



Non-Conformance Penalties for 2004 and Later Model Year Emission Standards for Heavy-Duty Diesel Engines and Heavy-Duty Diesel Vehicles: Response to Comments

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**Non-Conformance Penalties for 2004 and
Later Model Year Emission Standards for
Heavy-Duty Diesel Engines and
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Response to Comments**

Assessment and Standards Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency

RESPONSE TO COMMENTS DOCUMENT

Non-Conformance Penalties for 2004 and Later Model Year
Emission Standards for Heavy-Duty Diesel Engines and Heavy-Duty Diesel Vehicles

Table of Contents

INTRODUCTION 3

SECTION 1: GENERAL NCP ISSUES 4

 Issue 1.1: Shape of Penalty Curves 4

 Issue 1.2: Comparison to Rulemaking Costs 5

 Issue 1.3: NCP Implementation Timing 6

 Issue 1.4: Evaluation of NCPs After Implementation 7

 Issue 1.5: “Sunsetting” of NCPs 7

 Issue 1.6: Additional Penalty Factors to Consider 8

 Issue 1.7: Interaction of NCPs with Consent Decrees 9

SECTION 2: ISSUES REGARDING THE PROPOSED ANALYSIS 11

 Issue 2.1: General Support for Analysis 11

 Issue 2.2: Warranty, Maintenance, and Repair 11

 Issue 2.3: Fixed Costs 12

 Issue 2.4: Other Costs 13

 Issue 2.5: Statistical Methodology 13

 Issue 2.6: Determination of Upper Limit 14

 Issue 2.7: Sources of Data 20

 Issue 2.8: Discount Rate 21

 Issue 2.9: Estimated Market Share 23

SECTION 3: ADDITIONAL RELEVANT ISSUES 24

 Issue 3.1: Canadian Sales 24

 Issue 3.2: Alternative Use of Penalty Funds 25

 Issue 3.3: Issues Regarding Collection of Data Prior to and After Proposal 25

List of Commenters and Abbreviations

California Air Resources Board	CARB
Caterpillar Inc.	CAT
Cedar Valley Freightliner	CVF
Cummins Inc.	Cummins
Detroit Diesel Corporation	DDC
Engine Manufacturers Association	EMA
National Automobile Dealers Association	NADA
New York State Department of Environmental Conservation	NYDEP
Pony Pack Inc.	PPI
Puget Sound Clean Air Agency	PSCAA
San Joaquin Valley Air Pollution Control District	SJVAPCD
Seneca Economics and Environment, LLC	SEE
Volvo Powertrain Corporation	VPC

INTRODUCTION

The EPA proposed this regulation on January 16, 2002, at 67 FR 2159. The proposal announced the opportunity for written public comment until March 18, 2002. The proposal also provided notice of a public hearing which was held on February 15, 2002 in the Washington, DC area.

Complete transcripts of the public hearing and the full text of each comment letter may be found in Docket No. A-2001-25. All data and information relied upon by EPA in developing the regulation also may be found in Docket No. A-2001-25. This docket is available for public inspection and copying between 8:00 a.m. and 5:30 p.m., Monday through Friday, excluding government holidays, at Room M-1500, Waterside Mall, 401 M Street, S.W., Washington, D.C.

This document summarizes the written and oral comments submitted at the public hearing on February 15, 2002, as well as any comments received during the public comment period, and records EPA's responses to those comments. The reader should note that many of the most significant comments are also addressed in the preamble for the final rule and the responses in this document cross-reference the corresponding discussion in the preamble where appropriate. The responses presented in this document are intended (1) to augment the responses to comments that appear in the preamble to the final rule, or (2) to address comments not discussed in the preamble to the final rule.

EPA received approximately 20 written comments. A copy of each comment letter received is included in the rulemaking docket. A list of commenters and the EPA docket item number assigned to their correspondence is also included in the docket. All of the comments have been carefully considered, and where determined to be appropriate, changes have been made in the final regulation.

SECTION 1: GENERAL NCP ISSUES

Issue 1.1: Shape of Penalty Curves

COMMENT: CARB commented that EPA should change the shape of the NCP curve to increase the penalties for engines emitting near the applicable standard. Cummins did not specifically address the shape of the curve, but commented on the use of MC_{50} and MC_{90} , which both are used to determine the shape of the curve. Specifically, they commented that MC_{50} should be set equal to COC_{50} and that MC_{90} should be set equal to COC_{90} . They argued that "the use of the single cost component to derive MC_{50} is troublesome and results in inaccuracies in the NCP calculation." (The values that they recommended for MC_{50} were higher than the values proposed, and would have made the NCP penalties higher for compliance levels near the standard.) Cummins also commented that, "by constraining the F factor to 1.1 to 1.3, the Agency is artificially lowering the NCPs."

RESPONSE: We believe that we should generally follow the existing regulations in this rulemaking regarding the shape of the NCP curves, unless we have reason to believe that the resulting NCPs would not appropriately implement the requirements of the CAA. For example, we would not follow the regulatory penalty formula if we determined that the resulting penalties would not remove the competitive disadvantage to the complying manufacturers. However, neither CARB nor Cummins provided a basis to believe that the proposed shape of the curves would not properly implement the requirements of the CAA.

MC_{50} is intended to represent the marginal cost of fully complying with the standards for the last increment of emission reduction for the average engine. Thus, it is appropriate to use a single cost component to calculate MC_{50} . This last increment should involve generally the most expensive controls, especially the most expensive calibration adjustment. However, in our analysis of minimum values for MC_{50} , we effectively considered all cost components. We compared these calculated values to the minimums to ensure that our estimates were no lower than the average.

Cummins mistakenly commented that EPA has set MC_{50} equal to COC_{50} in past rulemakings. MC_{50} was actually set equal to COC_{50} divided by the difference between the UL and the applicable standard. In some cases, the difference between the UL and the applicable standard was 1.0 g/bhp-hr so that MC_{50} coincidentally had the same numeric value (with different units). If we had used that approach in this rule, we would have estimated MC_{50} for LHD, MHD, and Urban Bus as COC_{50} divided by 2.0 g/bhp-hr (4.5 g/bhp-hr - 2.5 g/bhp-hr). Similarly, we would have estimated MC_{50} for HHD as COC_{50} divided by 3.5 g/bhp-hr (6.0 g/bhp-hr - 2.5 g/bhp-hr). The comparison of this approach with the approach that we are using is described in the Technical Support Document.

Cummins did not provide a rationale why the marginal cost of compliance (MC_{50}) should be identical to a total cost of compliance (COC_{50}), without regard to the magnitude of the emission reduction associated with a total cost. We believe that such an approach would be inappropriate. We also believe that the approach used in previous rulemakings is a simple approximation, and when information is available to more precisely determine the marginal cost of the last step in compliance, it is appropriate to use such information. It is also worth pointing out that if we used the approach from previous NCP rulemakings, the MC_{50} values would be significantly lower than the values being finalized and the values recommended by Cummins. This would have the opposite effect from the values recommended by Cummins.

With respect to the F factor, the 1985 rulemaking that established the first NCP regulations determined that the use of a constrained F factor to determine the value of X would generally result in properly shaped curves, and that the resulting NCPs would meet the requirements of the CAA.¹ Cummins commented that the constraint on the F factor would result in NCPs that are too low, but provided no information to show that the resulting NCP curves would not meet the requirements of the CAA. We continue to believe that the final NCP curves developed using an F value of 1.3 are sufficiently steep to remove the competitive disadvantage for the complying manufacturers and appropriately implement the requirements of the CAA.

Issue 1.2: Comparison to Rulemaking Costs

COMMENT: Caterpillar commented that we should set the NCP using the same cost estimates used in the standard-setting rulemaking. In their comments they compared those rulemaking costs to similar cost categories described in the draft Technical Support Document for this rulemaking. They stated that we did not justify our "departure from the cost estimates used in the 2004 Final Rule."

Cummins commented that the difference in the cost numbers "estimated in 1998 for the 2004 rule emissions standards" from the cost numbers estimated in 2002 for the NCP "reflects the engine manufacturers (and EPA's) better understanding of the actual cost of the technology based on the actual cost to develop and to capitalize their plants to manufacture the technology."

RESPONSE: The CAA directs EPA to set NCPs that remove the competitive disadvantage to the complying manufacturer. We believe that this is best implemented by using the latest and most accurate information that is available. As we have done in previous NCP rulemakings, we collected new cost information to not only determine average costs, but also 90th percentile costs. Also, rulemaking costs generally reflect longer term costs, rather than the manufacturing and operating costs associated with engine produced during the first model year of the standards. For these reasons, we are calculating the final NCPs in the same manner as was proposed.

