

MEETING  
BEFORE THE  
CALIFORNIA AIR RESOURCES BOARD

HEARING ROOM  
CALIFORNIA AIR RESOURCES BOARD  
2020 L STREET  
SACRAMENTO, CALIFORNIA

THURSDAY, DECEMBER 8, 1994

9:31 A. M.

Nadine J. Parks  
Shorthand Reporter

## MEMBERS PRESENT

Barbara Riordan, Acting Chairwoman  
Eugene Boston, M.D.  
Joseph C. Calhoun  
Lynne T. Edgerton  
M. Patricia Hilligoss  
John Lagarias  
Jack C. Parnell  
Doug Vagim

## Staff:

Jim Boyd, Executive Officer  
Tom Cackette, Chief Deputy Executive Officer  
Mike Scheible, Deputy Executive Officer  
Michael Kenny, Chief Counsel

Lynn Terry, Acting Chief, Office of Air Quality,  
Transportation & Planning  
Dean Saito, Manager, So. California Liaison Section  
Gayle Swiegert, District Planning Liaison

Bob Cross, Assistant Chief, Mobile Source Division  
Steve Albu, Chief, Engineering Studies Branch, MSD  
Allen Lyons, Staff, Advanced Engineering Section, MSD  
Michael Terris, Staff Counsel

Michael Carter, Chief, Off-Road Control Regulations  
Branch, MSD  
Jack Kitowski, Toxics and Fuels Section, MSD  
Annette Guerrero, Staff, MSD  
Tom Jennings, Staff Counsel

Patricia Hutchens, Board Secretary  
Wendy Grandchamp, Secretary  
Bill Valdez, Administrative Services Division

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1 MR. LAGARIAS: Yes.

2 MS. HUTCHENS: Parnell?

3 MR. PARNELL: Yes.

4 MS. HUTCHENS: Riordan?

5 CHAIRWOMAN RIORDAN: Aye.

6 MS. HUTCHENS: Vagim?

7 SUPERVISOR VAGIM: Aye.

8 MS. HUTCHENS: Passes 6-2.

9 CHAIRWOMAN RIORDAN: Motion passes.

10 I wish to thank all of those of you who gave  
11 testimony today who are in the audience, who stayed with us  
12 through a rather difficult discussion, because this is such  
13 a technical issue.

14 I want to thank the staff, and thank the Board  
15 members, and let's take a ten-minute break. We deserve it,  
16 somehow.

17 (Thereupon a recess was taken.)

18 CHAIRWOMAN RIORDAN: I'll call the Board back to  
19 order. If you would like to testify on the next item,  
20 please sign up with our Board Secretary.

21 The next agenda item today is the 94-12-3. This  
22 is a public hearing to consider amendments to the fuel  
23 specifications for M100 fuel methanol.

24 Alternative fuels specifications for M100 fuel  
25 methanol were adopted by this Board in 1992. Included in

1 those specifications is a requirement that M100 contain a  
2 flame luminosity additive, because M100 burns without a  
3 readily visible flame under daylight conditions.

4 This requirement will become effective January  
5 1st, 1995. Since a suitable flame luminosity additive has  
6 not been developed which satisfies the luminosity  
7 requirement without increasing the emissions of M100, staff  
8 is proposing that additional flexibility be added to the  
9 current regulation.

10 At this point, I would like to ask Mr. Boyd to  
11 introduce the item and the staff's presentation. Perhaps  
12 that's really going to be Mr. Cackette.

13 MR. CACKETTE: I stole his remarks here real  
14 quickly. And if I'm on the right one -- tell me if I'm on  
15 the wrong one here.

16 (Laughter.)

17 MR. CACKETTE: If I start saying OBD II, I'll know  
18 I've goofed.

19 CHAIRWOMAN RIORDAN: Yeah, right.

20 MR. CACKETTE: Thank you, Chairperson Riordan.

21 As you indicated, today, we will be presenting a  
22 proposal that deals with flame luminosity of M100 fuel  
23 methanol, which is pure methanol.

24 The Board first adopted this requirement in 1992,  
25 because there was a stated concern that the fuel did not

1 have any readily visible luminosity. And I think the  
2 situation that people often remember is in the old Indy  
3 races, where they use M100, you'd see at a refueling  
4 somebody dancing around who was actually on fire, but nobody  
5 knew it. And that's the lack of flame visibility that is a  
6 characteristic of methanol.

7           Since there were no suitable additives available,  
8 the Board directed the staff to investigate whether there  
9 was something that might be invented to add luminosity to  
10 the flame, and told us to come back to you.

11           Well, we did that. And we had a research contract  
12 that was monitored by a number of parties, and a suitable  
13 additive that gave flame luminosity without taking away all  
14 of the environmental damages of pure methanol was not found.

15           And, due to the safety issues involved with a fuel  
16 that had no readily visible flame, staff does not recommend  
17 at this time that the luminosity requirement be removed.  
18 Because of the low emissions potential of M100, staff is  
19 proposing that additional flexibility be allowed that would  
20 allow vehicles to continue to operate on M100 -- and those  
21 vehicles that are using that fuel today are largely trucks  
22 and buses -- as long as the safety concerns can be  
23 addressed.

24           And those safety concerns could be addressed by  
25 having a fire suppression system on those vehicles. And

1 virtually all of them that are in operation today do have  
2 fire suppression.

3 So with that, I'd like to turn it over to Ms.  
4 Annette Guerrero, who will be making the staff presentation.

5 CHAIRWOMAN RIORDAN: Okay. Thank you very much.  
6 Ms. Guerrero?

7 MS. GUERRERO: Thank you, Mr. Cackette.

8 Good afternoon, members of the Board. As Mr.  
9 Cackette, today, staff will be proposing an amendment to one  
10 of the specifications for M100 fuel.

11 Following a hearing on March 12, 1992, the Board  
12 adopted fuel specifications for M100 motor vehicle fuel.  
13 M100, which is nominally a hundred percent methanol, is an  
14 alternative fuel with a naturally high octane rating, and  
15 has the potential to provide significant reductions over  
16 gasoline and diesel fuels.

17 The original specifications were established to  
18 ensure a fuel purity that would allow vehicles to maintain  
19 low emissions, while at the same time providing maximum  
20 engine durability.

21 One concern associated with M100, however, was  
22 that it burns without a readily visible flame under maximum  
23 daylight conditions. This could potentially create a safety  
24 hazard. Therefore, included in the original proposal was a  
25 requirement that the fuel contain an additive to enhance

1 flame luminosity.

2           At the time of the originally hearing, as Mr.  
3 Cackette mentioned, an acceptable flame luminosity additive  
4 had not yet been identified. For this reason, the Board  
5 instructed staff to investigate potential additives, which  
6 would satisfy the luminosity requirement and delay the  
7 deadline for compliance until January 1, 1995.

8           Southwest Research Institute was contracted by the  
9 ARB, California Energy Commission, and the South Coast Air  
10 Quality District to identify potential additives and to  
11 demonstrate the effects of those additives on exhaust  
12 emissions.

13           In the first phase of their test program,  
14 Southwest Research conducted an extensive literature search  
15 to identify potential additives. Two candidates were  
16 selected -- four percent Toluene plus two percent Indan, or  
17 five percent cyclopentene with five percent Indan.

18           In the second phase of the test program, Southwest  
19 Research compared the exhaust emissions of four fuels --  
20 M85, which is an 85 percent methanol/15 percent gasoline  
21 blend; M100, and M100 fuels blended with the identified  
22 additives.

23           To measure the exhaust emissions, Southwest  
24 Research tested a 1989 Volkswagen Jetta. The methanol with  
25 luminosity additives produced emissions whose ozone forming

1 potential were about the same as methanol blended with  
2 gasoline, but significantly higher than M100.

3 In addition, carbon monoxide and Nox emissions  
4 from methanol with additives were greater than or equal to  
5 those of M100. Based on the extensive research and the  
6 emissions testing results at Southwest Research, it is  
7 generally accepted that no additive is currently available  
8 which could satisfy the luminosity requirement while  
9 achieving the low-emission benefits of M100.

10 M100 is a desirable alternative fuel because it  
11 promotes energy diversity and because engines optimized for  
12 M100 have the potential to achieve low exhaust emissions.

13 There are approximately 379 heavy-duty M100  
14 vehicles currently in operation in the State. Upholding the  
15 current luminosity requirement could, however, potentially  
16 end the use of M100 as a motor vehicle fuel in California.

17 Therefore, staff cannot recommend -- however,  
18 staff cannot recommend that the luminosity requirement be  
19 removed entirely, because there remain potential safety  
20 concerns involved with the fuel that has no readily visible  
21 flame.

22 Therefore, staff is proposing an alternative which  
23 would allow continued use of M100 fuel without relaxing  
24 safety concerns.

25 Under current regulations, fuel suppliers are

1 prohibited from selling, supplying, or using motor vehicle  
2 fuel which does not meet the commercial or certification  
3 fuel specifications.

4           The amendments staff is proposing would allow  
5 persons that sell, supply, or use M100 to utilize a  
6 noncomplying fuel as long as they can demonstrate that it  
7 will be used only in vehicles that are equipped with some  
8 type of fire suppression system or equipment.

9           In this way, the safety concerns can be adequately  
10 addressed and M100 can still be used as a motor vehicle fuel  
11 in California.

12           All except four of the M100 vehicles in operation  
13 at this time are already equipped with fire suppression  
14 equipment.

15           Staff envisions two basic types of equipment; one,  
16 a system that automatically detects and suppresses on-board  
17 fires or; two, an on-board system that enhances flame  
18 luminosity.

19           A typical fire suppression system would consist of  
20 a sensor or sensors, a fire suppressant and a system to  
21 activate the release of the compound. If the sensor detects  
22 light and/or heat of a fire, a compound is instantaneously  
23 released to extinguish the flame.

24           A luminosity enhancing system would contain a  
25 luminosity enhancing substance in a bladder within the fuel

1 tank. The substance would be designed to be released in the  
2 event of a fire or rupture of the fuel tank.

3 The substance thus released in the fuel tank would  
4 mix with the fuel to produce a luminous flame.

5 Methanol proponents claim that the fire or safety  
6 hazards associated with the use of M100 are not significant,  
7 because pure M100 is difficult to ignite and does not burn  
8 easily. While staff acknowledges that M100 may be difficult  
9 to ignite, experiments have shown that the flame is  
10 invisible under maximum daylight conditions.

11 Staff believes there is not enough information  
12 available regarding the potential for M100 fires to conclude  
13 that lack of luminosity is not a significant concern.

14 Staff is therefore recommending that the  
15 regulations be amended to allow motor vehicles to utilize a  
16 noncomplying M100 fuel if it can demonstrated that those  
17 vehicles are equipped with either an automatic fire  
18 suppression system or with a system that enhances  
19 luminosity.

20 That concludes my presentation. We do have a  
21 short video on a comparison of M100 to gasoline, the actual  
22 flame of the fuels. If the Board would like, we can view  
23 that.

24 Okay.

25 (Thereupon, a video demonstration was given

1 by staff.)

2 MS. GUERRERO: I'd be happy to entertain any  
3 questions the Board might have at his time.

4 CHAIRWOMAN RIORDAN: Are there any questions by  
5 any of the Board members at this time for the staff?

6 Apparently not.

7 So, let me ask -- I think our Secretary's out. We  
8 have a speaker list.

9 MR. LAGARIAS: Madam Chair?

10 CHAIRWOMAN RIORDAN: Yes, Mr. Lagarias.

11 MR. LAGARIAS: While we have time, has there been  
12 any consideration to changing the luminosity standard?  
13 Usually standards have a factor of safety.

14 And if -- is there a possibility that the standard  
15 can be reduced so additives might be less required?

16 MR. CROSS: I think the problem is that to add  
17 enough multicarbon hydrocarbons to the methanol so that it  
18 becomes luminous, you've already affected its reactivity.  
19 In other words, M85 is kind of a nice luminosity fuel, and  
20 that's already impacted it.

