

Dated: August 24, 1990.

Richard N. Smith,

Acting Director, U.S. Fish and Wildlife
Service.

[FR Doc. 90-21853 Filed 9-14-90; 8:45 am]

BILLING CODE 4310-55-M

Test Register Federal Register

Monday
September 17, 1990

Part VII

Environmental Protection Agency

40 CFR Part 86

Control of Air Pollution from New Motor
Vehicles and New Motor Vehicle Engines;
Interim Regulations for Cold Temperature
Carbon Monoxide Emissions From Light-
Duty Vehicles and Light-Duty Trucks;
Proposed Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 86

[AMS-FRL-3701-3]

RIN 2060-AC59

Control of Air Pollution From New Motor Vehicles and New Motor Vehicle Engines; Interim Regulations for Cold Temperature Carbon Monoxide Emissions From Light-Duty Vehicles and Light-Duty Trucks

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: Today's action proposes cold temperature carbon monoxide (CO) exhaust emission standards for light-duty vehicles and light-duty trucks. The proposed emission standards at 20 °F are: 10.0 g/mi for light-duty vehicles (LDVs); 12 g/mi for light-duty trucks (LTDs) up to 3,750 lbs loaded vehicle weight; and 15 g/mi for LTDs with loaded vehicle weight of greater than 3,750 lbs. These standards apply to 40 percent of each manufacturer's production in model year 1993, increasing to 100 percent in 1995. Vehicles produced by small-volume manufacturers (less than 10,000 units/year and LTDs with gross vehicle weight ratings over 6,000 lbs are exempt until 1995 when 100 percent of these vehicles must comply.

The benefits of this proposal are estimated to be a 20-29 percent reduction in mobile source CO emissions at 20 °F. Averaging overall temperatures, the proposed rule is estimated to be able to reduce annual CO emissions by 2.6-3.1 million tons by the year 2000 and 5.8-7.7 million tons after complete fleet turnover.

DATES: EPA will conduct a public hearing on this notice of proposed rulemaking on November 1, 1990, in Ann Arbor, Michigan. The hearing will convene at 9 a.m. and will adjourn at such time as is necessary to complete the testimony. Written comments on this notice will be accepted for 30 days following the hearing, until December 3, 1990. Further information on the public hearing can be found in section VI, Public Participation.

ADDRESSES: The public hearing will be held in the conference room of the U.S. Environmental Protection Agency, Motor Vehicle Emission Laboratory, 2565 Plymouth Road, Ann Arbor, Michigan 48105. Written comments should be submitted (in duplicate if

possible) to: The Air Docket, room M-1500 (LE-131), Waterside Mall, Attention: Docket No. A-89-01, 401 M Street SW., Washington, DC 20460.

Materials relevant to this proposed rulemaking are contained in Docket No. A-89-01. The docket is located at the above address and may be inspected from 8 a.m. until noon and from 1:30 p.m. until 3:30 p.m. Monday through Friday. A reasonable fee may be charged by EPA for copying docket materials.

FOR FURTHER INFORMATION CONTACT: John M. German, Certification Policy and Support Branch, Certification Division, U.S. Environmental Protection Agency, 2565 Plymouth Road, Ann Arbor, Michigan 48105, Telephone (313) 688-4214.

SUPPLEMENTARY INFORMATION:

I. Introduction

Section 202(a) of the Clean Air Act (CAA) gives the Agency the authority to regulate emissions from new motor vehicles which in the Administrator's judgment cause or contribute to air pollution which may reasonably be anticipated to endanger public health. Under this authority, the Agency has promulgated regulations (40 CFR part 86) requiring that motor vehicles meet CO emissions standards for the full useful life of the vehicles as defined in section 202(d). The standards currently apply at temperatures of 68 °F (20 °C) to 86 °F (30 °C). The action being taken today will extend the regulation of CO emissions from new vehicles to temperatures lower than 68 °F. This action is being taken because motor vehicle carbon monoxide (CO) emissions continue to contribute excessively to unacceptable CO air quality, with many urban areas exceeding the 8-hour CO national ambient air quality standard. While CO air quality should improve in the near term, that trend is expected to reverse by the late 1990's due to growth in vehicle miles traveled (VMT) unless further action is taken to reduce CO emissions. Most CO exceedances occur at temperatures below 68 °F, and 20 percent occur below 20 °F. Federal motor vehicle CO emission standards currently apply at temperatures no lower than 68 °F. At colder temperatures, vehicle CO emissions increase greatly. Therefore, improved control of CO emissions from vehicles when operating at colder temperatures, as proposed today, should significantly help local areas attain acceptable air quality for CO.

II. The Proposed Regulation

A. Intent

EPA's air quality analysis reveals an immediate need for reductions in cold temperature CO emissions. EPA believes that technology exists and is reasonably available to lower cold temperature CO emissions from LDVs and LTDs. Therefore, the Agency is proposing, as an interim step which can be implemented quickly, initial standards for the light-duty classes which will require improvement in calibrations and, in some cases, adoption of better existing technology.