We disagree with Caterpillar that we did not justify why the analysis in this NCP rulemaking differs from the analyses for the model year 2004 standard-setting rulemakings. These differences were discussed in detail in Chapter 3 of the Draft Technical Support Document for the proposal for this rulemaking. As described in that document, there are three main reasons for the differences. First, the goal of this analysis is to estimate manufacturer and operator costs during the first year of the new standards rather than to project the long-term costs. While we did make some attempt to project cost decreases with time, the only category in which we separately estimated short-term and long-term costs in the FRM was hardware cost category. The 2000 FRM analysis did not include an analysis of short-term fuel, warranty, or repair costs. Thus, Caterpillar's comparison of the various estimates of costs in the different categories is not valid. Second, the baselines for calculation of compliance costs differ significantly due to issues associated with the Consent Decrees. More specifically, the assumed baseline engine used in the previous analyses is very different than the upper limit engine that served as the baseline for heavy-heavy engines cost analysis. Finally, we now have more detailed information about costs identified in the earlier analysis, as well as cost

¹ The product of MC_{50} times F is the slope of the NCP curve for compliance values less than X. Larger values of F would result in steeper slopes and higher penalties for compliance levels near the standard.

categories not previously included. During the previous rulemakings, we requested cost comments from manufacturers, but received very little input regarding our cost estimates. However, we received a great deal of input from manufacturers for this rulemaking.

Issue 1.3: NCP Implementation Timing

COMMENT: EMA and Caterpillar commented that EPA must set NCPs in advance to allow manufacturers adequate lead time. EMA stated that EPA should establish NCPs in the rulemaking that establishes the emission standards. Caterpillar argued that NCPs "are not useful if they are not set with sufficient lead time to allow manufacturers to make rational marketing decisions."

Cummins commented that the timing of this rulemaking relative to the implementation date of the new standards is no later than past NCP rulemakings, and earlier than most of them. They also commented that even considering the timing relative to the consent decrees, this rulemaking was consistent with past NCP rulemakings. They stated that "as long as the NCP rule is finished before October 2002, NCP manufacturers will have adequate time to price their products."

RESPONSE: Historically, NCPs have never been established in the rulemaking that establishes the emission standards. Indeed, this is essentially impossible to do, given that such rulemakings often occur many years prior to the effective date of the new emission standards, at a point in time in which it is typically difficult, or even impossible, to clearly judge whether the necessary criteria are in place in order to establish NCPs. For example, in the 1999 review, we assessed the NCP eligibility criteria due to comments raised during the rulemaking process. We found at the time that two of the three necessary criteria could be met, but that a judgement regarding the third - the determination of the likelihood of a technological laggard - could not be made at a date so distant from the implementation of the standards (64 FR 58472, 58513, October 29, 1999).

These NCPs are being set with lead time relative to the implementation of the new standards that is comparable to or longer than lead time associated with past NCP rules (see table below). The NCPs in this rule are being established almost 18 months prior to the effective date of the new standards, a period of lead time that we believe is adequate and consistent with historical NCP rulemakings. Cummins' comments regarding appropriate lead time relative to the Consent Decrees is not relevant, as this rulemaking addresses the 2004 model year regulatory requirements.

Timing of Past NCP Rulemakings		
Model Years for Which NCPs Were Set	Date NCPs Were Established	Federal Register Citation
1987 and 1988	December 31, 1985	50 FR 53466
1991	November 5, 1990	55 FR 46622
1994	December 28, 1993	58 FR 68540
1996 and 1998	February 23, 1996	61 FR 6944

Issue 1.4: Evaluation of NCPs After Implementation

COMMENT: The NYDEC commented that the NCP upper limit should be continuously reevaluated and reduced as appropriate over time.

RESPONSE: As is discussed in **Issue 1.5** (below), the nature of the annual adjustment factor in the NCP formula greatly diminishes the practical application of NCPs for many years after initial applicability. Of course, one way to reduce the size of the NCP in the “out years” would be to move the compliance level closer to the standard. This would have same effect as reducing the upper limit. Thus whether the use of NCPs is partially inhibited by the increase in the NCP penalty rate over time, or those using NCPs tighten up their compliance levels to reduce the penalty per engine, the effect being sought by the commenter (i.e., lower emitting engines in use) will be achieved. Thus, EPA expects there will be no need to reduce the UL in a future rulemaking.

Issue 1.5: “Sunsetting” of NCPs

COMMENT: The SJVAPCD commented that, although they support the use of an annual adjustment factor, they recommend making the NCPs available for only a limited amount of time in order to provide an added incentive for manufacturers to produce complying engines in a timely manner. They do not suggest what an appropriate time period would be, however.

RESPONSE: This issue is broader than the scope of this NPRM, but it was in fact considered in the NPRM and FRM which established the generic NCP rule (see 50 FR 9204 and 50 FR 35374 and supporting material in public docket EN -85-02.) . The NCP equation which was developed in that rulemaking incorporates an annual adjustment using two factors. The first is a straightforward adjustment for inflation effects on the dollar value of the NCP relative to the initial year. The second factor in the NCP formula links the annual rate of NCP increase to the rate of NCP use, and increases the real inflation-adjusted penalty with time to the extent that the penalties are used. The equation for calculating time and usage effects is shown below and is described in detail in the regulations at 40 CFR 86-1113-87.

$$AAF_i = 1 + I_{i-1} + A_i \left[\frac{1}{1 - \text{frac}_{i-1}} \right]^i$$

where: AAF = annual adjustment factor

i = year under consideration since NCP availability

I = percentage increase in overall CPI for previous year relative year NCPs first offered for this rule

A = usage adjustment factor A = 0.10 for first year of adjustment and 0.08 thereafter

frac = fraction of engines using NCPs in this subclass for previous year

Referring to the NCP equation, these effects are cumulative since the NCP for any given year n is calculated using the running product of the AAF term (see 86.1113-87). These equations taken together show that:

- 1) No adjustments occur in the first year.
- 2) If NCPs are not used in the second or subsequent years the value of the NCP increases with the rate of inflation.
- 3) If NCPs are used the NCP for the subsequent year increases by a factor dependent on the fraction of engines in a given subclass using NCPs (see frac_{i-1} above).

4) Since NCPs should be most valuable when new standards are first being met, and less important in later years after the NCP is implemented, the rate of this adjustment increases with each year (i). This affect is moderated somewhat by the factor(A_i) which is set at 0.10 for the second year and 0.08 for subsequent years.

For example, if there were zero inflation and NCPs were used on 10 percent of the engines sold for 5 years, the penalty rate would increase as shown below:

Year of NCP Use	Penalty Rate Increase Over First Year
1	n/a
2	12.3%
3	24.6%
4	39.82%
5	58.7%

EPA believes that the construction of NCP penalty formula provides adequate means that will practically limit their use for a large number of years after initial applicability.

Issue 1.6: Additional Penalty Factors to Consider

COMMENT: Cummins commented that EPA should add "an additional amount in the range of several thousand dollars" to the cost of the NCP to address buyer perception issues. DDC commented that they share the concern that the cost-based NCP will not fully equalize the purchasing decision between compliant and non-compliant engines, and that EPA should ensure that all of the factors are considered and quantified. DDC also commented that EPA include in the penalty a cost associated with the environmental disbenefit.

Cummins argued that there is an "exaggerated fear of buying unproven technology" and that "simply setting NCPs equal to the actual costs to develop, manufacture and operate compliant technology may not provide adequate disincentives to purchase existing (higher emitting) technology engines." They suggested that one way of measuring the additional premium that should be added to the straight cost calculation of NCP would be to look at the margin lost to the lost-sale manufacturer, since "the choice to purchase existing (higher emitting) engines represents a lost sale to the engine manufacturer that was prepared to sell an environmentally-more-beneficial engine."

SJVAPCD strongly supported the view that the NCP should go beyond removing the competitive disadvantage from a complying manufacturer. They suggest that the cost of an NCP should "significantly exceed the competitive benefit gained by building a non-conforming engine."

