ASLEEP AT THE WHEEL

The Environmental Protection Agency's Failure to Enforce Pollution Standards For Heavy-Duty Diesel Trucks

A Staff Report
Prepared for the Use of the

Committee on Commerce
U.S. House of Representatives
Tom Bliley, Chairman

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At the direction of Commerce Committee Chairman Tom Bliley, Committee staff prepared the following report with respect to the Committee's investigation into the adequacy of the Environmental Protection Agency's enforcement of pollution standards for certain diesel truck engines.

I. EXECUTIVE SUMMARY

By law, the Environmental Protection Agency (EPA) is charged with the responsibility to set pollution emission standards for all motor vehicles, including the large trucks that use heavy-duty diesel engines. By law, EPA also is charged with the duty to ensure that all vehicles meet those Federal emission standards before they are sold to the American public and begin traveling our Nation's roadways. However, as described in detail in this report, EPA has failed to meet this latter responsibility with respect to heavy-duty diesel truck engines and, in so doing, has compromised greatly its overall mission -- namely, "to protect human health and to safeguard the natural environment."

The Committee's extensive investigation has revealed a pattern of gross negligence and striking indifference by EPA throughout the early and mid-1990s to the very real possibility -- now a known certainty -- that diesel truck engines were emitting pollutants far in excess of regulatory standards. During this time period, EPA received repeated warnings and increasingly specific information from outside experts suggesting that its emission testing protocol -- known as the Federal Test Procedure (FTP) -- was flawed and outdated, and was easily circumvented by advances in electronic engine controllers being used by diesel engine manufacturers. Yet, despite being presented with this credible, and in some cases convincing, information, EPA clung to its flawed test and failed to take any serious action to even investigate these suspected practices until 1997 -- *more than six years* after the Agency was first provided with credible evidence that these large trucks may be emitting pollutants far in excess of Federal limits.

The chronology of events set forth in this report, and reflected in Figure 1 below, paints a troubling picture of a bureaucracy too slow and too arrogant to understand the profound changes taking place in emission control technology, and the impact of those changes on the Agency's testing

processes and vehicle pollution levels. It also raises the question of whether this Federal agency was too close to the industry it was charged with regulating to adequately protect human health and the environment. Instead of vigorously fulfilling its statutory mandate to design and implement an effective certification procedure that ensured diesel engines actually complied with Federal emission limits, EPA continued for six years to, in the words of a former key EPA official, "rubber stamp" the engine manufacturers' self-certification that their engines met all applicable standards. Indeed, EPA's self-proclaimed "discovery" of excess emissions from diesel engines in 1997 did not even result from a targeted investigation by the Agency. Rather, the Agency stumbled across these excess emissions during the testing of a diesel engine it had received as part of an unrelated audit conducted two years earlier.

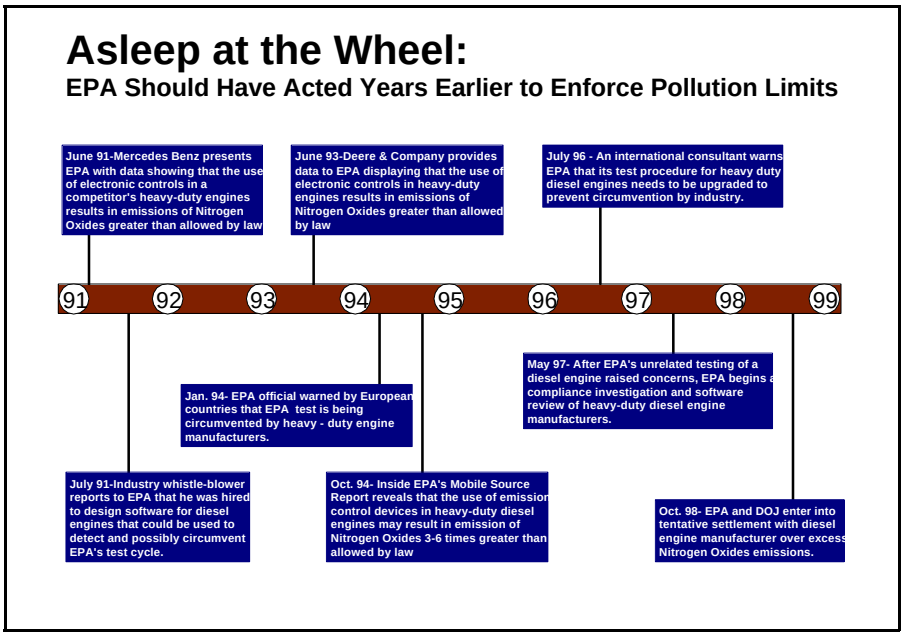

Figure 1

The precise negative impact on public health and the environment caused by EPA's gross negligence in enforcing diesel emission standards is unknown, although the Agency's own estimates suggest that these faulty diesel engines resulted in more than 1.3 million tons of "excess emissions" of nitrogen oxides (NOx) *in 1998 alone*. This amount equals six percent of such emissions from all cars, trucks, and industrial sources nationwide, and is greater than the total annual NOx emissions from many entire industries.

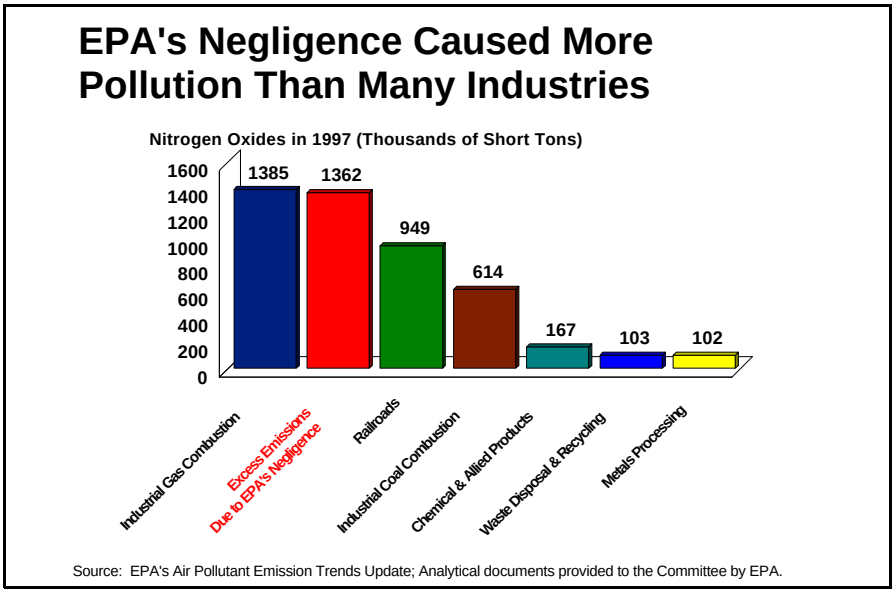

Figure 2

In more practical terms, these excess emissions are equivalent to having 72% more diesel trucks on the road, or an additional 65 million passenger cars. And that is only for 1998. During the six years of EPA inaction, the environmental and public health damage surely was staggering, and the impact on other Federal and State clean air programs will probably never be known.