21 And when you look at the other substitute  
22 additives, you kind of run into the same problem.

23 MR. LAGARIAS: Okay.

24 CHAIRWOMAN RIORDAN: I do have my speaker list  
25 now. And let me invite Dr. Short from the American Methanol

1 Institute forward for testimony.

2 DR. SHORT: Well, good afternoon, Madam Chairman  
3 and members of the Board.

4 I'm representing AMI as you heard. And AMI, or  
5 the American Methanol Institute, represents the majority of  
6 the world's methanol producers, an organization based in  
7 Washington.

8 The flame luminosity requirement in the M100  
9 specification is an excellent example of the kind of  
10 innocuous and almost insignificant clause which can, in  
11 fact, spell the death of a major technology.

12 And in so doing, it would not only destroy a  
13 future major industrial option for California, but also a  
14 future major air pollution reduction option.

15 I intend to show you that this requirement is  
16 neither necessary nor defensible. And I have given you  
17 written testimony, which -- in greater detail and with  
18 references -- supports the arguments I'm going to make.

19 First of all, you've heard there's no realistic  
20 alternative method for giving flame luminosity to M100.  
21 That's because M100 is an extremely clean fuel. And just  
22 about anything you could imagine which would confer  
23 luminosity would take away that cleanliness, so you would  
24 destroy the very thing that you want to use it for.

25 On the other hand, the M100 fire risk is very

1 small. The other fuels, which you would have to use if you  
2 couldn't use M100, are much higher risk. So, in effect, if  
3 you forego the use of methanol in the future by insisting on  
4 a luminosity requirement that can't be met, you're forcing  
5 people to use other fuels which are a higher fire risk.

6 And that view is not just my own view. That view  
7 is held also by the Environmental Protection Agency, which  
8 has written you a letter on this subject supporting the  
9 views of the American Methanol Institute.

10 M100 technology development -- why is this  
11 important and what does it mean for California?

12 Well, not only are M100 dedicated vehicles  
13 extremely clean and easily capable of meeting your ULEV  
14 requirement in the future, but methanol's also the best  
15 option, in fact, for direct oxidation methanol fuel cells.

16 These are the ultimate technology for clean  
17 transportation, because in that technology you're taking a  
18 liquid and you're oxidizing it directly in a fuel cell to  
19 CO2 and water. There are no emissions whatsoever.

20 And under these circumstances, a local  
21 organization in California, the Jet Propulsion Laboratory,  
22 has made some improvements on direct fuel cell oxidation.  
23 Those improvements are being taken up by a company in  
24 Detroit called Detroit Center Tool, who are now engaged in  
25 developing for mass production a fuel cell based on this

1 technology, which they anticipate will be in mass production  
2 in around 1998.

3 Now, that fuel cell is not going to be designed  
4 for cars. It's going to be designed initially for portable  
5 power generation, for smaller engines of the kind which  
6 power lawnmowers, or chain saws, or air blowers, and that  
7 kind of thing. It's an application which has great merit,  
8 because those sources, of course, add to air pollution. And  
9 also, it implies that you could not have in that kind of  
10 application the kind of automatic fire suppression  
11 equipment, which is preferably feasible and economic for a  
12 heavy-duty engine in a bus, for example, but not really very  
13 feasible for a light-duty engine, and certainly not for a  
14 portable engine.

15 I could, in passing, say -- with regard to the  
16 need for the bladder, which was described by the staff  
17 representative, that, if there is such a technology for a  
18 bladder to automatically kick a fire out, why don't we have  
19 them already for gasoline cars? It's the same principle.  
20 We don't, and there isn't such a technology, nor can we  
21 allow the future of methanol to depend on the uncertain  
22 development of a successful technology of that kind.

23 Why should we? We don't insist on such  
24 developments for any other technologies, so why do it for  
25 methanol?

1 I've got it there that California jobs depend now  
2 on M100. That's perfectly true. This was a California  
3 invention, the fuel cell that I'm talking about. And there  
4 are people now in California who are doing research on  
5 developing that fuel cell.

6 Their research and their jobs would become  
7 meaningless if you were to insist on this flame luminosity  
8 requirement, because there wouldn't be any point in using a  
9 fuel whose eventual use is going to be illegal.

10 Now, it seems to me a lot of this discussion  
11 really depends upon how hazardous is this nonluminosity  
12 given all the other characteristics of methanol in a fire  
13 situation?

14 And let me say a couple of things from a personal  
15 point of view. First of all, there was mention about old  
16 videos showing Indy car drivers beating out flames they  
17 couldn't see or which you couldn't see. They obviously knew  
18 the effects all right.

19 That's perfectly true. But the key thing about  
20 those videos is that the drivers lived. If that had been  
21 gasoline, they would not have lived. And the reason is  
22 methanol's particular and specific fire safety  
23 characteristics -- low flame temperature, low rate of  
24 propagation, low radiant heat flux, and all the rest of  
25 those things.

1 I personally have had burning methanol running  
2 down my arm when I was working in the laboratory early in my  
3 youth, and I suffered no ill effects whatsoever. I brushed  
4 it out, and there wasn't even any blister.

5 So, actually, it's a very innocuous material, even  
6 when you do have a fire and even when that fire is  
7 nonluminous, which is actually a very unlikely occurrence.

8 If I could have the next overhead, please.

9 Just a word or two about risk analysis. A risk is  
10 a product of three factors: It's the hazard itself, which,  
11 in this case, the hazard is pure methanol fire with a  
12 nonvisible flame. That's the hazard.

13 The effects of that hazard occurring -- and you  
14 measure the effects by the amount of damage it can do. And,  
15 in this case, the amount of damage that a methanol fire can  
16 do is actually quite low, given that it has to be a pure  
17 methanol fire in the first place. If it's associated with  
18 other stuff, then it has smoke and flame, so you can forget  
19 it.

20 So, it's only pure methanol fires not associated  
21 with any other materials -- a very rare occurrence; that's  
22 what we're talking about. What's the risk of that?

23 And the fact is the risk isn't very high, because  
24 methanol does have an extremely low flame temperature. It  
25 has low radiant heat, and a very low rate of propagation.

1 And it's difficult to ignite.

2           You then multiply those first two factors by  
3 finally the probability of this event occurring. And what  
4 are the chances that a pure methanol fire will (a) ignite  
5 and (b) not involve any other type of material?

6           And the EPA has done an analysis of this situation  
7 and come to the conclusion that the probability is very low  
8 indeed. In fact, because of the low vapor pressure of  
9 methanol and its high ignition temperature -- and it has a  
10 high ignition temperature; that's why it's a high octane  
11 fuel, of course -- that if you multiply these factors out,  
12 you're talking about a very low risk indeed.

13           And the methanol industry's prepared to shoulder  
14 that risk. We're quite happy for people to go ahead in the  
15 full light of the knowledge that the flame is nonluminous,  
16 because we think the risk is very low, and the chances of  
17 killing the future industry are 100 percent if you keep the  
18 luminosity requirement. They're very uncertain if you  
19 don't.

20           So, we're requesting that you remove the  
21 luminosity requirement completely forthwith so we can get on  
22 with the business of developing the fuel.

23           The EPA came to the conclusion, having quantified  
24 these risks, that the fire risk associated with M100 was  
25 about 10 percent of the total fire risk we currently

1 shoulder as a society with gasoline.

2           You are asking for that 10 percent to be even  
3 lower. We say that if you're really concerned about fire  
4 risk of liquid fuels, let's concentrate a little more on  
5 some of the other liquid fuels which, in our view, are much  
6 more dangerous.

7           So, as long as there is any doubt left about the  
8 future acceptability of methanol, people will not continue  
9 to develop the technology which is so badly needed.

10 Therefore, we ask you to remove that uncertainty by removing  
11 the flame luminosity requirement.

12           Thank you.

13           CHAIRWOMAN RIORDAN: Thank you, Dr. Short.

14           DR. SHORT: I have -- after this, I have a video,  
15 but I think you may not -- it shows very similar stuff. It  
16 shows a fuel tank of a methanol car being ignited in  
17 comparison with a fuel tank of a gasoline car. It's pretty  
18 graphic.

19           It takes about three minutes to watch if you'd  
20 like to see it.

21           CHAIRWOMAN RIORDAN: Well, let's have it.

22           DR. SHORT: Okay. Fine.

23           CHAIRWOMAN RIORDAN: That would be fine. I think  
24 it takes a minute to make that change.

25           Yes, Dr. Boston has a question while we're setting

1 up the film.

2 DR. BOSTON: Doctor, what was your position on the  
3 fire suppressing system on these vehicles if they had M100?

4 DR. SHORT: Well, currently, all the heavy-duty  
5 vehicles using M100 have automatic fire suppression systems.  
6 And they have worked extremely well. But I would like to  
7 defer answering that question to Mr. Karbowski, who I think  
8 is coming after me, because he's an operations man with the  
9 MTA, who run the vast majority of M100 vehicles. And he  
10 will tell you in better detail than I can about the efficacy  
11 of their operation.

12 CHAIRWOMAN RIORDAN: Yes, Ms. Edgerton.

13 MS. EDGERTON: I want to ask the staff. It's my  
14 understanding -- I want to ask a question of staff.

15 It's my understanding that the staff proposal is  
16 that there be no luminosity requirement, but that there be  
17 fire suppression required. Have I got that wrong?

18 Let's clarify that. That's what I don't  
19 understand.

20 MR. CROSS: It's either/or. We retain the  
21 luminosity requirement in the absence of fire suppression  
22 equipment.

23 MS. EDGERTON: So, it's my understanding, though,  
24 that no luminosity -- no additive has been identified that  
25 wouldn't -- that would add -- that would meet the luminosity

1 requirement that wouldn't add to the emissions.

2 MR. CROSS: That's right.

3 MS. EDGERTON: So, as a practical matter, the  
4 luminosity -- as a practical matter, the luminosity  
5 requirement is an empty item. I mean, essentially, it seems  
6 to me that the thrust of what it is, is essentially, the  
7 regulation that's proposed would be that they'd have to have  
8 a -- I guess in a smaller thing like a chainsaw, you'd have  
9 to put something in it so you could see it, and then it  
10 would be emitting --

11 MR. CROSS: Chainsaws aren't motor vehicles. So,  
12 they wouldn't fall under --

13 MS. EDGERTON: Oh, that's a good point.

14 (Laughter.)

15 MR. CROSS: When you make the fuel cell bigger  
16 and put it in a car, yes.

17 DR. BOSTON: It's close to a Geo Metro.

18 MR. CROSS: Same power.

19 (Laughter.)

20 DR. SHORT: If I could interject there, if you did  
21 have a future where you had a methanol fuel cell chainsaw,  
22 you've got to fuel it somehow, where you would go is a  
23 fueling infrastructure that had been established nationwide  
24 for mobile sources.

25 So, it's not quite the case that you wouldn't need

1 to have mobile sources as well. You would need to put in  
2 the infrastructure to provide the fuel for all these small  
3 engines as well.

4 MS. EDGERTON: Thank you. So, if I understand  
5 this correctly, the measure -- for purposes of near term --  
6 as you proposed it -- as staff's proposed it, as a practical  
7 matter, would require fire suppression on all the motor  
8 vehicles.

9 MR. CROSS: On the M100 vehicles.

10 MS. EDGERTON: On the M100 vehicles. And longer  
11 term, as a practical matter, would require additives which  
12 would increase the emissions of the particular appliance.

13 MR. CROSS: The additive exists now. One could  
14 use M85 instead. In other words, there are a lot of  
15 methanol cars running around that use M85, which is just a  
16 commercial gasoline, which has sufficient luminosity right  
17 now.

18 I think the concern with the M100 industry and  
19 that we raised in our staff presentation is that M85 is not  
20 as clean a fuel with respect to air pollution as M100 is.