RESPONSE: EPA sought comment on this issue and included a lengthy discussion on the matter in the NPRM. However, since we believed that the proposed NCPs would be sufficient to remove the competitive disadvantage for the complying manufacturers, no specific proposal was included for an additional factor. The comments that we received that supported the inclusion of an additional factor were conclusory and did not provide any information that would lead us to believe that

finalizing NCPs based only on the estimated costs of compliance would be insufficient to remove the competitive disadvantage for the complying manufacturer. Therefore, since the commenters provided factual basis to believe that effects of purchaser perception need to be accounted for separately, we still believe that no additional factor is necessary.

We also believe that developing an additional factor to address potential purchaser reluctance would be problematic. Incorporating Cummins idea of including profits from lost sales is one consideration, but since it does not directly reflect a cost of compliance, it would be difficult to implement. Evaluating this option would require price elasticity, price, and cost information not available to EPA at this time and even so still may not capture the relatively intangible nature of consumer behavior in this situation where decision may not be based solely on price. DDC's idea of incorporating a cost element related to the environmental disbenefit of higher emitting engines reflects a cost to society but not necessarily a cost to the purchaser.

With respect to the SJVAPCD comment, we believe that the existing NCP formulas that use "worst-case" costs as well as average costs will frequently result in there being some margin between the penalty and the economic gain that might otherwise be obtained from selling a non-conforming engine. That is why engine manufacturers have generally not used NCPs extensively in the past.

The points raised by the commenters present some interesting issues for future consideration. However, we believe the NCPs being finalized will appropriately implement the requirements of the CAA without adding an additional factor.

Issue 1.7: Interaction of NCPs with Consent Decrees

COMMENT: Cummins commented that the 1998 NCPs multiplied by a factor of 1.5 do not reflect the cost of compliance to achieve the 2004 standards. They stated that it is imperative that the Agency promulgate NCPs for 2004 that accurately reflect the cost of compliance to meet the 2004 standards.

Caterpillar commented that EPA's NPRM is not timely, given that EPA claim's this rule will impact the NCPs for Consent Decree companies in October, 2002. Caterpillar stated that EPA's proposal cannot apply to engines set to be introduced in seven months. Caterpillar commented that the NCP final rule must clearly state that the rule does not apply to Consent Decree engines.

Caterpillar commented that it was improper to consider the Consent Decrees in this rulemaking. They added that, assuming that it was proper to consider the Consent Decrees, then EPA should consider the requirements that will take effect in October of 2002. They stated that these upcoming requirements will require manufacturers comply with FTP and EURO III levels of 2.5 g/bhp-hr for NOx + NMHC.

RESPONSE: As was stated in the proposal, this rulemaking establishes NCP's for the 2004 model year NMHC+NOx emission standards for heavy-duty diesel engines. We agree with Cummins to the extent that they support NCPs that accurately reflect the actual costs of compliance with the 2004 standards. However, Cummins comments regarding the penalty provisions of the Consent Decrees are not relevant to this rulemaking. The analyses associated with this rule were performed, and decisions were made independently from the penalty provisions of the Consent Decrees.

Caterpillar's comment regarding the timing between this rulemaking and the Consent

Decrees are not relevant to this rulemaking. This rule establishes NCPs under the regulations for the model year 2004 NMHC+NO_x standard. Caterpillar's comments that these NCPs cannot apply to Consent Decree engines and that EPA should state this final rule does not apply to the Consent Decree engines are not relevant to this rulemaking. The only issue before the Agency and being decided in this rulemaking is the applicability of NCPs, under EPA regulations, for model year 2004 and later engines. Issues of Consent Decree interpretation or implementation are not before the Agency and are not relevant to this rulemaking.

Caterpillar's comment that EPA should consider the requirements that will take effect in October of 2002, instead of those already in effect is addressed in section 2.6.

SECTION 2: ISSUES REGARDING THE PROPOSED ANALYSIS

Issue 2.1: General Support for Analysis

We received general comments from CARB, Cummins and DDC supporting our analysis (or the rulemaking in general). We also received more specific comments on our analysis. These more specific comments are discussed below.

Issue 2.2: Warranty, Maintenance, and Repair

COMMENT: DDC provided detailed recommendations to modify our analysis of warranty, maintenance and repair costs. First, they commented that their historical information suggests that the per-mile post-warranty repair rate should be 35 percent less than the warranty repair rate, rather than 50 percent less, as we used in our draft analysis. They also commented that our post-warranty repair cost is too low because it does not include the engine manufacturers' markup for replacement parts. They argued that this markup will result in a cost (dollars per repair) to the operator for post-warranty repairs that is significantly higher than the cost to the engine manufacturer for warranty repairs.

With respect to demurrage costs, DDC agreed with our proposed approach of estimating the costs based on rental prices. However, they suggested that we drop the cost of insurance, since insurance for rental vehicles would likely be included in the owners normal insurance policy. They also commented that the total downtime for each repair would normally be 1.5 to 2 days when logistical factors such as vehicle pickup and delivery are included. Finally, they commented that EPA could alternatively estimate the demurrage cost as two days of lost revenue plus meals and lodging for the driver.

With respect to scheduled maintenance, DDC commented that a typical EGR engine should experience three more oil changes than a current engine, and will require EGR maintenance at rebuild.

In addition to these public comments on maintenance issues, we also received updated information from several manufacturers relating to maintenance. This information was also considered in our final analysis.

RESPONSE: Based on the public information provided by DDC and confidential information provided by other manufacturers, we continue to believe that the best estimate for the per-mile post-warranty repair rate is 50 percent less than the warranty repair rate. While DDC projects that per-mile repair rates will only drop by 35 percent after the warranty periods, at least one other manufacturer projects that per-mile repair rates will only drop more than 50 percent. Therefore, we are basing our final estimates of post-warranty repair rates on a 50-percent decrease. However, we do believe that our estimated cost per repair in the draft analysis for heavy-heavy duty engines (\$700 per repair) was slightly high. Based on updated information from manufacturers, we now believe that the repair cost for heavy-heavy duty engines is more likely to be \$500 per repair. As described in our analysis, using a lower cost per repair will have the effect of increasing the number of repairs. We agree with DDC that we should markup the cost of parts for post-warranty repairs.

We agree with DDC's comments that we should drop the insurance costs for our estimate of

demurrage costs. However, we do not agree that we should increase the time allotted for each repair. We still believe that most repairs will be completed within one day. While a few repairs may take more than one day, many others may be completed in less than one day, or even during other scheduled maintenance. Thus, our estimated demurrage costs are equal to the approximate cost of renting a vehicle for a single day. We continue to believe that a rental based cost estimate is more reliable than a lost revenue estimate, which would be highly dependent on the type of freight being hauled.

We have included all of the updated information regarding scheduled maintenance into our final costs estimates.

Issue 2.3: Fixed Costs

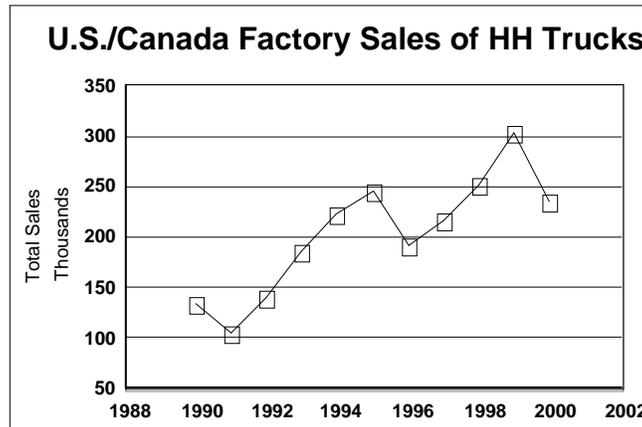
COMMENT: DDC provided detailed recommendations to modify our analysis of fixed costs. They believe that our proposed estimates of fixed costs were amortized over too many engines. First, they stated that manufacturers will attempt to recover the fixed costs associated with the 2004 standards before the new 2007 standards begin to be phased-in. They stated that "it is not correct to assume that the planned EGR system for 2004 will in fact be useable in 2007 and beyond." They argued that manufacturers will take advantage of the averaging provisions for model years 2007-2009 to produce a single technology product rather than produce both very low NOx engines and the 2004-era engines. They suggested that we use a three-year amortization period instead of the proposed five-year period.

DDC also commented that we should base our cost analysis on modeled market volume rather than current sales volumes. They argued that the compliance costs associated with the 2004 standards will affect the market and must be accounted for.

