Safe to Delay 1985 Diesel Rule, Study Says

The experts judge the clean air goal too ambitious; others judge the experts to be defeatist

America's car manufacturers got their plum pudding before Christmas this year when the National Research Council (NRC), the contact arm of the National Academy of Sciences, released a report on strategies the government should follow in controlling pollution from diesel cars. The final report of the NRC's diesel impacts study committee,* issued on 22 December, concludes that the government's goal for diesel engines in 1985 is too ambitious and should be dropped. This is good news for General Motors, which is trying to overturn the 1985 diesel requirement.

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By 1990, one-quarter of the new cars on U.S. highways may be diesels

The NRC report was challenged immediately by an environmental group, the Natural Resources Defense Council (NRDC). According to the NRDC, the report is too pessimistic. It omits mention of promising developments in diesel technology that occurred in 1981, for the authors essentially stopped collecting data in August 1980.

Regardless of whether or not it is technologically out of date, the report is likely to influence strategy at the Environmental Protection Agency (EPA). Diesel makers have found that the most demanding EPA diesel standard is the one that restricts the quantity of fine particles (particulates) emitted in exhaust smoke. At present, the EPA says that auto engines may not emit more than 0.6 gram of particulates per mile traveled. In 1985 that standard is due to be tightened to 0.2 gram per mile. In September 1981, General Motors filed a petition with the EPA asking that the 1985 standard be "suspended" indefinitely while the EPA makes a study of various alternatives for attacking diesel pollution. GM argued that it was "technologically infeasible" to meet the 1985 standard. For example, GM said, it would have been necessary to order the required manufacturing equipment no later than June 1981. The NRC's report lends credibility to GM's petition.

While it probably will not be difficult for GM and other manufacturers to produce lightweight diesel cars that meet the 1985 standard, the NRC's report says, it will be difficult to make large "family" cars over 2000 pounds that satisfy the requirement. The advantage of the diesel over the gasoline engine is that it uses a smaller volume of less expensive fuel to produce the same power. Some of that economic attraction would be lost in the big cars, GM fears, if it becomes necessary to fit them with exhaust filters to catch particulates. Small cars would not require the filters. One effect of dropping the 1985 particulate standard, therefore, may be to eliminate the need for some particulate filters and thereby make large cars more salable.

GM estimates that if current plans work out, the number of new diesel cars sold each year will grow from about 4 percent of the market today to around 20 or 25 percent by 1990. Because a diesel engine emits 30 to 100 times more particulate matter than an equivalent gasoline engine, this pollution problem has been rightly identified as a major public health concern for the remainder of the decade.

The new report on diesels notes that very few studies have been made of the effect of diesel smoke on the health of animals or humans. But it is known that diesel particulates carry chemicals that are dangerous. As the report says, particulates are "bits of aggregated carbon formed during incomplete combustion of diesel fuel; they are submicron in size, with complex organic chemicals adsorbed on their surface. Among the many chemicals in diesel exhaust are known or suspected carcinogens, toxic substances, and mutagens." Carried into the lung on tiny specks of soot, these poisons may make their way past the body's normal defense systems and into the bloodstream.

There are a couple of other potential threats posed by particulates, neither of them well researched. One concern is that when particulates are present in large quantities, as they probably will be in 1990, they may interact in unforeseen ways with sunlight and other chemical pollutants near cities, creating new types of photochemical smog. Second, particulates absorb sunlight and reduce visibility. The NRC's report estimates that if diesel autos eventually do account for 25 percent of the cars on the road, visibility

*"Diesel Cars: Benefits, Risks, and Public Policy," final report of the Diesel Impacts Study Committee, Assembly of Engineering, National Research Council. The committee was chaired by Henry S. Rowen, professor of public management at Stanford University, now on leave at the Central Intelligence Agency.

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in Los Angeles may decline by as much as 20 percent, and visibility in Denver may decline by as much as 50 percent.

After considering all these problems, the NRC committee decided that the risks were not great enough or well enough defined to justify the EPA's 1985 standard of 0.2 gram of particulates per mile. Instead, the report concludes, the EPA should keep the present standard and review it every 3 years, beginning in 1983, to see whether it needs to be strengthened. "Only a relatively small number of diesel-powered cars will be made and sold in the next few years," the report notes, "so the benefits and risks will appear slowly. Exposure to diesel emissions, for instance, will be at a low level for some years. . . ." The authors claim that society may benefit by encouraging "dieselization" of the auto fleet: oil consumption may be reduced and traffic fatalities may be reduced if people take advantage of the economies of switching from fragile gas-powered to heavier and safer diesel-powered cars. In general, the report urges the EPA to be more flexible, to impose strict standards first on heavy polluters (trucks and buses), and to set less ambitious standards at shorter intervals.