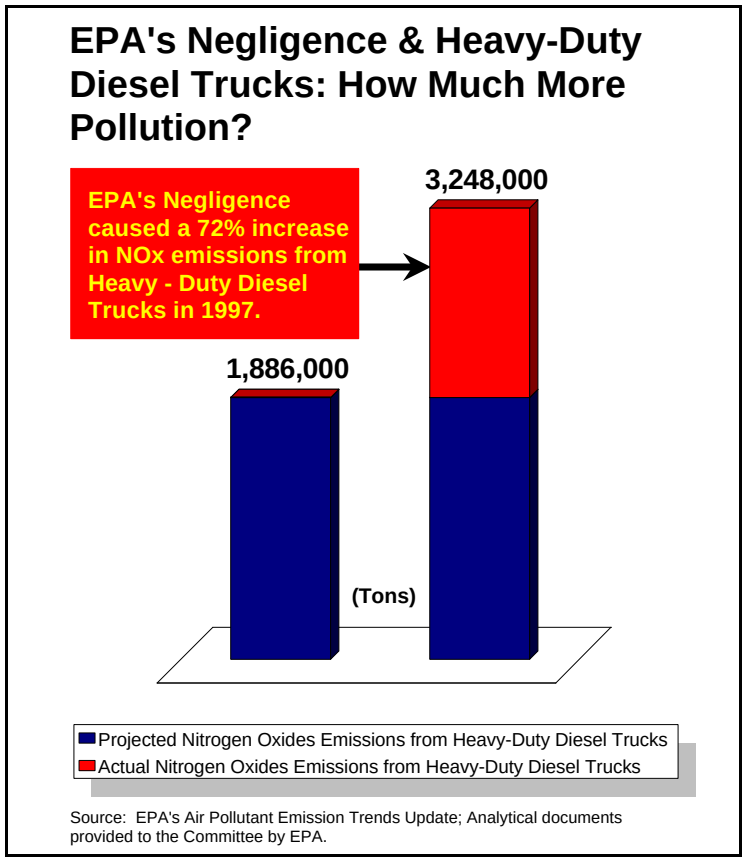

Figure 3

Indeed, according to EPA, these pollution violations have occurred since 1988, exposing the American public to elevated levels of NOx -- and the resulting smog, soot and dust particles -- for the last 11 years. Over this time, nearly 6.9 million tons of NOx have been emitted by diesel trucks traveling our Nation's roadways, which -- using EPA's methodology for calculating adverse health effects of NOx -- may have caused up to 5,600 premature deaths and up to $31 *billion* in health-related costs. These estimates include the cost of increased asthma attacks, bronchitis, reduced lung functions and other breathing problems incurred by the American public -- particularly its most sensitive populations such as the elderly, children, and asthmatics -- as a result of excess NOx emissions and the pollutants they generate. According to EPA, NOx emissions also cause acid rain, which damages agricultural crops and pollutes our Nation's drinking water -- damage in addition to the health-related cost figures cited above. In short, the scope and magnitude of this regulatory debacle may well be unprecedented.

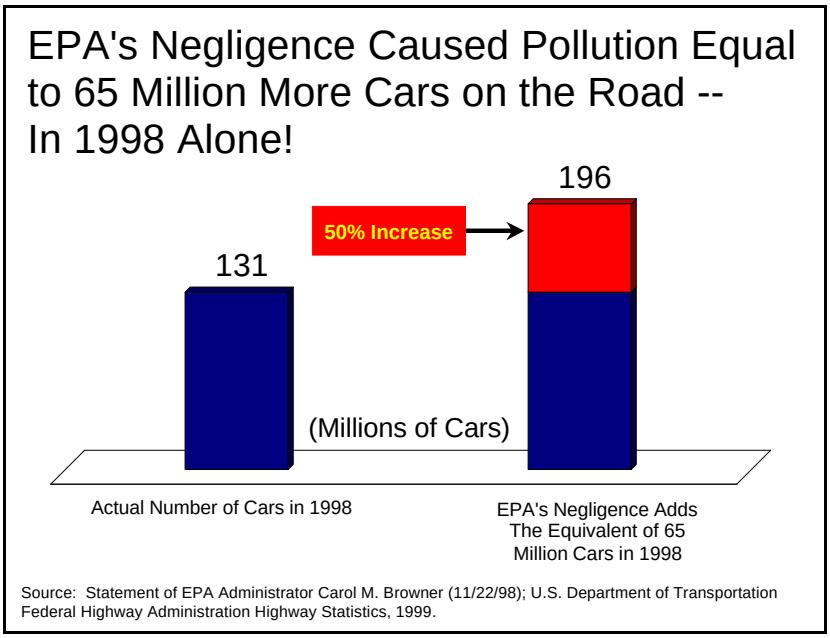

Figure 4

After the Committee began its investigation, EPA and the Department of Justice entered into a settlement in October 1998 with certain diesel engine manufacturers, under which these manufacturers agreed to pay civil fines for allegedly utilizing "defeat devices" to circumvent EPA's emission testing protocols. According to EPA and the Department of Justice, this enforcement action resulted in the largest Clean Air Act settlement in history. While EPA continues to boast publicly about this record-setting enforcement action, no amount of penalties will ever undo the severe damage that a decade of EPA inaction caused to our Nation's air and the public's health and welfare. Indeed, these "record" fines do not even begin to put a dent in the health-related costs suffered by the American people. Ironically, the Attorney General has stated that the message of the diesel settlement to industry is that "an ounce of compliance is worth a pound of penalties." It appears that this same message should be targeted at EPA, which could have prevented much of this harm by focusing on testing and compliance issues years ago rather than launching an enforcement action six years too late.

Adverse Health Effects of EPA's Negligence

	1988 - 1998	1999 - 2027	Total
Tons of Nitrogen Oxides	6,865,835	5,049,391	**11,915,226**
Deaths*	5,600	4,180	**9,780**
Health Costs* ($ Billions)	31	23	**54**

*Figures are based on EPA health effect methodology as referenced in documents provided to the Committee

Source: Analytical documents provided to the Committee by EPA.

Figure 5

The overwhelming record of EPA inaction -- and its resulting harm to Americans -- also makes a mockery of EPA Administrator Carol Browner's public claims that the diesel settlement underscores the Clinton Administration's "commitment to vigorously enforce the environmental laws of this nation and to ensure that the air people breathe is safe and clean." This case also proves the point that the toughest pollution standards in the world -- another oft-quoted Administration refrain – are meaningless without effective oversight and enforcement.

Moreover, even under the terms of EPA's much-touted settlement, over 5 million tons of "excess" NOx will continue to be emitted in the foreseeable future. Again using EPA's own methodology, these future excess emissions could account for up to 4,180 additional premature deaths and over $23 billion in additional health-related costs over the next 27 years. Thus, the American public will continue to pay well into the new millennium for EPA's failure to do its job properly in the past.

This report does not address the question of whether heavy-duty diesel engine manufacturers engaged in illegal efforts to circumvent Federal emission requirements, or the related question of whether the use of electronic engine controllers in the manner herein described constitutes or constituted a "defeat device" under Federal law. EPA and the Department of Justice have so alleged, but the diesel engine manufacturers have denied all allegations of unlawful conduct. The settlement agreements between the parties do not contain any admissions or concessions by any of the parties

on these points, and the Committee's review of this matter suggests that neither side would have had an easy case if this enforcement action had proceeded to trial. The Committee -- as one of the principal oversight bodies with jurisdiction over EPA -- properly focused its investigation on the question of whether EPA, as the regulatory authority charged with developing, implementing, and enforcing Federal emission requirements, adequately performed the tasks it was charged by the Congress with carrying out. To that question, the only possible answer can be no.

II. BACKGROUND ON THE EMISSION TESTING AND CERTIFICATION PROCESS

Title II, Part A of the 1970 Clean Air Act provides EPA with the authority and responsibility to establish motor vehicle emission standards. Under this authority, EPA has both promulgated and revised emission standards applicable to heavy-duty diesel engines. Using the specific authorities granted by Congress under Section 206 of the Clean Air Act, EPA created a system to test and certify new diesel engines as complying with emission standards. Such engines have been tested and certified using a process designed by EPA in the 1970s, known as the Federal Test Procedure ("FTP").

Under EPA regulations, each year the engine manufacturers are responsible for testing a model of each engine they plan to sell in the upcoming year, using the protocols established in the FTP to measure pollution emissions. Assuming the engines pass the FTP, the manufacturers then certify the results to EPA, which essentially accepts those certifications at face value (having previously approved each manufacturer's general testing policies and practices), and issues a certificate of conformity to the manufacturers for each engine type. Without a certificate of conformity, a heavy-duty diesel engine manufacturer is prohibited from selling that particular engine. Thus, through the denial of a conformity certification, EPA has the power to shut down production of an engine, resulting in serious economic ramifications for heavy-duty diesel engine manufacturers. Such a shut down also could have a major impact on the manufacturers of diesel trucks, who may use a particular engine in more than one vehicle line.

EPA designed the current version of the FTP in the late 1970s, prior to the widespread use of electronic engine controllers in heavy-duty diesel engines. The Preamble to the Proposed Federal Test Procedures, written in 1979, indicates that EPA revised the FTP primarily to address the problem of emissions in urban areas. EPA explained that the anticipated environmental benefit of replacing the original steady-state test (which simulates highway driving conditions) with a transient test procedure (which simulates urban driving conditions) would be "urban air quality improvements."[1] Indeed, the proposed FTP cycle was developed using urban data collected in New York and Los Angeles.[2] Thus, the FTP, as revised, was not designed to account for the emissions produced by extended, long-haul highway driving, a common occurrence for heavy-duty diesel trucks. EPA's theory at the time was that urban emissions likely would be greater and, by controlling those emissions, one also would control emissions under highway, or steady-state, conditions. That theory was plausible given that, in the 1970s, heavy-duty diesel engines were controlled by unsophisticated, mechanical carborators such that emission levels when the engine was *not* performing on the

[1] U.S. EPA Proposed Rulemaking, *Control of Air Pollution from New Motor Vehicles and Motor Vehicle Engines*, 44 Fed. Reg. 9464 (February 13, 1979).

