to the on-board evaporative emissions control systems in response to the new enhanced evap test procedures. The problems identified by in-use studies have been addressed by improving the design, which further reduces the possibility of small leaks in the future.

More importantly, radically improved designs needed to meet both the enhanced evaporative and the federal on-board refueling vapor recovery requirements have significantly reduced the resistance of vapor flowing to the canister, which has dramatically reduced the potential emissions resulting from small leaks.

The previous data we submitted for a 1990 vehicle are no longer applicable. As illustrated in this figure, the emissions from a 20 thousandths leak on a 1995 Cavalier with 7.0 RVP fuel are expected to range from negligible from many leak locations to three grams, depending on leak location.

Average emissions from 20 thousandths inch leaks would be much less than three grams HC. This dramatic reduction from the 35 grams that was observed on a 1990 vehicle (sic).

Recent data generated by another manufacturer supports this trend, showing emissions from 20 thousandths

inch leak that are less than 0.2 grams HC.

In addition, the auto industry has developed the evaporative emissions service port and new off-board leak location tools and procedures, which will be implemented beginning with the 1996 model year. The service port allows nonintrusive access to the evaporative system for testing and repair purposes in both the assembly plant and in-use service applications. This system will be used in the assembly process to reduce the likelihood that vehicles with leaks will be sold, and will also significantly reduce the probability of repair-induced leaks in the field.

Finally, the staff's analysis presented in Mail-Out No. 94-38 overestimates the contribution of evaporative emissions from a vehicle with a 20 thousandths inch leak.

Whereas, the staff's analysis suggest that vehicles with evaporative leaks between 20 thousandths and 40 thousandths inches could cause 2003 model year fleet average HC emissions to increase by more than 50 percent, GM's analysis suggests that the increase would be less than one percent, even assuming that 7.8 percent of the vehicles have such leaks.

Something else I want to emphasize: At this point, no enhanced evaporative systems with OBD II have been introduced in the field. We have no experience. There's very little in-use information about the ability of the

current diagnostic system to reliably detect 40 thousandths inch leaks or about the ability of the service industry to locate and repair such leaks.

Our data demonstrates that our vacuum-based diagnostic, which is calibrated to detect 40 thousandths inch leaks, will actually detect smaller leaks in many cases.

For example, in order to detect a 40 thousandths inch leak located in the canister area, a vacuum decay time constant must be used, which will result in detecting leaks even smaller than 40 thousandths that are located in the fuel tank area.

In addition, several smaller leaks could combine to cause a 40 thousandths inch leak to be indicated. If a 20 thousandths inch threshold were used, the result would be detection of leaks smaller than the 20 thousandths inch and false MILs.

Therefore, before we implement a 20 thousandths inch threshold, we must prove that the service industry is able to find and fix leaks even smaller than 20 thousandths of an inch. And the staff has not demonstrated this.

In addition, we've begun evaluation of our evaporative diagnostics capability to detect 20 thousandths inch leaks. And our initial results indicate that it will not be possible to restrict monitoring conditions enough to

reliably detect such small leaks.

The CARB staff's analysis and Mail-Out 94-38 did not account for vehicle-to-vehicle variability or fuel slosh with high RVP fuel, which may cause false MILs.

Such high RVP fuel is commonly available in States around California and in the Northeast States that will receive California vehicles.

Therefore, it's likely that changes to both hardware and monitoring algorithms will be necessary to detect 20 thousandths inch leaks and avoid false MILs.

Considering that (a) the number of leaks between 20 thousandths and 40 thousandths of an inch on older vehicles may be very small; (b) we have dramatically improved designs to reduce both the possibility of and the emissions that would result from leaks on future vehicles; (c) we are introducing an evaporative system service port and off-board leak check procedure which will reduce the possibility of leaks following new vehicle assembly or in-use repair; and (d) our existing diagnostic will detect many leaks less than 40 thousandths of an inch. We do not believe that it is reasonable or cost-effective for us to redesign our evaporative diagnostic system to meet a 20 thousandths inch threshold requirement.

Furthermore, before requiring a 20 thousandths inch threshold, the staff must demonstrate that it is

feasible to find and fix leaks even smaller than 20 thousandths of an inch.

Therefore, GM recommends the following:

One, an industry/government study to identify and quantify evaporative emissions leaks in the real world and to evaluate their emissions impact;

Two, to allow time for the current evaporative system diagnostics to mature in the field. As I mentioned, we're concerned that the service community may not be able to verify, locate, and repair these leaks.

This will require proper training, tools, and some real world experience. Changing the diagnostic strategy after only one or two years in the field may create much confusion if new detection tools and methods need to be implemented.

And, three, have -- the CARB should have a workshop during calendar year 1998 to review the field results with the 40 thousandths inch leak detection systems, proposed OBD strategies to detect 20 thousandths inch leaks, potential real world emissions impact of a 20 thousandths inch threshold, and the ability of the service industry to find and repair leaks smaller than 20 thousandths inch leaks.

The Board should delay requiring a 20 thousandths inch threshold until it has demonstrated to be cost-

effective and until it has been demonstrated that it can be feasible to find and repair leaks smaller than 20 thousandths of an inch.

If this can be demonstrated, the 20 thousandths inch threshold should be phased in starting no sooner than the 2001 model year to allow sufficient leadtime for new diagnostic systems and hardware.

If the CARB elects to delay the phase-in, GM would prefer that the phase-in be modified to coincide with the phase-in of the federal on-board refueling vapor recovery requirements.

(Thereupon, there was a pause in the proceedings to allow the reporter to replenish her Stenograph paper.)

CHAIRWOMAN RIORDAN: Go right ahead. You may begin.

MR. FERRIS: All right. Thank you.

Okay. Many of the rest of my comments are very similar to what you've already heard from AAMA and so on. I'm trying to try and abbreviate them as much as possible.

CHAIRWOMAN RIORDAN: And I would appreciate that. Thank you.

MR. FERRIS: Yes. First, regarding the statistical MIL illumination protocol, there seems to have been some confusion about extending the average run length

from six to ten, and that that may make it more difficult for the staff to validate OBD systems in certification and in-use testing.

In fact, the industry has committed to implement what we refer to as a fast initial response feature, which should make it very easy for the staff to verify that the emission thresholds have been set properly for diagnostics that are using the exponentially weighted moving averages.

So, I don't think that certification and in-use verification testing is the issue there.

Regarding misfire monitoring for diesels, the CARB staff has proposed adding section (b)(3.5), which requires misfire monitoring for diesels under limited operating conditions beginning with the 1998 model year.

In response to the staff's request, GM has investigated various techniques for misfire detection on details. To date, none of these techniques has proven to be practical and reliable.

While similar crankshaft speed fluctuation technology, as used for gasoline-fueled engines, should theoretically work, we anticipate there may be unique problems inherent to diesels that may make it difficult to implement.

Therefore, GM recommends that the feasibility of misfire monitoring for diesels be addressed at a future

workshop, and that implementation be delayed until the 1999 model year to give us one more year to work on this challenging requirement.

Regarding the comprehensive component monitoring, I think the discussion clarified the issue that there are those monitors where we have thresholds that are one-and-a-half times the standards. And then, under the comprehensive component requirements, we are looking for the staff's interpretation as "any measurable increase in emissions," which may be a very small increase. So, for example, if you have a vehicle whose baseline emissions are half the standard, if emissions increase by 10 or 15 percent, we would -- supposed to illuminate the MIL for a malfunction -- for example, a transmission solenoid or a temperature sensor, even though emissions would still be well below the standard.

And so, the concern here would be, if that monitor did not work properly, we could conceivably be recalled, even though the vehicle's emissions are well below the standards, and we just don't think that that's the appropriate thing to do.

Regarding misfire monitoring for gasoline vehicles and tampering protection, our comments are essentially the same as AAMA, so that basically concludes my presentation.

And I'd be happy to try and answer any questions

you may have.

CHAIRWOMAN RIORDAN: Thank you very much. And, Board members, are there questions for this witness?

Mr. Calhoun.

MR. CALHOUN: Yes. Mr. Ferris, what do you think of the idea of extending the -- starting with some number higher than six and phase in that number or reducing it to, shall we say, what the staff has suggested?

Suppose we start out with 10, which is what the EWMA suggested -- not the EWMA, but you and the association suggested, and then at some later date reduce it to six?

MR. FERRIS: I guess I don't feel that, in this case, it's a matter of stringency really. We need the extra flexibility to go out to 10. We agree with the staff that anything beyond 10 would not be reasonable from a statistical perspective.

One of the reasons why we think we need something more than six is that we can optimize the statistical process to detect gradual deterioration.

If limited to six, we may have to deoptimize to detect step-function changes, which are easy to detect anyway.

The major reason for using the statistical process is to detect gradual deterioration. We'd like to have the flexibility to optimize the exponentially weighted moving

average to detect gradual deterioration, and we need flexibility beyond an average run length of six to do that.

And I guess I'd like to reemphasize that we don't think there's any air quality sacrifice; that only in the unlikely event that you have a step-function change to exactly the malfunction threshold would potentially the two in a row be quicker. In 99.9 percent of real world kinds of failure modes, which are either gradual or step-function change to something other than the threshold, the exponentially weighted moving average will always detect a malfunction more quickly.

MR. CALHOUN: I guess I'd like to get the staff's response to Mr. Ferris' comment.

MR. LYONS: I think on the first point, this goes back to what Bob said earlier about the quality of the monitoring strategy.

I think Dave and also Barbara said that the EWMA is actually faster in detecting problems. And the number crunching I've done, it's pretty impressive.

Then, you look at something that's very fast and very powerful, yet they're asking for as much as five times on average more trips to detect a problem, I think it goes back to indicate that, on the type of monitoring strategies they want to implement this on, that they have a lot more noise or variability in the system than virtually any other

manufacturer.

And at ten trips on average, the variability associated with that can push you out to 20 trips or so. And I think we're just not sure that that's not going to be unmanageable in the field. And six to us seemed like a good compromise. Try and take a look at it, and then, if down the road it doesn't seem to make any difference, then perhaps we can consider it again.

MR. CALHOUN: The next question I'd like to ask pertains to the suggestion that the two times the standard be extended to the LEV and ULEV. What is your reaction to that?

MR. LYONS: For catalyst monitoring?

MR. CALHOUN: For the catalyst monitoring. That's on page 4 of the GM testimony.

MR. LYONS: And I think there's a typo there. I think it's 2.5 times the standard.

MR. CROSS: I'm going to start off on this. But then, I think that the others will pipe in.

That was linked, I think, to your whole discussion about catalyst monitoring, where you were expressing concerns about whether the manufacturer is choosing to optimize its system for emissions or optimize its systems for monitoring.

And I think that sort of the tone of Dave's

comments was that the designs that GM has been working on to date have focused, I would say, more on emissions and costs linked with emissions than on monitoring.

And I think that -- in other words, just sort of, we'll figure out how to meet the standards and then we'll figure out how to monitor it later kind of view.

And maybe I'm -- I'm probably overstating it to make a point. But that's intentional to make that point.

And what that causes is that -- is that you have systems which are designed to meet the standards, which are then hard to monitor. And, for example, the -- as he said, the catalyst volumes may not -- may end up being an emissions design, which is okay, but not very easy to monitor.

And the staff's view is that, with the OBD regulations in place, it's important that the systems be designed with both constraints in mind at the same time. In other words, when you're sizing a catalyst, you should be recognizing that it needs to be monitored, also.

And that, in the exchanges that we've had with GM, has led us to some interesting things. One being that, you know, they're talking about their floor pan tear-ups. The reason they have floor plan tear-ups is because they designed their floor-pans for the catalyst systems which are emissions designed, but maybe are not quite optimally

designed for monitoring.

And then, that plays over into the statistics of EWMA, because if you have a system which is hard to monitor, then you need better statistics to do it.

And the staff's view on all of this stuff has been that you -- that the monitoring and emissions goals should be met sort of simultaneously, and that the best possible monitor should be used that statistics, when properly applied to that, will work in six trips, and that the monitoring thresholds, which are tied to the statistics and the ease of the monitoring methods, are then reasonable.

And so, I guess what I'm saying -- that was a very long answer -- but the nutshell of all of this is that, if the system is properly optimized to be monitored in addition to being emissions designed, and the statistics are properly applied, then the thresholds that we're suggesting, we think, are reasonable, both with respect to EWMA and with respect to the -- in other words, the number of trips and with respect to the number of times the standard we're suggesting.

MR. CALHOUN: I understand your point.

I think the point you're making is that the system has to be optimized such that it can -- you can monitor the various components as well as meet the emission standards. And you also stated that, in the case of GM, they're

focusing on meeting the emission standard.

This kind of gets back to the point that Ms. Edgerton brought up earlier. And that is, you're required to monitor the component. And at some point, when the component starts to deteriorate, turn on the light. Now, whether or not that vehicle exceeds the emission standards is all together a different question.

And I think that's going to be a problem that the Board's going to have to deal with.

MR. CROSS: But I think historically the Board has always dealt with this in its warranty regulations and everyplace else by basically saying, if the component is, quote, "broken," i.e. out of spec, and it's an emissions-related component -- regardless of whether it causes an exceedance of the standard or not -- something needs to be done with it.

So, you have a long history of going the same direction which the staff has on this one.

CHAIRWOMAN RIORDAN: Mr. Ferris, I'll give you an opportunity to respond, but we're not going to get into a debate.

MR. FERRIS: And I just wanted to suggest that in the case of catalyst deterioration, it's not a malfunction typically. You're talking gradual deterioration here. And I would argue that if the vehicle's emissions are still

below the standard, it's not a malfunction and the light should not come on.

I hope it's clear to the Board that the combination of the low-emission vehicle standard's extremely stringent and difficult to meet and extremely stringent diagnostic standards present a major technological challenge to us, and extremely difficult. And pushing it in as quickly as it can is likely to result in false MILs.

MR. CROSS: Can I -- this is not debated. It's only to correct the record

(Laughter.)

MR. CROSS: For catalyst monitoring, it's one-and-a-half times the standard for LEVs, and with an interim of two. So, for that specific component, we're not talking about turning on the light with the system actually below the emission standards.

CHAIRWOMAN RIORDAN: Okay.

Supervisor Vagim?

SUPERVISOR VAGIM: Thank you, Madam Chair. I just have a quick question on the .02 detection.

Is it going to be more difficult in an environment of a large engine, V8, what have you, a large bore engine, under acceleration? Will that have a different effect on that test on a continuous basis than a small engine that doesn't draw as much gas?

Because, if you're drawing fuel out of a tank, aren't you creating a vacuum? And if you're using a vacuum method, aren't you really setting up a --

MR. CROSS: I think it's -- the engine size shouldn't make any difference, because the vacuum characteristics of the engines are not that much different.

SUPERVISOR VAGIM: But the fuel drawn of a tank would be.

MR. FERRIS: It's not a continuous monitoring.

MR. CROSS: Yeah, the monitor only -- as David is saying, the monitor is only run under very specific conditions. And I think that the rate that the fuel is going out of a tank is not a major factor in terms of affecting measurement.

SUPERVISOR VAGIM: So, it won't have -- that small of a thing will not have a detrimental effect on the test itself then?

MR. CROSS: No. I don't think that specific factor will.

SUPERVISOR VAGIM: And you say it's not an ongoing test. At what point in the cycle is it being done?

MR. ALBU: We tested some very large -- a Ford pickup truck, and we also tested a very small Volkswagen Jetta to make sure this thing would work.

We think that the most likely condition would be a

highway cruise condition, whereby you run the monitor for about 50 seconds.

SUPERVISOR VAGIM: And that you would -- the monitoring systems would seek that level before it started to run? In other words, it would look for those conditions before --

MR. ALBU: Yes, it'd look for a steady state 50-mile-an-hour condition --

SUPERVISOR VAGIM: Get on a freeway, and then it would do it; climbing a mountain, it wouldn't do it?

MR. ALBU: Yes. And I might add that our test did take into account the RVP of the fuel as well as temperature before we even started the test.

SUPERVISOR VAGIM: And you say that's not going to take software changes?

MR. ALBU: The monitoring for 20 thousandths should take software changes only in our view, maybe a slight change in the hardware, but nothing significant.

If it is significant, we'd be willing to come back and offer a change to the phase-in.

SUPERVISOR VAGIM: Thank you.

CHAIRWOMAN RIORDAN: Are there other questions?

Ms. Edgerton, and then --

MS. EDGERTON: Going back to a little bit more of the big picture here with respect to this OBD and the

emissions, say for example, on the LEV -- on our LEV standards, your concern, as I understand it, is that with OBD II on a LEV vehicle, the light would go on at times when the emissions level was not violated.

MR. FERRIS: Correct. And there are two circumstances, I guess, where I'm concerned about that, where that might happen. One is with regard to comprehensive components, where an individual component, when it has a malfunction, may only cause a very small increase.

The other is with something like catalyst monitoring, where the threshold is really one-and-a-half times the standards. However, because we don't have our catalyst systems optimized for diagnostics yet, as we push and try to do that, it may result in premature illumination of the MIL which, in that case, could mean illuminating the MIL when emissions are below the standards.

And, in fact, I think some of the data that the staff presented in the previous mail-out this summer, in June, showed that they were able to illuminate the MIL with a catalyst monitor that was at very low emission, but it was, in fact, I think, below the standard. I could be mistaken about that.

MR. ALBU: No, our MIL came on at one-and-a-half times the standard. And I don't think there's that risk.

I thought I asked, in fact, General Motors a while back about this phase-in. I know I met with Ford for nearly a half a day on this. And with the phase-in that we've suggested, I thought General Motors also agreed that, with this phase-in they we're proposing -- dropping to 30, 60, and 100 -- that you, too, could implement this one-and-a-half times the standard catalyst requirement in a reasonable manner without a lot of tear-up.

I thought that we agreed to that.

MR. FERRIS: On TLEVs, I think that's correct.

MR. ALBU: No. We agreed to it on all LEVs.

MR. FERRIS: I'm sorry. I don't recall agreeing to that.

MS. EDGERTON: Well, let me ask again: On the LEV, though -- say you have a LEV and the light's going off, the light isn't supposed to go off for some of the components, as you say, until after you're well beyond -- I mean the threshold is one-and-a-half times.

MR. FERRIS: For many major monitors, that's correct.

MS. EDGERTON: For many major monitors.

MR. FERRIS: But for the comprehensive components, there is no one-and-a-half times the standard threshold.