One of the NRC's recommendations for relaxing standards has already been adopted. On 24 December, the EPA published in the *Federal Register* a proposal that would change the way the agency calculates particulate emissions for light-duty diesel trucks and cars. Rather than require every vehicle in 1985 to meet a standard of 0.2 gram of particulates per mile, the EPA would allow manufacturers to average the emissions from several types of engine, requiring the entire company fleet of diesels to meet the standard. As an EPA official explained, this will benefit companies that produce several types of diesel engine. The effect will be to make it cheaper to produce large diesel cars, the EPA says, saving U.S. automakers several hundred million dollars.

There is an important flaw in the NRC report, according to David Doniger, an attorney at the Natural Resources Defense Council. (He has asked the government on NRDC's behalf to reject General Motors' petition.) Doniger claims that the study is a year and a half out of date, and that "technology for controlling diesel emissions has advanced at a breakneck pace" since the last deliberations of the NRC committee in August 1980. He singles out for particular criticism this statement in the report's summary:

> None of the particulate control devices now under development has yet been proven in road durability tests of 50,000 miles. The history of developing the catalytic converter for gasoline engines in the early 1970's suggests about a five-year lag between the design and demonstration of such devices and their production and commercialization—an interval that will make it difficult for the larger and heavier diesel cars and pickup trucks to meet the EPA's 1985 standard.

Doniger says, first, that the car manufacturers themselves have told the EPA in public proceedings that it will take 3, not 5, years to deploy a particulate exhaust filter once they have decided on the correct technology. He pointed this out in written comments to the authors of the report earlier this year.

In addition, Doniger says one company, Johnson Matthey of West Chester, Pennsylvania, has already developed a good particulate filter and that the device has all but proved its viability in a long-distance trial being run in Texas. The NRC report may be correct that no device has endured the full 50,000 miles required by EPA's road test, but the Johnson Matthey device has gone 40,000 miles with no problems.

George McGuire, vice president in charge of research at Johnson Matthey, says that last summer and fall he wrote twice to Frank Press, president of the National Academy of Sciences. McGuire says he asked the diesel study committee to "come again and see what we've accomplished since their last visit" in 1980. He got no answer to the first letter. Then on 20 November he received a brief note from Press saying that his letters had been forwarded to the diesel committee. By then, of course, the report had been written. The committee had held its last meeting in January of 1981, 10 months earlier, and it was not about to rewrite the report just to accommodate one small exhaust device.

McGuire claims that his filter, a trap oxidizer that fits onto the tail pipe, has proved its effectiveness for use on a Volkswagen Rabbit. He expects it will soon be certified by the EPA as having passed the 50,000-mile test, with insignificant effects on fuel economy. By next spring, McGuire says, his company could be producing the device at a rate of 100,000 a year. Within 2 years, the annual production rate could be in the millions, if the capital were available. McGuire says the price charged to the car manufacturers would be $75 to $100 per filter in 1985 dollars.

The chairman of the diesel impacts study committee, Henry Rowen, has taken leave from Stanford to work at the CIA and does not wish to comment. However, David Hazen, executive director of the National Academy of Engineering, did offer an opinion. He says Doniger is correct; the report is a year old. There were problems in production and in getting some of the calculations finished. But Hazen adds that committee members were given copies of Doniger's critique of the draft report, and after seeing it they did not find it necessary to make any changes.

"It really is stretching a point," Hazen believes, "to say that the technology is available today when the 50,000-mile durability test has not been completed." The assertion that it will take 5 years to deploy a particulate control device, according to Hazen, is based by historical analogy on the time needed to develop the catalytic converter for gasoline engines. Finally, Hazen agreed that the committee may have shown bad judgment in deciding not to hold an open meeting to review data in the report with interested people like Doniger before publication.—ELIOT MARSHALL

Philip Handler Dies

Philip Handler, president of the National Academy of Sciences from 1969 until his retirement last June, died on 29 December in Boston where he had been hospitalized for several months. Death was attributed to lymphoma complicated by pneumonia. Handler was 64.

As a statement from the Academy noted, Handler was always open about the satisfaction he felt in the NAS presidency which he held for the statutory limit of 12 years. "I have had an absolutely glorious time," he said just before his retirement. "Opportunities for service which are at the same time warm, loving, rich experiences are very rare. I have been very fortunate. . . ."

In October, President Ronald Reagan awarded Handler the National Medal of Science, citing among other qualities his "national leadership in furthering the state of American science."

Handler, a biochemist, spent most of his academic career at Duke University, to which he had hoped to return after leaving the Academy.

—B.J.C.

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