21 So, as soon as you add something to M100 to make  
22 it a luminous fuel, you alter its characteristics, which  
23 make it a less air pollution friendly fuel.

24 MS. EDGERTON: And, also, I guess it makes it less  
25 safe.

1 MR. CROSS: A little bit.

2 MS. EDGERTON: Thank you.

3 MR. CROSS: It's arguable, depending on what you  
4 use to make --

5 MS. EDGERTON: I mean, if you add 15 percent  
6 gasoline, gasoline burns more intensely --

7 (Thereupon, several persons spoke simultaneously.)

8 CHAIRWOMAN RIORDAN: Supervisor Vagim had a point.

9 SUPERVISOR VAGIM: Does M100 have an odor to it?  
10 Is there is odorant built into it?

11 DR. SHORT: M100 does not smell particularly -- it  
12 has a very faint, ethereal smell, that's all.

13 SUPERVISOR VAGIM: But it doesn't -- that's an  
14 inherent part of the process --

15 DR. SHORT: Pure methanol has a very, very faint,  
16 ethereal smell. That's all.

17 SUPERVISOR VAGIM: But in natural gas, say, you  
18 put an odorant in --

19 DR. SHORT: Natural gas has an odor due to the  
20 butanol mercaptan.

21 SUPERVISOR VAGIM: And you can't see natural gas  
22 either. Obviously, if you get this on you, you can tell  
23 it's on you because of the odor.

24 DR. SHORT: Well, if you spilled methanol on your  
25 skin, you would certainly know it, simply because it would

1 look like water.

2 SUPERVISOR VAGIM: Well, you wouldn't walk around  
3 and wave your arm that had methanol on it and approach  
4 somebody lighting a match for a cigarette.

5 DR. SHORT: Actually, it wouldn't ignite under  
6 those circumstances.

7 SUPERVISOR VAGIM: So, what you're saying -- are  
8 we overestimating the risk factor then?

9 DR. SHORT: Absolutely, yes.

10 SUPERVISOR VAGIM: Now, the other issue is the  
11 amount that you would need to to power a motorized vehicle.

12 Do you need a bigger containment vehicle to get --

13 DR. SHORT: My answer is, yes, but methanol can be  
14 very much more efficient in an internal combustion engine,  
15 because it can sustain a much higher compression ratio, and  
16 lots of other possibilities present themselves.

17 There was a paper on this, which I referred to in  
18 my testimony, which outline those. And it's anticipated  
19 that the dedicated M100 vehicle will be between 30 and 40  
20 percent more efficient than today's gasoline vehicle.

21 SUPERVISOR VAGIM: For the same volume?

22 DR. SHORT: For the same power output. For the  
23 same performance I should say.

24 SUPERVISOR VAGIM: Okay. But not volume going in,  
25 though?

1 DR. SHORT: No, no. The strict energy equivalency  
2 of methanol is about 1.85 times the volume of gasoline for  
3 the same energy. But you get that back in large part with  
4 increased efficiency.

5 SUPERVISOR VAGIM: How does that stack up with  
6 natural gas, about the same ratio?

7 DR. SHORT: Oh, natural gas just can't approach  
8 the efficiency of methanol.

9 SUPERVISOR VAGIM: So, it's even higher than  
10 natural gas in the sense that it will --

11 DR. SHORT: In terms of efficiency, in terms of  
12 BTUs per unit of power, yes. But going beyond that, fuel  
13 cells can be very much more efficient still.

14 SUPERVISOR VAGIM: And the fuel cell again, can  
15 you describe your definition of a fuel cell?

16 DR. SHORT: Well, there are two kinds of fuel  
17 cells which would involve M100 methanol. One is an indirect  
18 fuel cell, whereby the liquid methanol is taken on board and  
19 is gasified to hydrogen, and hydrogen is the fuel, which is  
20 oxidized. With that system, it works. And most of today's  
21 practical demonstrations involve that kind of system, but it  
22 has some disadvantages involved. You have at least a three-  
23 phase system inevitably and all kinds of problems associated  
24 with gasification storage and leakages. Whereas, the direct  
25 method takes liquid fuel, liquid methanol, dilutes it with

1 water, and puts it straight into the fuel cell where it's  
2 oxidized. So, it's only a two-phase system and, obviously,  
3 it doesn't have any kind of -- it doesn't suffer from the  
4 many complications of an indirect system.

5 SUPERVISOR VAGIM: And in the fuel cell, you're  
6 creating -- you're oxidizing it and creating a heat source?

7 DR. SHORT: There's some heat generated, yeah.  
8 That heat is actually used beneficially in the car.

9 SUPERVISOR VAGIM: As a byproduct?

10 DR. SHORT: Yeah.

11 SUPERVISOR VAGIM: Okay. But the actual ignition  
12 then is moved onto the next phase out of the fuel cell?

13 DR. SHORT: There is no ignition.

14 SUPERVISOR VAGIM: No ignition. Well, where do  
15 you get your BTUs as the power in your --

16 DR. SHORT: It's an electrical oxidation.

17 SUPERVISOR VAGIM: Oh, so you're creating --

18 DR. SHORT: Yeah.

19 SUPERVISOR VAGIM: So, it's a byproduct -- the  
20 real byproduct --

21 DR. SHORT: The byproduct is CO2 and water, just  
22 the same as from an internal combustion engine.

23 SUPERVISOR VAGIM: But your primary benefit is the  
24 electricity that is generated off of it?

25 DR. SHORT: The primary benefit is you've got a

1 totally clean vehicle, and it's also extremely efficient in  
2 terms of resources; you're using twice as efficiently as a  
3 combustion engine.

4 SUPERVISOR VAGIM: Not quite a ZEV.

5 DR. SHORT: Not quite a?

6 SUPERVISOR VAGIM: Not quite a ZEV, right?

7 DR. SHORT: It would be more than a ZEV, since the  
8 current kind of ZEV would depend on a battery, which depends  
9 on generated power. This uses power which is generated  
10 within the fuel cell, and it doesn't have any combustion  
11 process associated with it and, therefore, no pollution.

12 CHAIRWOMAN RIORDAN: Would you like to now go to  
13 your video?

14 DR. SHORT: I think we're ready.

15 CHAIRWOMAN RIORDAN: All right.

16 (Thereupon, a video demonstration was  
17 presented by Dr. Short.)

18 CHAIRWOMAN RIORDAN: All right. Do you have any  
19 final comments, Dr. Short?

20 DR. SHORT: I may like the opportunity to come  
21 back, depending on what the staff recommends.

22 CHAIRWOMAN RIORDAN: Okay. There are some  
23 questions by Board members.

24 Mr. Calhoun?

25 MR. CALHOUN: Dr. Short, would you care to

1 elaborate on the comment you made regarding the Institute's  
2 willing to step up and assume liability for any fires caused  
3 by methanol?

4 DR. SHORT: What I was referring to is that, by  
5 standing here today and saying we don't want the luminosity  
6 requirement, and whatever ensuing problems -- and it is,  
7 after all, our product -- and whatever it is, we stand by  
8 them. And there are product liabilities on everything.  
9 That's all I was referring to.

10 We're not asking for our liability to be assumed  
11 by the Board.

12 CHAIRWOMAN RIORDAN: Supervisor Vagim?

13 SUPERVISOR VAGIM: That demonstration was M85?

14 DR. SHORT: No. M100.

15 SUPERVISOR VAGIM: That was 100?

16 DR. SHORT: Yes.

17 SUPERVISOR VAGIM: Okay. Thank you.

18 CHAIRWOMAN RIORDAN: Any other questions?

19 Okay. Thank you, Dr. Short.

20 Our next speaker is Dan Fong from the California  
21 Energy Commission.

22 MR. FONG: Thank you, Madam Chairwoman. Having  
23 witnessed the earlier debate on OBD II, just let me say I've  
24 always been impressed with the Board's patience.

25 CHAIRWOMAN RIORDAN: Thank you.

1 MR. FONG: The staff of the California Energy  
2 Commission is pleased to have this opportunity to testify on  
3 this proposed amendment to the flame luminosity requirement  
4 in specifications for M100 fuel methanol.

5 As in numerous other areas where the Board and the  
6 Energy Commission have a common interest, I would like to  
7 commend the Board for its continuing foresight in  
8 identifying alternative fuels and advanced vehicle  
9 technology as important elements in the State's strategic  
10 plan to reduce mobile source air pollution and to reach  
11 attainment of health-based air quality.

12 We fully support this vision, and believe it also  
13 supplies important energy diversity and economic benefits  
14 for the State as well.

15 The Energy Commission staff supports the proposal  
16 to amend this particular section in Title 13 of the  
17 California Code of regulations. We believe that this  
18 additional flexibility does, in fact, help us who are  
19 currently using M100 as a fuel.

20 Now, your staff has already presented information  
21 regarding previous analysis and work to attempt to improve  
22 M100 as a fuel, including its luminosity characteristics.  
23 And I think you understand the difficult problem that we've  
24 discovered in pursuing those kinds of improvements.

25 On the one hand, M100 may be a very good air

1 quality fuel, but if we want to make it visible, then, in  
2 essence, we may be eliminating it as an option for cleaner  
3 air.

4           Given this situation, the Energy Commission staff  
5 believes that it's time to do perhaps a formal fire risk  
6 assessment, one that includes flame luminosity as one of the  
7 important elements of that kind of assessment, and to also  
8 look at other important elements, which would enter into  
9 this question of whether or not M100 is a safe fuel with or  
10 without a flame luminosity ingredient.

11           We believe that in this broader context, we'll  
12 have a much more solid position in comparing the relative  
13 risk of M100 with or without a luminosity ingredient versus  
14 other fuels, which are currently in the marketplace.

15           To make it simple, if we were to spend a dollar on  
16 providing flame luminosity for M100, I'd like to know how  
17 much less personal injury or how much less property damage  
18 is going to result from that kind of an expenditure versus  
19 an equal expenditure, for instance, in reducing fires or  
20 personal injury from gasoline-related events.

21           Just as a policymaker, I think we'd like to be  
22 able to balance the various cost-effective decisions that  
23 you have to consider when you adopt various other rules.

24           So, in summary, the Commission staff believes that  
25 the adoption of the proposed amendment for the flame

1 luminosity requirement is adequate for the short term. We  
2 recognize that there is a need to perhaps overcome a  
3 perception of risk, but, at the same time, we strongly  
4 recommend that the Board instruct the staff to participate  
5 in a much more formal fire risk assessment along with the  
6 Energy Commission and potentially other interested parties.

7 We believe that this will quantify the luminosity  
8 risk of M100 and other fuel formulations with respect to  
9 other fire risk elements.

10 And in doing so, we would place in perspective the  
11 cost/benefit of these various options to improve fire  
12 safety.

13 I'd be happy to respond to any questions at this  
14 time.

15 CHAIRWOMAN RIORDAN: Thank you, Mr. Fong. Let me  
16 ask Board members if there are any questions? Mr. Calhoun.

17  
18 MR. CALHOUN: Yes. Mr. Fong, do you think the  
19 Commission is willing to take the lead in organizing this  
20 risk assessment -- the risk associated with methanol?

21 MR. FONG: Yeah, we certainly would entertain a  
22 discussion about who the responsible party should be.

23 MR. CALHOUN: You're suggesting that we instruct  
24 the staff to get involved in taking a greater risk  
25 assessment. I'd like to see the Energy Commission take a

1 very prominent role in participating in this.

2 MR. FONG: We certainly would do that.

3 CHAIRWOMAN RIORDAN: Ms. Edgerton.

4 MS. EDGERTON: Mr. Fong, it's nice to see you  
5 here.

6 MR. FONG: Thank you.

7 MS. EDGERTON: The last time we were together, we  
8 were talking about electric school buses.

9 If I understand you correctly, you're saying that  
10 the California Energy Commission supports the staff  
11 recommendation that you have to either have the luminosity  
12 additive or you have to have the safety -- or you have to  
13 have the safety stuff, provided, however, that you would  
14 like for there also to be a study to see if that makes  
15 sense.