Today's proposed rule has not been determined to be sufficient to bring all areas into compliance with the NAAQS for CO or to maintain compliance over the longer term. The standards being proposed have been developed based upon the levels of control that EPA believes are technologically feasible in the very near term. While EPA is confident that the measures being proposed today are cost-effective and necessary in the near term, a great deal of uncertainty exists as to the causes of CO nonattainment and the amount and kind of mobile source controls needed to bring all areas into compliance. EPA is undertaking a long-term study to identify areas where further regulation may be needed. This long-term study will be used as the basis to establish long-term motor vehicle CO standards, as may be deemed necessary, and to identify other measures that may be necessary to bring all areas into compliance and assure air quality is maintained. However, information already available indicates that the improved cold temperature vehicle emission performance, as would be achieved by today's proposal, will provide low cost and relatively near-term benefit to supplement local area efforts to attain the NAAQS for CO.

B. Proposed Regulations

1. Vehicle Standards

The agency is proposing standards of 10.0 g/mi for LDVs; 12.0 g/mi for trucks with a loaded vehicle weight less than or equal to 3,750 lbs (i.e., LTD1s); and 15.0 g/mi for trucks of greater than 3,750 lbs loaded vehicle weight but less than or equal to 8,500 lbs gross vehicle weight rating (GVWR) (i.e., LTD2s). These standards would apply when the vehicle is tested at 20 °F according to a revised Federal Test Procedure (FTP) also being proposed today, and would apply for the useful life of the vehicles; i.e., 50,000 miles for LDVs and 120,000 miles for all LTDs.

The proposed standards are expected to require recalibration or other changes in virtually every vehicle. As discussed in section IV.E. of this preamble and analyzed in detail in the draft regulatory support document, chapter VI, required changes will range from perhaps only recalibration for some vehicles equipped with the most technically advanced designs expected to be available to more substantive changes in hardware, especially for the larger engines and applications. The proposed standards were selected considering the maximum reductions achievable given the very near term implementation proposed. Even so, it seems necessary to phase in the applicability of these standards over the 1993 through 1995 model years to provide adequate lead time.

Legislative revisions to the CAA are still under consideration by the Congress at the time of this proposed rulemaking. It would be undesirable to delay this proposal until the legislative process is complete in order to conform the proposal to any amendments that are adopted. The final rule will include any relevant requirements, including any useful life requirements, that have been legislatively adopted and for which a notice of proposed rulemaking is not required. Commenters should note the legislative developments and the possibility of changes in making their comments.

2. High-Altitude Applicability.

High-altitude standards would be patterned after current FTP high-altitude provisions for LDVs. All LDVs would be required to comply with the cold CO standard at all altitudes. For LDTs, it is also proposed that all LDTs would be required to meet the cold CO standard at all altitudes.

3. Effective Dates

The standards are proposed to be phased in over the 1993 through 1995 model years for LDVs and most LDTs, as follows:

Model year	LDVs and LDTs with 0-6,000 lb GVWR	LDTs with 6,000-8,500 lb GVWR *
1993	40% **	0
1994	80% **	0
1995	100%	100%

* The current CAA requires 4 years of lead time for trucks over 6,000 GVWR.

** Small-volume manufacturers may exempt up to 10,000 vehicles until the 1995 model year.

4. Compliance Procedures

To satisfy the proposed requirement to certify 40 percent of the 1993 model year eligible production volume and 80 percent of the 1994 model year production volume to the cold temperature CO standards, manufacturers would be allowed to select any combination of LDV or LDT (except LDTs over 6,000 lb GVWR) families.¹ Only entire engine families could be included when determining the production volumes subject to cold CO standards. Compliance with the requirement that a certain percent of production volume meet the standard would be based upon the actual production of each engine family. If the manufacturer's year-end production report indicated noncompliance, the certificate(s) of conformity would be rendered void *ab initio* at the conclusion of the model year for any family in exceedance of the applicable standard.

To determine compliance, the manufacturers would be required to submit test data on one emission data vehicle within each engine family subject to the standard. To help ease the cost burden and facility lead time constraints on manufacturers, EPA is proposing to allow manufacturers to test a single data vehicle from the set of emission data vehicles within each engine family. The vehicle selected must be the one expected to emit the highest levels of CO at 20 °F in that engine family. At EPA's option, the Administrator may designate the test vehicle. This vehicle would be tested using the test procedure proposed today, or an alternate procedure approved in advance by the Administrator. However, even if alternative test procedures are approved by the Administrator for manufacturer testing, EPA would reserve the right to conduct confirmatory testing using the test procedure proposed today. As always, EPA would reserve the right to require, prior to granting certification, confirmatory testing of any data vehicle at low or high-altitude. Testing would occur at 20 °F at a facility of the Agency's choosing. The emission data vehicles tested would be those selected for testing according to the current regulations.² EPA would not require

¹ Trucks over 6,000 lbs GVWR may not be included in the calculation of a manufacturer's eligible production volume. Manufacturers may group trucks under 8,000 lbs GVWR with LDVs and determine an overall percent of production volume to satisfy the phase-in requirements.