MS. EDGERTON: But for the comprehensive components -- taking it back to the individual components --

since the test for the individual components is at one-and-a-half times the threshold, don't you get beyond there?

MR. FERRIS: The one-and-a-half times the standards threshold does not apply to the miscellaneous comprehensive component, such as temperature sensor, solenoids, et cetera.

The one-and-a-half times the threshold applies to things like catalyst, and EGR, and oxygen sensor -- the major emission control components -- fuel system, et cetera.

MS. EDGERTON: Well, let me ask you this. What would you recommend?

I mean, the dilemma here is clear. I know it's hard for you to think about yourself as a member of the Air Resources Board perhaps, but --

MR. FERRIS: No, we've been thinking about it --

(Laughter.)

MR. FERRIS: -- and our --

MS. EDGERTON: I mean, you wouldn't want to. But, really, this is a very serious matter. Because, when the components aren't working -- and we do need all these emissions reductions -- how are we going to know and how's anybody going to go back and get it fixed?

When you have the option of having a light go on, so you know something's not working, I mean, from my point of view, it's a question -- I'm supposed to be representing,

you know, the --

MR. FERRIS: I understand.

MS. EDGERTON: -- citizens of California.

MR. FERRIS: Yes.

MS. EDGERTON: We have in front of us a technology that -- the opportunity to know when something's not working and, if it's not working, they can go back and get it fixed, and then we won't have the emissions in the air.

Now, that's important.

MR. FERRIS: I understand that. Our counterproposal is -- I think the staff's interpretation I'm sort of briefly summarizing, but any measurable increase in emissions for these miscellaneous components amounts to something like a 10 or 15 percent increase in emissions. And our counterproposal would be let's make it a 25 percent increase in emissions, something more substantial, something that would mean that it's more likely that the vehicle is exceeding the emissions by the time the light comes on.

MS. EDGERTON: But you've already got 35 percent-- we've already got 35 percent of the engines certified to these -- to this other standard. I --

MR. CROSS: Recall the discussion we had a little while ago about synergism and old cars.

In other words, the way that we dealt with this issue -- the Board dealt with it when they originally

adopted OBD was to recognize that asking the manufacturers to deal with all the possible combinations of little components that exceed the standards cause the standards -- or cause the emissions to go up a little bit.

When they're worn out, in combination, when the vehicle gets older, and how to monitor that situation was, we said, okay, what we'll do is we'll set the big components at one-and-a-half times the standard, and we'll require you to monitor the little ones individually for a measurable, i.e. 10 percent or whatever, increase in emissions.

And we think that's a reasonable compromise when you look at the real world, where, as Steve was talking about earlier, the cars have all kinds of crazy combinations of components which fall out of spec when they get old.

And who knows exactly when the standard's going to be exceeded with all the statistical combinations that you could come up with.

CHAIRWOMAN RIORDAN: Mr. Cackette, you want to --

MR. CACKETTE: I just want to make a brief comment to sort of look at the other global aspect of this proposal.

I was sitting in a meeting, a public meeting, of the I&M Review Committee, and the Bureau of Automotive Repair was up testifying about enforcement and how well mechanics were doing.

And they gave the statistic out that -- they asked

the repair industry, "What are some real common problems with today's cars?"

And they then went out and planted those problems in cars and took them to practicing mechanics.

And 50 percent of the mechanics couldn't fix them, couldn't find the problem at all.

One of the critical issues here is that we've got to help the repair industry and the consumers that own these cars to be able to get them fixed. They're getting more and more complicated for all kinds of reasons, not just emissions, but other reasons. And to have a system, such as OBD, that finds all of the things that are problematic, identifies them for the mechanic, and then allows them to fix them is really critical to maintaining low emissions.

And to have a system that's sort of short on that aspect, where you find some components that are problematic but not other ones, and together those other ones that aren't monitored still cause a drivability problem and emission problem or whatever, is this going to lead to a lack of confidence in the system?

This things got to work if we have any chance of getting these cars to stay clean. And in our SIP and in our projections of emission reductions from cars that are used towards demonstrating attainment, we've got these cars assumed in the next decade to be emitting, on average, at

under 1.5 times their standard throughout their useful life.

And so, you know, this is critical to attainment. It's critical to maintaining the cars. And it's really that fixing them and keeping them clean is at the heart of the entire control program that we've proposed to you in the SIP.

So, I hope you'll, you know -- I hope you can benefit from keeping that in perspective as well as these multitude of technical issues that are here in front of us.

CHAIRWOMAN RIORDAN: Dr. Boston, and then Mr. Lagarias.

DR. BOSTON: I remember a couple years ago, when we were putting these rules into effect to start with, that the point was made, and I don't think it's been made today, that if one major component fails -- even though that doesn't lead to an emissions exceedance -- it could cause anther major component to fail down the stream, which could even be more expensive to fix.

So, it seems to me that it would be to the auto manufacturers' interest also to find these breakdowns before it leads to something more major.

MR. FERRIS: I think I agree with you. In General Motors' case, we would monitor these things. We would just not call them emission components, because we don't feel that they have a significant impact on emissions when they

malfunction.

So, there would be a stored code that a mechanic could use. Of course, I can't commit to that for the rest of the industry, but I know what General Motors plans would be would agree with you.

CHAIRWOMAN RIORDAN: Any other questions, Dr. Boston?

DR. BOSTON: No.

CHAIRWOMAN RIORDAN: Mr. Lagarias.

MR. LAGARIAS: In your figure with your written testimony, you made a comparison of the 24-hour diurnal emission losses with a 1990 Buick with a 9 RVP fuel compared to a '95 Cavalier with a 7.0 RVP fuel.

MR. FERRIS: Yes.

MR. LAGARIAS: How much of the difference would you attribute to the difference in the Reid vapor pressure of the fuel?

MR. FERRIS: I think it's a small percentage. It's the RVP. The major difference -- and it's kind of hard to appreciate. The major difference is in the resistance to flow to the canister. The evaporative emissions in general are heavier than air.

They tend to act like a liquid almost. And in our 1990 and older configurations, we tended to have a fairly small restriction between the fuel tank and the canister.

And sometimes the canister itself had a lot of restriction and the lines had a lot of restriction. And so, the vapors were forced out a small hole.

With the new systems, especially as we move to the federal on-board refueling vapor recovery systems, we have to eliminate resistance to flow to the canister.

And so, now, we're finding -- if, for example, we moved from a 55 thousandths orifice between the fuel tank and the canister. We're moving now to an 80 or a 90 thousandths inch orifice, much bigger in comparison to a 20 thousandths inch hole, and we've eliminated the rest of the resistance to the flow into the canister; so, now, the vast majority of the vapor will be flowing into the canister as compared to a 1990 system where the majority flowed out a small leak into the atmosphere.

MR. LAGARIAS: Well, when the canister gets saturated, doesn't the -- in effect, it doesn't work any longer? Doesn't the vapor breathe through the canister?

MR. FERRIS: Well, as part of the enhanced evaporative system requirements, we're really beefing the canisters. And again, as a part of the federal on-board refueling vapor recovery requirements, we're beefing up the capacity of the canisters. So, they have to be able to endure a three-day, 99 percentile diurnal now. They have to be able to accommodate the refueling vapors.

So, I think we've eliminated that problem.

MR. LAGARIAS: All right. I've heard the argument made that in the wintertime, the RVP of the fuel goes up very high, 11 to 12. Then the tendency to evaporate becomes more pronounced.

MR. FERRIS: Correct.

MR. LAGARIAS: Would that be a time when the warning indicator lights become more sensitive to indicating losses?

MR. FERRIS: That's precisely correct. We're concerned about false MILs from someone who goes to Nevada or someplace skiing in late March or something, or even they can have leftover fuel. You can get higher RVP fuel than in April and May when temperatures are getting very hot, and that may result in false MILs.

MR. LAGARIAS: In your analysis of the Cavalier, you indicated there might -- you compared it with a fuel cap leak, a plumbing leak. Is there any evaporative leak that you're including there as well?

MR. FERRIS: A fuel cap is the fuel cap absent, which would be a gross leak. I guess I'm not sure I understand your question there.

MR. LAGARIAS: Well, it shows -- your curve shows a fuel cap leak. I assume that's --

MR. FERRIS: Yeah, that's sort of the worst case

gross leak, I believe.

MR. LAGARIAS: But it would be -- it's not the fuel cap itself, as much as it is the size of the hole in the fuel cap.

MR. FERRIS: I think a fuel cap leak means the fuel cap is absent. It's, you know, a big hole.

MR. LAGARIAS: Then why would it be shown for a .04, or a .02, or .06 leak?

MR. FERRIS: Oh, you're right. I'm sorry. You're absolutely correct. It's the size of the leak in the fuel cap location. You're correct. I am wrong.

MR. LAGARIAS: But where is the evaporative loss through the canister that would be presumably also occurring?

MR. FERRIS: No, there wouldn't be any evaporative loss through the canister. The rest of the vapor --

MR. LAGARIAS: The breathing through the canister.

MR. FERRIS: I'm sorry?

MR. LAGARIAS: The breathing through the canister. You're assuming complete recovery in the canister?

MR. FERRIS: Correct. I mean I think the idea is you still would have something like 35 grams of vapor generated by this 24-hour diurnal. With the new systems, the vast majority of that vapor would now go into the canister and be stored there, and then burned when the

vehicle was started rather than escaping into the atmosphere.

MR. LAGARIAS: All right. Now, I'm just going to digress slightly. The federal test procedure -- I heard the argument made that these should only be measured through the FTP process. Am I correct in understanding that's going to be updated?

MR. FERRIS: That is correct.

MR. LAGARIAS: And will that include higher revolution applications, above 3500, so that they take the higher revolution conditions, which the FTP process -- which I think was developed in '67 -- does not affect current driving practices?

MR. CROSS: Are we talking about misfire now?

MR. LAGARIAS: Well, I'm talking in general.

MR. CROSS: The answer is, yes, the FTP will be updated to include a, quote, "off cycle" test, which is designed to represent higher speeds and loads --

MR. FERRIS: Yes.

MR. CROSS: -- which are outside of what are defined by the current FTP. And that process is well along and ARB, and EPA staff, and the manufacturers are cooperating very closely on developing that procedure and the standard.

MR. LAGARIAS: And that does affect misfires that

we're concerned with at this point.

MR. CROSS: Except for -- the staff's proposal goes outside, I think, of the -- may go outside of the operating regime of even the off-cycle test, in a sense that to define a, quote, "map," that everybody understands, we run -- we're running through the limits of the engine's operating range, if you will, with the one area blanked out.

MR. LAGARIAS: All right. And I just had one last comment, which I've lost. I'll come back to it.

Thank you, Mr. Ferris.

CHAIRWOMAN RIORDAN: Okay. Are there any other questions at this time?

Let me thank this witness then very much.

MR. FERRIS: Thank you.

CHAIRWOMAN RIORDAN: If it is all right with the Board, and particularly our recorder, I'd like to finish the testimony of the next witness before we break for lunch. Madam recorder, is that all right with you?

Okay. Mr. Nishikubo, representing Chrysler Corporation.

MR. NISHIKUBO: Good afternoon.

My name is Norman Nishikubo, and I am a Vehicle Emissions Regulatory Planning and Compliance Specialist with Chrysler Corporation.

I wish to take this opportunity to thank your

staff for all of their efforts to address and resolve most of our concerns relative to the regulation before you today.

During the past two years, a cooperative effort was undertaken by both CARB and Chrysler to understand, recognize, and address each other's concerns applicable to the goals contained in the OBD II regulation.

A major part of the document before you is the end result of this cooperative effort.

Now, putting the pleasantries aside, I do not wish to leave the impression that the requirements contained in the document before you will easily be met. This regulation, from its onset and continuing today, represents a major and monumental technological challenge.

Human resources as well as monetary resources will continually be pushed to their limits in order to meet these requirements. In fact, some of the provisions contained in the proposed OBD II regulation may prove to be nonattainable.

n the other hand, attainment may occur. We just don't know what the future outcome will be at this time.

The comments of the American Automobile Manufacturers Association presented earlier described concerns with several OBD II requirements. We support those comments.

However, we commit to all of you, just as we have

to your staff, to devote all reasonable efforts to attain the stated goals. Our commitment is essential to help ensure the protection of the interests of Californians as well as our own.

Thank you for the opportunity to present our views on this important issue. If you've got any questions, I'll be glad to attempt to answer them.

CHAIRWOMAN RIORDAN: Are there any questions for this witness by any of the Board members?

Well, you've given us a very nice beginning for our lunchtime.

MR. NISHIKUBO: Thank you.

CHAIRWOMAN RIORDAN: And I appreciate that.

I'd like to indicate the audience and to the Board and staff that -- let's reconvene at 1:15. That gives us a little better than 30 minutes. And that'll probably be a pretty good lunch break I think. Okay.

(Thereupon, the luncheon recess was taken.)

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AFTERNOON SESSION

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CHAIRWOMAN RIORDAN: I'll call the Board meeting back to order, if I might, and invite Mr. Stepper, who represents Cummins, to come forward to the podium.

Is Mr. Stepper here? Well, perhaps he'll be back from lunch.

Mr. Grossman, representing Lamborghini.

He's out for a drive in his Lamborghini.

(Laughter.)

CHAIRWOMAN RIORDAN: Maybe he went to rescue his Lamborghini.

Mr. Deane, from the Specialty Equipment Market Association. No, let's see. Who do we have coming here?

Mr. Deane. Well, I'm glad you're here. Thank you.

MR. DEANE: Thank you. If I had a Ferrari, I probably would not be here.

CHAIRWOMAN RIORDAN: I would agree with you.

(Laughter.)

MR. DEANE: Madam Chairwoman, members of the Board, my name is John Russell Deane. And I represent the Specialty Equipment Market Association, SEMA, and the Auto Internationale Association, AIA.

Both associations comprise manufacturers and

distributors of automotive parts and accessories. They are part of the automotive aftermarket and an integral part of the automotive industry the citizens of California have dome to rely upon.

Without the aftermarket, it is doubtful that the array of parts and services which we enjoy would be available to the consumer.

Certainly, delays and inconvenience would result from any decrease in the viability of the aftermarket. Without doubt, the cost of owning a motor vehicle would increase dramatically were there no aftermarket.

A balance has evolved between the vehicle manufacturers and their dealers and the automotive aftermarket in providing parts and services to the consumer. Roughly 75 percent of that aftermarket is made up by the industry we represent.

That balance, however, has been created by a consumer preference. And today, that balance is, in fact, in very, very serious trouble. As a matter of fact, the very existence of the automotive aftermarket as we know it is in question.

This is not a result of a change in consumer preferences, but rather by government fiat. I would like to address this serious problem and some of the efforts which have been undertaken to deal with it.

I've also prepared written remarks, which I will submit with my oral remarks, and I would request that they be made part of the record. These comments are provided on behalf of not only SEMA and AIA, but also the Automotive Engine Rebuilders Association, the Auto Parts and Accessories Association, the Auto Parts Rebuilders Association, the ASA -- the Auto Services Association -- the Auto Service Industry Association, the Automotive Warehouse Distributors Association, the Motor and Equipment Manufacturers Association, and of course, SEMA and AIA.

For many years, the participants in the automotive aftermarket have been able to design and manufacture parts which, when installed on vehicles, allow the vehicles to operate properly, perhaps even better than they were originally configured.

Similarly, the service industry has been able to properly maintain these vehicles. For two important reasons this is changing. The first is that governmentally mandated on-board diagnostic systems and sophisticated computer technology are making it more difficult to design and manufacture parts which are compliant with OBD, and especially the new OBD systems, and are making it more difficult to undertake service-related -- emissions-related service of motor vehicles without access to information relating to the operation of emission controls systems and

the on-board diagnostic systems.

The second reason for this is that, while we are seeking additional information about and access to the on-board computers, the proposal before the Board seeks to preclude that information and access through mandated antitampering measures.

In order to preserve a viable aftermarket, a new alliance must be formed among the Board, the vehicle manufacturers, and the automotive aftermarket. Such an alliance must recognize the need and value of preserving a viable and competitive aftermarket.

We must recognize the concerns of the Board and the concerns of the vehicle manufacturers with regard to aftermarket involvement in sophisticated emission control systems. We must be prepared to analyze those concerns and develop realistic solutions.

This will not be an easy process and will require a good-faith effort on the part of all parties if we are to succeed.

We are prepared to begin that process now. Even though not a word today has been spoken about the demise of the automotive aftermarket in dealing with the issues of on-board diagnostics, we are gratified that the Board and the ARB staff recognize the importance of a viable aftermarket in seeking to ensure consumer satisfaction and to ensure an

effective emissions control strategy.

We are further gratified that the Board is taking a leading role in seeking to form the alliance which I refer to and to find practical solutions to technical problems.

Under the guidance of the Board, we will soon engage in discussions involving the Board, representatives of the vehicle manufacturers, and representatives of the automotive aftermarket.

We will place on the table all of the technical issues which we face and seek solutions. We have already begun this process, and -- with the issues at least that have been brought forward so far. We pledge today to work earnestly in good faith to find a means of resolving our difficulties, and affecting our alliance.

We would join with the vehicle manufacturers in suggesting, however, the deferral of the adoption of the antitampering provisions until we've been able to deal with these matters.

We appreciate the efforts of the staff in solving these problems, and we look forward to our continued involvement with them.

Thank you.

CHAIRWOMAN RIORDAN: Thank very much. Board members, are there questions for this witness?

MR. LAGARIAS: One question.

CHAIRWOMAN RIORDAN: Yes, Mr. Lagarias.

MR. LAGARIAS: The manufacturers of automobiles say that they've spent a lot of money -- and I well believe it -- to develop their equipment, their emissions control equipment.

And they think it's proprietary or at least it's money that they've invested, and they would like to continue selling it.

How do you answer the question that they pose? They say, "We've invested in this. Why should we open up our big investment to the aftermarket if they haven't put up their money to enter the market"?

MR. DEANE: Well, part of the partnership that I think that we're going to propose involves the aftermarket putting up the funding, the resources, the human resources as well, in dealing with these technological issues.

The fact of the matter is that while there has been a tremendous amount invested in terms of emission control technology, as well as the on-board diagnostics systems that are currently in place, the fact of the matter is that, to deny the aftermarket the opportunity to participate eliminates an entire industry.