[2] *Id.*, at 9466.

designated test cycle were not likely to vary much from emission levels experienced when the engine was operating *on* the test cycle.

However, even back in the mid-to-late 1970s, EPA was aware of the existence and use of sophisticated electronic engine controls, primarily in light-duty vehicles such as automobiles. EPA was concerned at that time that electronic engine controls could potentially be used to circumvent EPA test procedures. In 1978, EPA issued an advisory entitled *Prohibition on Emission Control Defeat Devices*, which provided engine manufacturers with objective criteria to evaluate whether an auxiliary emission control device ("AECD") would be considered a defeat device due to increased NOx emissions during highway driving.[3] EPA concluded that it was likely that most, if not all engines, would employ electronic engine controls by the 1980s, and that the use of such controls may result in a reduction in the effectiveness of emission control systems.[4] In other words, electronic engine controls could lead to gaming, or circumventing, of emission control requirements.

Specifically with respect to diesel engines, various electronic engine control technologies have been used to regulate emissions since the late 1980s -- a fact that would have been contained in the test certification documentation provided to EPA by the engine manufacturers.[5] The potential of such technologies to increase engine performance and maximize fuel economy, at the expense of greater off-cycle emissions of NOx, has been well established, and -- more importantly -- was well known within both the diesel engine manufacturing industry and EPA for many years.[6] However, as recounted below, EPA -- remarkably, inexplicably -- failed to take any action to either review its FTP design to account for this possibility, or investigate whether this potential for adverse emission outcomes was more than just theory.

III. EPA'S FAILURE TO ENFORCE POLLUTION STANDARDS FOR HEAVY-DUTY DIESEL TRUCKS

EPA has not fulfilled its mission "to protect human health and to safeguard the natural environment" because the Agency was warned repeatedly that certain heavy-duty diesel engines were releasing "excess emissions" of pollutants, but failed to take any serious action to investigate the matter for six years. More specifically, EPA was informed, as early as 1991, that certain heavy-duty diesel engine manufacturers were using an electronic fuel injection strategy that would retard engine timing to meet the FTP, but would advance engine timing under long-haul highway operation in order

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[3] U.S. EPA, OMSAPC Advisory Circular 24-2, *Prohibition on Emission Control Defeat Devices -- Optional Objective Criteria*, at 3 (December 6, 1978) (attached hereto as Exhibit A).

[4] *Id.*, at 1-2.

[5] Interviews with U.S. EPA staff in Ann Arbor, Michigan (February 25, 1999); Telephonic Interview with Robert Maxwell, former Director of the Engine Certification Division, Office of Mobile Sources, U.S. EPA (March 29, 1999).

[6] Interviews with U.S. EPA staff in Ann Arbor, Michigan (February 25, 1999); Interviews with heavy-duty diesel engine manufacturers in Washington, D.C. (December 18, 1998 & January 13, 1999).

to improve performance and fuel economy -- resulting in higher levels of NOx emissions than permitted under Federal law. EPA was made aware on several other occasions throughout the early- to mid-1990s that heavy-duty diesel engine manufacturers could use, and were using, electronic engine controls to recognize and meet the FTP, and that these controls influenced engine behavior such that, once the engines were off the FTP, they would emit higher levels of pollutants. EPA also had been aware for many years that the FTP it designed to test the compliance of heavy-duty diesel engines with Federal emission standards was in need of revision to better account for the use of such electronic engine controllers. Yet, despite having all of this information, this regulatory and enforcement agency stood aside meekly, while potentially serious violations of pollution limits were occurring.

EPA's failure to respond to the increasingly specific information it was receiving regarding the likelihood of high in-use emissions from heavy-duty diesel engines throughout the 1990s is inexplicable. Despite being presented with credible, and in some cases convincing, information that certain heavy-duty diesel engines were emitting pollution in significant excess of their certified levels, EPA failed to pursue any potential noncompliance by heavy-duty diesel engine manufacturers until years later. The chronology of events described below paints a troubling picture of a bureaucracy too slow and too arrogant to understand the profound changes taking place in emission control technology, and the impact of those changes on the Agency's testing processes and vehicle pollution levels. It also raises the question of whether this Federal agency was too close to the industry it was charged with regulating to adequately protect human health and the environment.

A. *The First Clear Warning -- The June 1991 Meeting between EPA and Mercedes-Benz:*

In June 1991, representatives from Mercedes-Benz, a diesel engine manufacturer, arranged a meeting with several EPA staff members from the Agency's Office of Mobile Sources Engine Certification Division in Ann Arbor, Michigan.[7] At the meeting, Mercedes-Benz presented test data to EPA that showed that the engine timing on a competitor's engine increased after a certain amount of time had elapsed beyond the length of the FTP cycle.[8] The engine was tested using a steady-state (highway) test, rather than the transient test used by EPA.[9] Mercedes-Benz claimed that, during highway operation, electronic software programmed the engine to increase the ignition timing, leading

[7] Interviews with U.S. EPA staff in Ann Arbor, Michigan (February 25, 1999). EPA correspondence with the Committee, however, seems to indicate that the Agency received similar information as early as 1990. *See* Letter from Richard D. Wilson, Acting Assistant Administrator for Air and Radiation, U.S. EPA, to Commerce Committee Chairman Tom Bliley (March 16, 1998) (attached hereto as Exhibit B).

[8] Interview with John Anderson, Senior Program Manager, Office of Mobile Sources, U.S. EPA, in Ann Arbor, Michigan (February 25, 1999); Charts of Test Data Presented by Mercedes-Benz to U.S. EPA (June 1991) (attached hereto as Exhibit C).

[9] Interview with John Anderson, Senior Program Manager, Office of Mobile Sources, U.S. EPA, in Ann Arbor, Michigan (February 25, 1999).

to increased performance but also an increase in NOx emissions.[10] Mercedes-Benz asked EPA whether what it had discovered about its competitor's engine optimization strategy -- namely, using electronic controls to increase engine timing when off the FTP cycle -- was a permissible strategy for Mercedes-Benz to use for its certified engines.[11]

EPA responded to this significant meeting *not* by placing its experienced engineers on the case, but by assigning a recently-hired college graduate named Michael Samulski to investigate the matter. In fact, Mr. Samulski's supervisor at the time, who assigned him this task, told Committee staff that he (the supervisor) viewed the exercise more as a "training assignment" for Mr. Samulski than as a serious compliance investigation.[12] For his part, Mr. Samulski attempted, unsuccessfully, to identify the manufacturer of the engine in question "through a review of *available* certification and testing data,"[13] and could not reach any firm conclusions about whether defeat devices were being used by any diesel engine manufacturers. His report, however, did conclude that "electronic controls are being used to tailor an[ ] engine's performance to the transient test," and that "electronic control may be used to allow the engine to operate 'cleaner' during testing than during actual road use."[14] The report also proposed two options for further investigation -- namely, that EPA either acquire and test one or more engines, or request additional information from the diesel engine manufacturers about their practices in this regard.[15] Despite these sensible recommendations, his superiors at EPA took no action on the report, and the Agency did not re-evaluate Mr. Samulski's findings or recommendations until 1997 as part of its compliance investigation.[16] Had EPA followed through on the common-sense recommendations of this recent college graduate back in 1991, the Agency likely would have discovered the problem with excess in-use emissions far sooner than it eventually did.

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[10] Interview with Thomas Baines, Senior Program Manager, Office of Mobile Sources, U.S. EPA, in Ann Arbor, Michigan (February 25, 1999).

[11] *Id.*

[12] Interview with John Anderson, Senior Program Manager, Office of Mobile Sources, U.S. EPA, in Ann Arbor, Michigan (February 25, 1999).

[13] Letter from Richard D. Wilson, Acting Assistant Administrator for Air and Radiation, U.S. EPA, to Commerce Committee Chairman Tom Bliley, at 6 (March 16, 1998) (emphasis added) (attached hereto as Exhibit B).