16 MR. FONG: We're supporting the proposed amendment  
17 to add additional language to the code that allows current  
18 users of M100 to continue to use that fuel without perhaps  
19 having a flame luminosity aspect ingredient. That's what  
20 we're supporting.

21 Now, I personally also would think that, based  
22 upon my knowledge and understanding of the chemical  
23 properties of methanol versus, for instance, gasoline --  
24 methanol, in my mind, represents a lower fire risk than  
25 gasoline, even without a flame luminosity characteristic.

1 I also personally think that these other elements,  
2 you know, ignition, heat release, et cetera, are potentially  
3 more important in terms of fire risk and potential personal  
4 injury and property damage than flame luminosity.

5 At the same time, I recognize as well that, you  
6 know, if methanol is to be really successful in the  
7 marketplace, we may have to overcome public perception and  
8 concern about it not having flame luminosity.

9 And so, a study that would actually quantify what  
10 that risk might be would be a useful tool to use in terms of  
11 explaining to the public what they might be exposed to if,  
12 for instance, you saw a lot of M100 vehicles on the road,  
13 and they did not have some sort of special additive for  
14 flame luminosity.

15 We all take risks in every day life, but it's good  
16 to know what that risk is. And I think a risk assessment  
17 would go a long way toward convincing a good majority of the  
18 public that M100 is a safe fuel and potentially one that you  
19 don't need any further adjustment to in terms of a  
20 luminosity enhancing ingredient.

21 All I'm saying is, for now, until we have that  
22 quantitative basis to make a decision, we actually would  
23 support the continuation of the current luminosity  
24 requirement.

25 MS. EDGERTON: Well, so -- wait a minute. I was

1 all fine until that last thing. It sounded to me like you,  
2 at first, the amendment you support was the American  
3 Methanol Institute's amendment.

4 CHAIRWOMAN RIORDAN: No.

5 MR. FONG: Supporting the proposed staff's  
6 recommendation --

7 MS. EDGERTON: Okay.

8 MR. FONG: -- and add language that allows fire  
9 suppression equipment to be used in lieu of a luminosity  
10 ingredient in the fuel.

11 MS. EDGERTON: Okay. Well, I guess my next  
12 question is would you also support further deferral of the  
13 adoption of a regulation -- of this regulation by the ARB  
14 until we had such a risk assessment?

15 MR. FONG: I think the on-board fire suppression  
16 requirement is one that is already being implemented by the  
17 industry for heavy-duty vehicles -- for instance, for buses,  
18 where you do have a lot of people on board a single vehicle.  
19 If that vehicle were to be involved in some accident and you  
20 had some fire event, it probably does make sense to have  
21 some on-board fire suppression equipment.

22 And that's why the Commission required that in all  
23 of our school buses that we have demonstrated, not just the  
24 methanol buses. But we've also installed fire suppression  
25 equipment in our natural gas and in our advanced diesel

1 buses.

2           So, where there is great risk of significant  
3 personal injury, it probably makes sense to look at the  
4 additional cost that might be required to put on an on-board  
5 fire suppression system.

6           A school bus, for instance, can be up to a  
7 \$200,000 vehicle. The fire suppression system adds maybe  
8 two to four thousand dollars to that vehicle cost,  
9 relatively minor in terms of the overall value of that  
10 vehicle. And plus, it's going to be carrying up to 80  
11 individuals, so there's a good argument to perhaps put on-  
12 board fire suppression on that kind of vehicle, which makes  
13 sense.

14           MS. EDGERTON: Except we don't require it on  
15 gasoline vehicles.

16           MR. FONG: Correct, we don't.

17           MS. EDGERTON: So, the reason would be is because  
18 it's a newer fuel, and so we want it to be more of an  
19 additional safety measure just because it's new. We don't  
20 require suppression on gasoline school buses, and our  
21 children ride around in those.

22           MR. FONG: Well, as it turns out, no manufacturer  
23 in the United States makes gasoline-powered school buses  
24 because of the fire risk.

25           MS. EDGERTON: Oh, that's a good point. It's

1 diesel. Thank you.

2 CHAIRWOMAN RIORDAN: Thank you very much. Are  
3 there any other questions?

4 I'd like to thank this witness, and call our next  
5 witness, which is Paul Wuebben from the South Coast Air  
6 Quality District.

7 MR. WUEBBEN: Thank you very much, Madam  
8 Chairwoman and members of the Board.

9 I am Paul Wuebben, the Clean Fuels Officer for the  
10 South Coast AQMD. And we certainly appreciate the  
11 opportunity to present our comments on this important  
12 recommendation made by your staff.

13 We do endorse the changes on an interim basis made  
14 by your staff, and do so based on the -- partially on the  
15 fact that the MTA, of course, is showing tremendous  
16 environmental leadership by operating the largest methanol  
17 M100 bus fleet in the world. And also the fact that, in the  
18 absence of these proposed immediate changes, in a less than  
19 a month -- on January 1 -- the operation of those buses  
20 would be, in effect, illegal, and they would have to  
21 terminate their operation.

22 So, there is great urgency for acting in some  
23 fashion today.

24 We have, of course, worked very cooperatively with  
25 the ARB and the Energy Commission on this issue for a number

1 of years. We did cosponsor the study that was referred to,  
2 which, of course, indicated that any additive to M100 will  
3 end up, in effect, contaminating M100 and increasing  
4 emissions, which, as you know, is certainly not -- not our  
5 objective.

6 We do believe that it is essential to put this  
7 issue in a long-term context. If the proposed commercial  
8 restrictions on marketing M100 are maintained -- and that's  
9 how we do view this long-term flame suppression technology  
10 requirement -- we believe that a significant barrier to M100  
11 commercialization research and development will be created.  
12 For example, a permanent requirement to utilize on-board  
13 fire detection would place a major cost advantage (sic) for  
14 light-duty M100 applications.

15 Now, such a commercialization barrier could  
16 effectively ban M100 use, despite its cleaner burning  
17 properties compared to M100 (sic) or even gasoline. And, as  
18 I have in my testimony on the last page, some NOx data that  
19 shows you that comparing M100 to M85, it may be surprising  
20 that even relative to M85, M100 produces NOx emissions in  
21 heavy-duty engines between 25 and 50 percent. And this  
22 applies both to engines developed by Detroit Diesel  
23 Corporation and also by Navistar.

24 And, of course, diesel fueled heavy-duty engines  
25 would emit far higher levels of NOx and particulate. And

1 these NOx reductions are, of course, critical as we continue  
2 to implement the local air quality management plan.

3           So, to help take advantage of those benefits, the  
4 district has entered into some important M100-related  
5 development projects. For example, we have just started a  
6 collaboration with Cummins and Chrysler focused on the  
7 medium-duty 5.9 liter engine. It's an extremely popular  
8 engine used in medium-duty truck applications. In that  
9 case, we're looking at optimizing M100.

10           In discussions with Chrysler, I've been told --  
11 and I've been also cleared to make this statement publicly--  
12 that they are formally considering M100 as part of the  
13 optimization strategy for taking their two liter -- I should  
14 say their two-cycle engine to a further point along the  
15 commercialization path.

16           Volkswagen has also indicated -- and I believe in  
17 writing -- that they actually see no luminosity safety  
18 constraints to M100 and, in fact, prefer M100 to M85 on a  
19 fire safety basis as well as an emissions basis.

20           The district is also cosponsoring with your Board  
21 a development program on M100 using an FEV technology, which  
22 we believe has been structured to attain the ultra low  
23 emission vehicle standard. And, of course, the use of M100  
24 is also an option being looked at as part of the partnership  
25 for new generation vehicles, which is being looked at --

1 advanced nationally.

2           And perhaps the most important issue with respect  
3 to M100 is that it's a key option for early  
4 commercialization of fuel cell technology, both either as a  
5 reformed approach, taking methanol essentially as a hydrogen  
6 carrier, converting those ions into electricity, or through  
7 the direct methanol approach discussed earlier.

8           We are working directly on this type of  
9 technology, and the district intends, next year, to be the  
10 first site in California that would actually have the first  
11 M100 fuel cell refueling site that's in operation. There's  
12 a specification difference between that M100 and the fuel  
13 being used by the MTA, for example.

14           We're also, of course, doing that in connection  
15 with Georgetown Department of Transportation and the  
16 Department of Energy.

17           Equally exciting is the work that was referred to  
18 earlier at the Jet Propulsion Labs on the direct methanol  
19 fuel cell, which has a long-term ZEV potential, certainly.

20           So, in the interest of long-term air quality  
21 progress, we believe that it's essential that we not -- that  
22 a permanent barrier for M100 commercialization not be  
23 created. And given the long-term importance, we believe it  
24 would be very constructive to pursue the quantitative and  
25 technical evaluation that was recommended by the Energy

1 Commission.

2           And I think also that this qualitative assessment  
3 is going to help put M100 into context. Because, clearly,  
4 as you've seen and heard repeatedly today, it's harder to  
5 start M100 fire compared to M85 and compared to gasoline,  
6 due essentially to its lower vapor pressure and to its  
7 higher latent heat of vaporization.

8           If there is a fire, there's less risk, because  
9 it's cooler. It's a slower moving flame. It's smokeless.  
10 And it's less toxic.

11           As you may know, most fire-related fatalities  
12 occur because of the inhalation effects, not even direct  
13 burning. Those problems occur far earlier.

14           And, of course, if one needs to extinguish the  
15 fire, it's easier to do so. So, we think that that  
16 technical evaluation will help enhance the confidence that  
17 the Board may need to move us into that later point where we  
18 recognize the -- some of these luminosity issues in a better  
19 perspective.

20           So, we appreciate the responsiveness of your staff  
21 to address this near term issue to get this on the agenda,  
22 and we also think that the MTA has been extremely diligent  
23 in approaching this, and hope that the Board is very  
24 receptive. I appreciate this opportunity.

25           I'll answer any questions.

1 CHAIRWOMAN RIORDAN: Thank you. And let me offer  
2 to the Board members, are there any questions for Mr.  
3 Wuebben? Yes, Dr. Boston.

4 DR. BOSTON: You would also recommend eliminating  
5 the fire suppression system on these vehicles?

6 MR. WUEBBEN: Personally, I think that if one  
7 looks at all -- from a technical standpoint, I believe that  
8 most people -- I don't know anyone technically who would not  
9 agree that, from a fire risk standpoint, M100 is safer than  
10 M85 or gasoline.

11 I think, technically, there's virtual unanimity on  
12 that precise point. In terms of the process that the Board  
13 needs to go through to provide a sufficient public  
14 confidence in that judgment, I believe that there is  
15 probably an adequate basis right now. But I certainly agree  
16 with the Energy Commission as well that an additional study  
17 would enhance everyone's confidence.

18 So, there's benefits both ways.

19 But, certainly, we need a near term fix. And the  
20 longer-term issue is one that does need to come back to your  
21 board. In fact, we would suggest that this study be brought  
22 back well within the two years and, in fact, on an expedited  
23 basis, because there are important resource and investment  
24 decisions being made about M100 technology, particularly  
25 JPL, because they look for equity investors -- Cummins, FEV

1 technology, et cetera.

2 So, there very well may be an adequate basis for  
3 the Board to act today to eliminate the requirement, but a  
4 study would also, you know, I think very prudent to do.

5 CHAIRWOMAN RIORDAN: Other questions? Ms.  
6 Edgerton.

7 MS. EDGERTON: If this Board were to -- if we were  
8 to decide to pass this amendment, but with a sunset, a two-  
9 year sunset, would there be any advantage to that?