And, at this point in time, not only does that pose a serious threat to the people who are in the industry, it poses a serious threat to consumers in California who

rely upon that industry to work on their cars.

MR. LAGARIAS: Well, I think that's a very good point. But if you invest in technology, that's a substantial investment. How do you protect your investment, let's say, from -- in your case, you say, "We'll put up the money. We'll be partners in it."

What happens if this information just leaks out and goes out all over the world, and then the investment that has been made in this technology comes back in a cheaper version to haunt you?

MR. DEANE: Well, that deals with the issue of the release of the information. And there's been a lot of controversy on how this information might be made available to the automotive aftermarket. And I think there are a variety of solutions to that. And it depends upon the different types of parts we're talking about.

But I would see, as there are currently devices being used and methodologies being used to deal with the data, which is contained in the on-board diagnostic systems without actually having access to the information, I believe that there are intermediary systems that can be used to protect the proprietary nature of that data and still provide the aftermarket the opportunity to design parts.

MR. LAGARIAS: All right. Well, I certainly would encourage an alliance between the aftermarket and the

primary manufacturers, and our participation to the extent appropriate.

Is that in motion now?

MR. DEANE: Yes, it is. And I believe a workshop has been scheduled for sometime early February, and we're very much looking forward to that.

In the meantime, there are a number of technical discussions underway to try to identify the very specific issues that may be of concern, not only to the vehicle manufacturers but also to the Air Resources Board itself.

MR. LAGARIAS: thank you.

CHAIRWOMAN RIORDAN: Are there any other questions for this witness?

Supervisor Vagim?

SUPERVISOR VAGIM: Well, does your -- does your aftermarket also include then the independent automobile repair folk, too?

MR. DEANE: Yes.

SUPERVISOR VAGIM: Are they a separate group, or are they all --

MR. DEANE: Yes.

SUPERVISOR VAGIM: -- part?

MS. HUTCHENS: Well, the service industry is obviously part of the automotive aftermarket. I represent parts manufacturers and distributors.

But they are part of the automotive aftermarket and they, of course, are affected by this program as well.

SUPERVISOR VAGIM: Have they been part of the dialogue that you --

MR. DEANE: They have been, yes.

SUPERVISOR VAGIM: Okay. Good. Thank you.

CHAIRWOMAN RIORDAN: Ms. Edgerton?

MS. EDGERTON: I would assume that some sort of leasing arrangement or franchising arrangement, something like that, of their software and technology is what you're talking about; is it?

MR. DEANE: Well, we'd suggest that everything is on the table. I think that there's going to be -- again, depending upon the types of parts we're talking about, there's going to be a need to determine what type of information must be made available. And the issue of -- God forbid the word "licensing" -- I think that everything is on the table in trying to determine how this information can, in fact, be transferred.

So, licensing may well be one of the approaches.

MS. EDGERTON: It's not on the table as to whether they own what they develop, is it?

MR. DEANE: No, no. In terms of providing the information to the automotive aftermarket.

MS. EDGERTON: I see.

MR. DEANE: That's one of the means by which I think this information may be made available to the aftermarket.

MS. EDGERTON: Thank you.

CHAIRWOMAN RIORDAN: Okay? Staff, any comments? I think that concludes the Board's questions.

MR. ALBU: As Mr. Deane has said, we are trying to work to form a discussion group to fine solutions to these problems.

I think one of things that we're interested in is avoiding the incentive for tamperers to get into these systems. If legitimate aftermarket companies indeed will participate, we'd like them to do so in a reasonable manner, in a business relationship, for example.

We don't want to cut them out of the whole issue, then they would be forced into seeking tamperers to try to get back their business.

So, this is part of the security issue overall, and we think that the staff believes it makes more sense to try to work this out rather than to force people to do things that we wouldn't like.

CHAIRWOMAN RIORDAN: Okay. Thank you very much. Thank you --

MR. DEANE: Thank you.

CHAIRWOMAN RIORDAN: -- Mr. Deane.

Let me go back. I had called on Mr. Mark Stepper from Cummins.

Is he now in the room?

MR. STEPPER: Thank you for letting me come up and make the comments, even though I missed my first call there.

Ladies and gentlemen of the Board and the staff, my name is Mark Stepper. I'm the Manager of On-Board Diagnostic Programs for Cummins Engine Company, headquartered in Columbus, Indiana.

Cummins is a leading worldwide designer and manufacturer of fuel-efficient diesel engines and related products for trucks and other equipment.

Cummins engines ranging from 76 to 2000 horsepower provide power for a wide variety of equipment in its key markets -- heavy-duty truck, midrange truck, power generation, bus, and light commercial vehicles, industrial products, government, and marine.

In addition, Cummins produces strategic components and subsystems critical to the engine, including filters, turbochargers, electronic control systems.

Cummins also produces natural gas engines for some applications. This year, we are celebrating our 75th anniversary in providing for these very important markets. And we continue to march forward in developing state-of-the-

art products to meet the needs of the future.

Cummins offers its support for the latest revisions on the on-board diagnostic II rule. We have worked proactively with the ARB staff over the last several years in identifying and clarifying aspects of this regulation, and feel confident that the changes and additions proposed here today are appropriate and technically justified.

The additional clauses identifying differences between diesel engine technology and gasoline engine technology, the recognition that some engines are certified on engine dynamometer, and the recognition of alternate communications protocol with J1939 are major steps forward with this regulation, which crosses a multitude of vehicle classes and weight categories.

However, one element of the proposal -- proposed regulation is of potential concern to us. That is the requirement for the detection of misfire on diesel engines effective in 1998.

Cummins has only recently begun the research into the methodology and practical application of misfire detection and measurement.

As we stand before you today, we are not convinced that over the next two to three years, that we will be able to reliably detect misfire on a diesel engine.

However, the latitude provided by the staff for detection only of complete lost of combustion, only during certain operating conditions, and only once per driving cycle increases our confidence as we continue our research and development of such a system.

We commit to continue to update the staff on our progress on a periodic basis, and we urge the staff and the Board to proceed with establishing a workshop and another status review hearing in 1996, to determine if the changes would be needed to this or other aspects of the OBD II regulation that applied to the 1998 and later model year vehicles.

Cummins thanks the Board and the staff for their attention and for the opportunity to present our views on this proposal.

If there are any questions, I'd be happy to entertain them at this time.

CHAIRWOMAN RIORDAN: Thank, Mr. Stepper. Let me ask the Board members. Are there any questions from any of the Board members?

I see none. And, sir, we thank you for your testimony and I appreciate your being here.

MR. STEPPER: Thanks.

CHAIRWOMAN RIORDAN: Let me go back and also call on Mr. Michael J. Grossman from Lamborghini? Are you here?

MR. GROSSMAN: I'm coming.

CHAIRWOMAN RIORDAN: Good.

MR. GROSSMAN: The car wasn't fast enough to get me here.

(Laughter.)

CHAIRWOMAN RIORDAN: Well, we were afraid that, you know, maybe you had to go find it somewhere. You never know.

MR. GROSSMAN: No, not in this fine town.

CHAIRWOMAN RIORDAN: They're sought after.

MR. GROSSMAN: I'm Michael J. Grossman, the United States Engineering Representative for Lamborghini.

The fact that I'm following the gentleman from Cummins -- let me assure you there's no truth to the rumor that we're only going to be building diesel passenger cars.

(Laughter.)

MR. GROSSMAN: In any case, we are a small volume manufacturer in perhaps the truest form. We support the staff amendments presented here today, and we are appreciative of CARB's traditional history of understanding and consideration of the additional and particular problems small volume manufacturers must face and, most particularly, extra small volume manufacturers like us.

While the staff amendments address many problems, there is still an extremely significant problem for us,

manufacturers like us, and even some large volume manufacturers.

This problem is particularly for engines larger than 8 cylinders, particularly 10 and 12 cylinder engines, and even during the FTP. This is for misfiring.

As one could imagine, it's a significant problem for these engines of 10 and 12 cylinder capacity. We are working diligently on this, but this still may be a significant problem for us in future years. We would like to ask for additional delays for the 10 and 12 cylinder engines, particularly for small volume manufacturers, and most specifically during FTP cycle as well as the non-FTP cycle, up through the year 2000.

We also hope that the Board will pay -- or let's say be particularly sympathetic to our problems and, if not, if they can't be addressed now, at least leave open to perhaps a hearing in 1996, where these can be addressed, depending upon the progress in the future.

Thank you for the opportunity.

CHAIRWOMAN RIORDAN: Thank you, Mr. Grossman.

Maybe staff -- would you care to comment on the request?

MR. ALBU: I think that we acknowledge that the V10 and the V12 engines are more difficult to accomplish misfire monitoring on. I think that we're also aware of

some new approaches out there that could possibly apply to these engines, and we'll be looking at those.

And I think that we'd like to maybe put Mr. Grossman in contact with these people to see if we can explore further this new methodology.

We will, of course, reconsider it in 1996. Other manufacturers -- Ford and Chrysler, for example -- will be making V10 trucks and so forth. They have similar problems. So, we will be monitoring this.

I think for over the FTP range, I guess time is getting short, since you have to comply, I think, in 1996, with the FTP. If -- well, as I say, we can work with you to get in touch with a couple of vendors that we're aware of more recently.

But sure there be a problem in '96, right now, the regulations only provide for paying a deficiency (sic) for a deficiency. That's one alternative, not desirable perhaps, but hopefully we can avoid that.

CHAIRWOMAN RIORDAN: Board members, questions? Dr. Boston.

DR. BOSTON: Mr. Albu, it seems in the past, that we did have exemptions for small vehicle manufacturers or small manufacturers of small numbers of vehicles. Do you recall what that -- how that could be applied here?

MR. ALBU: Yes. What we did in the past, when we

first adopted a regulation, was we had a phase-in of OBD II over 1994, '95, and '96. And what we allowed for small volume was to begin compliance in '96, not 1994. So, that was the first phase of this greater leniency.

In addition, with the new proposal for the full range of monitoring, we will give the small volume manufacturer up until the year 2000 to comply with the full speed and load range.

So, I think that, if we can make progress with these outside developers by 1996, that FTP range requirement by '96 maybe can be met, and we think that certainly by the year 2000, the technology will be there to do the full range as well.

So, hopefully, we can avoid the problem.

DR. BOSTON: Mr. Grossman, how many cars do you sell in California every year?

MR. GROSSMAN: Well, we manufacture about four or five hundred vehicles a year worldwide. And of that, about 50 percent are in the United States, and about 40 to 50 percent of that volume is in California.

But there's an additional corollary to this as some of you may be aware. Manufacturers like us, we can't build separate vehicles for different portions of the United States.

And with the new regulations coming into effect in

the Northeast, it virtually demands that a manufacturer like us, and even some fairly larger than us, must manufacture what are called 50 State vehicles. So that, essentially the vehicle that we build for California, we have to sell only that vehicle across the United States.

So, it's not just a problem of the volume that we have for sale in California, though that is significant -- by our standards at least -- it's a problem of our entire United States production, which presents 50 percent of our worldwide sales.

DR. BOSTON: Did you just give out a trade secret about a V10 engine? You don't currently have one.

MR. GROSSMAN: Well, we have one on our back shelf so to speak. But, no, I meant that, in that basically it's engines larger than V8 that the technology today has had some problems with, not only us. You probably hear about it or read about it from other manufacturers. And we still have problems with it on the -- even on the FTP cycle in some areas of it.

Admittedly, we could take advantage of the deficiency availability, but our engineers are proud, and they don't like to -- let's say they don't like to sort of hang their coat over their head even for one small part.

We've been working diligently on this as well as working together with the staff, speaking numerous times

with the staff and getting some pointers in which directions to move and people to go to.

We also have been working together with Dr. Razoni, (phonetic), a professor who used to be at the University of Michigan. He's now at the University of Ohio. And he, together with us, and engineers from the University of Bologna, we're going to be presenting a paper on misfire in large engines at the SAE conference next March.

And also, I've had contact with some of the sensor manufacturers and others that have been working on these projects for other manufacturers, but they haven't -- they haven't done any work on anything larger than a V8 to date. So, it is a bit of a problem.

DR. BOSTON: Well it sounds like staff is sympathetic to your needs and will work with you in a workshop in '96.

CHAIRWOMAN RIORDAN: Okay? Any other?

MR. LAGARIAS: Madam Chair?

CHAIRWOMAN RIORDAN: Mr. Lagarias.

MR. LAGARIAS: Tell me, do you have two chips in your car? One to go through the FTP cycle and one so that a normal Lamborghini driver would run the car?

MR. GROSSMAN: No, not at all. You're not allowed to do that.

(Laughter.)

MR. LAGARIAS: What happens when you have a misfire?

MR. GROSSMAN: That's called something -- that's something called a defeat device.

MR. LAGARIAS: Yes, but --

MR. GROSSMAN: We don't even have a switch on our hood.

MR. LAGARIAS: Well, considering --

MR. GROSSMAN: That was -- excuse me. That was the original genesis of the defeat device. It was a switch on the hook, where it would -- when the hood was opened, the emission control devices would be effective; and when the hood was closed, the switch would operate and it would cut out all the emission control devices.

(Laughter.)

MR. LAGARIAS: Well, I'm glad to hear --

MR. GROSSMAN: Mr. Calhoun, I think, remembers --

(Laughter.)

MR. GROSSMAN: -- those days.

MR. LAGARIAS: What happens if you have a misfire, does your speed drop from 175 down to 135 or something?

MR. GROSSMAN: No. One thing, it's hard to detect in 12 cylinders. But one thing, you know, to address one of the concerns of the staff in regard to misfire, we don't like misfire any more than the staff or perhaps probably

even less.

If our catalysts get damaged -- and now they're guaranteed for eight years and 80,000 miles -- our cost is $15,000 on a catalyst system.

So, that's fairly significant. And we have to pay for it. In light of that, for the last -- I believe it's about the last nine years, even on the model that we sold previous to current model, we've had a device called a catalytic overheat sensor system. And what that does is it's thermocouples placed in and around the catalyst area, which sense any overtemperature conditions.

And, as well as processing a warning -- first, a variable flash, then a steady flash, then an audible tone. It also shuts off the fuel supply.

(Laughter.)

MR. GROSSMAN: Because we don't want our catalysts ruined by customers not paying attention to lights.

MR. LAGARIAS: Thank you.

MR. GROSSMAN: And we have those -- those devices are on all our vehicles today.

So, that's how we combat it, even when it's nondetectable.

MR. LAGARIAS: Thank you.

MR. GROSSMAN: Okay. Thank you very much gentlemen.

CHAIRWOMAN RIORDAN: Thank you --

MR. GROSSMAN: Gentlemen and ladies.

CHAIRWOMAN RIORDAN: -- Mr. Grossman.

That poses an interesting followup to Supervisor Vagim's theory of lights. You notice what they do on a Lamborghini.

The next speaker represents the Motor and Equipment Manufacturers Association. Paul Haluza?

MR. HALUZA: Following Lamborghini.

My name is Paul Haluza, and I'm Director of Government Relations and Public Affairs for the Motor and Equipment Manufacturers Association.

For those of you that may not be familiar with our group, we represent about 750 U.S. manufacturers of motor vehicle parts, accessories, automotive chemicals, and related equipment.

About 55 to 60 percent of our members sell to vehicle manufacturers original equipment new, and about 75 to 80 percent of our members sell independent parts into the aftermarket, although I'm going to have to check and see if we have one that has a $15,000 catalyst replacement.

I don't have a formal statement. My purpose for being here today is to add our support to the statement that Mr. Deane introduced into the record, and say that we support it.

Our concern, again, is for the antitampering provisions in the proposed rule. We do appreciate the fact that Steve Albu and others on the staff have recognized the potential adverse impact, unintended impact, of these regulations. And we're pleased to be working with him in trying to seek a resolution.

In the meantime, I guess our position is that we think that this provision is premature, in light of a potential solution between the groups. Because, at that time, I think we all stand for strong antitampering provisions.

And none of the people in the aftermarket do support the tampering, but we think that these provisions in a way pass the key of ownership to the vehicle manufacturers. And this is a fearful thing for the independent aftermarket.

We've heard some discussion today, I think, with regard to the service technicians' needs. But we have not heard any real discussion with respect to the independent parts manufacturers.

In some respects, the antitampering provision does bestow upon the vehicle manufacturers the right to design a vehicle. And again, as a matter of public policy, should a small group control that design?

Historically, the aftermarket -- to answer Mr.

Lagarias' question earlier to Mr. Deane about the investment, historically, before we'd gotten into the world of computerization of vehicles and electronics, everyone from the vehicle manufacturers on down to the parts manufacturers used reverse engineering in order to design component and build replacement parts.

Now, with this new-age computer that's running the vehicle, and with the way the antitampering provision is written and proposed by staff, what you've created really is an endorsement for copyright protection and are, in some ways, deputizing the vehicle manufacturers to enforce antitampering, because they will have a dual intellectual property protection as well as, again, the antitampering; thus, making reverse engineering virtually impossible. Because if anybody tries to break the software code in order to design a legitimate part -- I'm not talking now about an illegitimate part.

We share the Board's concern about the possibility of tampering, computer hacks. But, again, I'll remind you of an old adage that I remember: Laws are made to keep honest people honest. Those that have a profit motive are going to go in and break the codes, and then somehow are going to break down and sell their parts.

I would submit to the Board and to the staff that here are very ample antitampering provisions in the Clean

Air Act right now. In fact, they expanded the antitampering provisions in the Clean Air Act amendments of 1990 to include owners as well as manufacturers of defeat devices.

Certainly, a software package that defeats the OBD or the computer, the CPU control systems of the vehicle manufacturers would be tampering. It would be a defeat device.

So, with that, I just make those comments. And if you have any questions, I'll be happy -- I appreciate the opportunity to sort of present our views a little bit.

CHAIRWOMAN RIORDAN: We appreciate having you here. Supervisor Vagim, question for the witness?

SUPERVISOR VAGIM: Thank you, Madam Chair.

Let me reverse where I was going to go on my questions with what you last said. And that is, in the proprietary, exclusivity of the software code, would you see it being less problematic and without worrying about the integrity of this system -- which some say that you have to have this thing absolutely airtight if the integrity of the system is going to be maintained -- forgetting that for a second, if this was public domain systems, would the aftermarket folks have, let's say, more of an equal opportunity to achieve product development as well as less of a control -- and also having what we have pretty much today, less of a control of where you go in the aftermarket

world?