RESPONSE: We continue to believe that a five-year amortization period is appropriate for this analysis. In our recent final rule setting new emission standards for 2007 and later heavy duty diesel engines, we projected that manufacturers would rely on their 2004 technologies to help achieve the more stringent 2007 standards. While it is theoretically possible, as DDC suggested, that a manufacturer could comply on average with the 2007 phase-in requirements using a fully optimized NOx adsorber on an engine without EGR, we do not believe that is likely to be feasible when the standards are fully phased-in. Thus, we fully expect that manufacturers will be using their 2004 technologies in 2010. Given this, we believe that a five-year amortization period is appropriate for this analysis.

With respect to the annual sales volumes, we believe that the 2000 sales volumes represent a good estimate of what sales will be in 2004. There are reasons to believe that sales in 2004 may be higher, but there are also reasons to believe that sales in 2004 may be lower. As shown in figure 2.3-1, since 1990, there has been a long-term trend of increasing annual sales volumes. However, much of this increase was the result of the high economic growth rates observed in the 1990s. At this point, we cannot necessarily project that growth rates between now and 2004 will be that high. Moreover, some manufacturers have expressed concerns that purchaser perceptions may slow sales as the new technology is introduced into the market.

Figure 2.3-1



Issue 2.4: Other Costs

COMMENT: Several manufacturers provided updated cost data in their CBI comments. DDC also commented in support of the use of a multi-year fuel cost for heavy-heavy duty engines, given their expected lifetimes.

RESPONSE: We incorporated the updated manufacturer information into our analysis. In general, this updated information did not substantially change our analysis. The specific cases where we received updated information are identified in Chapter 3 of the Technical Support Document.

We agree with DDC that a multi-year average fuel price is appropriate for this analysis. Therefore, we are using a five-year average fuel price in the final analysis. We believe that a five-year average best approximates how purchasers will make purchase decisions, considering the economic significance of changes in fuel consumption rates. This issue is discussed in more detail in Chapter 3 of the Technical Support Document.

Issue 2.5: Statistical Methodology

COMMENT: Caterpillar commented that we incorrectly combined average costs for each category. They implied that our method only worked if the costs occur in "fixed proportions", and argued that we should have summed total costs for each manufacturer and then sales-weighted these total costs, rather than summing the sales-weighted cost in each cost category. Cummins supported our use of the sales-weighted mean of the costs for COC₅₀ instead of using median costs.

RESPONSE: It is not possible to estimate average costs in the manner suggested by Caterpillar because not all manufacturers provided cost data for each subcategory. Some of these manufacturers acknowledged that, while they were not able to estimate the cost for a category such as oil changes, they did believe that there would be some additional cost. More importantly, Caterpillar is incorrect in claiming that the two methods would produce different results. It is mathematically equivalent to sales-weight total costs for engine and to sum sales-weighted averages of subcategories of costs. This is true without regard to whether the costs occur in "fixed

proportions." An example of this is shown in the following table. Both methods result in an estimated average cost of \$982.53.

	Sales	Cost Category 1	Cost Category 2	Cost Category 3	Total
Manufacturer 1	1000	\$100	\$400	\$500	\$1000
Manufacturer 2	2000	\$150	\$300	\$500	\$950
Manufacturer 3	1500	\$200	\$300	\$800	\$1300
	Sales Weighted Avg.	\$136.50	\$331.75	\$514.28	\$982.53

Issue 2.6: Determination of Upper Limit

COMMENT: DDC and Cummins supported our proposed upper limits. Caterpillar commented that EPA should not base the NCPs for heavy-heavy duty engines on an upper limit of 6.0 g/bhp-hr. NYDEC also opposed the 6.0 g/bhp-hr upper limit for heavy-heavy duty engines, because of their concerns about "excess emissions in the field". They supported setting the upper limit at 5.3 g/bhp-hr. We did not receive comments opposing the upper limits for the other service classes.

Caterpillar stated that it was improper for EPA to consider the Consent Decrees in setting the upper limits. Caterpillar stated that EPA cited no technical analysis which justifies the use of a 6.0 g/bhp-hr NMHC+NOx Upper Limit. They also argued that the UL should be based on the capabilities of the technological laggards in 2004. They argued that this approach effectively counts the combined costs of complying with the 1998 NOx standard and the 2004 NMHC+NOx standard. Caterpillar states there is "no statutory or regulatory justification for an approach that utilizes the costs of bringing an engine that does not comply with the present emission standards into compliance with the next emission standards." Caterpillar also argues an Upper Limit of 6.0 g/bhp-hr is not appropriate because it counts the costs of "eliminating purported defeat devices even though the defeat device prohibition is not new." They further argued that the compliance costs of the Consent Decrees were "intended as punishment" and should not be considered to be costs of compliance with the 2004 emission standards.

Caterpillar stated that basing the upper limit on Consent Decree engines would put non-Consent Decree companies and new entrants to the market place at a disadvantage. They also argued that it will create a disincentive to investment in emission reduction because it would allow "a manufacturer to stay in the market where that manufacturer's engines would not have complied with the previous emission standard or UL (not just the current emission standard and UL)." Caterpillar stated that even if the Consent Decree emission levels were relevant to this rulemaking, EPA selected the wrong levels. Caterpillar stated that the Consent Decrees specify the 2004 FTP standards must be met by October 1, 2002, as well as a Euro-3 emission limit equal to the 2004 FTP standards, all of which must be met without the use of defeat devices.

Caterpillar stated that EPA attempted to justify an UL of 6.0 because the Agency did not collect cost data for HHDE's other than from a 6.0 g/bhp-hr NMHC+NOx baseline, but Caterpillar suggests that a "flaw" in EPA's approach "is not a basis for arbitrarily choosing a 6.0 g/bhp-hr UL".

Finally, Caterpillar stated that EPA improperly used non-existent off-cycle emissions requirements to set a UL. Caterpillar states that the NPRM implicitly concludes that a compliant engine would comply with Euro-III emission level, but such emission requirements do not apply until 2007, and therefore EPA has included costs of compliance for 2004 which are really costs of compliance for 2007.

RESPONSE: We have decided to promulgate, as proposed, Upper Limit values of 4.5/bhp-hr NMHC+NOx for light-heavy, medium-heavy, and urban bus engines, and an Upper Limit value of 6.0 g/bhp-hr NMHC+NOx for heavy-heavy duty diesel engines. These upper limit values will generally allow technologically lagging manufacturers to continue producing their current products until they can complete the development of their new engine models.

We understand the concerns raised by the NYDEC regarding the potential for in-use emissions that are above the standard. However, NCPs by their very nature allow production of engines which do not meet the otherwise applicable emission standards. We do not agree with NYDEC that the emissions allowed by this UL would be "excess emissions" in the sense of emissions attributable to defeat devices. This action does not weaken in any way the existing prohibition of defeat devices. A manufacturer whose engine has high emissions on, for example, the EURO III would need to certify to a comparable FTP level. Thus, the manufacturer would be required to pay an appropriate penalty that is consistent with the engines actual performance. The issue is whether the emissions that would be allowed to occur by the establishment of an UL for heavy-heavy duty engine of 6.0 g/bhp-hr is allowed and appropriate under the CAA. We believe that the CAA allows us to set an upper limit that allows continued production of current engines, and thus allows us to set the UL at 6.0 g/bhp-hr. Moreover, we believe that the penalties that would apply for compliance levels between 4.5 g/bhp-hr and 6.0 g/bhp-hr are large enough to provide a strong disincentive to produce engines that have emissions any higher than technologically necessary.

We disagree with Caterpillar's general comments that it was improper for EPA to consider the Consent Decrees in setting the upper limit. As discussed in the preamble to the proposal and for this final rule, the selection of an UL of 6.0 g/bhp-hr reasonably should allow existing HHDDE's in the marketplace which are manufactured by technological laggards to continue to be sold while the manufacturer works on the technologies necessary to bring such engines into compliance with the model year 2004 standards, without also requiring a concurrent design change to produce engines to a UL below the existing levels. The consent decrees have created a unique situation under which engines which would not otherwise be certified by EPA are currently allowed to be manufactured and sold. The vast majority of new HHDDEs do not comply with the existing emission requirements, and emit at NOx levels well in excess of the current emission standard. The selection of an UL of 6.0g/bhp-hr reflects that reality, in order to meet the goal described above. Caterpillar's comments suggest that EPA should ignore the existence of the consent decrees in considering the establishment of the Upper Limit. We disagree with this comment. Ignoring the Consent Decree would likely lead to setting an UL of 4.5 g/bhp-hr as with the other service classes. This would interfere with meeting the goal noted above, and be inconsistent with the other reasons noted below.