[14] Report of Michael J. Samulski, Mechanical Engineer, Office of Mobile Sources, U.S. EPA, *The Effect of Electronic Controls on the Transient Test* (August 14, 1991) (attached hereto as Exhibit D).

[15] *Id.*

[16] Interview with Michael J. Samulski, Mechanical Engineer, Office of Mobile Sources, U.S. EPA, in Ann Arbor, Michigan (February 25, 1999); Interview with John Anderson, Senior Program Manager, Office of Mobile Sources, U.S. EPA, in Ann Arbor, Michigan (February 25, 1999).

When asked to explain this lack of action, EPA staff suggested to the Committee that the Agency -- whose Air Office budget alone was over $400 million in Fiscal Year 1991, growing to roughly $500 million in Fiscal Year 1992 -- lacked the resources to purchase a diesel engine, which would have cost less than $ 20,000.[17] This response is also disingenuous, given that the Agency had the authority to conduct an on-site audit of a diesel engine manufacturer to test emission levels without actually purchasing an engine for its own use (as EPA later did for unrelated reasons in 1995). Further, the Agency could have followed Mr. Samulski's other suggestion -- namely, that it request additional information about timing and control strategies from the engine manufacturers (as EPA later did in 1997). EPA staff also suggested, in the Agency's defense, that Mercedes-Benz may have had a competitive motive for misrepresenting the test data to encourage EPA enforcement action against its competitor[18] – although the fact that Mercedes-Benz would not reveal the name of the competitor at the time and was seeking EPA permission to use a similar electronic engine control strategy would seem to undercut the credibility of this argument. But even if a healthy dose of skepticism were in order, the Agency's decision to do simply nothing was, and remains, indefensible.

B. *EPA Warned Again -- The July 1991 Industry Whistleblower:*

One month later, EPA again was presented with a credible allegation that certain diesel engine manufacturers may be skirting Federal emission standards. On July 12, 1991, an EPA project manager in the Engine Certification Division, Mr. Cliff Tyree, was contacted by an interested party outside of the Agency, who told him that a public citizen wanted to report what the citizen believed was a direct violation of EPA rules by an engine manufacturer that had hired him to write software for its fuel control system.[19] On July 23, 1991, Mr. Tyree contacted this individual, Dr. Thomas Fogwell, who confirmed that he was hired by a subcontractor of Detroit Diesel Corporation ("DDC"), a heavy-duty diesel engine manufacturer, to write software for DDC's fuel control system.[20] According to Mr. Tyree's contemporaneous notes of this conversation (and a later, confirmatory internal memorandum), Dr. Fogwell told Mr. Tyree that he was asked by DDC to design software that could be programmed to detect the EPA test cycle, and once detected, would retard

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[17] Interview with U.S. EPA staff in Ann Arbor, Michigan (February 25, 1999); Telephonic Interview with Robert Maxwell, former Director of the Engine Certification Division, Office of Mobile Sources, U.S. EPA (March 29, 1999).

[18] Interview with John Anderson, Senior Program Manager, Office of Mobile Sources, U.S. EPA, in Ann Arbor, Michigan (February 25, 1999).

[19] Logbook entry of Cliff Tyree, Senior Project Manager, Office of Mobile Sources, U.S. EPA (July 12, 1991) (attached hereto as Exhibit E) [hereinafter referred to as "Tyree Logbook Entry"]; Memorandum from Cliff Tyree, Senior Project Manager, Office of Mobile Sources, U.S. EPA, to Greg Orehowsky, Environmental Engineer, Office of Mobile Sources, U.S. EPA (May 20, 1997) (attached hereto as Exhibit F) [hereinafter referred to as "Tyree Memorandum"].

[20] Tyree Logbook Entry (attached hereto as Exhibit E); Tyree Memorandum (attached hereto as Exhibit F).

engine timing to reduce emissions.[21] This strategy apparently was aimed at ensuring that the engine could pass any selective enforcement audit ("SEA") testing by EPA.[22]

Following this conversation, Mr. Tyree contacted a senior official at DDC named John Fisher, who was "infuriated" by the suggestion that his company was doing anything illegal.[23] Although a meeting to discuss the issue was proposed, no meeting ever occurred.[24] According to Mr. Tyree, on several occasions he informed his supervisor, Robert Maxwell, who was the Director of EPA's Engine Certification Division at the time, about what he had learned from Dr. Fogwell, but Mr. Maxwell "HAD NO INTEREST IN PURSING [sic] THE ISSUE NOR DID HE WANT ME TO PURSE [sic] IT."[25] The matter was then dropped without any further EPA investigation.[26]

In a telephone interview conducted by Committee staff, Dr. Fogwell confirmed that he worked as a consultant in the Winter of 1990-1991 for a subcontractor that was hired by DDC to design software for its electronic diesel engine controllers. Dr. Fogwell stated that the DDC proposal centered around designing software that could program the engine controller to recognize when the engine was operating under conditions reflective of the EPA transient testing cycle and to maximize emission reductions in that mode. Such software also could be used to program the controller to recognize off-cycle conditions and to maximize non-emission goals such as fuel economy and engine power in that mode. Dr. Fogwell referred to this strategy as "dual mapping."

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[21] Tyree Logbook Entry (attached hereto as Exhibit E); Tyree Memorandum (attached hereto as Exhibit F).

[22] Tyree Logbook Entry (attached hereto as Exhibit E); Tyree Memorandum (attached hereto as Exhibit F).

[23] Tyree Memorandum (attached hereto as Exhibit F); Interview of Cliff Tyree, Senior Project Manager, Office of Mobile Sources, U.S. EPA, in Ann Arbor, Michigan (February 25, 1999).

[24] *Id.*

[25] Tyree Memorandum (emphases in original) (attached hereto as Exhibit F).

[26] When Committee staffed questioned Mr. Tyree's supervisor at the time, Mr. Robert Maxwell, about Mr. Tyree's recollection of these events, Mr. Maxwell stated that he did not recall them, but did not dispute them either. Mr. Maxwell acknowledged that he and others at the Agency were aware of information about possible excess NOx emissions from diesel engines, but that the issue simply was not a priority for the Agency at that time – "no one turned a rock over" to investigate the matter, he stated. Mr. Maxwell also conceded that the specificity of the allegations against DDC should have prompted some real investigation by the Agency at that time, and stated that the Agency would have had reasonable grounds to request further testing data and analysis from DDC had it chosen to do so. Telephonic Interview with Robert Maxwell, former Director of the Engine Certification Division, Office of Mobile Sources, U.S. EPA (March 29, 1999).

Dr. Fogwell stated that he had some concerns at the time as to the potential for such software to be used in a manner that was not consistent with the spirit of the Clean Air Act regulations, and that he expressed these concerns to the president of the DDC subcontractor that had hired him to work on this project. However, because he left the project in the Spring of 1991 prior to any actual design or implementation, Dr. Fogwell stated that he did not know what ultimately became of the discussions that he had had with DDC during that time.

After leaving the DDC project, Dr. Fogwell contacted a public interest organization to express his concerns about the potential misuse of electronic engine controllers, and through that initial contact, ended up speaking with Mr. Tyree at EPA. Dr. Fogwell confirmed that he alerted the Agency that there was a "definite possibility" that heavy-duty diesel engine manufacturers were using electronic engine controllers as a defeat strategy.[27] Dr. Fogwell's impression of EPA at the time of the initial contact was that the Agency did not fully understand the level of sophistication of electronic engine controllers, which was an order of magnitude greater than what EPA expected or imagined.[28] He said that EPA thought of controllers as mechanical devices rather than the small computers that they had become. Dr. Fogwell told Committee staff that, despite the significance of the information he provided to EPA in 1991, he was not contacted again by the Agency until nearly seven years later as part of the 1997 enforcement action against the heavy-duty diesel engine manufacturers.[29]

During a subsequent interview with Committee staff, DDC officials acknowledged designing and implementing a "dual-mapping" strategy that would program the engine to minimize emissions when operating under the FTP cycle, while maximizing non-emission goals such as fuel economy and engine power when operating off-cycle.[30] DDC, however, disputed any suggestion that its dual-mapping strategy was an attempt to skirt or circumvent EPA regulations.[31] Rather, the DDC representatives insisted that, so long as the engine operated within EPA emission limits under urban driving conditions, as reflected by the FTP cycle, there was nothing improper or unlawful with their attempt to maximize off-cycle performance through increased engine timing.[32] They argued that this strategy was consistent with a reasonable interpretation of EPA regulations, including those dealing with the FTP and what constitutes a "defeat device."[33]

While it is not the Committee's function to reach any judgment on this purely legal question, the Committee's review did uncover some statements by key EPA officials that could be construed

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[27] Telephonic interview with Dr. Thomas Fogwell, industry consultant (March 4, 1999).