I see this almost a potential direction towards the manufacturer. And I've never seen an absolutely safeguarded piece of code that's out in the public domain that doesn't eventually become public domain.

I mean, you can look at the computer software world now and very little of it is not available to those who want to copy it and that type of stuff.

MR. HALUZA: Here again, it's very difficult. I have to empathize with the vehicle manufacturers. They do have literally tens, if not hundreds, of millions of dollars invested in fulfilling a mandate by government -- basically the ARB with OBD II and the lower emission standards.

To put it in the public domain at this point obviously would help anyone who wants to work on a vehicle. And to be honest with you, I don't have the answer, other than what was heard today, which was the word "licensing."

And that is an anathema to me and to MEMA, because, again, who -- as your question earlier today -- who decides? Is it the vehicle manufacturer? Suppose the vehicle manufacturer doesn't like the color of my tie? I mean, you're placing -- you're placing the destiny of a hundred-fifty billion dollar business in this country -- industry in this country -- under the guise of OBD information -- well, information availability, but also the

antitampering provisions as it has been redevised.

SUPERVISOR VAGIM: But if you reversed, or we slid the method on which we are -- being proposed of licensing now, and that was licensing of those who are going to be part of the inspection and that type of thing versus have the aftermarket folks available, at their request, to purchase the right to sell through a license, that code, so they could have aftermarket products available.

Do you see that as a problem?

MR. HALUZA: I see that as a problem only from the standpoint, again, until someone can respond to my member companies: Who is going to make that decision of who gets the license, and how the license is granted. Because you are giving virtually the vehicle manufacturers an exclusivity in the development of their systems and their parts, can they charge -- what is going to be a fair price?

I mean there are a number of unanswered questions here that --

SUPERVISOR VAGIM: Let me get something straight. I guess, presumably in the industry now, your aftermarket folk can copy a product and sell it, and not infringe on a copyright or a patent, right?

MR. HALUZA: There are no -- virtually, there are no patents with regard to individual components --

SUPERVISOR VAGIM: Components, right.

MR. HALUZA: -- that I -- I mean, there may be a few out there, but mostly, they are not patented.

SUPERVISOR VAGIM: So, now we're delving into the same problem that the computer industry has, which is licensing of software.

And I think it was Microsoft that was just taken to court over their -- they're a monopoly, and lost, but won. Same way with IBM a few years ago. They lost, but won.

As a matter of fact, I think they beat the government. So, it's hard to ever override some of these things that are almost monopolistic. And that's where I see a problem. And hopefully, we can sort this out so everyone has a fair and equal -- even playing field, keeping where we are today. Because I think the aftermarket world basically has kept the prices of our components down.

I firmly believe that. And I think, if we take that away, we will start having higher and higher costs of some of our emission reduction devices.

But the question I want to ask you specifically is that they have a compelling requirement to back up all their parts in the emission with a hundred thousand mile run.

Now, is the aftermarket folk compelled with that same dilemma?

MR. HALUZA: The aftermarket is, to the best -- I

mean, the aftermarket is responsible for the part they put on the vehicle; but, no, they are not -- I mean they are not part of original equipment vehicle certification. If that's what you mean, no, they are not.

With the exception of replacement catalytic converters, which I believe California and the federal government have a 25,000 mile warranty. But the other parts are not.

I know most of our companies do engage in testing, because obviously they have, as an incentive, not to trigger the MIL light. But you bring up an interesting point, and that is with respect to the software. And I've heard a lot today about -- and we know of the -- I should say -- the desire to include or to make OBD an I&M tool.

I would think that, if the software program of a vehicle were changed, altered, whether it was legal or illegal, that that could be uncovered at the time -- at the time of inspection.

We would know at an inspection point. I don't think it takes a rocket scientist to do it. Because if you can reprogram E-PROM, you certainly can discover what program is on an E-PROM

SAE is working on a project, of which I am on a committee. It's called the "Missing Link." And what, in effect, this is trying to do is set up a mechanism by which

the vehicle would carry with it a permanent medical record, if you want to call it that.

It would contain the original configuration and any alterations that were made to that original configuration, whether it be a factory update, a field fix, or whether it would be a legitimate change in components or an addition of a component that required a program change.

But the way I read the current antitampering provisions in here, that would be illegal.

SUPERVISOR VAGIM: But, indeed, we're going to have to get that level you just mentioned, that the SAE folks are working on that, if we're ever really going to assure ourselves of integrity in this program.

MR. HALUZA: Yes. My only point is this: We do not say that we would not live with these antitampering provisions. I just feel that I would like to see it delayed until after we at least have some meetings and see if there is a meeting of the minds between the aftermarket, and work out maybe even better antitampering language.

But with it now, if it's adopted, it sort of gives the vehicle manufacturers a leg up in negotiations that take place, because you're bestowing upon them the protective rights.

SUPERVISOR VAGIM: Thank you.

CHAIRWOMAN RIORDAN: Mr. Lagarias, and then Mr.

Calhoun.

MR. LAGARIAS: Well, the availability and/or protection of proprietary software, which is the subject we're discussing at the present time, goes far beyond our interest here alone. While substantial, this is a universal or a national problem that affects many, many other areas. So, I think we have to look to see what's being done on a national and global basis on the protection and availability of software programs. Because it would be very easy to booby trap some of these proprietary programs to present their being used.

CHAIRWOMAN RIORDAN: Mr. Calhoun.

MR. CALHOUN: I guess I would just like to ask the staff. Do you have any comments concerning Mr. Haluza's suggestion that would delay the antitampering provisions until such time as you've had the workshop where you've addressed this issue?

MR. ALBU: I think that our view is that we need to have these preliminary requirements in place in order for industry to have an incentive to start dialoguing the issue with a high degree of good faith.

I mean, there's a tradeoff here, you know. Paul seems to feel that here's a leg up issue, but I think our ability, as the ARB, to try to get dialogue going depends to a large extent on the industry believing that we're going to

put these provisions in place. And they, too, as you've heard, would like to dialogue this further.

All we would like to do with this proposal is put a requirement on the books to get people working on it in a diligent manner. Otherwise, without this requirement, it's quite likely they may just wait a while and let the whole thing simmer some more.

And plus, we're concerned about cars that are going to go through I&M. We want them to be tamper proof. And if we start in 1999 to assure that, that's a good start. If we wait even longer, then I'm not sure that we can put OBD II as a replacement for the current smog check as quickly as we might like.

And so, we've got a timing issue here, an emissions issue, and also the whole issue of good-faith effort in the discussions that hangs in the balance.

Now, we have already committed to further negotiate and dialogue these issues with industry, both the aftermarket as well as the OEMs, to try to find a good position. I think that the dialogues and agreements that we have so far to continue working on this are fairly strong. And I think that we can keep these requirements and still make progress in these other matters.

CHAIRWOMAN RIORDAN: Okay. Other --

MR. HALUZA: May I respond, Madam Chair, just real

quick?

CHAIRWOMAN RIORDAN: Yes, you can respond, but not a debate.

MR. HALUZA: Okay. No. Steve and I have had a number of conversations with respect to this.

I would go back and again say that there's ample protection under current antitampering provisions to maintain the integrity of the OBD system, its software, short -- even if the antitampering provisions were not in your own regulations as a separate entity. So, that would be the point.

CHAIRWOMAN RIORDAN: Okay. Are there any other questions for this witness?

Then, we thank you very much for --

MR. HALUZA: Thank you very much.

CHAIRWOMAN RIORDAN: -- being here to testify.

Let me call next on Mr. Aaron Lowe from the Automotive Parts and Accessories Association.

MR. LOWE: My name is Aaron Lowe, and I'm Director of Legislative and Regulatory Affairs for the Automotive Parts and Accessories Association.

APAA is a trade association representing over 1600 manufacturers, manufacturers' representatives, distributors, and retailers of automotive parts and services nationwide. We are extremely concerned about the proposed antitampering

provision that ARB is looking at today.

I have prepared comments which I'd like submitted for the record. And since this has been covered fairly extensively already, I'd just like to add a few points.

This country has always had a tradition that, when a vehicle -- the car owner purchases a vehicle, he pays for a lot of the technology when he buys the vehicle.

Once that vehicle is out down the street, the car owner has always had the opportunity to go where he wants to get that car repaired and to use the parts that he wants to get -- for those services.

The antitamper provisions are going to be a major impediment to us producing parts and to a great deal of services that are being provided to the car owner by the independents unless they're modified.

We support the efforts that have been talked about today by Mr. Albu. And we are more than willing to begin the discussions.

However, when it comes to how this is going to be paid for, we think it should be remembered that the independent aftermarket also has a lot of development cost that goes into producing parts. We do a lot of work to improve parts that are made by the vehicle manufacturers to solve problems and make the cars operate better.

So, we're not -- we also have issues here. And,

also, the service industry will be spending a lot of money to use these OBD systems, and they're a much smaller entity than the new car dealer.

So, I just wanted to put that for the record, that the independents, also, are going to be involved in this extensive cost for development.

We think that this antitampering provision should be delayed if only to determine what kinds of problems -- what kinds of ways we're going to solve these problems. How are we going to assure that there isn't an independent parts industry out there that can produce parts that will work with these OBD systems.

I'm extremely concerned that, if we don't solve this problem soon, that when these OBD systems get out on the market and once they get out of warranty, we're going to be producing parts for those systems, and we want to make sure that they operate properly. Our members' reputations are on the line here, and so are the car companies.

Because of their cars aren't operating properly, then we're all out of -- then we're all in trouble, and the whole OBD system will lose consumer acceptance and consumer support, which we talked about earlier.

So, we would hope that the Board would decide to hold off on producing -- on approving these antitampering provisions till we decide exactly how we're going to solve

this problem.

And we don't think that this is going to hurt negotiations. I think the car manufacturers know we know that these antitampering provisions are pending and that they're going to be considered at some point. And I think that is enough impetus to get these discussions going. And I hope the car manufacturers also have the impetus to make sure that their cars are going to operate for a long time on the road without problems for the OBD system.

Thank you.

CHAIRWOMAN RIORDAN: Thank you very much.

And let me ask the Board members if there are any questions for this witness?

Mr. Parnell?

MR. PARNELL: Not for the witness, but for legal counsel.

CHAIRWOMAN RIORDAN: Yes, Mr. Parnell.

MR. PARNELL: A comment was made previously that, with respect to the antitampering provisions, that there were plenty of protections outside what the Board may or may not do.

In your view, is it incumbent for the Board to speak on this issue? Or are those protections indeed there?

MR. TERRIS: We have authority. We have authority under 43018 to establish regulations for the OBD systems.

And, as part of that, we have authority to set up antitampering requirements.

To the extent that -- I think some of the written comments mentioned that we don't have authority under the Clean Air Act. That's not necessarily true, not true in fact. We have authority under 209(b) to create California standards. And we have to go through a waiver process to basically get an exemption from the preemption -- general preemptions under 209(a).

And we have submitted a waiver request. It's held in abeyance right now, pending these amendments. And, hopefully, there'll be a waiver hearing in early winter, February/March to this year -- next year.

MR. PARNELL: My question didn't go to the issue of whether or not we have authority. It went to the issue of whether or not there are other protections in the general body of law someplace that would grant these people the protections that they need in the absence of the Air Board speaking on the issue. And that's what I think I heard someone allude to. It's the other body of law, whatever that means, that I --

MR. TERRIS: Under Section 202, as part of the waiver process, there'll be an evaluation of whether or not the California regulations are consistent and more protective than federal law. And we can create provisions

that are more protective than what's required under the federal law.

MR. PARNELL: I'm not explaining myself.

CHAIRWOMAN RIORDAN: Ms. Edgerton, do you want to comment?

MR. PARNELL: Counsel, you want to -- it was alluded to that there is a body of law that grants automobile or computer, or otherwise computer manufacturers protections under law that already exists, sufficient so that, if the Air Board were to take a respite on this issue until further developments, as has been suggested, were made, that there would be indeed some protection in place.

Which then suggests to me that it's not incumbent for us to act right now on this issue.

MR. ALBU: I think the concern we have is that, although there may be provisions in place, tampering is extremely hard to detect, and it may take place. And we can't enforce against it. That's our concern.

Also, if I might just add, the reason we want to put this in -- the staff wants to put this in place is because one of the purposes that our regulations provide is that, when a manager of an engineering department goes to his boss and says, "We need to develop computer systems that have antitampering provisions," they need leadtime to do that and they need to spend resources.

If they can't point to something in a regulation that requires them to look at this, the manager is usually turned down or may often be turned down. And there are some technologies being looked at right now between Motorola and the auto industry on boot loaders that can't be monitored when they're deencrypting information.

And these kinds of technologies will not move forward if we don't put these regulations in place now. And that's why we want to do that.

We are not trying to foreclose discussions or other alternatives, but we want to keep the technology moving forward. Otherwise, the consumers will be paying more than they need to to do smog checks, when the OBD II system is far better than the current smog check.

MR. PARNELL: Thank you.

CHAIRWOMAN RIORDAN: Ms. Edgerton.

MS. EDGERTON: It seems to me you can separate out the issues. And I would want to spend quite a lot of time looking at these issues before I would say anything definitive. I'm just speaking as a Board member, not -- but with respect to the intellectual property rights that companies have on -- with respect to their software, that's a proprietary right that they can choose to exercise or not exercise.

That's within their prerogatives. That is

different than this private property issue. That's a different issue in some respects from what we, as the Air Board, face, in my view, because we are governed by the idea of we're supposed to be cleaning the air by emissions reductions.

And one of the areas that we've specifically had difficulty with, as a State and even as a country, is with inspection and maintenance and the reliability of systems that try to control emissions over time.

So, it seems that the tampering reason -- the rationale behind ours, our antitampering provision, springs from a desire to protect the reliability of the emissions control measures that are in the cars.

So, we would have a right to -- the State of California, or the Air Resources Board, or the public -- would have -- has a public interest, a different kind of interest, not a private property interest, but a different kind of interest in ensuring that those are systems which are reliable so that we can continue to meet our SIP obligations, and we can continue to achieve those.

I think that's something we need to look at. I think Mr. Kenny says you all will be looking at that some more to try to split out those issues, so we can look at them more clearly.

It does seem to me that there's a need -- there's

a different interest that needs to be protected with respect to our antitampering and the other intellectual property interests that the auto manufacturers might have and that the parts industry might have as you develop your own software, if you were to do that. It seems to me that's another option that you would have --

MR. LOWE: If we're permitted to, yes.

MS. EDGERTON: If you're permitted to.

MR. LOWE: Right.

MS. EDGERTON: But I don't really see that our action is precisely blocking you from doing that. And I think our action is more directed toward the reliability of the OBD II systems, which we are trying to put in place.

If you'd like to comment on that, you can.

MR. LOWE: Well, if we can't access the system, and if we can't build parts that are going to operate properly with that system, it would make it difficult for us to do.

There might be some cases where we -- a software change might be necessary. And there might be cases where a part we may have might improve on the emissions of the vehicle over the OE part. And if a software change can't be made or improved in some way, then under the antitampering provisions, we can't touch that. We're not allowed to go into it.

There's a lot of implications on how we're going to be able to operate under these new systems, because it does change. We used to be able to -- it was pretty much, once the car got out there, it was competitive business between the OEs, the aftermarket, between aftermarket companies and how we operated.

Now, you're saying, well, the competition is still there, but the OEs determine who their competitors are going to be, because they're the ones that allow the key to the system.

And we just want to be able to continue to compete on a head-to-head basis with the OEs on these systems. We're not asking for an edge over the OEs, just the ability to continue to compete in that market.

And that's what we're concerned about with this.

MS. EDGERTON: Uh-huh. I appreciate your concern. And I understand that, irrespective of what we do, you'll be moving forward to try to figure out ways that you can participate in that market.

Our concern here is that the reliability of the systems, irrespective --

MR. LOWE: We're concerned about that, too.

MS. EDGERTON: -- irrespective of who's involved in it --

MR. LOWE: We're very concerned about that.

MS. EDGERTON: -- is sound, and that's our role. Thank you.

CHAIRWOMAN RIORDAN: Supervisor Vagim.

SUPERVISOR VAGIM: Thank you, Madam Chair.

You know, we've had antitampering provisions in, I think, all the California emission laws. The people tampered with the emission systems. They took them off, and they bypassed them, and all that kind of stuff. But when they went to inspection, they wanted to get a certificate, they had to put them back together again.

Now, what we're saying is that we know that happens, so let's really tightened it up and make it part of a proprietary trade secret, and lock it up in a safe and give one guy a key to it.

And, again, the computer software industry has dealt with that since time immemorial, and there hasn't been one place where they've been actually -- absolutely been able to safeguard that.

It's been busted everytime they try something different. If you remember, "Don't copy the floppy," and they had the ability to only copy once and then you couldn't copy. Well, there were those guys who came out with software that allowed you to override and copy a hundred time.s

Then they tried to do something else. Well, I

mean, there is some fairly good evidence it wasn't some crazy person who put a virus out in the public domain that caused all these problems with computers. It was the software writers themselves that kind slid that in there to say, "I told you so. You shouldn't copy that thing."

And so, you've got that kind of brewing here. And my concerns, and I've watched it, is that you can build the highest wall and think that no one's ever going to climb it. But what you do is you complicate the whole issue, because there's more sophistication in busting the regulation. Whether it's illegal or some other method in which it's quietly moved through the process, it all is tampering with the system.

And I think we need to have the ability to know that these systems -- the integrity of the system's being maintained, but yet the folks in the open marketplace have at this so they can be -- so we can continue with what we've always enjoyed in automobiles, the fact that it's been an open, competitive marketplace in an aftermarket world.

And we're tampering with that with this regulation. And I'm concerned about it.

CHAIRWOMAN RIORDAN: Okay. Thank you. Any other questions, comments?

I'd like to thank this witness and invite the next witness forward, Jack Heyler, and he represents the

California Automotive Service Councils.

MR. HEYLER: Good afternoon. Thank you for the opportunity to be here. I am Jack Heyler, a Diagnostic Consultant to Automotive Service Councils. It's a fancy title for a tired old mechanic.

(Laughter.)

MR. HEYLER: That is basically what I am.

Our association is the largest association of independent repair facilities in California, so I bring you a little different perspective than you've heard at least so far today.