Caterpillar states that EPA cited no technical data nor any statements from engine manufacturers that suggests a technical laggard could not comply with an UL of 4.5g/bhp-hr NMHC+NOx for HHDDEs. We disagree with the assumption inherent in this statement. Caterpillar's statement implies that EPA must perform a technical analysis which demonstrates that the level below the emission performance of existing engines could be achieved by technological laggards. Neither the CAA nor EPA's regulations require that EPA demonstrate that the Upper Limit

value is the lowest emission level achievable by the technological laggards in the given time frame. CAA Section 206(g)(2) requires that no certificates of conformity will be granted “ *if the degree by which the manufacturer fails to meet any standard promulgated under section 202(a) with respect to such class or category exceeds the percentage determined under regulations promulgated by the Administrator to be practicable.*” The statute requires that the Upper Limit value be the value “ *determined ... to be practicable*”. In past rulemakings EPA has interpreted its obligation to determine a “practicable” emission level to not require that the most stringent level achievable by technological laggards. For example, our regulations call for the UL to be set at the prior emission standard (where one is applicable), and do not call for EPA to determine whether the prior emission standard is the lowest level achievable by the technological laggards. That regulatory provision was based on setting the UL at the level of existing control, to ensure all heavy duty engines could meet it, to avoid the need for a separate design phase, and because of concerns over the ability to readily determine a level below the prior standard that would be practicable for all manufacturers. See 50 FR 35376-35377 (August 30, 1985) and 67 FR 2164-2165 (January 16, 2002).

With respect to the likelihood of technological laggards developing, we have placed into the docket for this rulemaking information from two heavy-heavy duty diesel engine manufacturers which leads EPA to conclude there is likely to be at least one technological laggard in model year 2004.² As specified in EPA’s existing regulations, one of the criteria for establishing an NCP is EPA must find “that there is likely to be a technological laggard” (see 40 CFR 86.1103-87(a)(2)).

In addition, EPA did provide data at the time of the proposal which indicates an Upper Limit of 6.0 g/bhp-hr NMHC+NOx would likely be achievable by all manufacturers in model year 2004. We included a memorandum to the docket for this rule which summarizes the certification data from model year 2001 heavy-duty diesel engines, and this memorandum was discussed in the proposal (See 67 FR 2165). This data shows that for the heavy-heavy service class, all engine families for Model Year 2001 had Euro-3 emission performance at or below 6.0 g/bhp-hr NMHC+NOx.³ This data shows there are a number of engine families with emission levels greater than 4.5 g/bhp-hr NMHC+NOx. If EPA were to establish an Upper Limit of 4.5 g/bhp-hr NMHC+NOx, or even 5.3 g/bhp-hr NMHC+NOx (a level for which we also requested comment), many of these engine families would not meet this value and would require additional development and perhaps the application of new technologies. It is reasonable to establish the UL so as to avoid requiring such a separate design cycle.

Caterpillar suggested that EPA’s selection of a 6.0g/bhp-hr UL effectively combines the costs of complying with the 1998 NOx standard and the 2004 NMHC+NOx standard, and that this implicitly combines the costs of removing alleged defeat devices. Caterpillar states there is “no

² See April 5, 2002 press release from Detroit Diesel Corp. in which they state “As previously announced, DDC will initially make approximately 95% of its current ratings available in October 2002.” EPA believes it reasonable to project this company may need NCPs for model year 2004 in order to offer a full product range. See also EPA Memorandum “Summary of Meeting between US EPA and Cummins Inc. on April 17, 2002 regarding 2004 On-highway Heavy-duty Diesel Engine Nonconformance Penalty Rule”, in which this company suggests some part of their product line of heavy-heavy engines may not be ready by model year 2004. A copy of both of these documents is available in the docket for this rule.

³ EPA Memorandum “Summary of Model Year 2001 Heavy-duty Diesel Engine HC and NOx Certification Data”, copy available in the docket for this rulemaking.

statutory or regulatory justification for an approach that utilizes the costs of bringing an engine that does not comply with the present emission standards into compliance with the next emission standards.” They also argued that our costs included the compliance costs of the Consent Decrees. We disagree with Caterpillar’s comments. We did not combine the costs of separately complying with the 1998 and 2004 standards, nor did we calculate Consent Decree costs. Rather, we have estimated the cost of compliance for model year 2004 relative to the UL of 6.0 g/bhp-hr. We recognize that our estimate of these compliance costs will be similar to the costs of separately complying with the 1998 and 2004 standards. However, the purpose of our calculation is separate and distinct - to assess as accurately as possible the cost of compliance for model year 2004 compared to an engine at the UL. EPA believes setting an UL at 6.0 g/bhp-hr is most appropriate for the reasons noted above and in the preamble. An UL of 6.0 g/bhp-hr best implements the policies behind an UL. EPA believes it is more appropriate to address issues of enforcement of past noncompliance with the defeat device prohibition through an enforcement mechanism. In selecting an UL in this NCP rulemaking, we intend to do no more than pick a level that best implements the policy behind setting an UL, as expressed in prior NCP rulemaking.

We disagree with Caterpillar’s comments that what EPA has done in this rule is not justified under the statute or EPA’s regulations. To the contrary, CAA Section 206(g)(2) directs EPA to establish an Upper Limit through a rulemaking which is “*determined ... to be practicable*”. The statute provides a large degree of discretion to EPA in determining a practicable UL. Nothing in the statute prohibit EPA from selecting the UL values promulgated in this final rule. As noted earlier, we believe that the UL values being established are appropriate under this provision of the CAA.

Caterpillar also argues an Upper Limit of 6.0 g/bhp-hr is not appropriate because it counts the costs of "eliminating purported defeat devices even though the defeat device prohibition is not new." EPA agrees that the defeat device prohibition is not new. However, this does not negate the reality that model year 2001 engines currently being produced by HHDDE manufacturers have high off-cycle emissions, and these same engines are the engines which are the basis for the UL of 6.0g/bhp-hr for the reasons noted above. The 2004 model year standards, including the defeat device prohibition, are clearly a new more stringent standard. This is true whether compared to the 1998 standard with the defeat device prohibition, or to the Consent Decree limits. The existence of such a new standard meets one of the regulatory criteria that must be met before NCPs are allowed. However, this new standard does not dictate the level of the UL, which is chosen for other reasons

We disagree with Caterpillar’s comments that a 6.0 g/bhp-hr UL would disadvantage non-Consent Decree companies and new entrants to the market place. In fact, an Upper Limit set at 6.0 provides non-Consent Decree companies and new entrants to the market the option of producing engines that emit up to 6.0 g/bhp-hr NOx rather than 4.5 g/bhp-hr, provided that they pay the appropriate penalties. . Therefore, a non-Consent Decree company or new entrant to the market who is a technological laggard and whose engines currently emits in the 4.5-6.0 range will benefit by the selection of a 6.0 Upper Limit, since the UL at 6.0 would allow the company to continue to sell today’s product while they invest the resources to comply with the new standard. Implicit in Caterpillar’s comments is the assumption that the NCPs are higher because of the choice of 6.0 g/bhp-hr for the UL. However, for values below 3.4 g/bhp-hr (the X value for HHDE), the penalties are defined by the marginal cost parameters F and MC_{50} . Since F and MC_{50} are independent of the UL, the penalties would be identical in this range for any UL value considered. As described below, we did not estimate the cost of compliance for an UL of 4.5 g/bhp-hr. However, depending on what techniques the manufacturers would otherwise have used to meet a 4.5 g/bhp-hr level, it is also not clear that the penalties between 3.4 g/bhp-hr and 4.5 g/bhp-hr would have been significantly lower if the UL had been set at 4.5 g/bhp-hr and, in fact, there are technical scenarios in which it could have

been higher. However, Caterpillar has provided no data which suggests that non-Consent Decree companies or new entrants intend to employ NCPs instead of complying with the standards. In fact, we received no comments from non-Consent Decree companies or new entrants which would indicate they are concerned that an UL of 6.0 puts them at a disadvantage. At least one such company who competes in the heavy-heavy service class, DaimlerChrysler (manufacturer of Mercedes-Benz), was directly notified by EPA of the publication of the proposal, and we received no comments from this company.⁴ In addition, the statute requires the EPA establish NCPs which “shall remove any competitive disadvantage to manufacturers whose engines or vehicles achieve the required degree of emission reduction” (see CAA Section 206(g)(3)(E)). The statute requires we remove any disadvantage which the *complying* manufacturer may encounter. While we do not believe that NCPs place any non-Consent Decree company or new entrant at a competitive disadvantage, the statute does not require that we establish an NCP which removes any disadvantage to the non-complying manufacturer. As articulated in the preamble for this final rule and in previous NCP rules (see for example 50 FR 35374), NCPs provide an alternative to a manufacturer who is already in the market so that a manufacturer need not exit the market if they are unable to comply with a new emission standard. New entrants to the market are by definition not already in the market, and NCPs have not previously been promulgated to provide a mechanism by which an engine or vehicle manufacturer could gain entry to the U.S. market by selling non-complying products.

