

smoke coming out of a diesel and these additives are being used more and more.

The engines too often are run underpowered by the operators which contributes to the smoke problems. If they would upsize the engines a little bit and operate them at the right point rather than "pushing" them this would help the problem. This sounds sort of wishy-washy, I guess. I recognize the problem but what are we doing about it?

There are some masking agents that some of the bus fleet operators are trying in their fuel to come up with a more desirable odor, and come up with something you don't mind as much as the normal odor. There is research being sponsored by PHS and other organizations on the diesel problems. It is going to be very difficult, I think, to completely get rid of this odor problem on diesels unless there is some technological breakthrough. This is the principal point against them, I think—just the odor—but I don't think there is any health problem with the diesel exhaust whatever—there is no control needed from that viewpoint.

Chairman MILLER. Thank you.

Mr. VIVIAN. I have listened to questions on this and asked similar questions some days ago and I am still left with the question of why is it so bad? What is the cause of the problem?

Mr. GAMMELGARD. I would presume that the primary reason for the problem is the formation of aldehydes in the exhaust—in the combustion products that come out of the exhaust pipe. Do you agree with that, Dr. Eckardt?

Dr. ECKARDT. Yes.

Mr. VIVIAN. These aldehydes are not formed in spark-ignited engines, is that right?

Mr. GAMMELGARD. Not to the same extent.

Mr. VIVIAN. Do they have any detrimental effect?

Dr. ECKARDT. About 40 years ago, a study on diesel engines was undertaken by the Bureau of Mines because they wanted to use them in mines where the ventilation was somewhat confined. Their study at that time indicated that the amount of exhaust coming out of a diesel, although obnoxious from an odor standpoint was not bad from a health standpoint and they permitted these diesels to be used.

Mr. VIVIAN. Is API currently carrying on any research in this field?

Mr. GAMMELGARD. Not in the health field. I indicated they are in the technical area.

Mr. VIVIAN. One of the purposes of the environmental pollution research is not only to make the atmosphere more capable for living but also more healthful.

Chairman MILLER. I would like to see local authorities enforce the law prohibiting the continued use of old cars which emit incredible amounts of exhaust smoke and fumes.

Mr. GAMMELGARD. I would like to discuss the question of industry-Government participation in abatement research and development. We certainly concur with the suggestion contained in your subcommittee's report that industry assume increasing responsibility for conducting much of the needed research, for this suggestion reflects your confidence in industry's capabilities and enlightened self-interest. We