First, I think it's important to note that ASC supports these OBD revisions in general. ASC has supported all on-board diagnostics development since I first became involved in '85 and '86. And maybe I should mention, I was one of the founding members of the Diagnostics Committee in the Society of Automotive Engineers, which developed and is continuing to develop the standards which support the on-board diagnostics regulations.

There are several provisions we would like to emphasize, the importance that I want to comment on, and we do have some concerns.

For OBD II to maximize the results from improved emission system diagnosis and repair, both for I&M fails and for in-service maintenance, don't forget emissions are

repaired everyday, not every two years. That's often overlooked.

The regulation, we feel, must address related needs and not facilitate restrictions on competition, which you just heard addressed, in auto repair in general. And I think this is critical to the success of I&M programs and to overall emissions maintenance as I said.

First, we are concerned that independents have access to all areas of service information which could affect emissions. That means almost all systems on the vehicle.

Next, we're concerned that the comprehensive component monitoring requirement be as strong as possible for the reason I just mentioned.

The systems are interrelated. They work together. You can have a problem in the right rear brake that could increase emissions. So, it's important to provide technicians a complete view of the data from all the components which can interrelate and which affect emissions.

And it also is especially important, since older cars can have a stackup of conditions, which are hard to sort out in the field on the shop floor. These are the vehicles which both fail I&M more frequently and require more frequent routine service between tests. And they're a large part of the emitting population of vehicles. You

might say high-emitting population of vehicles.

Another problem is that we need a standardized system for reprogramming on-board computer memory. Both the tools and the procedures need to be addressed here, which you might define as both hardware and software.

We are concerned that the system be secure. And the reason is that we cannot repair a nonstandard vehicle. So, we're concerned that the reprogramming methodology be accessible to us. But we are also concerned that it be secure. That is just as important to us as it is to the Air Resources Board and the public in general.

As I said before, we can't properly repair tampered vehicles. But we also know security is not guaranteed by restricting reprogramming, however it's restricted -- whether it be the dealers or through any controlled source that does not allow open competition in the marketplace.

Also, we feel that there's a need to standardize and facilitate access to service information databases by requiring the on-board system to electronically identify the vehicle, its current calibration status, and any approved modifications which have been introduced.

And maybe most important to the repair technician, to establish automatically a link to appropriate off-board service information tools and databases.

That's implied sort of in this proposed regulation, but it's not clear to me that that requirement exists.

There's also a problem we see with competitive parts availability, because, in fact, right now, there are some vehicle dealers who refuse to discount a part to me, their competitor. So, I have to add to the part and sell it over list price in order to stay in business.

And it becomes very hard to stay in business when you're charging more than your competitor. So, we're on an uneven footing right now, and there are concerns that if the parts question is not addressed -- and incidentally, as part of that, information for the toolmakers who design the tools that we use to diagnose and repair vehicles, the diagnostic tools being scan tools, electronic devices. If they cannot have the kind of information as the parts makers that we're also talking about, then we can't have the sophisticated kinds of diagnostic equipment we have to have to be competitive, not to mention, once again, the parts problem.

So, to sum up, the independent aftermarket needs these features. And I think they're needed to make a successful I&M program or to maintain vehicles and service properly.

There have been current surveys that indicate how bad the need is. It is bad.

So, I would suggest that air quality regulators cannot expect the best results from OBD II unless technicians who achieve the emission reductions have all the tools they need to do that.

Thank you.

CHAIRWOMAN RIORDAN: Thank you very much. And let me ask the Board members if there are any questions for this witness.

Ms. Edgerton?

MS. EDGERTON: Do you get any comfort from the notion that the staff has said that they're prepared to go forward and have a workshop in 1996, to look at most of these things. And then, if they see that there's a need to have changes, they'll get back to us?

That's a key point here in this whole discussion, it seems to me, that it's pretty much already agreed to that there will be a 1996 workshop. I don't misunderstand that?

MR. HEYLER: No. Thank you for asking that question, because it reminds me of something I skipped over in my presentation, and I'll answer the question.

There are two levels in terms of reprogramming and tampering protection, and this is from the standpoint of the aftermarket. The first level is to address the vehicles that have been out there starting in 1992, a larger proportion of the fleet every year. If we extend out till

1999, a period where independents have no opportunity to reprogram the vehicle that needs reprogramming for an update to a problem, then we're in extremely noncompetitive position. So, that's Tier 1, you might say.

Tier 2 -- and this is where I applaud the staff's work -- is to develop a system perhaps that would standardize access to assure a higher level of integrity to the system and resistance to tampering. So, I would say we'd support that enthusiastically. But it doesn't solve the problem if, as a businessman, you take six years' worth of vehicles out of my shop and move them over into a franchise dealer's shop, I may not survive. At least my business would be hard to make a living at. As you may be well aware, when I was in business for 47 years, and I learned fairly soon that it was the last 10 percent of volume that provides a hundred percent of profit in the years when I did make a profit.

So, it doesn't take a large bite out of the independent aftermarket to place a lot of those businesses in jeopardy. We're very concerned about that. I hope that answers your question. It may be more than you wanted to hear.

MS. EDGERTON: No. I appreciate all that you have said. But I also am aware of the points that you made that there are meetings that are starting with the afterparts

(sic), and the manufacturers, and the ARB. I guess they're starting -- now we're in December of 1994 --

MR. CROSS: We're starting immediately. I think that may be the confusion. In other words, the '96 workshop is a progress evaluation with -- on what the manufacturers are doing to meet some of the more difficult requirements. The meetings to deal with the service problems, the parts problems are essentially starting immediately. The first workshop is in February.

MR. ALBU: We're going to have some form of meeting in February, '95, and dialogue this spring. I've already talked with AAMA again about the aftermarket parts. And there's already some understanding being gained, in that they understand that the aftermarket parts manufacturers have to be in business.

And I think they're simply saying, at this point, at least, that rather than go back and redesign their OBD system, why not provide the parts specifications for the OEM parts to the aftermarket directly at a reasonable cost to let them copy it.

So, I think this can work out. It's just that we have to keep talking. I think Jack's point was that 1999 isn't soon enough to have tampering provisions in place and the other provisions in place to do the reprogramming generically.

And I think he's also saying that it's important to have all the parts monitored to ensure the mechanic has a real good chance to repair the car. I think we support all those points.

MS. EDGERTON: If I understand you, the idea -- from the staff's point of view -- would be that you would be back to us as -- with proposals for revisions after you have a series of say the first set of meetings in February, '95. And if it turns out that our regulations were -- if you found a better way to deal with these issues that we're talking about -- it really is kind of difficult for us to -- it is a very complex body of material that's before us. It's very difficult in this kind of forum to handle that.

MR. CROSS: It may turn out that the meetings will facilitate an awful lot of what needs to be done. Because, essentially, I think, many of these things are business transactions, and communication, and relationships which need to be established in order to get these segments of the industry working together on solving this problem.

It's hard to say whether that will result in necessarily regulatory changes in the immediate or near future. I think it's more a matter of -- the first step is to make sure that everybody's working on the same playing field and going the same way with the same goals, then we go from there.

MR. HEYLER: Thank you.

MS. EDGERTON: Thank you.

CHAIRWOMAN RIORDAN: Supervisor Vagim?

SUPERVISOR VAGIM: Thank you, Madam Chair.

I just want to make sure I understand. You said six years. That means from now, '94, you have a proprietary antitampering provision, right? So, '99, you're saying six years out of your --

MR. HEYLER: Basically, what I was referring to was the application of double E-PROM technology. The vehicles began, as I understand it, in 1992, but a small volume.

SUPERVISOR VAGIM: And as '94 kicks in --

MR. HEYLER: Yeah. You see, that technology is out on the streets right now. It is completely proprietary. I cannot work on a vehicle that needs recalibration.

SUPERVISOR VAGIM: The question, I guess, that I derive from that is a lot of proprietary effort goes into the so-called stagnant or dynamic noncomputerized emission devices. Yet, that's typically available aftermarket, isn't it, after the manufacturer puts them out? Or do you still have to go to the manufacturer for some of those parts?

MR. HEYLER: Historically, a larger percentage were available. Currently, in my view, it's -- from the field -- it's less and less aftermarket replacement parts,

and many emission parts aren't even available.

SUPERVISOR VAGIM: Yet, once your folks or the people in the aftermarket part production tears them down and sees what they're made of, they put most of those together. They do that, don't they?

MR. HEYLER: That's correct. I can't speak for that, because I'm really not in the parts business. But I would observe one thing. And that is that, as I buy a vehicle, I buy that entire package. I buy it with a water pump. I buy it with the computer and the program in it.

SUPERVISOR VAGIM: So, basically, that's all being done now. And essentially, even if we made this proprietary, someone theoretically could break it down -- no matter how much it's encrypted, could break it down, figure out what's on the E-PROM, put an E-PROM illegally together, and sell in the aftermarket black market.

MR. HEYLER: That's currently going on. We'd all like to deal with that and reduce that.

SUPERVISOR VAGIM: Sure. So, really, it doesn't do anything to help our emission control. Really, what we're after is emission control. So, why not put it out there so all people can create it, since they're going to get to it anyway and create a carbon copy of it. And they're doing that with nonsoftware equipment emission devices.

I don't see what the difference is. I mean, just because it's software and we can say now it's proprietary, to me, is -- I don't think you can equate what we're trying to do here with the computer world and all its different software ramifications.

And so, it's almost like should be available for-- it's still the manufacturer's car with still that emblem on it that's going to be driving on the streets. And it should have a reliable part in it. And just because it has another manufacturer's stamp on it under the hood somewhere should not be, I don't think, any more proprietary than any of the other devices that are being put on cars today, even though they were proprietary when they were being shipped for new market value because they had to meet a standard that this Board put out.

And what we're doing now is creating a new level of protection for those who manufacture; even though it will be illegal, it won't stop it from being done. And I don't now if that's the goal of this? Are we to clean up air or are we a -- be a patent office?

CHAIRWOMAN RIORDAN: Mr. Cross, did you have a comment?

MR. CROSS: Well, a lot of what was just said I think is important to clarify.

Basically, what happened was that automotive

computers used to have chips in them, which contained the program. You could physically change the chip, which had a problem.

And what's happened, as Mr. Heyler has pointed out, is that many of the automotive computers have a chip in them which can be reprogrammed without physically changing it. In other words, it's a chip which is, quote, "programmable." And that saves the car manufacturers lots of money, because they can use the same computer in a whole bunch of different models, and just tell the chip in there that this computer is going into a certain model or a certain version of the car.

So, they have very big computers that standardize them and then program these chips.

But the problem is that the amount of information that goes on those chips now is basically the complete calibration of the engine and the complete calibration of the diagnostic system. And so, the chip basically has all the parameters that control emissions on it and all of the codes which decide whether or not a component is broken or not on it; in other words, all the fault codes' decisions.

And so, when you're talking about programming access to these computers, you're really basically talking about the issue of completely redoing the calibration of the vehicle or completely -- you can -- if you had,

theoretically, full access to this chip on the computer, you could completely turn of OBD, for example, if you wanted to, and have it give a smog check station code that there was nothing wrong with the car.

And the staff is obviously a little concerned about that, because I can envision scenarios where a car has got 150,000 miles on it and somebody is really not to turn off OBD and have it check out okay.

The way we've been trying to deal with this dilemma, if you will, is working with the car industry to make it sort of difficult for the neophyte to get into these computers. Because the other option would be to go back to chips which you just burn the code into, and we have to completely remove them to reprogram, which is more costly for them.

What we've been trying to do is create some standardized way of getting into the computer to change it to do legitimate things that need to be done; in other words, allowing the independents and auto service centers to all go through sort of the same physical path, which is what the staff proposal stalks about, through a computer at the manufacturer's facility and back to the car.

And by doing all this, essentially, what you're doing is you're providing access to the things in the computer that are likely to need to be changed, and some

record of it, but not providing access to completely redo it.

And I think that the Supervisor's right that there is some risk in any of these things. People are still going to figure out ways to completely turn off OBD. And, honestly, that scares the heck out of staff. And that's something that we're very, very concerned about in the long term with this system.

But we think that putting a standardized way of connecting the service people to the computer without completely opening it up is really an important thing to do. And we think that the tampering provisions that we put in here establish that, and also kind of get us all talking to each other about how best to do this.

MR. ALBU: I just had one last thing.

CHAIRWOMAN RIORDAN: Yes.

MR. ALBU: We think that there's not going to be a real great incentive for hackers to get into the system, because, from our initial discussions, we will be changing the encryption and changing the seed and key on a fairly regular basis; so that any hackers are going to spend an enormous amount of time doing this kind of work and it won't be cost-effective.

In addition,to provide this service, if you will, to those who would like to tamper, they would have to

advertise to make any money, then we'll get them.

So, I think what we're saying is that we think that a reasonable, practical level of security can be put in place. And I'm not that concerned about professional hackers, because I don't think it's going to make a good business case out of this.

Those in the parts industry that develop parts that are not really appropriate, that don't pass emission, I don't believe is going to be cost-effective enough to do so.

SUPERVISOR VAGIM: I think the fear is that those who are legitimate, who make parts now, will now have an inability to make viable copies in the aftermarket world that work just as well in a production car.

MR. CROSS: You're suggesting reverse engineering, and they basically take the part off and measure its specifications, and replicate it.

SUPERVISOR VAGIM: Okay. But again, if one person controls the key and you can't have access unless you go to that person, aren't you really creating a monopoly?

MR. ALBU: No, because the part would have to be certified with us, and we would give the approval to go with that system.

SUPERVISOR VAGIM: So, ARB, then, is going to be the gatekeeper for those who come in and want to have --

MR. ALBU: If there's a certified package that

we've approved, we can grant the approval to get into the system.

SUPERVISOR VAGIM: Someone comes up with an aftermarket (sic) and puts a system together and meets all the tests, you'll give them the key?

MR. ALBU: Yes.

SUPERVISOR VAGIM: And what will be the -- who will have the -- what about the tariff of -- the cost of the key? Who regulates that?

MR. ALBU: The seed and key is provided by the --

MR. CROSS: We do it now.

MR. ALBU: We do it now.

MR. CROSS: It's an executive order essentially.

SUPERVISOR VAGIM: But you don't do it -- you aren't going to do it for free.

MR. CROSS: There are two -- we've been talking about two issues here; that we keep jumping a little bit. One is the question of the aftermarket part manufacturer which wants to make replacement parts for a car.

SUPERVISOR VAGIM: Uh-huh.

MR. CROSS: And the question is whether they need full access to the computer on the car or not to do that.

SUPERVISOR VAGIM: Well, let's say they want to make the computer. Let's say they want to go to the OEM or buy some Motorola, or whatever, and put the system together

and sell it to him. Now, you're saying that's going to be a trade secret part that no one else can get to?

MR. CROSS: Well, they can make a computer, but then they have to -- they would have to go through what's called an aftermarket part certification process. And if they demonstrate that the computer doesn't cause the vehicle too exceed emission standards --

SUPERVISOR VAGIM: But now, what you're doing differently here is you're saying, in order to be able to keep up with the seed and key change and the algorithm change, you've got to go to the guy that it originated with and keep asking permission to get into his system, to sign onto his master computer. Even though you gave him the seed and key to go in there, who's going to control the tariff to go into that master computer?

MR. ALBU: That's something that they have to work together on. It's in the best interest of industry to accomplish this as well.

SUPERVISOR VAGIM: Okay. But what he's saying is that that's -- and what other guys are saying -- that could become a monopolistic door that they can't go through without paying higher and higher tariffs to make them noncompetitive.

MR. CROSS: I think he's saying it is now, and he wants that to change.

SUPERVISOR VAGIM: Okay. So, are you saying --

MR. CROSS: And we're working -- and we're endeavoring to change it with him and --

SUPERVISOR VAGIM: He's saying that could be six years' worth of automobiles by the time we get to that.

So, what are we going to do about it? Talk more about it?

MR. CROSS: Workshop in February/

SUPERVISOR VAGIM: Workshop in February, or workshop in '96? I'm not sure which.

MR. CROSS: Workshop in February. The '96 workshop is on the other stuff relating to OEMs' progress on meeting the requirements.

CHAIRWOMAN RIORDAN: Ms. Edgerton has another question, followed by Mayor Hilligoss.

MS. EDGERTON: Well, I want to comment. I think that our obligation here -- we are not creating a black market. This proposal does not create a black market. This proposal says you can't tamper with the mechanism here, which would be this antitampering provision.

Indirectly, it has an effect on the market. That is a separate matter. And I -- my preliminary thought on that is that this is something that needs to be resolved by the market among the parties -- the industry, the manufacturers, and the parts people, and so forth. They are

the people equipped to do that.

We say don't have tampering with these provisions. I don't think that it's appropriate to say that we are creating -- by setting up a regulation which provides that you can't tamper with it -- a black market.

SUPERVISOR VAGIM: Let me clarify. The black market isn't created because we say no tampering. Clearly, that is an issue that this agency's been standing behind from Day One. The issue becomes a potential black market or a violation -- or creating people who want to do something right, doing something illegal, or without going to one gatekeeper in each manufacturer's controlled empire.

(Thereupon, there was a pause in the proceedings to allow the reporter to replenish her Stenograph paper.)

SUPERVISOR VAGIM: So, what we're creating, unlike any other part ever discussed before, which was reverse engineering to be certified, and to work, and all that -- is that the master gatekeeper will be the person who originally wrote it. And in order to go -- for them to go to manufacture a part that is equal to meet our regulation, they will always have to go back to that gatekeeper to ask permission.

And that is, basically, we are, through regulation, creating a path of more like a monopoly.

MS. EDGERTON: I guess my thought would be that perhaps we need to have someone come back and discuss the macro and microeconomic effects with the tampering provision.

I think your insights are very useful. I don't -- and I understand what you're saying. And I think they are very important observations.

By the same token, it is simply the case, it seems to me, in our economic system, the technological innovation in one sector does impact the overall competitive structure. And I don't know how much we can do about that. It's sort of like "gravity is."

And I'm not sure -- I, personally, am not sure what the significance of our role is in this overall effect of technological innovation and advancement in automobiles and diagnostic systems with respect to the adjustments in the overall competitive market.

I just don't see that as my -- and I'm not sure that that's my role here, is to make sure they're not a monopoly. If you want to have more discussion, that's fine. I just think that is something that happens when there's technological innovation, irrespective of what the Air Board does.

SUPERVISOR VAGIM: Our regulations shouldn't create monopolies either, nor should they necessarily try to

keep competitors at each other's throats either.