[28] *Id*.

[29] *Id*.

[30] Interview with Detroit Diesel Corporation in Washington, D.C. (April 22, 1999).

[31] *Id.*

[32] *Id.*

[33] *Id.*

as lending support to DDC's position on the scope and import of EPA's regulations in this area.[34] But even if the manufacturers' actions did not violate the actual letter of the law, the magnitude of the difference between on-cycle and off-cycle emissions clearly should have prompted the manufacturers to engage EPA in a more thorough dialogue about the technical capabilities of electronic engine controllers.

C. *EPA Warned Again and Acknowledges Potential Problem -- The June 1993 Comments by Deere &Company:*

Despite EPA's failure to recognize the significance of this problem, the adverse environmental effects of electronic engine controllers were becoming well known outside the Agency. On June 25, 1993, Deere & Company submitted comments on an EPA proposed rulemaking dealing with the control of NOx emissions from non-road diesel engines. Specifically, Deere noted that it had tested on-road engines from two different diesel engine manufacturers and found that the two engines used different algorithms to distinguish steady-state from transient operations.[35] Deere referred to the ability to distinguish transient operations and to adjust engine timing accordingly as "transient sensing algorithms."[36] Deere's test data showed that, for one of the diesel engines it tested, the emissions of NOx were higher than the standard set by EPA.[37]

In its official response to Deere's comments, EPA seemed to accept the Deere comments in theory, but nonetheless did not take any concrete steps to investigate whether this theory was being

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[34] *See, e.g.*, C. Bowman, *"EPA Off on Diesel Rigs' Emissions? Clean Air Goals May be Tougher to Meet," The Sacramento Bee* (October 18, 1997) (attached hereto as Exhibit G). This article reported that Chet France, a senior official with EPA's Office of Mobile Sources in Ann Arbor, Michigan, said that "EPA has neither regulated nor fully accounted for the heavy NOx pollution generated when the big rigs are cruising steadily down the highways, fully loaded." Moreover, Mr. Robert Maxwell, a former Director of the Engine Certification Division in EPA's Office of Mobile Sources, told Committee staff during a telephone interview that there was a subtle difference between an engineer creating an algorithm that caused an engine to meet EPA emissions standards (a legal objective), and an algorithm that could be programmed to defeat the EPA test procedure (an illegal objective), and that EPA had been worried for some time about how to distinguish the two objectives. He also stated that EPA's defeat device policy was written for mechanical controls and had not been amended to contemplate the use of electronic controls, which led to a "messy case" when applying the defeat device policy to heavy-duty diesel engines. Telephonic Interview with Robert Maxwell, former Director of the Engine Certification Division, Office of Mobile Sources, U.S. EPA (March 29, 1999).

[35] Comments of Deere & Company to U.S. EPA Notice of Proposed Rulemaking, *Control of Air Pollution: Emissions of Oxides of Nitrogen and Smoke from New Nonroad Compression-Ignition Engines At or Above 50 Horsepower*, EPA Air Docket A-91-24, at 3 (June 25, 1993) (attached hereto as Exhibit H).

[36] *Id.*

[37] *Id.*

put into practice by diesel engine manufacturers.[38] Although EPA was provided with actual test data showing that its FTP did not accurately measure in-use emissions of diesel engines, the Agency still took no action. At a minimum, these public comments from Deere should have given additional credence to the information EPA received two years earlier from Mercedes-Benz and Dr. Fogwell -- namely, that diesel engines, through the use of electronic controls, were capable of detecting the EPA test cycle, were programmed to "know" when they were operating off that test cycle, and were emitting higher levels of pollutants in actual use than they were certified to emit under Federal law -- and should have prompted some investigation by the Agency.

Yet, as far as the Committee could determine, EPA's only action in response to the comments submitted by Deere was to include these four sentences buried in the proposed Federal Implementation Plan for California's ozone non-attainment areas in 1994:

> The Agency has received information that certain on-highway heavy-duty diesel engines were using "transient sensing algorithms" that have the effect of retarding the timing during transient engine operating conditions and advancing the timing during certain steady-state conditions. Since injection timing has a very significant impact on NOx emission rates, with advanced timing settings being associated with higher NOx, the continued use of these algorithms could result in engines that appear to be very low NOx emitters for certification purposes, but would not be nearly so low when operated in-use. The Agency would consider such algorithms used to meet the 1.5 g/bhp -- hr standard to be defeat devices. They would not be an acceptable strategy. [39]

While this statement makes clear EPA's view that, under certain circumstances, the transient sensing algorithms may be considered illegal defeat devices, it was a sorely inadequate attempt by EPA to address the potential existence of excess emissions from heavy-duty diesel engines. It is difficult to see how these four sentences about defeat devices, buried in a complex plan having positive legal effect only in the State of California, could be considered an adequate substitute for real action on the part of the Agency. More telling is what EPA did *not* do at that time. EPA did not issue a guidance document, policy memorandum, or even a letter to the heavy-duty diesel engine manufacturers explaining the Agency's newly-announced position on transient sensing algorithms as defeat devices, nor did EPA investigate the use of transient sensing algorithms any further. When it came to enforcing Federal emission standards, it appears that EPA followed a policy of "don't ask, don't tell," in an attempt to -- as one former EPA official described it – avoid "a holy war with

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[38] U.S. EPA Response to Comments for the Notice of Proposed Rulemaking, *Determination of Significance for Nonroad Sources and Emissions Standards for New Nonroad Compression-Ignition Engines At or Above 37 Kilowatts*, at 48 (May 27, 1994).

[39] U.S. EPA Notice of Proposed Rulemaking, *Approval and Promulgation of State and Federal Implementation Plans; California -- Sacramento and Ventura Ozone; South Coast Ozone and Carbon Monoxide; Sacramento Area Reclassification*, 59 Fed. Reg. 23264, 23418 (May 5, 1994).

industry" on this issue.[40]

D. *EPA Warned Again -- The January 1994 ECE Meeting and Subsequent Press Reports:*

EPA's next warning about the inadequacy of its emission testing protocol came at the January 1994 meeting of the Economic Commission for Europe's ("ECE") Group of Rapporteurs on Pollution and Energy ("GRPE"). The GRPE Working Group held a meeting in Geneva, Switzerland, to discuss a new testing cycle for heavy-duty diesel engines. The European countries utilized a steady-state test rather than the EPA-designed transient test, and were considering ways to improve their testing protocol to more accurately reflect real-world emissions. According to the trip report filed by the EPA representative present at this meeting, the European regulators were leery about adopting EPA's FTP because of its deficiencies in capturing actual in-use emissions. In fact, the EPA representative reported to his superior at the Agency -- who was the director of the Office of Mobile Sources -- that some ECE countries "feel that the U.S. heavy-duty cycle is being circumvented by the use of transient sensing algorithms."[41] Once again, however, it does not appear that EPA took any action in response to the considered views of its counterparts in Europe regarding the adequacy of EPA's test cycle.

Nine months later, an article appeared in *Inside EPA's Mobile Source Report* on October 21, 1994, reporting that diesel engine manufacturers had developed software that enables diesel engines to meet NOx emission regulations while also enabling them to maximize fuel economy.[42] An official with a major European heavy-duty engine manufacturer was quoted as saying: "The widespread use of sophisticated engine controls has given the possibility of distinguishing between urban conditions and highway conditions."[43] The article stated that the engine-controlling software senses when the engine is driven in an over-the-road mode and changes the fuel injector timing to reduce fuel consumption, which results in significant increases in NOx emissions.[44] A U.S. source told the trade

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[40] Telephonic Interview with Robert Maxwell, former Director of the Engine Certification Division, Office of Mobile Sources, U.S. EPA (March 29, 1999).