10 I'm a little confused about whether -- on the one  
11 hand, you said we need the amendment for the near future so  
12 that we have a luminosity and/or safety suppression (sic),  
13 but we don't need it very long. Maybe we just need while  
14 we're getting this other study or --

15 MR. WUEBBEN: Well, I'm anticipating the results  
16 of the study, because I think, based on EPA's work and quite  
17 a bit of work that's gone on over the years, we know what  
18 the characteristics are, but that information has to be  
19 perhaps collected in a more overt manner.

20 But, certainly, a sunset on the luminosity  
21 requirement would give a strong incentive to get this  
22 research and technical evaluation performed in the quickest  
23 possible time frame. So, I think that would be a very  
24 constructive --

25 MS. EDGERTON: So, if there were a sunset in two

1 years and there were this study, then, do you think that  
2 the-- from what you know about the investment community, do  
3 you think that would have an effect, do you think --

4 MR. WUEBBEN: Yeah, I think that would be seen as  
5 a positive step in the sense that it would signal that the  
6 Board intends to remove the luminosity requirement after two  
7 years, unless the technical evaluation came back and  
8 indicated that that was an imprudent thing to do.

9 But it would certainly give a very clear signal  
10 and build confidence, which right now is something that is  
11 somewhat lessened.

12 MS. EDGERTON: Thank you.

13 CHAIRWOMAN RIORDAN: Staff, any comments on this  
14 last discussion?

15 MR. CACKETTE: I just wanted to offer a brief  
16 history of what we're doing here, because in listening to  
17 the discussion, I think maybe there's some confusion about  
18 what the regs do and what the amendments do.

19 What we started off with was adopting a methanol  
20 specification that said there must be a luminosity to the  
21 fuel, but we're going to exempt that requirement until 1/95.  
22 So, in other words, you could have nonluminous fuel sold  
23 until a few days from now.

24 So that, on 1/95, the fuel has to be luminous.  
25 And we've not found a luminosity additive. So, that

1 eliminates the ability of the fuel to be used, including the  
2 vehicles that are on the road.

3 So, we're proposing to amend the regulations to  
4 day, another way of getting around the luminosity  
5 requirement is to have fire suppression. Now, if we do the  
6 study, or the Board should decide that this isn't a  
7 significant risk, as some people may think it is, then what  
8 we would do is come back and eliminate the requirement for  
9 luminosity; in which case, then methanol would just be sold  
10 in its natural state.

11 So, that's kind of the process.

12 MR. BOYD: Let me add to what Mr. Cackette said.  
13 We're trying to keep methanol alive, frankly, as an  
14 experimental alternative fuel by the action we're  
15 recommending. Because, after ten years of studying, none of  
16 us have been able to find a satisfactory additive, other  
17 than the 15 percent gasoline. And the alternative is as the  
18 staff is recommending.

19 The other point, though, that I want to make to  
20 you here is, after having personally lived with this subject  
21 for more than a decade, and working with both the South  
22 Coast District and the Energy Commission on the subject for  
23 that period of time or greater, your staff, frankly, is  
24 being very conservative -- maybe overly conservative --  
25 because of the perception -- this reality problem -- that

1 afflicts M100, the myths that have been perpetuated relative  
2 to the dangers of methanol and M100. Thus, we're being very  
3 conservative in our protection of the public's health,  
4 although we're measuring the fire safety here more than air  
5 quality.

6 And recognizing there is a perception problem, be  
7 it right or wrong, thus suggesting this continuation or the  
8 addition of the fire suppression approach, which has been  
9 adopted by some. And I think the idea of a study is very  
10 acceptable to me, as staff, short of the Board finding that  
11 your staff is being overly conservative, as perhaps Mr.  
12 Wuebben suggested, we don't need to do that anymore.

13 So, I'm trying to put this all into context of why  
14 we're doing what we're doing.

15 CHAIRWOMAN RIORDAN: Thank you. Mr. Parnell.

16 MR. PARNELL: Well, I applaud what staff has done  
17 in terms of trying to keep methanol alive. I guess I have a  
18 view of what government should do that might be different  
19 from hers and what government shouldn't do. And I recognize  
20 why staff is being conservative. But good alternatives, to  
21 me, may be that we relieve the pressure on methanol and  
22 requiring it to be sold -- I mean M100 to be sold with no  
23 further restrictions, pending the study. At which time, if  
24 it is deemed necessary, that we can come back with the fire  
25 suppression requirement.

1           It would another alternative. It seems to me it's  
2 been said, and I assume that it's correct, that most  
3 vehicles burning M100 indeed do have fire suppression  
4 equipment on them. And that's been done voluntarily.

5           So, as long as that's the case, I suppose I, for  
6 one -- unless there's other testimony to the contrary --  
7 would support the idea of relieving, as the staff suggests,  
8 without the fire suppression mandate, suggest that the study  
9 be made, and come back another day and look at it.

10           SUPERVISOR VAGIM: Madam Chair?

11           CHAIRWOMAN RIORDAN: Yes, Supervisor Vagim.

12           SUPERVISOR VAGIM: Thank you. What is our fear,  
13 that someone will walk into a burning pan of methanol?

14           (Laughter.)

15           MR. CACKETTE: I think the graphic illustration,  
16 and this is not in any way to suggest that this will occur,  
17 but when you have a school bus and it is rear-ended, the  
18 tank cracks open, the methanol runs out and dribbles down  
19 the road a little ways or towards the sidewalk. And then  
20 some ignition source ignites it. Everybody jumps out of the  
21 school bus, because there was a wreck, runs out there, and  
22 walks -- somebody walks into the fire.

23           That's the concern, because you can't see the  
24 fire. And probably the issue here is, is that an extremely  
25 small risk or is it a substantial risk?

1 I think that most people, including your staff,  
2 thinks it's an extremely small risk. But at the time we  
3 were debating this, when the reg was first adopted, our fear  
4 was that, if that happened just once, then this fuel would  
5 get a name that would put it to death at that point.

6 And it hasn't happened so far, and there have  
7 been, you know, some fires associated with those buses and  
8 the fire suppression took care of it. There's not been that  
9 kind of situation that I just described. And we just don't  
10 know whether it'll happen or not.

11 So, our overconservatism is based on that premise  
12 alone.

13 SUPERVISOR VAGIM: But, indeed, if it does ignite,  
14 then it ignites all -- it would ignite the rest of the fluid  
15 that's on the ground, including stuff coming out of the bus,  
16 right, as we saw in that demonstration? It's not going to  
17 land in an isolated puddle and not go back to the bus, which  
18 you will see the flames of the other constituents, such as--

19 MR. CACKETTE: You'll see the bus burning, but you  
20 won't necessarily see the puddle.

21 SUPERVISOR VAGIM: But the kids who see it burning  
22 will run away from it, not towards it.

23 MR. CACKETTE: Well, that's exactly the point. If  
24 you saw the bus burning, you would run away from the bus.  
25 But if the fluid was out there a few feet away, you might

1 run right into that. That's the flame which you can't see.  
2 It's the picture where you've got the drywall there and you  
3 can't tell -- you've got some wiggles in the air from the  
4 heat, and you don't really see anything.

5 That was the concern.

6 SUPERVISOR VAGIM: If it was evening, you'd see  
7 the blue flame.

8 MR. CACKETTE: If it was evening, you would see  
9 something.

10 SUPERVISOR VAGIM: There's a real narrow band with  
11 the time, in addition to a spill in the middle of the road  
12 and all that other kind of stuff.

13 MR. CACKETTE: Sure. Right.

14 MS. EDGERTON: I don't think it's a narrow band of  
15 time.

16 MR. CACKETTE: School buses pick up kids in the  
17 light. Again, I don't want to overestimate these examples.  
18 I don't know if it's one in a zillion risk or not. But I'm  
19 just trying tell you that we agree technically that the risk  
20 is probably very low. And the only rationale we had was the  
21 one I described.

22 CHAIRWOMAN RIORDAN: Let's go on with --

23 MR. LAGARIAS: Madam Chair?

24 CHAIRWOMAN RIORDAN: Yes, Mr. Lagarias.

25 MR. LAGARIAS: I'd like the staff to let me know,

1 is it true that all school buses need fire suppression  
2 systems regardless of the fuel that they're using, or is it  
3 just unique to methanol?

4 MR. FONG: (From the audience) Maybe I can help  
5 there. New requirements that are being adopted here in  
6 California at least --

7 CHAIRWOMAN RIORDAN: Mr. Fong, we need to have you  
8 introduce yourself.

9 MR. FONG: Dan Fong with the California Energy  
10 Commission. New buses which are being ordered and built for  
11 California schools will have fire suppression equipment.

12 MR. LAGARIAS: Regardless of the fuel?

13 MR. FONG: Regardless of the fuel.

14 Now, this is not necessarily a national standard.  
15 I think we here in California are perhaps going a bit  
16 further than anybody else; that we tend to lead the nation  
17 in many other areas. It may well be in fire safety as well.

18 CHAIRWOMAN RIORDAN: Also litigation, so. . .

19 (Laughter.)

20 CHAIRWOMAN RIORDAN: I say that as a beneficiary  
21 of many of those lawsuits. As a public entity, it just goes  
22 without saying.

23 Ms. Edgerton.

24 MS. EDGERTON: So, if I understand correctly, our  
25 children are protected anyway by the school bus safety

1 regulation, and the fire suppression is going to be on there  
2 anyway.

3 CHAIRWOMAN RIORDAN: Mr. Kenny. You didn't like  
4 my comment; is that what you're saying?

5 MR. KENNY: No, your comment was fine, but also it  
6 sort of raises an opportunity to kind of respond to an issue  
7 that seems to be arising, so the Board's aware of it.

8 There's been some discussion of the potential for  
9 simply eliminating the luminosity requirement. In looking  
10 at the notice, there's at least a concern that I have that  
11 that might be beyond the scope of the notice for this  
12 particular hearing.

13 We did not notice it in that particular fashion.  
14 The notice basically limited it to the proposal that the  
15 staff's making to the Board. It is not a clear call, but it  
16 does seem that to proceed with the particular discussion of  
17 the luminosity -- eliminating the luminosity requirement  
18 could raise that particular concern.

19 CHAIRWOMAN RIORDAN: Thank you, Mr. Kenny.  
20 Now, any other questions for this witness?

21 Dr. Boston.

22 DR. BOSTON: A question of Mr. Cackette. If the  
23 methanol ran down the gutter, why would we see it with what  
24 the Board is recommending, what the staff is recommending?  
25 Is it the bladder in the tank that ruptures and spills

1 something that makes us see the flame? How does this  
2 regulation change what you just said?

3 MR. CACKETTE: No. What I was describing was our  
4 concern when we adopted the regulation in 1990. That was  
5 the general perception at the time. Because my example was  
6 not a very good one for the future, because they have fire  
7 suppression now. And it's probably not a very good point  
8 that it runs down the gutter before there's any ignition,  
9 because fire suppression wouldn't pick it up. It picks it  
10 up on the vehicle. Unless it's a bladder type. Right now,  
11 the type they use is more of a haline type.

12 DR. BOSTON: It was my understanding, though, that  
13 the bladder is something in the tank that, when it ruptured,  
14 it would create a luminosity to the fire. Is that wrong?

15 MR. CROSS: That's correct.

16 MR. CACKETTE: For that one, it would cause the  
17 luminosity. But I'm saying, the other one would use haline,  
18 and it wouldn't, because the vehicle wouldn't detect the  
19 fire if it's not on the vehicle. And in that case, my  
20 example wasn't a good one because, in either case, it could  
21 still ignite.

22 CHAIRWOMAN RIORDAN: Okay. Thank you very much.

23 SUPERVISOR VAGIM: Madam Chair?

24 CHAIRWOMAN RIORDAN: Is this a question of the  
25 witness?

1 SUPERVISOR VAGIM: I just want -- something that  
2 was brought up by our counsel, I want to make sure --

3 CHAIRWOMAN RIORDAN: I'll excuse the witness. But  
4 go ahead and ask the question of counsel. Only counsel is  
5 in a consultation, so just wait just a moment.