But the fact is this is deliberately accomplishing the latter. And I just don't want to see us getting into that. We're lending ourselves to the reversal of what kept the automobile industry available -- the automobile available to great masses of this country.

SUPERVISOR VAGIM: Mayor Hilligoss.

MAYOR HILLIGOSS: Yes, I wanted to ask if we put in the antitampering rule, what would be the incentives for the manufacturers to even give up that knowledge?

SUPERVISOR VAGIM: What's the incentives now --

CHAIRWOMAN RIORDAN: Wait, wait. Who were you asking that off?

MAYOR HILLIGOSS: Staff or anybody that wants to answer it.

CHAIRWOMAN RIORDAN: Well, let's let staff answer it, then go back to Supervisor Vagim.

Staff, did you hear the question?

MR. CACKETTE: We were having an inappropriate conference.

CHAIRWOMAN RIORDAN: You weren't having a conference.

MR. CACKETTE: On a technical issue.

CHAIRWOMAN RIORDAN: Perhaps you can repeat your question.

MAYOR HILLIGOSS: If we pass the antitampering rule in this today, what would be the incentives for the manufacturers to give up their knowledge? I see no incentive at all.

In a dealership, the service end of the dealership is the one that traditionally loses money. And this would keep the care owners coming back to the dealerships.

MR. CACKETTE: Let me answer part of it. On the reprogramming part of it, which is, if there's a manufacturer authorized change to the computer code, federal law requires the manufacturer to make that available to everybody. And that's the rulemaking we've been talking about. We've been a staunch supporter of that concept that, when there are authorized changes going on in the computer codes, all legitimate repair people ought to have access.

And the controls that we've talked about, going through the manufacturer is one way of making sure that that stays legitimate. I think that supports that and we've worked for that a long time.

So, on the reprogramming part, there's no way the manufacturer can say, "Only my dealers can reprogram a car."

Now, the parts aspect of it, that's a little bit different. What we've been saying there is we want to try to -- the legitimate way out of this, I think, is the marketplace way, which is that the car manufacturers work

with the aftermarket parts people to provide the information in a way that allows them to design replacement parts and for enhanced parts as well, specialty parts.

And the industry, in large, has relied on the existence of the aftermarket. I don't think there's been any attempt to try to put them out of business. I think they serve a very useful purpose. The provide parts that the manufacturers no longer want to provide or stock. They provide enhancements to people's cars and make owning that car more attractive; that is, they gussy it up, or change its performance, or whatever.

And I think that what we've tried to do is stimulate the three parties -- the two parties coming together so that there could be relationship established that isn't based on having to be a computer hacker to steal the code directly out of the computer.

MAYOR HILLIGOSS: What you're saying, then, is that there's a federal law saying they have to share?

MR. CACKETTE: They have to share on reprogramming. I don't think it says they have to share on parts, just on the programming.

MR. HEYLER: It's not clarified.

MR. CACKETTE: It's just on the programming piece. So, what we're trying to do is stimulate that other part on the parts, stimulate the parties coming together. And

Steve's already gone to a lot of effort to do that in his workshops to help it.

And I'll ask Steve. Has there been resistance by the manufacturers?

MR. ALBU: I think that the initial discussion and the conclusion of it -- the consensus out of the meetings, as I understood it, was that the OEMs felt that it would make ore sense, rather than trying to change the OBD system to accommodate a part, a different part design, just simply give the part manufacturer the OEM part design specs to copy at some reasonable fee. It's how you deal with anybody. I mean it's, you know. . .

CHAIRWOMAN RIORDAN: Okay? Do you have a follow-on question, Mayor Hilligoss?

MAYOR HILLIGOSS: Well, they say that they have to share, so that's the incentive then.

SUPERVISOR VAGIM: The issue is at some "reasonable" fee.

MAYOR HILLIGOSS: Yeah.

SUPERVISOR VAGIM: Now they can basically emulate a carbon copy and put it in the system, and it does not infringe.

MR. ALBU I think the person could still copy a part on his own and put it in place. It's just that it might be easier to just simply get the specs and buy them.

CHAIRWOMAN RIORDAN: All right. Let's move on. One final comment from the witness.

MR. HEYLER: I'll make it very brief. But I think the discussion about monopoly, which would impact my constituency, the independent auto repair shops, and probably put a lot of them out of business, is an important question.

And I think the question before the Board really should be the impact on the air quality program. And I agree in the sense that the impact on us, while important to us, will, in turn, have an impact on the air quality program.

I was in every air quality program as a shop owner and later as a close observer -- a whole lifetime, since the early sixties. And I have seen three programs fail. And I know the reasons they failed. And the reasons they failed were they weren't acceptable to the public and they would cause the public inconvenience or additional cost in various ways, or they affected the industry -- repair industry in various ways. And we conveyed that dissatisfaction to the public and the legislators who, in turn, took action.

So, I think it's important to put the monopoly concern into that context.

CHAIRWOMAN RIORDAN: Thank you.

MR. HEYLER: Thank you.

CHAIRWOMAN RIORDAN: Let me call on our final witness today, which is Chris Weaver, representing the Natural Gas Vehicle Coalition.

MR. WEAVER: Calling my name took me a little by surprise after that long interval.

I'm speaking now generally on behalf of the Natural Gas Vehicle --

CHAIRWOMAN RIORDAN: Could you just raise the microphone.

Thank you very much.

MR. WEAVER: I'm speaking now generally on behalf of the natural gas vehicle industry, and I'd like to raise just a couple of technical issues.

I will mention in passing that this issue of access to OBD calibrations is one of vital interest as well to people who want to build systems, such as aftermarket natural gas conversion kits. So, I expect they will be very much involved in the discussion on it. But I don't want to offer a position on it now.

The technical issues I'd like to address are two. One concerns the use of the word hydrocarbons throughout the proposed OBD document, the regulations. Hydrocarbons is, in our view, a dangerously imprecise word, because it is generally interpreted to mean total hydrocarbons as measured by a flame ionization detector.

And, in fact, the regulated quantities, when you're talking about TLEVs, LEVs, and ULEVs, which are vehicles that will mostly have to deal with these regulations, is not hydrocarbons, but reactivity adjusted nonmethane organic gas. And from the standpoint of gasoline vehicles, the difference between those two terms isn't very important. From the standpoint of natural gas vehicles, methanol vehicles, ethanol vehicles, the difference is critical.

And I would like to request the staff, in the final version of the regulations, go through and substitute in the correct term, which, if I understand, your intention is, in fact, reactivity adjusted NMOG and not hydrocarbons, in order to preclude the appearance of any unfortunate misunderstandings when the time comes to actually certify some natural gas vehicles under these regulations.

MR. LAGARIAS: Madam Chair?

CHAIRWOMAN RIORDAN: Yes, Mr. Lagarias.

MR. LAGARIAS: Well, I think you have a point, as far as nonmethane organic gases are concerned. But we have not -- the issue of reactivity adjustment is a separate issue that we deal with in a different manner. I don't think reactivity adjusted is appropriate.

MR. WEAVER: Well --

CHAIRWOMAN RIORDAN: Let me just ask staff if

there's a comment. I didn't know if you had finished your testimony or if there's other --

MR. WEAVER: I'm sorry. There's one other issue, and perhaps we should do both of them.

CHAIRWOMAN RIORDAN: Why don't you do that, and then we can ask staff.

MR. WEAVER: The other one is also a technical issue and pretty minor, except to us who are doing natural gas vehicles.

And that is that for lean-burn natural gas engines, the exact same issues apply as applied to diesel engines when it comes to assessing catalyst efficiency. We don't know of any technology that will work for those engines because of the presence of excess air in the exhaust stream. We'd like those included in the exemption for the time being.

CHAIRWOMAN RIORDAN: Okay. Now, staff, there are two issues that are raised by the witness. Do you have any comments?

MR. CROSS: Quite honestly, this one is -- the first one is on reactivity. The reactivity is one that we hadn't contemplated until this witness raised it within the context of the on-board diagnostics regulations, because it is one of will it or will it not affect the technical stringency of the regulation.

In other words, our frame of reference has always been primarily gasoline and diesel powered engines. And our thinking about stringency is in that frame of reference. And so, I think we agree that needs to be looked at.

But I'm not ready at this point to necessarily agree that it's -- out of hand that the correction that Chris is asking for is the right thing to do.

I think it's something that we want to look at more closely. Because with different fuels, you have different things that happen in terms of what technically can and can't be done.

CHAIRWOMAN RIORDAN: Should we leave it that that is an item that will be looked into and that we'll --

MR. CROSS: Sure. I think we can look at it. I just don't want to speak on it off the cuff right now.

CHAIRWOMAN RIORDAN: All right. Then the second.

MR. CROSS: We were arguing about that one; so, we didn't hear the second one. Could you quickly repeat it?

MR. WEAVER: Yes. The second item is that for lean-burn natural gas engines that have catalysts, as some of them do, the same technical limitations apply as applied to diesel engines with catalysts. They have excess air in the exhaust and, therefore, the ways you've defined to measure catalyst efficiency won't work. And we don't know of another way.

MR. CROSS: Okay. I'd like put that on the same list.

CHAIRWOMAN RIORDAN: We'll study that and get back.

Okay. Well, you've obviously raised two issues that are something that staff needs to look into. I appreciate that.

Are there any questions for this witness?

No. Thank you very much for being here, Mr. Weaver. Appreciate that.

That concludes the list of people who have signed up on our public comment list. Let me ask the staff, were there any written comments by people that were not able to testify today? There were a number of people, of course, who testified who -- we have taken your written comments to make them part of the record.

But are there others?

MR. LYONS: Yes, there are a few. First, Nissan. They state that the .02 inch leak detection requirement is premature, and they want additional time to study systems with .04 inch leak detection systems.

For misfire detection, they ask us to consider, in terms of temporary disablement of the misfire detection system, things other than transmission shifts or rough roads.

And those two items are the only examples they mention, but there are other things.

And for LEV catalyst monitoring, they state that the ARB is moving in the right direction; however, they have some concerns, especially on larger engines, and ask us to review it in calendar year 1996.

The next is IMPCO, two comments. The first is that our tampering system requirements are overburdensome to the aftermarket conversion industry.

The second is that, in terms of alternative fuel retrofit, is that the exemption provision for alternative fuel vehicles should extend until the 1999 model year. And that actually is the case in the regulation. I think that our proposal was misread.

Southern California Gas Company supports our rulemaking, particularly the additional leadtime for alternative fuel retrofits.

And the Engine Manufacturers Association supports our revisions, in particular the provision to extend SAE J1939 as an alternate communication protocol for medium-duty vehicles.

CHAIRWOMAN RIORDAN: Does that conclude, then, all of the written testimony?

MR. LYONS: Yes, it does.

CHAIRWOMAN RIORDAN: Mr. Boyd, are there any other

further comments by staff?

MR. BOYD: No, Madam Chair. I believe that concludes any information we have for the record.

CHAIRWOMAN RIORDAN: Then I'm going to official close the record. Since all the testimony, written submissions, and staff comments for this item have been entered into the record, and the Board has not granted an extension of the comment period, so this item will include the caveat: Written or oral comments received after the comment period has been closed will not be accepted as part of the official record on this particular agenda item.

We need to address the ex parte communications. So, Board members, have any of you had any ex parte communication? And, if so, you need to disclose those now.

MR. CALHOUN: I received some written comments from Ford, GM, and Chrysler. But the comments that they submitted were essentially the same as their testimony.

CHAIRWOMAN RIORDAN: All right. And those were written.

MR. CALHOUN: Yes.

CHAIRWOMAN RIORDAN: Thank you, Mr. Calhoun. Is there anyone else?

All right. Seeing none, then that would close that.

A resolution has been passed out to you,

Resolution 94-67. Let's take a minute and look through this.

CHAIRWOMAN RIORDAN: Mr. Vagim?

SUPERVISOR VAGIM: In the proposed regulation, there's a provision in the tamper proofing that equivalent methods shall be considered by the Executive Officer. Is that sufficient in your coming hearing or workshops?

If you find an acceptable alternate method that would be considered problematic for the aftermarket folks, it could be put in effect with this clause?

MR. ALBU: Yes. We've had some initial discussions with some manufacturers. There are other methods besides what we proposed, so there are ways of handling all these issues.

SUPERVISOR VAGIM: Now, I want to make sure, though, in your future discussions that are pending, that are imminent in February, or something like that you mentioned, where some of these problems will be rediscussed, that if you do find some fixes that are satisfactory to the aftermarket folks, that can be handled through this clause then?

MR. ALBU: Yes.

SUPERVISOR VAGIM: Thank you.

MR. CALHOUN: Madam Chair?

CHAIRWOMAN RIORDAN: Yes. Mr. Calhoun, I think

everybody's -- we've all read this.

MR. CALHOUN: Before I recommend adoption of Resolution 94-67, I'd like to preface my comments with -- I'd like to preface my comments.

We started this discussion off this morning, and I reminded the Board and the members of the audience that OBD regulations are, in my view, the most complex regulations that this Board has had to deal with. And I think the very fact that we are here today is an indication that they are, in fact, complex.

And some of the things that the staff thought could be accomplished have not been accomplished, so they come in today with some recommended changes. And that's consistent with the way the staff has acted in the past.

I'm very concerned about false lights. And I know they cause a lot of unrest, and a lot of unhappiness, and a lot of dissatisfaction among customers.

So, the suggestions that I'm going to make here for changes are being made with that point in mind.

CHAIRWOMAN RIORDAN: And these are amendments to the --

MR. CALHOUN: The proposed amendments to the resolution, yes.

CHAIRWOMAN RIORDAN: Okay. Fine.

MR. CALHOUN: I recommend that the phase-in be

changed from 40, 70, and 100 percent to 30, 60, and 100 percent.

CHAIRWOMAN RIORDAN: All right.

MR. LAGARIAS: That's for catalyst monitoring?

MR. CALHOUN: Yes. And the workshop that we talked about, that we also incorporate that in the resolution. I think that's just automatic, though, that we do that.

There was some discussion about comprehensive monitoring of the miscellaneous emission-related components. The big problem there is it's conceivable that a component may start to deteriorate, yet the vehicle may not exceed the emission standards. And that's reality.

So, my recommended amendment would be that we not turn on the lights when the system deteriorates. But, instead, you would set a code and illuminate the MIL only when the increase has been exceeded by 15 percent.

There were other changes that were suggested. The one that I'm having difficulty with is the leak orifice for the evap system. The current regulations propose 40 thousandths inch leak, and the staff is proposing to change that to 20 thousandths starting in 1998.

My recommendation would be that we start that in the year 2000.

There's been some suggestion that the statistical

test for illuminating the MIL be done at 10 trips, as suggested by General Motors. We don't believe that at this point in time that that's absolutely necessary. And if, in fact, it becomes necessary, we can address that at some later point in time.

The anti- the two-level antitampering, which involves encryption, I think we'll accept the staff's recommendation there.

The recall threshold, it had been suggested by AAMA that the recall threshold be extended to 1996, from -- 2.5 times the standard be extended to 1996. And perhaps that's not appropriate at this particular time.

We also recommend that the standards for ULEV and LEV -- I believe the AAMA recommended that that standard be increased from 2 to 2.5 times. And we would recommend that that be incorporated, also.

Those are the major changes that -- do we have any questions by the staff?

CHAIRWOMAN RIORDAN: Let me just -- you're going to make that in the form of a motion?

MR. CALHOUN: Yes.

CHAIRWOMAN RIORDAN: Okay. Is there a second to that motion?

MR. LAGARIAS: Madam Chair, I'd like to add to that, if I could, before a second.

CHAIRWOMAN RIORDAN: All right. Let's see if the maker of the motion will accept your suggestions.

MR. LAGARIAS: Well, in the comprehensive monitoring of miscellaneous emission-related components, I agree that if the -- that the indicator light should not come on until the standards are exceeded by at least 15 percent over the standard.

However, it's always possible that there are failures in the -- of the components that do not cause the standard to be exceeded, and we have a computer code in there in the event that the computer code recognizes that some of the components have failed, even though the standard has not been exceeded, the computer code can be programmed so that when that car is serviced or taken in for a check, the mechanic will know that that part has failed, and he could service it, even though it has not resulted in a failure on the part of our exceedance of the emission standards?

Is that acceptable?

CHAIRWOMAN RIORDAN: Is that acceptable?

MR. CALHOUN: Yes.

CHAIRWOMAN RIORDAN: Okay. We'll make that part of the original motion.

MR. LAGARIAS: On the monitoring of emission -- of evaporative leaks at .020, you're suggesting that standard

be put off to the year 2000. I have no objections to that, except that at the workshop that is scheduled two years from now, '96, that that issue be addressed in the event that the technology is there and it makes sense to enforce that regulation at an earlier time.

MR. CALHOUN: That's acceptable.

CHAIRWOMAN RIORDAN: Do you accept that?

MR. CALHOUN: Yes.

CHAIRWOMAN RIORDAN: Okay.

MR. LAGARIAS: And finally, on the recall threshold, you're suggesting that the standard be increased from 2.5 to 2 times.

MR. CALHOUN: For LEV and ULEV. I'm very concerned about, when we start moving down to that particular stringency, whether or not the manufacturers are going to have the ability to --

MR. LAGARIAS: Well, as I recall, if it's 2.5 times for the ULEV, that would allow emissions higher than the LEV; is that correct?

CHAIRWOMAN RIORDAN: I think there's a question to the staff.

MR. CACKETTE: Well, I was a little bit confused about what the motion was, also, on this ULEV. If I understand it correctly, for that -- for those standards, we provide a higher threshold for recall for two years

basically.

MR. ALBU: For LEV vehicles, they already have a provision in place that they not be recalled until they exceed two times the standard, so it's already there.

MR. CALHOUN: Okay.

MR. LAGARIAS: So, I would say, then, accept that standard.

CHAIRWOMAN RIORDAN: Okay. Is that acceptable to you?

MR. CALHOUN: Yes.

CHAIRWOMAN RIORDAN: All right.

MR. LAGARIAS: And I think that's a very good motion, Joe.

CHAIRWOMAN RIORDAN: All right. And so, you've now seconded --

MR. LAGARIAS: I second the motion.

CHAIRWOMAN RIORDAN: -- this amendment that Mr. Calhoun now has agreed to some of the additional amendments.