[41] U.S. EPA Memorandum, *Trip Report: UN/ECE/WP-29/GRPE Meeting in Geneva, January 17-20, 1994*, from Thomas Baines, Senior Technical Advisor, Regulation Development and Support Division, U.S. EPA, to Richard D. Wilson, Director, Office of Mobile Sources, U.S. EPA (January 27, 1994) (attached hereto as Exhibit I). A similar warning about the possibility of defeating the U.S. transient test through use of electronic controls in heavy-duty diesel engines is contained in a 1993 report, received by EPA, issued by the Organization for Economic Co-Operation and Development. See *Control of Emissions from Heavy-Duty Vehicles*, OECD/GD (93)11, at 55 (Paris 1993) (attached hereto as Exhibit J).

[42] "*Software Said Able to Cut Urban NOx Emissions, Hike Them For Highway*," *Inside EPA's Mobile Source Report*, at 12 (October 21, 1994) (attached hereto as Exhibit K).

[43] *Id.*

[44] *Id.*

publication that, "[a]ccording to some informants, the emissions can be 3-6 times the amount of NOx that the engine was certified at."[45]

Despite what should have been alarming information to our Nation's pollution regulator, an EPA official was quoted in this same article as saying that the Agency had not seen much evidence of electronic engine controllers being used with such results -- apparently ignoring the specific information that EPA had received in 1991 and 1993 showing exactly that.[46] This article also reported an EPA official stating that the EPA test cycle did not cover over-the-road driving conditions: "[W]e feel that if you get control under urban conditions, you get proportional control in all conditions. But you have to look at the data before you can conclude that these things are happening," the official said.[47]

Yet, as noted above, EPA apparently took no steps to look at such data, even though it was provided to the Agency on at least two prior occasions. This quote also is illustrative because it demonstrates EPA's ignorance of technological developments in this area, as well as EPA's arrogance about the quality of its own testing protocol. And it seems to ignore or deny the specific and credible information EPA received in 1991 and 1993 refuting the assertion about proportional controls in all conditions under the FTP.

E. *EPA Stumbles Upon More Evidence and Slowly Begins to Take Action -- 1996-1998:*

After several more years without any action by EPA to investigate this troubling matter, the Agency once again received a warning from a knowledgeable outsider that its FTP for heavy-duty diesel engines may not be adequate. On July 8, 1996, Michael P. Walsh, an international consultant on mobile source issues, wrote a memorandum to Margo Oge, the Director of EPA's Office of Mobile Sources, pointing out the need for EPA to improve its compliance program for heavy-duty diesel engines and suggesting that EPA consider upgrading the test procedure for these engines.[48]

While no concrete action was taken immediately, in May 1997 EPA received an engine from a diesel engine manufacturer that had failed a routine and unrelated enforcement audit two years earlier.[49] The Office of Mobile Sources then tested this engine using the FTP as well as a variety of

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[45] *Id.*

[46] *Id.*

[47] *Id.*

[48] Letter from Richard D. Wilson, Acting Assistant Administrator for Air and Radiation, U.S. EPA, to Commerce Committee Chairman Tom Bliley, at 6 (March 16, 1998) (attached hereto as Exhibit B).

[49] *Id.*, at 4. This routine audit of a heavy-duty diesel engine, conducted by EPA in 1995 as part of a separate in-use initiative, showed a violation of the particulate matter emission standard. The audit was not specifically designed, nor did it detect, the excess NOx emissions at issue in the diesel engine enforcement action settled in October 1998.

"steady state" tests that were different from the FTP and simulated extended highway driving. These tests showed that, when the engine was operating in a steady-state (highway) mode for an extended period of time, emissions of NOx were significantly higher than the level at which the engine was certified. The results of the tests, which according to EPA appeared to show the existence of questionable calibration strategies, were reported on May 29, 1997.[50] It was at this time that EPA began its compliance investigation and software review. As part of this review, in the Fall of 1997 EPA finally sought information from diesel engine manufacturers concerning the use of computer controls and engine calibration strategies. Remarkably, despite all of the evidence discussed above, EPA claims that "it was in response to these inquiries that EPA first learned that there was widespread use by several engine manufacturers of questionable calibration strategies."[51]

In November and December of 1997, EPA held meetings in Washington, D.C., with diesel manufacturers and the California Air Resources Board to discuss its concerns about whether engines were employing proper emission controls. In letters subsequently sent to diesel engine and truck manufacturers, EPA indicated that it was "concerned that manufacturers may employ engine control strategies that maximize fuel economy during such off-cycle operation but inappropriately reduce the level of emissions control. Such strategies may be in violation of the Clean Air Act's (the Act) prohibition against defeat devices."[52] EPA followed up these meetings with multiple information requests to diesel manufacturers under the authority of section 208 of the Clean Air Act. These requests asked for detailed technical information on all devices that advance fuel injection timing, information on products employing such devices, computer codes, software instructions and other data, as well as steps needed to remove or render inoperative all such devices.[53]

During the Fall of 1997, EPA also issued conditional certificates of conformity for engines manufactured for the 1998 model year. These certificates indicated that any engine that employed a defeat device was not covered by the certificate of conformity. The certificates further required manufacturers, within 60 days, to "show cause" why strategies for fuel injection timing, including certain algorithms, did not constitute defeat devices. Manufacturers submitted, at various times during the Spring of 1998, responses to these show cause orders, containing historical, regulatory and technical information, as well as legal arguments. During this same period, extending into the Summer of 1998, EPA and the manufacturers held numerous meetings and discussions, which eventually led to announcement of a consent decree in October of 1998. It is notable that the negotiation and announcement of the consent decree occurred during the same period of time when diesel engine manufacturers would need to seek and obtain certificates of conformity for the upcoming 1999 engine model year.

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[50] *Id.*

[51] *Id.*

[52] Substantially similar letters were sent to all diesel manufacturers identified in the enforcement action, as well as other companies, by Bruce C. Buckheit, Director, Air Enforcement Division, U.S. EPA. The quotation cited above appears in many similar letters, variously dated, in early to mid-December 1997.

[53] Section 208 requests were contained in the correspondence cited immediately above, as well as follow-up letters sent at various times in the Winter and Spring of 1998.

In summary, then, EPA knew from experience dating back to the 1970s that computer controls can affect the emission of regulated pollutants from motor vehicle engines, and that, by the late 1980s, such controls were being used in heavy-duty diesel engines. EPA had specific knowledge, dating back to a meeting with Mercedes-Benz in 1991, that electronic engine controllers gave diesel engine manufacturers the ability to program their engines to recognize and distinguish urban from highway driving conditions and to recognize the FTP -- information corroborated shortly thereafter by a knowledgeable whistleblower working for a key diesel engine manufacturer. EPA also twice received actual test data, in 1991 and again in 1993, showing excess levels of emissions by "certified" diesel engines during on-road use. By 1994, if not earlier, EPA knew that its European counterparts -- who utilized a different test cycle for diesel engines -- believed that EPA's FTP could be and was being circumvented through the use of transient sensing algorithms. However, despite all of this increasingly specific and credible information, EPA did not take any action as a result, and still has not proposed revising the FTP to more accurately reflect actual driving conditions. The steps that the Agency finally did take -- such as the 1997 testing and requests for information -- were actions that EPA at all times had the authority to take, and were basic, common-sense steps the Agency should have taken way back in 1991. Instead, EPA permitted the regulatory confusion created by the clash of new technology with its out-dated testing regulations to fester for years, and then used this very confusion, and its veto power over the sale of new engines, to forge an enforcement settlement as a means of covering up its past failures in this area -- all the while proclaiming a sham "victory" in its efforts to protect the environment.

EPA's failures to ensure the effectiveness of its testing protocol and to investigate the very real possibility of excess in-use NOx emissions from diesel engines have resulted in the American public breathing air over the past decade that is far more polluted than it should have been. If EPA had done its job of enforcing Federal pollution limits, much of this harm could have and would have been avoided. Further, as noted earlier, these elevated pollution levels will persist well into the next decade even under the terms of EPA's settlement agreement with the engine manufacturers. The section below explains this adverse impact, as well as related issues.

IV. THE ADVERSE IMPACT OF EPA NEGLIGENCE ON HUMAN HEALTH AND THE ENVIRONMENT

The precise negative impact on public health and the environment caused by EPA's gross negligence in enforcing diesel emission standards is unknown, as is the precise effect that EPA's inaction may have had on other Clean Air Act programs. The Committee, on several occasions from the Spring to the Fall of 1998, requested that EPA provide detailed information relating to the amount of "excess emissions" from heavy-duty diesel engines and the effect that these emissions may have had on human health, the environment, and other Clean Air Act Programs.[54] To this day, EPA's responses to these basic questions remain wholly unsatisfactory, and raise questions about the underlying basis for the October 1998 settlement agreement with the diesel engine makers.