6 SUPERVISOR VAGIM: That notice that we have that  
7 went out, you know, the plain English document that we have  
8 here?

9 (Laughter.)

10 SUPERVISOR VAGIM: It does say that this is -- the  
11 Board will consider an amendment of the luminosity  
12 requirement and specifications of M100 fuel used in  
13 California vehicles, and it goes on to explain about why we  
14 should or shouldn't take out the luminosity requirements.  
15 So, isn't that sufficient to do what we'd like to --

16 MR. KENNY: Actually, I don't think it is,  
17 Supervisor Vagim. Although it does discuss basically the  
18 fact staff is proposing a modification to the luminosity  
19 requirement, the entire context of the notice is in  
20 relationship to the fact that the luminosity requirement is  
21 there, and how basically the safety issue, with regard to  
22 the luminosity, is going to be addressed.

23 It does not talk about basically the elimination  
24 of the luminosity requirements.

25 So, anyone who would actually read the notice

1 would not really be on reasonable notice that there is a  
2 potential in this particular hearing for elimination of that  
3 requirement.

4 SUPERVISOR VAGIM: But the notice spells it out as  
5 a continuation of the luminosity policy. So, if we don't  
6 continue that, we basically satisfy the notice.

7 MR. KENNY: I'm not sure I followed that.

8 SUPERVISOR VAGIM: Well, the whole notice is about  
9 whether or not we should continue with luminosity or not.

10 MR. KENNY: Well, it's not about continuing  
11 luminosity requirements. It's about how the luminosity  
12 requirement's going to be implemented. I think that's the  
13 distinction that's important here.

14 MR. BOYD: Supervisor Vagim, we have an ongoing  
15 exemption from the luminosity requirement which expires at  
16 the end of this calendar year.

17 SUPERVISOR VAGIM: Right.

18 MR. BOYD: So, a luminosity requirement will kick  
19 in the first of January, and we're recommending some  
20 variations to that luminosity requirement to keep the issue  
21 viable.

22 CHAIRWOMAN RIORDAN: Okay. Thank you. Let me  
23 call on the next witness, which is Gary Clark from the L.A.  
24 County Metropolitan Transportation Company.

25 MR. BOYD: We lost our witness.

1 CHAIRWOMAN RIORDAN: We lost our witness.

2 How about Mr. Karbowski?

3 (Thereupon, the reporter requested time to  
4 replenish her paper supply.)

5 CHAIRWOMAN RIORDAN: Yes, why don't you change  
6 your paper.

7 Mr. Krabowski, I guess you double for Mr. Clark,  
8 too? Is that what you do?

9 If you'll wait just a moment until we have some  
10 paper.

11 Just to let the audience know, I -- obviously  
12 pushing ahead -- forgot Mr. Taylor. But don't worry, Mr.  
13 Taylor, you're going to be right after Mr. Karbowski.

14 Okay? Are we ready now?

15 MR. KARBOWSKI: Good evening, Madam Chair and  
16 members of the Board.

17 My name is George Karbowski. I'm the Project  
18 Manager for the Los Angeles County Metropolitan  
19 Transportation Authority methanol bus fleet.

20 I just want to make a few brief comments today.  
21 And first of all, I would like to thank the ARB staff, and  
22 particularly Annette Guerrero for her expeditious and  
23 professional manner in getting this before the Board,  
24 because I'd like to point out that, as of January 1st, 1995,  
25 had this issue not come before the Board and hopefully be

1 resolved in some way, shape, or form, we would actually have  
2 a little difficult time, because the methanol bus fleet that  
3 we currently operate in Southern California is about 15  
4 percent of our operating fleet. In no way is it a  
5 demonstration project.

6 We travel approximately 1.3 million miles per  
7 month, have accumulated approximately 30 million miles since  
8 we started operating methanol buses. And that equates to  
9 roughly a half a billion passenger miles.

10 I'd like to point out that all 333 of our methanol  
11 buses are equipped with automatic fire sensing and  
12 suppression systems. The system that we do use is a system  
13 that was originally designed for the M181 tank, so it's a  
14 defense conversion project that is produced right here in  
15 Southern California; in fact, in Santa Barbara.

16 Our safety record with M100 fuel has been  
17 exemplary. The system has worked quite well. We have had a  
18 sort of notable fire back in 1989, just barely two or three  
19 months into the project. The fire was contained in the  
20 engine compartment and the damage was virtually  
21 undetectable. It took us a while to figure out why the  
22 system went off.

23 I would like to point out that the MTA will comply  
24 with whatever regulations are put forth by the Air Resources  
25 Board. I would like to mention, however, that in 1991, when

1 we decided to pursue with 303 of these buses, the 6092  
2 Detroit Diesel methanol engine was the only engine certified  
3 by both the EPA and the California Air Resources Board and,  
4 thus, was the only choice that we had for a transit bus at  
5 that time.

6 Generally, the life of a transit bus in our  
7 operation is about 12 years. And subject to the Board's  
8 recommendations, and the eventual law, and fuel supply  
9 issues, we intend to run those buses 12 to 15 years.

10 Don't have much else to say. Again, we're very  
11 happy that this did get before the Board. I stand here  
12 ready to answer any questions that you have.

13 CHAIRWOMAN RIORDAN: And I appreciate that. Let  
14 me ask the Board members if there are any questions.

15 I see none, but we thank you for being here. And  
16 I have a lot of other questions, but they don't relate to  
17 this.

18 MR. KARBOWSKI: Thank you very much.

19 Let me go back to Mr. Timothy Taylor from the  
20 Sacramento Metropolitan Air Quality Management District.

21 MR. TAYLOR: Thank you very much, Madam Chair and  
22 members of the Board. I'm Tim Taylor with the Sacramento  
23 Air Quality Management District.

24 Thank you for the opportunity to comment on the  
25 proposed amendments to the fuel specifications for M100 fuel

1 methanol. Sacramento is a federal and State ozone  
2 nonattainment area. Over 70 percent of ozone precursors are  
3 from the mobile source sector.

4 M100 methanol is responsible for approximately up  
5 to ten tons per year of NOx emission reductions in the  
6 Sacramento area right now.

7 The Sacramento Metropolitan Air Quality Management  
8 District does not support the proposed regulation to require  
9 all motor vehicles using 100 percent methanol, or M100, as a  
10 fuel to be equipped with an automatic fire detection and  
11 suppression system. We believe that every fuel should be  
12 used in respectful manner. But fuels, by their nature, are  
13 dangerous and each have different characteristics which need  
14 to be considered in determining their safety.

15 We believe that M100 does not pose an increased  
16 danger over the use of gasoline for the following reasons:  
17 Methanol is much less flammable than gasoline, thus harder  
18 to ignite. Methanol burns at a lower temperature and  
19 produces a lower heat flux than gasoline.

20 And although a methanol flame in a pool fire is  
21 hard to detect in direct sunlight, the likelihood of other  
22 combustible material that would produce smoke or other flame  
23 luminosity being present is good. Some of these materials  
24 are tires, paint, underseal, hoses, et cetera.

25 The U.S. Environmental Protection Agency has

1 sponsored testing performed by Southwest Research Institute.  
2 A video was produced from that that illustrates these  
3 points. I have provided a copy of this video to you with a  
4 copy of my testimony. I a reading my little letter. Here's  
5 the video. It's exactly what you've already seen, so I  
6 don't think I need give you another copy of it.

7 Sacramento has had real world experience in the  
8 use and storage M100. The Sacramento area currently has  
9 four M100 fueling sites. Two are above ground 2,000 gallon  
10 tanks, and two are public access 10,000 gallon underground  
11 tanks.

12 The above ground tanks and one underground tank  
13 have been in use for over a year without incident. These  
14 sites have been permitted by their respective fire districts  
15 without special conditions.

16 In addition, Sacramento school districts have been  
17 operating 14 buses using M100 for over a year. These buses  
18 are equipped with fire suppression systems, but not because  
19 M100 is more dangerous than other fuels. These buses are  
20 part of the California Energy Commission's clean safe school  
21 bus demonstration, where all buses are equipped with fire  
22 suppression systems, regardless of the fuel.

23 If M100 use is restricted in this way, it may  
24 limit the alternative fuel options available for relieving  
25 Sacramento's ozone problem. This restriction singles out

1 one particular property of methanol. It should be noted  
2 that E100, or pure ethanol, will have very similar burn  
3 characteristics, but will not have the same restrictions.

4 Thank you for the opportunity to address the  
5 Board.

6 I would like to make one other comment to echo  
7 sentiments that were voiced earlier by Dr. Short and by Paul  
8 Wuebben from South Coast, and that is a luminosity  
9 requirement has less of an impact on larger vehicles where  
10 fire suppression systems are truly cost-effective. But it  
11 sends a signal to people who may be thinking of developing  
12 technology for lighter-duty vehicles -- sedans, even medium-  
13 duty vehicles, and eventually fuel cells -- that that area  
14 is something that they can't get -- that they should not get  
15 involved in. It sends a wrong signal that could turn them  
16 off on any future development of fuel technologies in the  
17 lighter duty areas. Thank you.

18 CHAIRWOMAN RIORDAN: Thank you, Mr. Taylor. Are  
19 there any questions by the Board members for this witness?

20 Seeing none, we thank you very much for being  
21 here.

22 I'd next like to call on Mr. James Schroeder from  
23 the Jet Propulsion Laboratory.

24 MR. SCHROEDER: Thank you, Madam Chair and Board.

25 I was a little surprised to hear how famous the

1 direct methanol fuel cell has become. I am a member of the  
2 technical staff. I'm a materials scientist at the Jet  
3 Propulsion Laboratory, and I do work on the fuel cell  
4 program. But I have a second hat. I am a liaison officer  
5 for the Technology Transfer and Commercialization Program  
6 Office. And it's through this program office that I have  
7 been working with a company called DTI, based in California,  
8 and their partners DCT in Detroit.

9           These companies have been funding our direct  
10 methanol fuel cell effort at a very generous investment on  
11 their part. And we are making good progress.

12           I would like to talk just a little bit about the  
13 direct methanol fuel cell. Methanol can be used in a fuel  
14 cell two ways, as was mentioned earlier, by reforming it,  
15 which is a high temperature process, which cracks the  
16 methanol into hydrogen and other components of the methanol.  
17 And then the hydrogen is fed to the fuel cell, so it acts  
18 like a hydrogen fuel cell.

19           About two years ago, our researchers at the Jet  
20 Propulsion Laboratory tried a novel approach, which was to  
21 mix methanol with water, a five percent methanol solution,  
22 and feed it directly into the fuel cell.

23           And it works. And at first, of course, the  
24 outlook was not good. But we have increased the efficiency  
25 of this fuel cell several fold now in these two years. We

1 are being funded by other government agencies, as well as  
2 private industry, to develop this fuel cell.

3 Our fuel cell operates at only 95 degrees celsius,  
4 or about 200 degrees Fahrenheit, below the boiling point of  
5 the water that we're using the fuel mixture.

6 So, it is an inherently safe fuel cell, because it  
7 doesn't get hot and it doesn't provide for an ignition  
8 source.

9 Even though we only use five percent methanol in  
10 the water solution, however, we would like to be able to go  
11 to our local methanol station and fill up our tank with pure  
12 M100, because it would require a very large tank if we have  
13 to carry around a five percent solution. We wouldn't get  
14 very far with a five percent solution in our gas tank.

15 The water that we do use just goes -- we only use  
16 a couple of liters of water, which goes around and around,  
17 and we just keep adding methanol to it, which gets converted  
18 into electricity and more water and carbon dioxide.

19 It has the potential to be very efficient. It has  
20 the potential to create a lot of jobs in Southern California  
21 and in other parts of the country, and it has the potential  
22 to reduce emissions incredibly, because it has no emission  
23 other than CO2 and water.