We disagree with Caterpillar’s comment that a 6.0 UL for HHDDE’s create’s a disincentive to invest in emission reductions. First, NCP’s are specifically designed to encourage compliance with the applicable emission standard, in particular for engines near the upper limit value. The per engine penalty can be much greater than the average cost of compliance, and for engines at the UL, the per engine penalty is intended to represent the 90th percentile costs. Nevertheless, even if the UL of 6.0 g/bhp-hr resulted in lower penalties than a 4.5 g/bhp-hr value, there would still be significant incentive to reduce emissions. Selling products in a competitive market where your costs (including penalties) are at the high end of the range provides a strong incentive to apply technologies to reduce the penalty being paid, and thus lower emissions.

We disagree with Caterpillar’s comments that EPA selected the wrong emission level from the Consent Decrees. Caterpillar’s comments suggest that EPA should set the Upper Limit for the heavy-heavy engines at the October 1, 2002 limits set in the Consent Decrees. However, the October 1, 2002 levels from the Consent Decrees are the 2004 model year emission standards (2.5 g/bhp-hr NMHC+NOx). Setting the UL for the 2004 standards at 2.5 g/bhp-hr NMHC+NOx would be inconsistent with the intent of §206(g) of the CAA. With the UL equal to the standard, there would be no way for a manufacturer to employ the NCP. Such an approach would be inconsistent with the policy behind setting an UL at a prior, higher level, to provide time for technological laggards to come into compliance.

We disagree with Caterpillar’s comments that EPA’s selection of the UL was arbitrary because of limitations in the data collected. While it is true that for the HHDDE’s, all of the confidential cost data we received included the cost of compliance for model year 2001 engines to comply with the 2004 FTP standards, and all of the MY2001 engines were in fact operating at emission levels on the order of 6.0 g/bhp-hr NOx+NMHC, that is not the primary reason why EPA

⁴ See E-mail message from William Charmley, US EPA to “Interested Parties”, including Mr. Jim Chen (jcchen@hhlaw.com), attorney for Mercedes Benz. Copy available in the docket for this rule.

selected an UL of 6.0. As discussed in the proposal, we considered and requested comment on alternative UL values of 4.5 g/bhp-hr and 5.3 g/bhp-hr NMHC+NO_x (see 67 FR 2165). The primary reason for the selection of an UL value of 6.0 is this value will allow technological laggards to continue to produce existing engines (through the payment of a penalty), and allow such laggards to focus their research and development efforts on complying with the 2004 emission standards. We have concluded that this UL value is most consistent with the objective of the CAA's NCP provision, as well as our previous NCP rulemakings. The reality of the existing market-place is that the vast majority of HHDDE's are emitting at emission levels on the order of 6.0 g/bhp-hr NMHC+NO_x. Since the role of an NCP is to address the problems associated with a transition from a prior emission requirement to a new more stringent requirement, it is appropriate to consider the effects of the *de facto* HHDDE emission limits established by the Consent Decrees in establishing the UL for the 2004 model year NMHC+NO_x standard. The existence of the Consent Decrees October 1, 2002 emission requirements does not remove the technical issues laggards face, and we have in fact received information which leads us to conclude a technological laggard is likely to exist for the model year 2004 heavy-heavy service class, and such engines are currently operating at emission levels on the order of 6.0 g/bhp-hr NMHC+NO_x.

It is correct that we were not able to collect from engine manufacturers true cost data for a complying heavy-heavy engine which operates at a 4.5 g/bhp-hr level to comply with the 2.5 g/bhp-hr standard. All of the companies who provided data to us currently make products which emit at off-cycle emission rates on the order of 6.0 g/bhp-hr. Those companies do not know what the costs of compliance to go from a level of 4.5 to 2.5 would be, since they do not make such products. EPA did request cost data from heavy-heavy companies who do make engines without high-off cycle emissions, but those companies declined to provide EPA with cost estimates. However, even if we had accurate estimates of the compliance costs associated with an UL of 4.5 for heavy-heavy duty engines, an UL of 6.0 would still be more appropriate, for the reasons noted above.

We disagree with Caterpillar's comments that we have improperly included costs of compliance with model year 2007 supplemental emission standards in establishing NCPs for the model year 2004 standards. In 2004, engine manufacturers must comply with the FTP emission standards, as well as the prohibition of defeat devices. In 2007, manufacturers must comply with the FTP emission standards, which will include supplemental standards referred to as the supplemental steady state standard and the not-to-exceed standard, as well as the prohibition of defeat devices (See 40 CFR 86.004-11 and 40 CFR 86.007-11). Caterpillar states that the proposal "implicitly concludes" that engines must comply with the 2007 supplemental standards in 2004. There is nothing in the record which supports this statement. In fact, this NCP is based on compliance with the 2004 standards and the defeat device prohibition, not the 2007 standards. In our request for cost data from engine manufacturers, EPA was clear that we were requesting cost information for engines which companies are designing to comply with the 2004 standards. Our request for information contained the following statements (See EPA Memorandum "Collection of Compliance Cost Estimates for the Purpose of Establishing NCPs for the 2004 Heavy-Duty Diesel NMHC+NO_x Emission Standard", copy available in the docket for this rule, docket item II-B-02):

- ".. we are collecting information in preparation for a notice of proposed rulemaking regarding the establishment of non-conformance penalties (NCPs) for the model year 2004 heavy-duty diesel engine NMHC+NO_x standards."
- ".. we would like to gather company specific cost information regarding your cost of compliance with the 2004 standards."

- “For the 2004 compliant engines, this should include a description of the technological and calibration changes necessary to meet the emission standards.”
- “The 2004 engine fixed costs should only include those costs attributable to meeting the 2004 emission standards.”

There is no evidence which supports Caterpillar’s comments on this issue. We did not modify the manufacturer costs (which were requested for compliance with the model year 2004 standards) in anyway to reflect compliance with the 2007 standards. We expect that manufacturers would include in their estimates for MY 2004 compliant engines that such engines would not include defeat devices, since an engine equipped with a defeat device would not comply with the 2004 requirements. Manufacturers at their option may have considered EPA’s recent guidance regarding defeat devices (such as Advisory Circular 24-3) . Any such consideration would not be inconsistent with our request that manufacturers cost estimates should be based on compliance with the model year 2004 standards, as this guidance discusses defeat device prohibition. The technological approaches to comply with the defeat device prohibition in model year 2004 would in any case be similar to those used to comply with the model year 2007 supplemental standards for 2.5 g/bhp-hr NOx+NMHC engines. This overlap in technology, however, does not invalidate the information received from manufacturers concerning the model year 2004 standards. No adjustment was made to the manufacturer data, nor was any adjustment necessary to address this overlap. Therefore, we continue to believe that it is appropriate to rely on this manufacturer information.

Issue 2.7: Sources of Data

COMMENT: Caterpillar commented that EPA based the proposed NCP on incomplete information. They stated that EPA’s request for cost data from a number of engine manufacturers prior to the proposal did not address all of the relevant issues. Specifically, Caterpillar commented that EPA’s request for information did not define critical terms like the term Upper Limit, and did not ask the manufacturers to state the assumptions they used as to the regulatory status of the baseline engine. Thus, they argue that the data collected would not be comparable. They also comment that it is unclear whether the data collected by EPA reflects the costs of compliance with accelerated 2004 emission standards. Caterpillar also commented that EPA’s request for cost data prior to the proposal did not include all of the information EPA needed to complete the rule. Specifically, Caterpillar points to EPA’s statement in the proposal regarding the proposed Upper Limit value of 6.0 g/bhp-hr NMHC+NOx for the heavy-heavy service class for which EPA noted it “does not believe it could readily develop the cost figures for such a development phase.”