[54] Letter from Commerce Committee Chairman Tom Bliley to Carol M. Browner, Administrator, U.S. EPA, at 2,4 (February 24, 1998) (attached hereto as Exhibit L.); Letter from Commerce Committee Chairman Tom Bliley to Carol M. Browner, Administrator, U.S. EPA, at 3,4 (October 20, 1998) (attached hereto as Exhibit M.)

In one EPA response to a request for information on excess emissions, EPA told the Committee: "We have been developing and refining estimates from alleged use of defeat devices and expect that process to continue."[55] The response continued to say that, until settlement discussions were completed, "more complete estimates cannot be calculated."[56] One would think that it would be difficult to have meaningful settlement negotiations or complete such negotiations without first having some credible estimates of the excess emissions and damage caused, yet it appears that the Agency's approach was the exact reverse. In fact, it was not until EPA and the Department of Justice announced the government's settlement with the diesel engine manufacturers in October 1998 that EPA finally provided more precise data to the Committee on the precise level of excess emissions.

Even then, however, the Agency made no specific mention in its public statements regarding its settlement as to the amount of harm to human health and the environment that was caused by these excess emissions, which would seem to be an important consideration in evaluating the scope and adequacy of the remedies and penalties agreed to by the government. There also is no evidence that the Agency ever developed final estimates of such harm, or fully evaluated the impact of such large amounts of excess pollution on other Clean Air Act programs. These are yet additional factors that raise legitimate suspicion that the Agency may have been more interested in covering up its own failures in this area than truly going after what it has called an intentional strategy to violate Clean Air Act regulations by diesel engine manufacturers.[57]

While the precise negative impact on public health and the environment caused by EPA's gross negligence in enforcing diesel emission standards is unknown, the Agency's own estimates suggest that these faulty diesel engines resulted in more than 1.3 million tons of "excess emissions" of nitrogen oxides (NOx) *in 1998 alone*. This amount equals six percent of such emissions from all cars, trucks, and industrial sources nationwide, and is greater than the total annual NOx emissions from many entire industries. In more practical terms, these excess emissions are equivalent to having 72% more diesel trucks on the road, or an additional 65 million passenger cars. And that is only for 1998. During the six years of EPA inaction, the environmental and public health damage surely was

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[55] Letter from Richard D. Wilson, Acting Assistant Administrator for Air and Radiation, U.S. EPA, to Commerce Committee Chairman Tom Bliley, at 11 (March 16, 1998) (attached hereto as Exhibit B).

[56] *Id.*

[57] Indeed, EPA's public actions in this matter appear to be in stark contrast to other Agency pronouncements regarding the health benefits of various Clean Air Act regulatory actions. For example, when EPA announced the final revised ozone and particulate matter standards in July 1997, it estimated that 15,000 lives would be saved annually, and that we would avert 350,000 cases of aggravated asthma and 1 million cases of significantly decreased lung function each year. More recently, when President Clinton announced new "Tier II" vehicle standards and lowered sulfur content in gasoline in December 1999, the Administration claimed that such actions would prevent "4,300 premature deaths, 260,000 asthma attacks among children, and 173,000 cases of childhood respiratory illness." By comparison, the Agency's silence on the health effects of its own negligence in this case is truly deafening.

staggering, and the impact on other Federal and State clean air programs will probably never be known.

Indeed, according to EPA, these pollution violations have occurred since 1988, exposing the American public to elevated levels of NOx -- and the resulting smog and soot -- for the last 11 years.[58] Over this time, nearly 6.9 million tons of NOx have been emitted by diesel trucks traveling our Nation's roadways, which -- using EPA's methodology for calculating adverse health effects of NOx – may have caused up to 5,600 premature deaths and up to $31 *billion* in health-related costs.[59] These estimates include the cost of increased asthma attacks, bronchitis, reduced lung functions and other breathing problems among the American public, particularly our most sensitive populations such as the elderly, children, and asthmatics.[60] According to EPA, NOx emissions also cause acid rain, which damages agricultural crops and pollutes our Nation's drinking water -- damage in addition to the health-related cost figures cited above.[61] In short, the scope and magnitude of this regulatory debacle may well be unprecedented.

After the Committee began its investigation, EPA and the Department of Justice entered into a settlement in October 1998 with certain diesel engine manufacturers, under which these manufacturers agreed to pay civil fines for allegedly utilizing "defeat devices" to circumvent EPA's emission testing protocols. According to EPA and the Department of Justice, this enforcement action resulted in the largest Clean Air Act settlement in history.[62] While EPA continues to boast publicly

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[58] U.S. EPA Chart, *Estimated Total and Net Excess NOx Emissions* (November 3, 1998) (attached hereto as Exhibit N).

[59] U.S. EPA Chart, *Estimated Health Effects of Excess NOx Emissions* (undated) (attached hereto as Exhibit O).

[60] U.S. EPA Press Release, *DOJ, EPA Announce One Billion Dollar Settlement With Diesel Engine Industry For Clean Air Act Violations* (October 22, 1998) (attached hereto as Exhibit P). *See also* U.S. EPA Regulatory Impact Analysis, *NOx SIP Call, FIP, and Section 126 Petitions*, Volume 2, Ch. 4, at 17 (December 1998) (identifying three health effects for inclusion in calculation of the benefits and costs related to the reduction of NOx emissions in 22 states: mortality associated with short-term exposure, hospital admissions for all respiratory diseases, and acute respiratory symptoms); *id.* (stating that "both ozone and particulate matter have been associated with increased risk of premature mortality in adult populations . . . The mean value of avoiding one statistical death is estimated to be $4.8 million").

[61] *Id.*

[62] *Id.* According to the press release, seven manufacturers, Caterpillar Inc., Cummins Engine Company, Detroit Diesel Corporation, Mack Trucks, Inc., Navistar International Transportation Corporation, Renault Vehicules Industriels, s.a., and Volvo Truck Corporation, will pay collectively $83.4 million in civil penalties, will spend roughly $850 million to introduce cleaner new engines, rebuild some older engines to cleaner levels, and recall certain pickup trucks to conduct new emissions testing, and will spend an additional $109.5 million to undertake research and development projects to design low-emitting engines and other ways to lower NOx

about this record-setting enforcement action, no amount of penalties will ever undo the severe damage that a decade of EPA inaction caused to our Nation's air and the public's health and welfare. Indeed, these "record" fines do not even begin to put a dent in the health-related costs suffered by the American people. Ironically, the Attorney General has stated that the message of the diesel settlement to industry is that "an ounce of compliance is worth a pound of penalties."[63] It appears that this same message should be targeted at EPA, which could have prevented much of this harm by focusing on testing and compliance issues years ago rather than launching an enforcement action six years too late.

The overwhelming record of EPA inaction -- and its resulting harm to Americans -- also makes a mockery of EPA Administrator Carol Browner's public claims that the diesel settlement underscores the Clinton Administration's "commitment to vigorously enforce the environmental laws of this nation and to ensure that the air people breathe is safe and clean."[64] This case also proves the point that the toughest pollution standards in the world – another oft-quoted Administration refrain – are meaningless without effective oversight and enforcement.

Moreover, even under the terms of EPA's much-touted settlement, over 5 million tons of "excess" NOx will continue to be emitted in the foreseeable future.[65] Again using EPA's own methodology, these future excess emissions could account for up to 4,180 additional premature deaths and over $23 billion in additional health-related costs over the next 27 years. Thus, the American public will continue to pay well into the new millennium for EPA's failure to do its job properly in the past.

As noted above, EPA generally has not calculated the effect that these excess emissions may have had, and may continue to have, on existing state and local efforts designed to protect human health and the environment.[66] Despite the fact that, in the year 2000 alone, over 1 million tons of "excess" NOx emissions will spew from the exhaust stacks of large trucks traveling on America's highways, EPA has not attempted to quantify in any meaningful way what effect these emissions will have on efforts to meet the tighter ozone standard issued by EPA in 1997 (but now remanded to the Agency by court action), or the recently proposed "reinstated" Clean Air Act ozone standard that existed prior to 1997. Instead, EPA indicated in Committee staff briefings that it does not project

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emissions in the future.