24 So, whatever you decide today, I hope you will at  
25 least put the direct methanol fuel cell in your exceptions

1 column so that we may continue to pursue this technology and  
2 to develop it to a commercial product.

3 I will be happy to entertain any questions.

4 CHAIRWOMAN RIORDAN: Thank you, Mr. Schroeder.  
5 Are there any questions by members of the Board?

6 SUPERVISOR VAGIM: Madam Chair?

7 CHAIRWOMAN RIORDAN: Yes, Supervisor Vagim.

8 SUPERVISOR VAGIM: Someone said there was a  
9 pamphlet on a direct methanol fuel cell.

10 MR. SCHROEDER: I did not bring that with me.

11 SUPERVISOR VAGIM: But will you share that one  
12 time with the Board sometime down the road or send one up?

13 MR. SCHROEDER: We would be happy to come back to  
14 your Board meeting at any time. And I will have the project  
15 manager, Dr. Gerald Halbert (phonetic) make a full-blown  
16 presentation.

17 The people at NASA are quite excited about this  
18 one. Dan Golden visited the laboratory about two months ago  
19 or six weeks ago. One of the things that he especially  
20 wanted was a tour of the fuel cell laboratory to see how  
21 it's performing.

22 So, it's getting national attention. Some of the  
23 government funding we are now getting is from the ARPA,  
24 which used to be DARPA. They would like to use fuel cells  
25 to power things in the military, because they don't leave

1 much of a signature. They're not hot. And they're very  
2 efficient.

3 CHAIRWOMAN RIORDAN: Mr. Lagarias, did you have a  
4 question?

5 MR. LAGARIAS: What kind of energy output are you  
6 getting from a five percent methanol water mixture?

7 MR. SCHROEDER: Right now, we're achieving about  
8 one-half of a volt using air in the oxygen side. We're  
9 getting one-half of a volt at about, I think, 350 milliamps  
10 per square centimeter.

11 MR. LAGARIAS: So, it's a very small unit that  
12 you're testing on.

13 MR. SCHROEDER: Well, we think that the project  
14 that we're doing for DTI/DCT is to create five kW modules.  
15 The thing about a fuel cell is it's very modularized. If  
16 you need it for a lawnmower, you'd need 1 kW. If you need  
17 it for an automobile, a small car, you need 10 or 15 kW. If  
18 you need it for a bus, you need 50 or 75 kW.

19 But we're going to be creating five kW stacks  
20 under our work. And a 5 kW stack will be about this higher  
21 and -- more like a bread box (indicating with hands).

22 Now, there is some ancillary equipment. We need  
23 to have some blowers and pumps and things to move the air  
24 and pump the fuel's water.

25 MR. LAGARIAS: That's very exciting.

1 MR. SCHROEDER: And we are very excited about it.

2 CHAIRWOMAN RIORDAN: Thank you very much. I don't  
3 know if staff has a comment. There was sort of a request  
4 for an exemption, if I recall what you said toward the end  
5 of your --

6 MR. BOYD: Madam Chair?

7 MR. SCHROEDER: Well, I agree with all the people  
8 who were here before me that it seems a very safe fuel.  
9 But for fuel cells, it's exceptionally safe.

10 CHAIRWOMAN RIORDAN: Okay. Mr. Boyd.

11 MR. BOYD: Madam Chair, I wanted to assure the  
12 witness, as well as the Board, that I don't think any action  
13 being proposed here today would affect this experimental,  
14 which we would certainly encourage. And in the event that  
15 they were to scale it up and want it in a vehicle that they  
16 would want to run on the public streets of California, your  
17 Board and your staff is authorized and does historically  
18 grant permits for experimental work that provides exemptions  
19 and exceptions to our regulations. And we'd certainly be  
20 glad to assist and participate in their work.

21 MR. SCHROEDER: Well, we hope to do a lot more  
22 than demonstration vehicles on Southern California -- or any  
23 part of California's streets fairly soon.

24 CHAIRWOMAN RIORDAN: All right. Very good. Thank  
25 you very much. That was an interesting --

1 MR. SCHROEDER: Thank you.

2 CHAIRWOMAN RIORDAN: -- interesting report.

3 And our final speaker is Christopher Colucci from  
4 the National Renewable Energy Laboratory.

5 MR. COLUCCI: Good evening, you all. It's been a  
6 long day, so I thought I'd get through this pretty quickly.

7 My name is Chris Colucci from the National  
8 Renewable Energy Laboratory. We're a Department of Energy  
9 laboratory. But the comments that are going to follow are  
10 representative of just the Alternative Fuels Utilization  
11 Program, and it shouldn't be taken to represent an official  
12 Department of Energy position.

13 They're not necessarily going to take a position  
14 on this. This is just our view as the Alternative Fuels  
15 Utilization Program.

16 We pretty agree with a lot of what has been said  
17 already from CEC and South Coast Air Quality Management  
18 District. Our view is before any luminosity or fire  
19 suppression requirement becomes a permanent regulation, a  
20 thorough assessment of the inherent risks of different fuel  
21 formulations will take place.

22 This risk assessment is needed to determine the  
23 actual need for the luminosity requirement. As we've heard  
24 before, there are different risk associated with different  
25 fuels. We think a very thorough assessment of these risks--

1 looking at M100, M85, reformulated gasoline, diesel fuel --  
2 comparing, and even maybe the special methanol formulation  
3 that has resulted from the CARB funded work done at  
4 Southwest Research concerning the additive they had come up  
5 with there, to determine what is actually the risk and how  
6 they compare to each other.

7 We think this is important to do before any of  
8 these regulations become permanent. And also, along with  
9 the risk assessment, we believe there needs to be an  
10 engineering analysis of all the problems associated -- and  
11 hazards associated with methanol use in transportation, and  
12 public refueling, and end use.

13 We think, with this study, you could solve maybe a  
14 lot of the problems through education of the public and  
15 through further design of public refueling, the vehicles,  
16 storage, that there won't be as -- there'll even be less  
17 risk.

18 So, we think that a lot -- like this risk  
19 assessment and study should be done before any permanent  
20 regulations come into place.

21 To build on that, one of the programs that the  
22 Alternative Fuels Utilization Program that is planning to do  
23 in the next two years is to develop what we call universal  
24 methanol fuel. This fuel formation -- this is a fuel that  
25 would be able to work in light-duty and heavy-duty vehicles

1 and, in the long run, maybe even fuel cells.

2 And one of the things we don't want to eliminate  
3 from this is the use of M100 for all these vehicles.

4 So, to -- the initial part of this program, we're  
5 going to try to fund a risk assessment of methanol and  
6 compare it to other fuels to decide what is the important  
7 properties and where those -- so, what I would probably  
8 recommend in the long run is to maybe use the hardware, the  
9 fire suppression, add that to the requirement for maybe a  
10 while until it's finalized -- until we can do this risk  
11 assessment and determine how necessary it is.

12 I think, personally, that many of these fire  
13 suppression devices and other hardware devices are going to  
14 be required of conventional fuels -- of gasoline and other  
15 areas in the long run.

16 So, what I'm mostly saying is, we are planning at  
17 the National Renewable Energy Laboratory to fund some work  
18 in terms of risk assessment of M100 and compare it to M85  
19 and other fuels. And I think, before you make any permanent  
20 regulation, you should hopefully find out some better, more  
21 positive results from our work.

22 CHAIRWOMAN RIORDAN: Okay. Thank you. Are there  
23 any questions of this witness?

24 Yes, Ms. Edgerton.

25 MS. EDGERTON: Can you tell me when you expect to

1 get back your work that you're planning to do so that you  
2 can fund some studies on this?

3 MR. COLUCCI: We're in the process of putting out  
4 a request for proposals on this work in the next month or  
5 so, and we hope to have phase one of this work -- which  
6 would be the risk assessment work, and the engineering  
7 study, and some initial testing -- done in the next year or  
8 so.

9 But the whole length of the project where we're  
10 going to be looking at trying to develop a universal fuel,  
11 and we want to keep M100 as a possibility for that fuel,  
12 probably won't see -- a total of two years, probably.

13 MS. EDGERTON: Okay. Can you tell me how much  
14 money you have for the project?

15 MR. COLUCCI: We have in '95 funds approximately a  
16 quarter of a million dollars.

17 MS. EDGERTON: And you're looking for one study or  
18 two studies?

19 MR. COLUCCI: We're looking for probably -- that's  
20 for the whole project. And part of the project will include  
21 probably two studies. And we'll also have some '96 funds,  
22 and we're also looking for co-funding people. So. . .

23 MS. EDGERTON: Thank you.

24 CHAIRWOMAN RIORDAN: Any other questions?

25 MR. PARNELL: I have a question of counsel.

1 CHAIRWOMAN RIORDAN: Pardon me?

2 MR. PARNELL: I have a question of counsel.

3 CHAIRWOMAN RIORDAN: Oh, fine. But we can excuse  
4 this witness.

5 MR. COLUCCI: Thank you.

6 CHAIRWOMAN RIORDAN: We thank you very much for  
7 being here. And let me then -- Mr. Parnell, would you like  
8 to ask 00

9 MR. PARNELL: I just wanted clarification. Is it  
10 your position that the proper notice was not given if it's  
11 the wish of the Board to do away with the luminosity portion  
12 attached to the fire suppression equipment? It's not  
13 properly issued; it may not be?

14 MR. KENNY: I think it's a close call.

15 It would be my personal opinion that, in reviewing  
16 the notice, that the notice does not constitute proper  
17 notice for eliminating the luminosity requirement. I think,  
18 though, that other people could disagree with that.

19 I think that it is possible that it might be  
20 sufficient. But I think that the better call in this  
21 particular instance is that the notice is insufficient.

22 SUPERVISOR VAGIM: Madam Chair, when it says --

23 CHAIRWOMAN RIORDAN: Yes, Supervisor Vagim.

24 SUPERVISOR VAGIM: -- consider an amendment to the  
25 luminosity requirement, what do you feel the grandest,

1 encompassing part of that would be? "Consider an amendment  
2 to the luminosity"?

3 MR. KENNY: I think the overall tenor of the  
4 notice, as a whole, needs to be looked at. And I think,  
5 when you look at the overall notice, as a whole, we are  
6 looking at basically the luminosity requirement in the  
7 context of a safety requirement, and that that safety  
8 requirement is being modified in a particular fashion.

9 But the safety requirement is being contemplated  
10 as being continued. And there is nothing, it seems to me,  
11 in the notice that indicates that the potential safety issue  
12 associated with the luminosity is going to be eliminated.

13 SUPERVISOR VAGIM: Then the resolution before us,  
14 then I presume, is worded as a continuation of the  
15 concurrent luminosity requirement.

16 MR. KENNY: That would be correct.

17 MR. JENNINGS: Maybe I could add some points as  
18 well. As we tried to indicate before, what's on the books  
19 is a requirement that all motor vehicle M100 fuel meet the  
20 luminosity requirement. And then it says that's applicable  
21 as of January 1, 1995. That's what our regulation says  
22 right now.

23 So, if the Board took no action, there would be a  
24 luminosity requirement starting next month. The staff made  
25 the proposal to provide an exception to the luminosity

1 requirement in situations where the vehicles have the fire  
2 suppression equipment or whatever.

3 Under the Office of Administrative Law's rules,  
4 the Board can make changes to the specific proposal that's  
5 been made as long as a reasonable member of the directly  
6 affected public could have determined from the notice that  
7 these changes to the regulation could have resulted.

8 Now, obviously, the only reason you have a hearing  
9 is to consider testimony. And when you consider testimony,  
10 you're not always going to adopt the specific terms of  
11 what's proposed.

12 The question that you would need to decide and  
13 then would be reviewed by the reviewer at the Office of the  
14 Administrative Law before the action becomes effective is  
15 whether the change is within the scope of what I just  
16 indicated.