RESPONSE: We disagree with Caterpillar’s comments that EPA’s request for cost data prior to the proposal did not address all of the relevant issues. First, it was not necessary for the collection of the cost data prior to the proposal to define the term Upper Limit, or to inform manufacturers at that time what Upper Limit values EPA was considering for the proposal, since EPA was not requesting comments at that time, but rather we were requesting data. EPA’s data request did specify both the “baseline” engine and the “control” engine, for the purposes of estimating the costs of compliance. As documented in an EPA memorandum to the docket, EPA’s request for cost data clearly stated that the baseline engine was “a model year 2002 engine”, and the control engine was a “2004

compliant engine”.⁵ Before the proposal, we discussed with each manufacturer their submissions to confirm that we properly understood them. This included discussions of the baseline engines. We did, in fact, receive cost information from some manufacturers in response to our request for a control engine that we determined were costs of compliance with the consent decree’s October 1, 2002 requirements. We rejected and did not use these data in our analysis, and in every case we requested and received from the engine manufacturer costs of compliance for the model year 2004 standards.

We disagree with Caterpillar's assertions that our data request prior to the proposal did not request all of the data EPA needed for our proposal, and that our request was flawed. EPA's data request prior to the proposal was not intended to request comment on all aspects an NCP rule. That is the purpose of the public notice and comment process. Caterpillar's specific comment is in reference to EPA's statement in the proposal that “EPA does not believe it could readily develop the cost figures for such a development phase” (67 FR 2165). This statement was regarding the costs of a development phase from an UL level of 6.0 g/bhp-hr NMHC+NOx to an UL level of 4.5 g/bhp-hr NMHC+NOx for the heavy-heavy service class. This statement does not reflect a flaw in the data EPA requested from engine manufacturers. Our request for data from manufacturers was not for them to speculate on costs for a development program which they did not undertake. Rather, our request from manufactures was for them to provide us with data that reflected the actual development programs they were performing (i.e., making a model year 2001 engine comply with the 2004 emission standards). For most heavy-heavy service class engine manufacturers, they have not needed to undertake the development of a HDDDE which complies with an emission level of 4.5 starting with an engine that complied with an emission level of approximately 6.0. That is, the HDDDE manufacturers who are subject to the Consent Decrees manufacturer products which have high off-cycle emissions, and these products are not required to comply with EPA's existing regulations (i.e., the 1998 requirements). Most CD manufacturers will go directly from today's product to a product which complies with the 2004 standard, by-passing engines which comply with the 1998 regulations.

Again, EPA's request prior to the proposal was for the cost estimate for the development programs that the manufacturer was actually undertaking keyed to costs for the 2004 model year, not for a theoretical development program, or a prior model year. In addition, EPA took comment on all of these issues, and received no additional or different data other than the data discussed above and in the Technical Support Document. We also received no indications that manufacturers misinterpreted our request for data.

Issue 2.8: Discount Rate

COMMENT: Two of the manufacturers commented that EPA should finalize the NCPs based on a seven percent discount rate. One of the manufacturers commented that EPA should use a three percent discount rate. Caterpillar cited a study by Ibbotson Associates to support using a real discount rate of seven percent or higher. DDC stated that they use seven percent for their internal analyses. Cummins cited EPA's Science Advisory Board and current interest rates for U.S. Treasury Bills as support for using a three percent discount rate. Seneca Economics and

⁵ See EPA Memorandum “Collection of Compliance Cost Estimates for the Purpose of Establishing NCPs for the 2004 Heavy-Duty Diesel NMHC+NOx Emission Standard.”, copy available in the docket for this rule, Docket Item II-B-02.

Environment (SEE) submitted comments critical of EPA's use of a seven percent rate for both compounding and discounting and suggested that EPA should use different rates for past and future cash flows relative to the base year.

RESPONSE: The purpose of a discount rate in the context of an NCP analysis is to reflect the impact of manufacturer and user business decision making criteria with regard to meeting the CAA principle that NCPs remove the competitive disadvantage for the complying manufacturer. The rates used in the NCP should reflect the time value of money used by manufacturers and users in business decisions and transactions. EPA has historically used a seven percent rate in rulemakings in a societal costs context. The commenters supported the seven percent value as well as values above and below it. Unfortunately, no user such as truck or bus fleet or owner commented on this issue. The comments from SEE on the basic principles which should be followed in establishing compounding and discount rates address the basic reason why EPA raised the issue in the NPRM. That reason was that we anticipated that manufacturer costs and user costs may need to be handled differently. However, SEE provided no data to assist in the analysis. The manufacturers generally supported EPA's value, but it is in fact higher than the after-tax Treasury bill rate suggested by SEE and is perhaps more in line with the time value of money/market risk premium for future costs suggested by SEE.

For purposes of this rule, EPA is using of a seven percent rate. Based on present information, it appears to be adequately representative of industry practice. However, EPA will likely continue to include in future analyses sensitivity on other rates and to examine whether the rates for future rules should be assessed in a manner similar to that suggested by SEE.

To put this issue into context, the effect of using different discount rates is shown in the tables below. If a smaller discount rate had been used for both pre-production and operating costs, the NPV of the *fixed* costs would have been lower, but the NPV of the *operating* costs would have been higher. The net effect of a smaller discount rate would generally be penalties that are higher. While there are differences, the differences are not large.

NCP Calculation Parameters with 7% Discount Rate

	Light-Heavy	Medium-Heavy	Heavy-Heavy	Urban Bus
COC₅₀	\$1,240	\$2,740	\$6,810	\$3,930
COC₉₀	\$2,710	\$4,930	\$12,210	\$6,660
MC₅₀	\$2,000 per g/bhp-hr	\$1,400 per g/bhp-hr	\$5,600 per g/bhp-hr	\$3,800 per g/bhp-hr
F	1.3	1.3	1.3	1.3
UL	4.5	4.5	6.0	4.5
X	3.0	4.0	3.4	3.3

NCP Calculation Parameters with 3% Discount Rate

Parameter	Light Heavy-Duty Diesel Engines	Medium Heavy-Duty Diesel Engines	Heavy Heavy-Duty Diesel Engines	Urban Bus Engines
COC₅₀	\$1,200	\$2,830	\$7,290	\$4,090
COC₉₀	\$2,770	\$5,340	\$13,720	\$7,230
MC₅₀	\$2,000 per g/bhp-hr	\$1,630 per g/bhp-hr	\$6,510 per g/bhp-hr	\$4,420 per g/bhp-hr
F	1.3	1.3	1.3	1.3
UL	4.5	4.5	6.0	4.5

Issue 2.9: Estimated Market Share

COMMENT: Caterpillar stated that we should use the market share from the 2001 Ward's Communication, Factory Sales to sales-weight our costs. Caterpillar provided this market share data for 1999 and 2001 in their written comments.

RESPONSE: We agree that we should use the most recent sales data, and have updated our analysis. Since the proposal we have received several estimates of sales for 2001, and have updated the sales figures in final analysis for each service class for which we received new data.⁶

⁶ "Data Received from Heavy Duty Diesel Engine Companies regarding 2001 Medium-Heavy and Heavy-Heavy Diesel Engine Sales", William Charmley, EPA Memorandum, copy available in the docket for this rulemaking.

SECTION 3: ADDITIONAL RELEVANT ISSUES

Issue 3.1: Canadian Sales

COMMENT: Volvo and DDC commented that EPA should address the potential for operators to circumvent U.S. requirements by purchasing their vehicles in Canada. DDC also recommended that EPA "clarify the meaning of 40CFR86.1113-87(g)(1)(i) which, in relevant part, states that non-conformance penalties must be paid "for all nonconforming engines or vehicles produced by a manufacturer.... and distributed into commerce". They stated that it is unclear whether the phrase "distributed into commerce" is intended to mean only U.S. directed production or whether it includes other engines that receive the NCP certification label, such as products delivered to Canada and Mexico.

RESPONSE: The EPA Administrator issues a certificate of conformity for those vehicles or engines determined to be in compliance with the Act and its implementing regulations. For those engines covered by certificate of conformity, 40 CFR §86.095-35 (a) states:

The manufacturer of any motor vehicle (or motor vehicle engine) subject to the applicable emission standards (and family emission limits, as appropriate) of this subpart , shall, at the time of manufacture, affix a permanent legible label, of the type and in the manner described below, containing the information hereinafter provided, to all production models of such vehicles (or engines) available for sale to the public and covered by a Certificate of Conformity under §86.091-30(a).

The emissions label identifies the engine and provides additional specific information relative to emission levels, date of manufacturer, model year, engine family, power, etc., and includes a prominent statement that the engine conforms to U.S. EPA regulations for the applicable model year.