[63] *Id*.

[64] *Id.*

[65] U.S. EPA Chart, *Estimated Total and Net Excess NOx Emissions* (November 3, 1998) (attached hereto as Exhibit M).

[66] The Agency has included such emissions in emission baselines with respect to recent rulemakings involving new "Tier II" standards for motor vehicles, as well as Agency findings regarding petitions filed under Section 126 of the Clean Air Act. However, the Agency has not attempted to calculate the effect of such emissions on current implementation of the National Ambient Air Quality Standard for ozone.

any significant effect on the implementation of current air pollution programs, including a massive 22-state effort directed at controlling stationary sources of NOx.

Thus, even though EPA estimated that diesel engines subject to the consent order would emit nearly 12,000,000 excess tons of NOx overall, it does not project any impact on the current ability of States or local governments to meet Clean Air Act requirements. It would seem to defy common sense that such a large amount of pollution can be emitted in this country and no one will suffer, or that any area has not been disadvantaged in attempting to comply with Clean Air Act requirements. Moreover, and regardless of whether EPA's position has any technical merit, EPA's assertion certainly does not negate the fact that such pollution levels were unanticipated both by EPA and state and local governments, which relied on these faulty EPA projections when devising their pollution control programs.

Simply put, EPA's failure to enforce pollution limits for heavy-duty diesel trucks, despite repeatedly being presented with evidence that they were being broken, has caused certain and severe damage to the Nation's environment and to the health of its citizens. And no amount of penalties or future mitigation activities promised by the diesel engine manufacturers under the EPA settlement will ever erase that damage.

V. INVESTIGATION SCOPE AND METHODOLOGY

At the direction of Commerce Committee Chairman Tom Bliley, the Committee investigated the following issues relating to EPA's diesel engine emission certification program:

(1) When EPA had actual or constructive knowledge that diesel engine manufacturers were installing technology that could act, or have the potential to act, to avoid or circumvent the Agency's prescribed FTP;

(2) When EPA should have had actual or constructive knowledge that diesel engine manufacturers were installing technology that contained "questionable calibration strategies";

(3) The strategies being employed by heavy-duty diesel engine manufacturers to comply with the FTP following the introduction of computer engine controls;

(4) What actions EPA took, or should have taken, in response to information that was provided to the Agency that high in-use emissions were resulting from electronically-controlled heavy-duty diesel engines;

(5) The extent of adverse impact on human health and the environment caused by "excess emissions" from diesel engines, as well as the impact on other Clean Air Act programs; and

(6) What the future impact on human health and the environment will be because of continued "excess emissions" under the terms of the settlement agreement signed by EPA in October 1998, and the impact that these "excess emissions" will have on other Clean Air Act programs.

To answer these questions, the Committee began in early February 1998 to gather information from various sources. In February 1998, Committee staff received a briefing from EPA employees regarding the current status of diesel engine compliance certificates, the scope and nature of settlement discussions being held with diesel engine manufacturers, certain test results that indicated different emission "maps" at different engine speeds and operating conditions, the trade-off between NOx emissions and fuel economy in current diesel engines, applicable regulatory definitions, and initial estimates of the environmental impact of "excess emissions" from such engines.

After the first briefing, Committee staff requested further information from EPA concerning several matters. Committee staff then received additional briefings and conducted telephone interviews with EPA officials. In order to seek clarity in certain matters, as well as to review the conduct of the Agency in this matter, Chairman Bliley then determined that a request and review of certain Agency records was necessary.[67]

Documents relevant to the Committee's review of this matter were first provided by EPA in March 1998, in response to Chairman Bliley's February 24, 1998 letter to EPA Administrator Carol Browner. By agreement with the Committee, however, EPA withheld certain documents from the initial production of documents in March 1998 that related to the ongoing Department of Justice/EPA investigation. A subsequent document request was sent by the Chairman to EPA on October 20, 1998. Documents responsive to this request, in addition to documents formerly withheld with the assent of the Committee, were reviewed by Committee counsel at EPA offices. After this review, copies of certain documents that were reviewed by Committee counsel were physically provided to the Committee.

Staff from the Committee then traveled to EPA offices located in Ann Arbor, Michigan, to interview several EPA employees who were and still are involved with the heavy-duty diesel engine certification program. Committee staff also interviewed several private parties and former EPA officials with knowledge of activities relevant to this matter. To this end, Committee staff met with representatives of several heavy-duty diesel engine manufacturers to gather information about their activities relating to emission control technology and strategies, the nature of the heavy-duty diesel manufacturing industry, the marketplace for heavy-duty diesel engines, and other relevant matters. Committee staff also conducted a telephone interview of the industry whistleblower who had alerted EPA in 1991 to the potential misuse of electronic engine controllers by diesel engine manufacturers, as well as a telephone interview with a leading producer of electronic engine controllers to learn more about how these controllers operated, when they became universally used by heavy-duty diesel engines, and the trade-offs between fuel efficiency and pollution reduction when using electronic engine controllers.

The facts and findings contained in this report are based on the above-referenced sources, and are specified with greater particularity in the footnotes accompanying the report's text.

VI. EXHIBITS

[67] All correspondence between the Committee and EPA regarding this investigation is attached hereto as Exhibit Q, including correspondence that is referenced throughout this report as separate exhibits.

A. U.S. EPA, OMSAPC Advisory Circular 24-2, *Prohibition on Emission Control Defeat Devices -- Optional Objective Criteria* (December 6, 1978).

B. Letter from Richard D. Wilson, Acting Assistant Administrator for Air and Radiation, U.S. EPA, to Commerce Committee Chairman Tom Bliley (March 16, 1998).

C. Charts of Test Data Presented by Mercedes-Benz to U.S. EPA (June 1991).

D. Report of Michael J. Samulski, Mechanical Engineer, Office of Mobile Sources, U.S. EPA, *The Effect of Electronic Controls on the Transient Test* (August 14, 1991).

E. Logbook entry of Cliff Tyree, Senior Project Manager, Office of Mobile Sources, U.S. EPA (July 12, 1991).

F. Memorandum from Cliff Tyree, Senior Project Manager, Office of Mobile Sources, U.S. EPA, to Greg Orehowsky, Environmental Engineer, Office of Mobile Sources, U.S. EPA (May 20, 1997)

G. Chris Bowman, *"EPA Off on Diesel Rigs' Emissions? Clean Air Goals May be Tougher to Meet," The Sacramento Bee* (October 18, 1997).

H. Comments of Deere & Company to U.S. EPA Notice of Proposed Rulemaking, *Control of Air Pollution: Emissions of Oxides of Nitrogen and Smoke from New Nonroad Compression-Ignition Engines at or Above 50 Horsepower*, EPA Air Docket A-91-24 (June 25, 1993).

I. U.S. EPA Memorandum, *Trip Report: UN/ECE/WP-29/GRPE Meeting in Geneva, January 17-20, 1994*, from Thomas Baines, Senior Technical Advisor, Regulation Development and Support Division, U.S. EPA, to Richard D. Wilson, Director, Office of Mobile Sources, U.S. EPA (January 27, 1994).

J. Report of the Organization for Economic Cooperation and Development, *Control of Emissions from Heavy-Duty Vehicles*, OECD/GD (93)11 (Paris 1993).

K. *"Software Said Able to Cut Diesel Urban NOx Emissions, Hike Them for Highway," Inside EPA's Mobile Source Report*, Vol. 2, No. 21 (October 21, 1994).

L. Letter from Commerce Committee Chairman Tom Bliley to Carol M. Browner, Administrator, U.S. EPA (February 24, 1998).

M. Letter from Commerce Committee Chairman Tom Bliley to Carol M. Browner, Administrator, U.S. EPA (October 20, 1998).

N. U.S. EPA Chart, *Estimated Total and Net Excess NOx Emissions* (November 3, 1998).

O. U.S. EPA Chart, *Estimated Health Effects of Excess NOx Emissions* (undated).

P. U.S. EPA Press Release, *DOJ, EPA Announce One Billion Dollar Settlement With Diesel Engine Industry For Clean Air Act Violations* (October 22, 1998).

Q. Correspondence between the Committee on Commerce and U.S. EPA relating to the Diesel Investigation.

For additional copies of this document, please contact:

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The document is also available on the Internet at:

http://www.house.gov/commerce/asleepatthewheel.html