You know, for everybody, I recognize it's very difficult, but the recorder, fortunately, has this all down, so that you totally understand that if there is any question by any of the Board members, we certainly can read those back if you have any questions.

MS. EDGERTON: Can I make a substitute motion?

CHAIRWOMAN RIORDAN: Pardon me?

MR. CACKETTE: Can I have some clarification. I didn't understand a couple of them.

CHAIRWOMAN RIORDAN: All right. Let's go back.

MR. CACKETTE: Just so we can understand what we have to implement.

On the .020 -- the 20 thousandths leak requirement, it wasn't clear to me from the discussion whether the motion was to change the proposed regulation to delay implementation to 2000. And then, in '96, if you find that it turned out it was feasible, to do it earlier, and come back for another reg change to the Board, or was it look at it in '96 and --

MR. CALHOUN: Right, as you described it.

MR. CACKETTE: So, it's delay it and then, if somehow it can be done earlier, come back. Okay.

CHAIRWOMAN RIORDAN: Okay.

MR. CACKETTE: And on the comprehensive monitoring, the level at which the light turns on, I heard-- thought I heard Mr. Calhoun say, when there's a 15 percent increase in emissions, and that was consistent with the way the GM person described that today, which was the light shouldn't have to come on until --

MR. CALHOUN: 15 percent above the standard.

MR. CACKETTE: Oh, well, okay. That is a major relaxation compared to the other interpretation, which is --

I thought I heard them saying make sure -- wherever the car is, make sure there's an emissions increase of so many percent before the light comes on.

And the other one is -- let's say the car's at half the standard.

CHAIRWOMAN RIORDAN: It would be 15 percent at the standard.

MR. CACKETTE: Yeah, it would bee 15 percent at the standard versus going all the way to the standard, which would be 50 percent plus another 15 percent. So, in one case, you'd have 65 percent increase when the light comes on; the other one would be a 50 percent increase.

CHAIRWOMAN RIORDAN: Mr. Cackette, let's ask Mr. Calhoun what he meant there.

MR. CALHOUN: One of the difficulties we have in this is I would expect that the Board would really be challenged in those cases where we're attempting to force a recall when a vehicle did not exceed the emission standards, and we go do various test measurements. You find that there's a lot of test variability. And the manufacturers are very concerned that, if there is an emissions increase that's real -- and in this particular case, having a 15 percent increase in emissions, still complying with the emissions standards, I'm not so sure that we want to impose a recall based on that.

CHAIRWOMAN RIORDAN: So, your motion basically was, unlike what Mr. Cackette said, yours is 15 percent above emission level requirement. Okay? That's what we need to know.

MR. CALHOUN: Yes.

MR. LAGARIAS: And that's what I'm supporting.

CHAIRWOMAN RIORDAN: And that's what Mr. Lagarias is supporting.

Now, there is an offer of a substitute motion. And let me, just for the Board, because some chairs handle these differently than others. Let me make very clear how this would happen.

A substitute motion can be advanced, and we will vote on that, if it is seconded, and deal with that.

If it is not successful, then we would go back to the motion of Mr. Calhoun, seconded by Mr. Lagarias, and deal with that motion.

SUPERVISOR VAGIM: I'm not quite clear. Would this be an amendment to the amendment, or will this be --

CHAIRWOMAN RIORDAN: No. Well, we'll ask Ms. Edgerton. She had offered -- said a substitute motion, which may not have been heard by the rest of the Board.

So, Ms. Edgerton?

MS. EDGERTON: Yes. I'd like to offer a substitute motion in which I -- includes various components

of what Mr. Calhoun and Mr. Lagarias have provided, but has some differences, which I hope you will think improve the measure.

Certainly, I -- I mean, I would agree with the phase -- that the phase-in be changed for catalyst to 30, 60, 100 percent. I'm also comfortable with the workshop in the resolution. And so, that substitute motion would include that provision.

The substitute motion would also include the acceptance of the antitampering. That's nothing. That actually doesn't change anything.

So, the other two pieces do have to do with the evaporative monitoring requirement, in which I would propose that we either remain the same -- well, we do remain and accept the staff proposal.

And I would also propose, with respect to the components monitoring, that we go with the staff proposal. And we'll see if there's -- I'd like to have an opportunity to speak to the motion.

CHAIRWOMAN RIORDAN: Right. Let us get a second.

DR. BOSTON: Second.

CHAIRWOMAN RIORDAN: A second, Dr. Boston.

Discussion. Ms. Edgerton?

MS. EDGERTON: With respect to the two items at issue, the comprehensive components monitoring and the leak

orifice, it strikes me, with respect to the comprehensive components monitoring, that the issue before us is what is really an OBD system. Is it a diagnostic system for the various components they are monitoring so they tell us which things are working, which I can see a customer accepting very favorably.

I would like to see that in my car, even if I wasn't over the emission standards, so I could get it fixed. Or whether the OBD system is directed at an exceedance of all the evaporative emissions -- I mean of all the emission standards generally, my understanding is that it is a -- that I believe the consumers will be able to understanding it as generally telling them when something's not working very well and needs to get fixed.

And so, I'm comfortable with that.

The second piece with respect to -- and I'm not even -- that's useful. We know technologically that we have the technology to make those work. We've given a double deficiency free to the manufacturers. And it seems that that's a reasonable -- reasonable thing.

I don't know how we move ahead to capture all the reductions we can capture if we don't have the system even tell the consumer that things aren't working, especially when we have the capability to tell this person that they're not working.

In any case, I would think, for the time being, even if -- even if there's further -- even if we do want to further understand the consumer preferences here, it seems to me the purpose of today (sic), that that is the better course, because we can learn so much about how we can help to really clean the air as much -- and I think it's -- personally, I think it's consistent with our obligations under California law to achieve the maximum reductions possible as soon as possible.

So, I feel obligated to make this motion -- I mean the substitute motion.

Secondly, with respect to the orifice and the leaking, I'm not quite sure why, but my understanding is that Ford and Chrysler said they would be able -- they would try to comply with the staff proposal, and that General Motors has said that they do not want to.

My inclination is to go with the folks who indicate that they will try, and let's try.

And one reason, which I find completely compelling, it's to my understanding, it's about 30 days -- 30 tons per day of ROG that are at stake if the 0. -- if .02 is not implemented.

Now, I can't help but remember, three weeks ago, we were here talking about the South Coast achieving an overall budget of ROG for mobile sources of 116 per day.

And, of course, as you know, I live in the South Coast. People are tired of hearing me say that probably. But I do, and it's part of my obligation on this Board to discuss, I believe, the effect of our regulations on all of those Californians who live in the South Coast.

So, I would -- that is why I would recommend that we give us a try. And if it turns out to be something -- if both of these are tried, and if they turn out to be something that is creating a problem beyond what I've heard today, then we'll go back and have another look.

MR. CALHOUN: May I comment on this?

CHAIRWOMAN RIORDAN: Yes, yes.

Further discussion, Mr. Calhoun.

MR. CALHOUN: I guess I was in a -- it must have been a little different room, Ms. Edgerton. I didn't hear GM say that they didn't want to comply with the .02 standard.

I thought what I heard GM, Ford, and Chrysler say was that they weren't sure what would be required in order to comply with the .020 standard, and that it may, in some cases, require a change in hardware.

And this could also require system changes, or require some additional time. And that's one of the reasons why I'd suggested that we phase it in at a later date. Give them a little time, because we don't want the customers

unhappy.

I agree with you. I want to get all of the evaporative emissions that we can possibly get, but I can also suggest one other way we can get these evaporative emissions without this particular requirement. And that is to do something about the evap systems that are occurring on the vehicles on the road. But I won't go into that.

So, I don't think that I heard anybody say, "We don't want to comply with this particular regulation."

The other comment I would make would be, my proposed amendment would have required that the code be set whenever there was a measurable increase in emissions, which would not turn the light on until the emission standard had been exceeded by 15 percent above the standard --- that the violation not be until you exceed the 15 percent above the standard.

So, what you are hoping to accomplish would also be accomplished, because the very code would already be set. And so, when the people take their vehicle in for repair, this work would automatically -- this would automatically be indicated to the people.

MS. EDGERTON: Let me get one answer back.

CHAIRWOMAN RIORDAN: I'll let you comment, and then Mr. Lagarias.

MS. EDGERTON: I'll just follow the process of

point, counterpoint just to those two.

With the respect too the 1998 -- the proposal to extend the -- going down to the 0.02 (sic) to the year 2000 as opposed to 1998, I -- reasonable people disagree and differ on these things, but I see in the description of the way the future would unfold in the 1996 workshop provision in this memo, which would enable us -- which would enable the staff then to come back and recommend to us -- make recommendations to us that this was not achievable, or that there were problems with having that go in 1998.

I feel constrained to keep as much as possible the goals, the direction in which we're trying to go, and to keep the necessary focus in each segment, so that everyone is moving in the same direction.

So, while I appreciate what you say, I respectfully would prefer -- and that's why I make the motion -- would prefer to move forward with 1998, with the understanding that we have this 1996 workshop and can report back to us.

On the lights, I understand that there would be a code for when people take their lights in -- I mean take their car in and that, if that was something that was checked, it could be checked and the owner could make a change.

By the same token, my -- I think it would be very

good to have the light go on. I think people are used to having a light go on when they don't plug in their seat belt. They're used to having the light go on for a lot -- when the door is open. I know the light goes on and the door isn't open on my car. There are lots of little lights that go on, and makes me feel very technologically advanced in my Geo Prizm, which I think very much. Made in California.

But, in any case -- so, I'd like to have my lights go on when all of my emissions control stuff is not working, I'd like to have my lights go on. And I think the people in Southern California would like to have the lights go on if it means that we can have -- have more emissions reductions.

I would like to strive for it. Thank you.

CHAIRWOMAN RIORDAN: Okay. Thank you. Mr. Lagarias.

DR. BOSTON: Can I withdraw my second if she drives a Geo?

(Laughter.)

CHAIRWOMAN RIORDAN: No, Dr. Boston. No, Dr. Boston, that's not acceptable.

All right. Mr. Lagarias.

MR. LAGARIAS: When the lights go on again all over California --

(Laughter.)

MR. LAGARIAS: -- there's the one (pointing to Ms. Edgerton).

(Laughter.)

MR. LAGARIAS: Our authority, as an Air Board, is based on controlling emissions, not on controlling cars. And if we're going to control emissions, we want to have an indication that indicates the emissions are exceeding the regulations, not necessarily that there's something broken in the car.

Now, the code would address that issue. But since our authority's based on emission control, the light should come on when the standards are being exceeded, not necessarily when something else is happening. And, therefore, I support Joe's position that we work on that basis.

Now, I'm ambivalent on the .020 leak. But I heard conflicting testimony from the Board and from the people testifying today on the significance of the leak. And so -- and I know that Ford and Chrysler have said they are working toward achieving it and, so, I'm sure will everyone else be there.

But I feel that with a technical issue of this type, it's appropriate -- since there are conflicting data in my mind -- that we resolve it by getting more information. I like the idea of an industry/government

workshop to look into this issue more completely.

If it turns, as the staff has suggested, that software changes can address this issue, then we have no problem in implementing it. Am I correct in remembering that? In implementing it at an earlier date.

But I feel that this is a technology pushing issue that needs more discussion.

CHAIRWOMAN RIORDAN: Okay. Mr. Lagarias, thank you.

Is there any further discussion? Dr. Boston.

DR. BOSTON: Well, I would like to speak in favor of Ms. Edgerton's position.

MR. CALHOUN: I thought you withdrew your second.

(Laughter.)

DR. BOSTON: It's because she drove that Geo.

MS. EDGERTON: I'll change my car.

DR. BOSTON: I feel that, number one, on the .02 standard for the leak detection and the evaporative system, that there has been a lot of progress made, and that to suddenly delay it for another two years really defeats our purpose.

I think we want to force this technology. And I look at it the way Lynne does. If they cannot and they put forth a very substantial effort, and it just doesn't work, then we can look at it again, and we can delay it at that

point.

But why delay it now when it may work and we can get another two years of air benefits out of the program. So that, I like Lynne's approach on that. And I would support that approach.

As far as the MIL light coming on, I don't disagree with the 15 percent, but I think if there's a major component of the emission system that fails, I think the light ought to come on immediately.

I think if the catalytic converter isn't working, I think a light ought to come on. I think if an oxygen sensor isn't working, I think a light ought to come on right now. I don't want to wait until the emissions become significant.

I think when one system like that starts to fail, then many things could happen down the line, and I think it would be a benefit to the manufacturer to repair that as soon as possible if he knows a major system has failed.

So, maybe there's two different lights here that are involved. But I think a light failure -- I mean a component failure ought to trigger a light right away. Maybe an emission light, you know, for the 15 percent I wouldn't object to.

But the other aspects of Lynne's proposal I also agree with -- the 30, 60, 100, the workshops, the

antitampering, and so forth.

So, I find myself more in agreement with Lynne's position than yours, Joe.

MR. CALHOUN: Well, I guess I --

CHAIRWOMAN RIORDAN: Mr. Calhoun, if you don't mind, Mr. Lagarias wanted to say something, then I will go to you. Because he wanted to talk about, I believe, the lights.

MR. LAGARIAS: Dr. Boston, if a catalyst fails, the emissions will increase, the light will come on. If the oxygen sensor fails, the emissions will increase, the light will come on.

This is only a component that fails that does not increase the emissions above the allowable standard that we're suggesting.

CHAIRWOMAN RIORDAN: Okay. Thank you, Mr. Lagarias.

Mr. Calhoun.

MR. CALHOUN: Well, I was going to point out that there's a difference between a deterioration in the system and a complete failure. But I think Jack's comments are appropriate.

CHAIRWOMAN RIORDAN: All right. Ms. Edgerton?

MS. EDGERTON: Yeah. I noticed when Mr. Lagarias spoke, there were -- a hand went up here from Mr. Cross. Is

that -- I would like to understand how this works.

MR. CROSS: I can --

MS. EDGERTON: Is that correct, that anything that goes --

MR. CROSS: I think that -- I'm going to let Mr. Albu follow this up. But I think that when we're talking about emissions increases as big as 15 percent above the standard, some pretty major stuff will not trigger the light, like an oxygen sensor failure, for example, in some cars.

So, I think that the point that I would want to make is that the staff kind of agrees with the idea that if it's a part that breaks and causes a significant increase, the light ought to be on.

But I think the question is the definition of significant and whether or not it's linked to the standards. And I think the reason the staff is concerned about having that definition tied to the standards or in exceedance of the standard is that there are some fairly major components that can fail that will not cause the vehicle to exceed the standard, certainly not immediately, maybe over time.

MR. LAGARIAS: Like what?

MR. CROSS: Like the oxygen sensor. In some cars, the EGR system. Others, Steve?

MR. ALBU: Those are typical examples, but that's

exactly right. And that's why we're a little bit concerned about giving that much latitude.

I think even GM suggested only a 25 percent increase of the standard. Even they were comfortable with that. And it seems like you're going beyond even that.

CHAIRWOMAN RIORDAN: Okay. Mr. Lagarias.

MR. LAGARIAS: Now, when you're saying 25 percent of the standard, you're not saying 25 percent above the standard, are you?

MR. ALBU: That's correct.

MS. EDGERTON: That's right, no.

MR. LAGARIAS: Well, I'm --

MS. EDGERTON: Just a point of information. I just wanted to ask Mr. Calhoun. Were you saying 15 percent over the standard, or 15 percent of the standard?

DR. BOSTON: He said over.

MS. EDGERTON: You meant over or of?

MR. CALHOUN: I said 15 percent over the standard.

CHAIRWOMAN RIORDAN: Over the standard.

MR. LAGARIAS: But I think I understood "of" the standard.

MR. CALHOUN: That's fine. I'm willing to accept that.

MR. LAGARIAS: So, our language says that 15 percent "of" the standard would trigger the --

DR. BOSTON: Well, that's different, and I support that.

CHAIRWOMAN RIORDAN: All right. Let's be sure.

SUPERVISOR VAGIM: I think we need some clarification of "of" and "over."

CHAIRWOMAN RIORDAN: This is the most interesting discussion this Board has had in a long time in probably the hottest room that we've ever had at a hearing.

Normally, we're freezing here; now, it's finally air I think is coming out.

All right. Because I think it is important, because the Board is going to have to choose between these two motions ultimately -- or heaven forbid, another one. But it is important that Mr. Calhoun's definition be clearly understood. So, Mr. Calhoun, let me ask you to restate that so it's very clear to this Board what you meant.

MR. CALHOUN: Okay. I will restate that part of the motion pertaining to the comprehensive monitoring of the emission related to components.

My recommendation was that the Board approve the setting of a code at any measurable increase in emission; that the code be set, but that a light not be turned on. Okay.

And that whenever there's -- my original recommendation was a 15 percent increase above the FTP

standard that turned the light on.

But after listening to the various comments, I'm willing to change that, such that if there's an increase that's equivalent to 15 percent of the standard, that they turn the light on.

CHAIRWOMAN RIORDAN: Okay. Mr. Lagarias, is that acceptable to you? All right.

SUPERVISOR VAGIM: Okay. Madam Chair, I need a clarification on that.

15 percent over -- if there is an increase of 15 of, now, does that mean you're taking the standard, taking 15 percent of that and adding it on top?

MR. CALHOUN: Yes.

SUPERVISOR VAGIM: So, it becomes an over anyway--

MR. CALHOUN: Yes.

SUPERVISOR VAGIM: -- but not necessarily 15.

MR. LAGARIAS: No.

MR. CALHOUN: It wouldn't 15 over the standard.

CHAIRWOMAN RIORDAN: Now, wait. Now, say that again, Mr. Calhoun, so that we're real clear.

MR. CALHOUN: Okay. My recommendation was that we set a code and not turn the light on whenever there is a measurable increase in emissions.

SUPERVISOR VAGIM: Exceeding the standard.

MR. KENNY: No.

MR. CALHOUN: No.

SUPERVISOR VAGIM: At any time then?

MR. CALHOUN: Yes, at any time.

CHAIRWOMAN RIORDAN: All right.

SUPERVISOR VAGIM: But then the light comes on.

MR. CALHOUN: You turn the light on whenever there is a 15 percent increase in emissions, and this increase be based on the emission standard.

Someone else mentioned -- I think one of the auto manufacturers had this in his testimony, the precise language. But they had suggested 25 percent. We're talking about 15 percent.