Nonconformance penalties allow a manufacturer to introduce into commerce heavy-duty engines(HDE) or heavy-duty vehicles (HDV), including light-duty trucks(LDT), which fail to conform with applicable emission standards upon payment of a penalty. Accordingly, there are additional regulatory requirements that apply to these engines and vehicles. Specific labeling requirements at 40 CFR §86.095-35 (h) (1) state:

Light-duty trucks and heavy-duty vehicles and engines for which nonconformance penalties are to be paid in accordance with § 86.1113-87(b) shall have the following information printed on the label required in paragraph (a) of this section, ..."The manufacturer of this engine/vehicle will pay a nonconformance penalty to be allowed to introduce it into commerce at an emission level higher than the applicable emission standard. The compliance level (or new emission standard) for this engine /vehicle is XXX."

When labeling an engine as specified in 40 CFR §86.095-35(a) and (h), a manufacturer clearly states that the engine conforms to U.S. EPA regulations and that the nonconformance penalty will be paid for any engine on which the NCP label is applied. Labeling an engine as such without payment of the penalty would be inappropriate and would misrepresent the status of that vehicle or engine. The NCP payment is the basis for allowing the higher than applicable emission standard for specific engine/vehicle. Without the NCP payment, the emission standard for such an engine is the stated applicable emission standard and not the compliance level that would be applicable to an

engine/vehicle under the NCP provisions.

In regard to the question of whether the phrase “distributed into commerce” is intended to mean only U.S. directed production or whether it includes other engines that receive the NCP certification label, such as products delivered to Canada and Mexico, it is clear that any engine which bears the U.S. EPA certification label is available for introduction into commerce. It will be assumed to be distributed into commerce and should pay the appropriate penalty to the U.S. Environmental Protection Agency in accordance with the NCP requirements. For those engines that do not meet U.S. EPA emission requirements or that are intended solely for export, the engine manufacturer must label the engines as such in accordance with the requirements for an export exemption as stated in 40 CFR § 85.1709. The export label on these engines /vehicles would not state that the engine conforms to U.S. EPA regulations and also would not state that a penalty had been paid in order to allow its introduction into commerce. Provided engines/vehicles are properly labeled, there will be little or no potential for operators to circumvent U.S. requirements by purchasing their vehicles in Canada or Mexico. Vehicle purchased in Canada or Mexico for use in the U.S. are subject to EPA regulations on imported vehicles.

Issue 3.2: Alternative Use of Penalty Funds

COMMENT: The SJVAPCD commented that revenues generated by the NCPs should be allocated to ozone non-attainment areas to be used for projects that would compensate for the emission reductions lost as a result of the use of NCPs. The PSCAA comments that the penalty money should be made available for regional PM and toxics reduction projects. Similarly, the NYDEC suggested that the NCP revenues should be directed “to the extent permitted by law” to diesel retrofit projects to reduce NOx from on- or off-road heavy-duty engines.

Pony Pack Inc. (PPI) suggested that in lieu of paying NCPs manufacturers should be provided the option of installing an auxiliary power unit (APU), in which case, PPI argues, “the penalties assessed would actually go toward solving the problem.” (PPI is a manufacturer of APUs). PPI states that their proposal would “reduce emissions, which was supposed to be EPA’s original intent.”

RESPONSE: Section 206(g) of the Clean Air Act, 42 U.S.C. §7525(g), authorizes EPA to establish nonconformance penalties, but it does not authorize EPA to retain and use any penalty monies paid by a manufacturer. Absent such authority to retain and use penalty monies received, the Miscellaneous Receipts Acts, 31 U.S.C. §3302(b), requires that such monies be deposited in the General Revenue Fund of the U.S. Treasury. Funds deposited in the General Revenue Fund may then be appropriated by Congress.

Issue 3.3: Issues Regarding Collection of Data Prior to and After Proposal

COMMENT: Caterpillar commented that for the collection of cost data prior to the proposal EPA “did not hold any industry workshops or meetings with the industry to discuss its survey or the data that would be used in the NCP rule.” Caterpillar also commented that “EPA gave manufacturers only two weeks to complete surveys. Given the significant potential effect of the NPRM this plainly was not sufficient to gather the information necessary to promulgate NCPs.”

In comments submitted by Caterpillar on April 8, 2002 and again on April 30, 2002

Caterpillar commented that they were concerned that EPA requested updated information from engine manufacturers after the close of the comment period. Caterpillar commented that if there were limitations in the data used for the rule, EPA should have extended the comment period and publically requested the necessary data. Caterpillar commented that they are concerned that the final NCP rule will be based upon information from Caterpillar's competitors for which EPA has provided no opportunity for comment. Caterpillar also commented that they are concerned with the time frame for the request of additional information. Caterpillar commented that EPA provided less than 20 days (April 8, 2002 letter from Caterpillar) or less than 10 days (April 30, 2002 letter from Caterpillar) to respond on a matter that will have "a profound impact on the industry, the economy, and air quality."

RESPONSE: We do not agree with Caterpillar's comment that it was necessary for EPA to hold an industry workshop prior to the proposal for this rulemaking. Prior to the proposal EPA collected cost data from a number of engine manufacturers to help in preparing the proposal for this rule. This data collection request was provided in writing to a number of engine manufacturers, including Caterpillar, as detailed in an EPA memorandum to this docket ("Collection of Compliance Cost Estimates for the Purpose of Establishing NCPs for the 2004 Heavy-Duty Diesel NMHC+NOx Emission Standard.", docket item II-B-02). This data collection request was provided in a consistent format to all manufacturers from whom EPA requested the information. We believe this collection format was sufficient to provide EPA with adequate cost information to provide the basis of a proposal. Caterpillar has provided no reason to explain how holding a workshop would result in more or different data, especially given the confidential nature of the data submitted.

Caterpillar commented that EPA only provided two-weeks to respond to our pre-proposal request for cost information from engine manufacturers. We believe this amount of time was sufficient for the collection of cost information which was already in the manufacturers possession. EPA was not requesting detailed analysis or comment on aspects of a proposal, we were simply requesting information which manufacturers already had. To the extent a manufacturer needed additional time they could have requested more time from EPA. In fact, a number of manufacturers did request additional time, and EPA still made use of their data. Caterpillar provided no indication to EPA that their cost data was not accurate, so we did not ask them if they needed additional time.

We disagree with Caterpillar's comment that EPA should have extended the comment period because we requested updated information from some manufacturers after the close of the comment period. After the close of the comment period, EPA contacted all of the engine manufacturers who had previously supplied EPA with confidential cost information who had not indicated in their public comments whether or not the data they previously supplied continued to be accurate. We contacted Caterpillar (and other engine manufacturers) in order to confirm whether or not the cost data they had provided in the late summer/early fall of 2001 continued to be an accurate representation of their cost estimates for compliance with the model year 2004 standards. As indicated in Caterpillar's letter to EPA of April 30, 2002, EPA also requested confidential internal company documents from a number of engine manufacturers who had submitted confidential cost data. The purpose of this request was to provide an additional verification that the data manufacturers supplied to EPA was consistent with internal company documents which companies use for briefings to senior management. Caterpillar's comments imply that EPA may not verify and confirm the accuracy of cost data relevant to the rule after the close of the public comment period. EPA believes it is appropriate to verify and confirm the accuracy of the cost data to ensure that NCPs accurately reflect the competitive disadvantage to complying manufacturers.

Caterpillar commented they are concerned they do not have an opportunity to comment on any updated information EPA receives from their competitors in response to EPA's request for information after the close of the comment period. However, the purpose of EPA's request to certain manufacturers was to confirm the validity and accuracy of the confidential cost data used for the proposal. Caterpillar already had an opportunity to comment on this data during the public comment period, and to provide its own data or information.

We also disagree with Caterpillar's comment that we did not provide them sufficient time to respond to EPA's request for information. Caterpillar's comments state that EPA did not provide enough time for Caterpillar "to respond on a matter that will have profound impact on the industry, the economy, and air quality." However, we did provide a 60 day public comment period which allowed Caterpillar and other interested parties an opportunity to comment on this rulemaking. In EPA's requests for updated data and documents, we were not asking Caterpillar to respond on specific issues, we were simply requesting Caterpillar to either provide data or to provide internal company documents already in Caterpillar's possession. In response to each of EPA's request for information, Caterpillar was able to provide the data, and they did not indicate that the information they provide was inaccurate or limited by the time frame of the request.