17 And the one concern that we want to press is that  
18 if the Office of Administrative Law was concerned that it  
19 was not within the scope, then we would basically have the  
20 regulation on the books January 1 without any exception for  
21 methanol fuel used for any vehicle that had the fire  
22 suppression device.

23 CHAIRWOMAN RIORDAN: Mr. Kenny, maybe I could ask  
24 just a brief question. And that is, given a more  
25 conservative view of what was the notice, it would seem to

1 me that -- while I don't necessarily agree -- but you could  
2 conceivably move forward with the staff recommendation as it  
3 is today, thereby, you know, people like MTA and others to  
4 continue to function. And that, after appropriate notice in  
5 the future, you could set this for rehearing with the  
6 appropriate notice and you could perhaps change it.

7 Am I correct?

8 MR. KENNY: That is correct.

9 CHAIRWOMAN RIORDAN: So, well, you know,  
10 Supervisor Vagim or Mr. Parnell, I think if you wanted a way  
11 to change it, that's the way to do it as opposed to giving  
12 up --

13 MR. PARNELL: Well, I believe in taking counsel's  
14 advice.

15 MR. BOYD: Madam Chair, just to elaborate on your  
16 point. The Board, in taking action today, could amend the  
17 resolution to direct the staff to come back either at a time  
18 certain or in the immediate future with a proposal that does  
19 whatever you deem is the direction you want to pursue.

20 CHAIRWOMAN RIORDAN: Okay. That's how to, I  
21 think, handle it, so you don't get into trouble with  
22 somebody arguing over a very small point of what this notice  
23 really meant.

24 Let us kind of take care of some housekeeping  
25 here. That was the last witness that was signed up.

1           So, what I'd like to do is ask staff to enter any  
2 written submissions into the record, if you would do so, at  
3 this time.

4           MS. GUERRERO: Thank you, Madam Chairwoman.

5           There are three written comments -- first from the  
6 American Lung Association. And they want the Board to make  
7 every effort to avoid impeding the development of M100, and  
8 they would like us to move forward with a solution to the  
9 luminosity issue that does not compromise emissions.

10           The next comment was from Volkswagen of America.  
11 Volkswagen's position is that a luminosity regulation that  
12 requires an additive is not necessary and will serve to  
13 inhibit development of a promising fuel technology.

14           The final written comment was from the U.S. EPA.  
15 And they feel that the chance of a luminous fire occurring  
16 is very small and that the risk associated with M100 fuel is  
17 less than gasoline, and that a luminosity requirement is not  
18 needed.

19           And that's it.

20           CHAIRWOMAN RIORDAN: Okay. Thank you.

21           Mr. Boyd, are there any further comments?

22           MR. BOYD: No, Madam Chair.

23           CHAIRWOMAN RIORDAN: All right. Then I'd like to  
24 officially close this record, because all the testimony,  
25 written submissions, and staff comments for this item have

1 been entered into the record, and to note that the Board has  
2 not granted an extension of the comment period on this  
3 portion of the agenda, which is 94-12-3.

4 Written or oral comments received after the  
5 comment period has been closed will not be accepted as part  
6 of the official record on this agenda item.

7 This item is one that we must acknowledge ex parte  
8 statements. Board members, are there any to report here?

9 Seeing none, we'll move on to review the  
10 resolution that is before us, if you'll take just a minute  
11 and look at it.

12 MR. LAGARIAS: Madam Chair?

13 CHAIRWOMAN RIORDAN: Mr. Lagarias.

14 MR. LAGARIAS: I move adoption of Resolution 94-  
15 68, with a question.

16 Have we agreed that the staff will be  
17 participating in a safety risk assessment on luminosity over  
18 the next two years?

19 CHAIRWOMAN RIORDAN: Mr. Cackette?

20 MR. CACKETTE: We're certainly willing to do that.  
21 We'll participate in the study.

22 MR. LAGARIAS: Fine.

23 MR. CACKETTE: With resources as well.

24 CHAIRWOMAN RIORDAN: There's a motion. Is there a  
25 second to that motion?

1 MR. CALHOUN: Second.

2 CHAIRWOMAN RIORDAN: Second by Mr. Calhoun.

3 Discussion? Is there any discussion on the  
4 motion?

5 Ms. Edgerton?

6 MS. EDGERTON: I'm for the motion, but I would  
7 like to offer a friendly amendment, which would then direct  
8 the staff to come back with an amendment which would enable  
9 us to eliminate the requirements that are in the -- the  
10 luminosity requirement.

11 SUPERVISOR VAGIM: Without a risk assessment?

12 That's basically the track that they're on.

13 MS. EDGERTON: And include any risk assessment  
14 which may have been provided by the time you get back to us,  
15 any additional risk assessment information which may be  
16 available.

17 CHAIRWOMAN RIORDAN: Is that acceptable to the  
18 maker of the motion?

19 MR. LAGARIAS: Perfectly.

20 CHAIRWOMAN RIORDAN: He's indicated yes. Is that  
21 acceptable to the seconder? Mr. Calhoun, is that  
22 acceptable?

23 MR. CALHOUN: Very good.

24 CHAIRWOMAN RIORDAN: All right. Then that motion  
25 has been amended.

1 SUPERVISOR VAGIM: Under discussion.

2 CHAIRWOMAN RIORDAN: Supervisor Vagim, discussion.

3 SUPERVISOR VAGIM: I don't know. Maybe it's the  
4 hour, but I feel like I got burnt -- not by M100.

5 MR. LAGARIAS: You didn't see it coming?

6 (Laughter.)

7 CHAIRWOMAN RIORDAN: Did you hear what he said?

8 SUPERVISOR VAGIM: What?

9 CHAIRWOMAN RIORDAN: You didn't see it coming?

10 (Laughter.)

11 SUPERVISOR VAGIM: I didn't see it coming?

12 CHAIRWOMAN RIORDAN: That's Mr. Lagarias' comment.

13 SUPERVISOR VAGIM: Thank you. That's right on,  
14 Jack, because -- and I don't want to cast -- because I can  
15 understand clearly where the issue is. But I feel like the  
16 notification has been stacked against modification. And I  
17 would hope these would be at least written so the Board  
18 could be more encompassing if it so chose.

19 It would be a simple inclusion in here to do that,  
20 and maybe this Board may want to do that. But eliminating  
21 that stacks the deck towards those who don't want to change  
22 it.

23 MR. KENNY: We do understand, and we will  
24 basically write them with that in mind in the future. In  
25 this particular instance, we simply did not anticipate that

1 particular direction.

2 SUPERVISOR VAGIM: I understand.

3 CHAIRWOMAN RIORDAN: Okay. Any further

4 discussion?

5 Madam Secretary, would you call the roll, please?

6 MS. HUTCHENS: Boston?

7 DR. BOSTON: Yes.

8 MS. HUTCHENS: Calhoun?

9 MR. CALHOUN: Aye.

10 MS. HUTCHENS: Edgerton?

11 MS. EDGERTON: Aye.

12 MS. HUTCHENS: Lagarias?

13 MR. LAGARIAS: Yes.

14 MS. HUTCHENS: Parnell?

15 MR. PARNELL: Yes.

16 MS. HUTCHENS: Riordan?

17 CHAIRWOMAN RIORDAN: Aye.

18 MS. HUTCHENS: Vagim?

19 SUPERVISOR VAGIM: Aye.

20 MS. HUTCHENS: Passes 7-0.

21 CHAIRWOMAN RIORDAN: Okay. Very good.

22 In noting the hour and --

23 MR. JENNINGS: I have a --

24 CHAIRWOMAN RIORDAN: Pardon me?

25 MR. LAGARIAS: Delay.

1 MR. JENNINGS: I hate to interject. I have a  
2 point of clarification.

3 CHAIRWOMAN RIORDAN: Yes.

4 MR. JENNINGS: I want to express my understanding  
5 of Ms. Edgerton's motion and just have her clarify. My  
6 understanding was that you were recommending that the staff  
7 come back with a proposal to repeal the luminosity  
8 requirement without waiting the two years for the risk  
9 assessment; is that correct?

10 MS. EDGERTON: I left it a little vague so you'd  
11 have more discretion to -- you know, I don't know what else.  
12 We have a lot of things on our agenda, and I didn't want to  
13 force this onto a particular timetable.

14 MR. PARNELL: At the appropriate time.

15 MS. EDGERTON: At the appropriate time.

16 SUPERVISOR VAGIM: But you could come back before  
17 two years.

18 CHAIRWOMAN RIORDAN: But with the information  
19 provided by the risk assessment.

20 MS. EDGERTON: My motion did not require a full  
21 risk assessment to be furnished, but I left it up to the  
22 staff, if they would like to have that information, and then  
23 come back, that would be fine. And if they felt they were  
24 ready to come back without it, that would be fine.

25 MR. CACKETTE: Well, to make the change, we have

1 to provide a rationale for it, and so we have to have some  
2 kind of an assessment that justifies removing the luminosity  
3 requirement. And obviously, you heard a lot of it today.

4 So, from our standpoint, it would be easiest to do  
5 the study and then immediately, upon completion of that,  
6 propose to you a change if the study so indicates.

7 MR. BOYD: Well, I would like to amend my Deputy's  
8 suggestion to say --

9 (Laughter.)

10 MR. BOYD: -- that let us assess -- I mean, we've  
11 all been burned here, Supervisor Vagim. We came in,  
12 obviously, a little flat-footed here, too. Let us -- and I  
13 appreciate the latitude. Let us assess what's out there and  
14 what's available to ascertain -- because, as I said in  
15 earlier remarks about us being super conservative in  
16 endorsing this study, the proponents of the study recognize  
17 the myth versus reality perception dilemma.

18 Let us assess what's available out there in the  
19 way of existing risk assessments and what have you. And  
20 then, make the determination that you afforded us as to  
21 whether we think there's enough to come forward or whether  
22 indeed we have to wait for the results of yet another study.

23 So, I appreciate that latitude. And all I'm  
24 modifying of Mr. Cackette's statement is, I'm not a hundred  
25 percent sure we have to wait the whole two years or even

1 conduct this particular study. There may be a lot of  
2 information out there.

3 Failing that, then, I think we would say we need  
4 the study, and we'd --

5 MR. LAGARIAS: Give us some visible light on this  
6 issue.

7 (Laughter.)

8 CHAIRWOMAN RIORDAN: Yes.

9 MS. EDGERTON: As Mr. Parnell said, Mr. Boyd just  
10 said what I meant.

11 (Laughter.)

12 CHAIRWOMAN RIORDAN: Well, I'm glad, because I  
13 would have had to have changed my vote otherwise.

14 The hour is drawing along here, and my suggestion,  
15 Board members, in recognition of what we intend to do  
16 perhaps about seven o'clock this evening, that we set over  
17 to tomorrow at 8:30 the last two agenda items.

18 Would that be agreeable with you all?

19 MR. LAGARIAS: Yes.

20 CHAIRWOMAN RIORDAN: Hearing no opposition, let me  
21 then adjourn to tomorrow morning at 8:30. And we'll look  
22 forward to dealing with the last two items on our agenda.

23 (Thereupon, the hearing was adjourned  
24 at 6:00 p.m.)

25

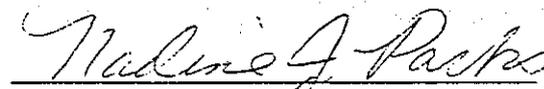
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## CERTIFICATE OF SHORTHAND REPORTER

I, Nadine J. Parks, a shorthand reporter of the State of California, do hereby certify that I am a disinterested person herein; that the foregoing meeting was reported by me in shorthand writing, and thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said meeting, nor am I interested in the outcome of said meeting.

IN WITNESS WHEREOF, I have hereunto set my hand this 20th day of December, 1994.

  
Nadine J. Parks  
Shorthand Reporter