CHAIRWOMAN RIORDAN: Okay.

SUPERVISOR VAGIM: Can I ask a question to try to get some clarification for myself?

CHAIRWOMAN RIORDAN: Sure.

SUPERVISOR VAGIM: Okay. Joe, when you say we have a threshold standard the system's going to be registered at, what you're saying is, when you exceed that by 15 percent, only then will the light come on, but the system itself will record that at that first exceedance.

MR. CALHOUN: Yes.

SUPERVISOR VAGIM: One person.

MR. CALHOUN: The code would be set.

SUPERVISOR VAGIM: Right. But what the attempt

here is to keep the light from flashing on at times --

MR. CALHOUN: False illumination.

SUPERVISOR VAGIM: False illuminations.

But the whole purpose and the thrust of your motion is to keep that light from arbitrarily coming on, and perhaps being arbitrarily turned off by the user of the automobile with tape or some other device, which actually fails the whole system by ignoring the light.

MR. CALHOUN: I think the main concern that I have that I indicated earlier, that we not have false lights. And it's possible that the light will come on at any measurable -- the way it was initially set, the light would come on at almost any measurement --

SUPERVISOR VAGIM: I understand that.

MR. CALHOUN: -- of emissions.

SUPERVISOR VAGIM: I understand that. But your thrust -- what I'm trying to get is your thrust of your motion that was a key system's integrity to the user -- that's the driver -- that they -- when it comes on, it really means something, not just always coming on and then starting to be ignored.

MR. CALHOUN: That's correct. Right.

SUPERVISOR VAGIM: Thank you.

CHAIRWOMAN RIORDAN: All right.

MS. EDGERTON: Point of information?

CHAIRWOMAN RIORDAN: Yes, point of information.

MS. EDGERTON: Mr. Calhoun, I see here in the AAMA testimony on page 3, paragraph 1, 2, 3, a sentence which maybe is the one that you're referring to. I just want to check.

It says, "AAMA. . ." I'll wait for you get there.

Page 3 of the AAMA testimony.

MR. CALHOUN: Yes.

MS. EDGERTON: (Reading) AAMA recommends that section (b)(10.1) be revised to apply only to electronic powertrain components that can cause exhaust emissions to increase by an amount greater than 25 percent of the applicable standard under FTP test cycle conditions only, essentially for that component. 25 percent It says an additive 25 percent. And you're saying --

Is that what you're talking about? So, it should be 15 percent instead of 25 percent overage for the particular component?

MR. LAGARIAS: Component or components, whatever.

MS. EDGERTON: Component or components.

MR. CROSS: Can I -- this is going to add more confusion, or should I wait?

MS. EDGERTON: It's a point of information.

SUPERVISOR VAGIM: He's reading it.

CHAIRWOMAN RIORDAN: Mr. Calhoun, do you mind if I

ask staff something while you look at that?

MR. CALHOUN: Go ahead.

CHAIRWOMAN RIORDAN: Okay. Staff?

MR. CROSS: Can I give a hypothetical example of what --

CHAIRWOMAN RIORDAN: Yes.

MR. CROSS: -- the issue is here?

CHAIRWOMAN RIORDAN: Yes, Mr. Cross.

MR. CROSS: If you had a car which was certified to a standard of 1, 15 percent would be .15, and in one case, if the car -- even though it was certified to the standard of 1 -- was running at say a half; in one case, what we're suggesting is that the light would be turned off at a half plus .15, which would be .65. In other words, a 15 percent increase of the standard no matter where the car is.

And so, you just established an absolute minimum increase, if you will, that is acceptable.

In the other case, what's being suggested is that a level be established of 1.15, which is where the light gets turned on no matter where the car starts out. So, it's sort of saying, we don't care where the car starts out. But if it goes over 1.15, the light better be on.

And I think, in the staff's view, the 1.15 view of things is not stringent enough. It doesn't turn the light

on early enough to alert the consumer of some fairly major problems.

And so, we and GM's -- or not GM's, but the auto manufacturers' suggestion is also consistent with the 1, where we're saying, if it was at .15, it would go to -- I'm sorry. If it was a .5 (sic), it would go to .65. In other words, the more stringent version. Except they wanted .25 percent increase rather than 15 percent.

SUPERVISOR VAGIM: In the of category. Could I ask one question of Mr. Cross on that particular point?

CHAIRWOMAN RIORDAN: Yes, on that particular point.

SUPERVISOR VAGIM: When you talk about this "of," first of all, you said a 1 would be again, what, the standard, or --

MR. CROSS: Yes.

SUPERVISOR VAGIM: Okay.

MR. CROSS: The hypothetical standard.

SUPERVISOR VAGIM: Hypothetical standard. But when you said, .5 --

MR. CROSS: Cars don't typically run at the standard.

SUPERVISOR VAGIM: Right.

MR. CROSS: They always -- they run below.

SUPERVISOR VAGIM: Right.

MR. CROSS: Except when they break down. But for under certification conditions, they run below.

SUPERVISOR VAGIM: Right.

MR. CROSS: So --

SUPERVISOR VAGIM: So, you're going to have to set something in there that says that's where that "below" is going to be the benchmark, right?

MR. CROSS: Don't need to. In other words, we're saying that, if you use the standard as the yardstick and say 15 percent of that, then you've established how much it can increase from wherever it is.

SUPERVISOR VAGIM: Okay. But from wherever it is below the standard, if it's running below the standard? Is that what you're saying?

MR. CROSS: Right.

SUPERVISOR VAGIM: So, in other words, you'll be monitoring the so-called nominal run. And if that increases above the nominal 15 percent or, in this case, 25 percent is suggested, it's only one way of looking at it.

MR. CROSS: Yeah. You've established a hypothetical test where you can take a car that is running wherever it is, you take a good part off and put a bad part on, and measure the emissions increase. And if it's more than say 15 percent and the light isn't on, then OBD isn't working right.

SUPERVISOR VAGIM: Let me ask a followup. Your proposed regulation, though, doesn't turn a light on till you exceed the standard itself, for one.

MR. CROSS: That varies. For comprehensive component monitoring, it's supposed to turn the light on for any, quote, "measurable emissions increase," as --

SUPERVISOR VAGIM: Increase.

MR. CROSS: -- it exists now.

SUPERVISOR VAGIM: Okay.

MR. CROSS: And we're -- and I think what your -- what AAMA was suggesting was to put some minimum definition on measurable, so that you don't end up having --

SUPERVISOR VAGIM: They build a 25 percent --

MR. CROSS: Right.

SUPERVISOR VAGIM: -- cushion in there, rather nominal.

MR. CROSS: We felt that seemed a little large, too. But it's kind of the Board's discretion.

SUPERVISOR VAGIM: You wouldn't have as much of a problem with that as you would with a 15 percent increase over the standard.

MR. CROSS: Absolutely. Nowhere near as much.

SUPERVISOR VAGIM: But that would build in a cushion for the system.

Would it also protect, let's say -- one of the

concerns is, if the device itself is not running at its optimum, but yet is still under the standard and is under, let's say, 25 percent, if it has a little glitch here and there, and it goes up above the nominal, the proposed regulation is to turn it on right now. If they have a 25 percent cushion, that would protect that device itself from being a little off from time to time; is that correct?

I mean, the device may fail -- not absolute fail, but --

MR. CROSS: I think so.

SUPERVISOR VAGIM: -- intermittent failure.

MR. CROSS: Yeah, there's multiple checks before the light goes on, as Tom said, so you would --

SUPERVISOR VAGIM: Pardon me?

MR. CACKETTE: It's not the first time that it's detected. Built out throughout OBD, when a fault's detected, there's -- it has to be detected again and again, at least twice, before you turn the light on. So, there is that way of dealing with a glitch as you pointed out.

SUPERVISOR VAGIM: Right. But that is a --

MR. CACKETTE: That's inherent in the whole regulation.

SUPERVISOR VAGIM: The whole regulation. But they're asking for a 25 percent cushion on top of that, right?

MR. CACKETTE: Yes.

SUPERVISOR VAGIM: From any increase.

MR. CACKETTE: Right.

SUPERVISOR VAGIM: No matter if it happens once --

MR. CACKETTE: The two, GM or AAMA thing's at 25 percent, and -- but whichever one that you pick, it still has to be detected at least twice before a light would come on.

SUPERVISOR VAGIM: Is that on any exceedance on any incident, or is that on an average?

MR. CACKETTE: It's on any monitored aspect, I think.

SUPERVISOR VAGIM: At a point in time, not on an average?

MR. CACKETTE: Yeah. So, it has to be verified before something happens to turn the light on.

CHAIRWOMAN RIORDAN: Okay.

SUPERVISOR VAGIM: But the peaking; it's a measure of peaking.

CHAIRWOMAN RIORDAN: Yes. Dr. Boston?

DR. BOSTON: Maybe you should take Mr. Calhoun's answer first.

CHAIRWOMAN RIORDAN: Mr. Calhoun.

MR. CALHOUN: The question Ms. Edgerton asked, yes, that is the precise sentence, except that they had

suggested 25 percent.

CHAIRWOMAN RIORDAN: And you are --

MR. CALHOUN: And I suggested 15 percent.

CHAIRWOMAN RIORDAN: -- at 15. Okay. All right. Dr. Boston.

DR. BOSTON: A question of Mr. Cross.

If I had a total failure of an oxygen sensor in the exhaust system and the engine fuel system picked that up and ran the car very rich, wouldn't that destroy the catalytic converter if it was running very rich for a long period of time?

MR. CROSS: Yes, it would. But that doesn't happen anymore. In other words -- well, it would if you had an air pump.

DR. BOSTON: Well --

MR. CROSS: But the way that the cars currently run now, though, that wouldn't happen. In other words, the backup calibration is so good that it would stay very close to stoichiometric.

But eventually -- eventually, with the lack of input, it would cause it to drift. In other words, you --

DR. BOSTON: But it is possible to damage a $15,0000 catalytic converter unless you get that -- whatever it is fixed that goes wrong, isn't it?

MR. CROSS: In some cases, yes.

DR. BOSTON: Yeah.

MS. EDGERTON: Point of information?

CHAIRWOMAN RIORDAN: Yes. And I think this will be the last, because I'd like to move on.

MS. EDGERTON: With respect to my substitute motion, I moved -- I mean the differences are the components, and I'm moving staff's proposal. What is the difference, in your view, on staff proposal from Mr. Calhoun's motion on the comprehensive components monitoring? Mr. Calhoun's motion as revised.

MR. CROSS: In terms of tons per day?

MS. EDGERTON: No. Just in terms of -- in terms of the actual electronic power --

MR. CROSS: Yeah, it's fine.

MS. EDGERTON: Hmm?

MR. CROSS: I'm sorry.

CHAIRWOMAN RIORDAN: She's trying to get a comparison of the two particular motions here.

MS. EDGERTON: I'd just like to hear you say the difference between --

MR. CROSS: They're very --

MS. EDGERTON: -- Mr. Calhoun is --

MR. CROSS: They're very, very close actually. In other words, your measurables may be plus or minus 10 percent. And so, 15 percent becomes measurable with some

sold margin, if you will.

MS. EDGERTON: Okay. What I'd like to do is -- that's fine. I'll take the 15 percent from Mr. --

(Laughter.)

MS. EDGERTON: I'll take the 15 percent in my motion. I'll amend my motion to include the 15 percent. So, the only difference left --

CHAIRWOMAN RIORDAN: Well, you have to get the second.

MS. EDGERTON: Oh, do I have to get a second? Did you hear that?

DR. BOSTON: I will accept it.

MS. EDGERTON: All right. So now, my substitute motion has the phase-in change for the 30, 60, 100; it has the workshop resolution; it has this -- instead of saying measurable, it has section -- it has section (b)(10.1) would be revised to apply only to electronic powertrain components that can cause exhaust emissions to increase by an amount greater than 15 percent of the applicable standard under FTP test cycle conditions only.

And then the last piece that I still have in my substitute motion -- and I think maybe the only thing that's different between the two now -- is the matter of this -- whether we want -- I mean my motion is to have the staff proposal, which would put the .02 in in 1998, as opposed to

2000, subject, of course, to the further input after the 1996 workshop.

CHAIRWOMAN RIORDAN: Okay.

MS. EDGERTON: Thank you.

CHAIRWOMAN RIORDAN: Very good.

SUPERVISOR VAGIM: Madam Chair, there's still one point of clarification on the nominal versus the 15 percent. I want to make sure.

Is it in staff's mind -- and, Mr. Cross, because you're the one who had this dialogue here -- 15 percent; in other words, we're talking 15, not 25. Of 15 percent, computed based on the nominal and in addition, or 15 percent of the standard added to the nominal?

MR. CROSS: The threshold would become 15 percent of the standard added to the nominal.

SUPERVISOR VAGIM: Added to the nominal. Okay. We're all on that same track. Okay.

CHAIRWOMAN RIORDAN: Okay. Now, we're going to deal with the substitute motion first. And let me ask the Secretary to call roll. And my assumption is --

SUPERVISOR VAGIM: Can there be some discussion on the motions themselves, because I think just coldly --

CHAIRWOMAN RIORDAN: Supervisor Vagim, what have we been doing?

SUPERVISOR VAGIM: Well, yeah, but --

(Laughter.)

SUPERVISOR VAGIM: We've been defining what the heck the motion's are.

CHAIRWOMAN RIORDAN: Oh, you've been defining. Okay. We're going to move on to something new. Yes, a very limited discussion, because I really think we are moving it too far.

SUPERVISOR VAGIM: Because, I mean, if we're going to shoot, I don't want to shoot someone between the eyes without at least delivering a wrapper anyway.

(Laughter.)

SUPERVISOR VAGIM: And that is this. I think there are some fine points in this. And, Ms. Edgerton, I believe you're right on about the fact of the tons, but, remember, there's a difference between '98 and 2000. And the emission standards that you in Southern California need are 2010 issues. And by far, that'll be a 10-year-old car at the minimum, even with Mr. Calhoun's motion.

So, I think there's sufficient time to bring this in. So, that's why, with all due respect, I'm going to not support the amendment to the amendment.

CHAIRWOMAN RIORDAN: All right. Any other discussion?

All right. Let us call roll on first the substitute motion, please.

MR. LAGARIAS: Which one is that?
CHAIRWOMAN RIORDAN: Well, that's --
MS. EDGERTON: Mine.
CHAIRWOMAN RIORDAN: That's hers.
And, Madam Secretary?
MS. HUTCHENS: Boston?
DR. BOSTON: Yes.
MS. HUTCHENS: Calhoun?
MR. CALHOUN: No.
MS. HUTCHENS: Edgerton?
MS. EDGERTON: Yes.
MS. HUTCHENS: Hilligoss?
MAYOR HILLIGOSS: No.
MS. HUTCHENS: Lagarias?
MR. LAGARIAS: No.
MS. HUTCHENS: Parnell?
MR. PARNELL: No.
MS. HUTCHENS: Riordan?
CHAIRWOMAN RIORDAN: Aye.
MS. HUTCHENS: Vagim?
SUPERVISOR VAGIM: No.
CHAIRWOMAN RIORDAN: Okay. The motion fails.
SUPERVISOR VAGIM: Now, can we discuss real quickly the amendment -- the original amendment?
CHAIRWOMAN RIORDAN: The original?>

SUPERVISOR VAGIM: Because that's what you're going to vote on next, right?

CHAIRWOMAN RIORDAN: No, there is no --

SUPERVISOR VAGIM: You made an amendment to the resolution, which is inclusive.

CHAIRWOMAN RIORDAN: Oh, Mr. Calhoun's motion includes some amendments, yes, but there's no amendment to the motion, because he accepted all of Mr. Lagarias' amendments.

SUPERVISOR VAGIM: It's an amendment to the written resolution.

CHAIRWOMAN RIORDAN: Yes.

SUPERVISOR VAGIM: I just want to stress that I agree with all the points. And the reason why I feel comfortable at this particular point -- and I want to stress this at this particular point -- and that is, that the equivalent methods of this tampering protection shall be considered by the Executive Officer.

I think -- I want to stress that we are a regulatory agency to clean up the air, not to be in the patent business. And I hope you folks in February will all entertain that.

So, thank you.

CHAIRWOMAN RIORDAN: Okay. Any other discussion?

Madam Secretary, will you call roll, please?

MS. HUTCHENS: Is this for the Joe Calhoun motion?

CHAIRWOMAN RIORDAN: This is for Mr. Calhoun's motion. Mr. Lagarias seconded.

MS. HUTCHENS: Boston?

MR. KENNY: Excuse me, Madam Chair?

CHAIRWOMAN RIORDAN: Yes.

MR. KENNY: Isn't it for Mr. Calhoun's motion as it amends the resolution?

CHAIRWOMAN RIORDAN: Correct. Yes. Well, and it encompasses the resolution as well.

SUPERVISOR VAGIM: It's a direct amendment to the resolution.

CHAIRWOMAN RIORDAN: And the amendments are added to, so that they may indeed cause some changes to that original motion -- or resolution, pardon me. Okay?

Madam Secretary?

MS. HUTCHENS: Boston?

DR. BOSTON: No.

MS. HUTCHENS: Calhoun?

MR. CALHOUN: Yes.

MS. HUTCHENS: Edgerton?

MS. EDGERTON: No.

MS. HUTCHENS: Hilligoss?

MAYOR HILLIGOSS: Aye.

MS. HUTCHENS: Lagarias?

MR. LAGARIAS: Yes.

MS. HUTCHENS: Parnell?

MR. PARNELL: Yes.

MS. HUTCHENS: Riordan?

CHAIRWOMAN RIORDAN: Aye.

MS. HUTCHENS: Vagim?

SUPERVISOR VAGIM: Aye.

MS. HUTCHENS: Passes 6-2.

CHAIRWOMAN RIORDAN: Motion passes.

I wish to thank all of those of you who gave testimony today who are in the audience, who stayed with us through a rather difficult discussion, because this is such a technical issue.

I want to thank the staff, and thank the Board members, and let's take a ten-minute break. We deserve it, somehow.

(Thereupon a recess was taken.)

CHAIRWOMAN RIORDAN: I'll call the Board back to order. If you would like to testify on the next item, please sign up with our Board Secretary.

The next agenda item today is the 94-12-3. This is a public hearing to consider amendments to the fuel specifications for M100 fuel methanol.

Alternative fuels specifications for M100 fuel methanol were adopted by this Board in 1992. Included in