² Manufacturers should note that this would include confirmatory testing of vehicles at high-altitude at a facility such as the Colorado Test Laboratory currently being used for high-altitude in-use compliance testing. Of course, the high-altitude

additional certification vehicles uniquely selected for evaluation of compliance with the cold temperature CO standard. Failure of a certification vehicle, including running change data vehicles, to meet the cold CO standard with deterioration factors (DFs) applied would be treated in the same manner as a failure under the current FTP.

EPA also expects that all vehicles would achieve proportional emission reductions for temperature conditions between a 20 °F test and the current FTP. The Agency has identified two options to assure this objective is met; these options are discussed later in this proposed rule.

EPA may also elect to test any fuel economy data vehicle for compliance with the cold temperature CO standard. Just as in the case of certification program emission data vehicles, the vehicle would be judged to be in compliance with the cold temperature CO standard if its 20 °F test result, with deterioration factor applied, was less than or equal to the standard applicable to that test vehicle. Failure of a fuel economy data vehicle to comply with the cold CO standard would be reason to reject the vehicle for fuel economy purposes and could be used by EPA to investigate the calibration of similar vehicles for noncompliance.

Due to the similarity between observed in-use DFs at 20 °F and typical certification DFs at 68 °F-86 °F,³ EPA proposes to allow manufacturers to use the same DF for cold temperature CO compliance as used for certifying that vehicle to the 68 °F-86 °F CO standard. At the manufacturer's option, the manufacturer may use a higher DF for cold temperature CO compliance demonstration. Also at the manufacturer's option, a durability data vehicle may be tested at 20 °F to generate a cold temperature CO deterioration factor. Only in this latter case may a manufacturer use a cold temperature CO deterioration factor which is lower than the DF used to demonstrate compliance with the 68 °F-86 °F CO standard.

The standards will be subject to the enforcement provisions of sections 206 and 207 of the Clean Air Act. All LDV

facility would have to be capable of meeting the cold temperature test conditions. High-altitude compliance is discussed more thoroughly in section IV.I, Enforcement.

³ Reference section on deterioration rates in chapter II of the regulatory support document. In general, it was found that, even though total gram per mile deterioration was higher at 20 °F, the in-use multiplicative DFs were lower at 20 °F than at 68 °F-86 °F due to the higher zero mile levels found at 20 °F.

and LDT production would be subject to potential 20 °F selective enforcement audits (SEAs). However, the proposed cold temperature CO SEA program would not begin until the 1995 model year to ensure that manufacturers have sufficient cold temperature testing capabilities.

All LDVs and LDTs would be subject to a 20 °F in-use compliance program for CO, similar to existing programs at 68 °F–86 °F for HC, CO, NO_x and particulates. In-use enforcement would also apply at high-altitude.

III. Background

A. CO Air Quality

Today, an estimated 78 million people in the United States live and work in areas which do not meet the national ambient air quality standards (NAAQS) for CO. Forty-one metropolitan areas exceeded the NAAQS for CO in 1988–89. Since vehicle emissions account for approximately 90 percent of the CO emissions in most urban areas, efforts which reduce total motor vehicle CO emissions will help improve ambient CO levels. The CO nonattainment problem will improve in the near term as (1) new cars and trucks replace older emission control technology vehicles, (2) inspection and maintenance (I/M) programs are adopted or improved, and (3) other control strategies are adopted, such as widespread use of oxygenated fuels. Even with these planned motor vehicle program improvements, a number of areas are still expected to continue to fail to meet the CO air quality standards unless additional reductions in motor vehicle CO emissions are achieved. Furthermore, the benefits of these other programs are expected to level off by the mid to late 1990s. In the longer term, CO nonattainment could increase as total CO emissions from motor vehicles increase due to continued growth in vehicle miles traveled (VMT), and lower vehicle speeds from increased traffic congestion. (CO emissions per mile increase with a decrease in vehicle speed.)

Exceedances of the CO NAAQS typically occur during cool or cold ambient conditions. (The notable exception to this is New York City which has an average temperature of 62 °F during CO violations.) Approximately 20 percent are at temperatures of 20 °F and colder. The exceedances occur predominantly from November through February, most often during periods of low winds and atmospheric temperature inversions that often accompany low temperatures.

Because cold temperatures increase CO emissions and because local and state governments (except California) are prohibited from regulating motor vehicle emissions, EPA has been urged to adopt some sort of cold temperature CO standard by state and local governments with environmental problems. To gather more information on the cold CO issue from the state and local governments, vehicle manufacturers and other knowledgeable parties, EPA held a public workshop on March 8 and 9, 1988. Among the topics discussed at the workshop were the nature of the cold CO problem, short and long-term projected attainment status, recent technology developments, and test procedure issues.

Manufacturers stated that, while there is currently a CO problem, cold temperature emission standards would not solve the problem. Manufacturers suggested that the CO problem was due to congested traffic during atmospheric temperature inversions. Vehicles operating in congested traffic, they argued, would typically have been operating for some time and would therefore have warm engines. Thus, a cold temperature emission standard which resulted primarily in reductions in emissions during cold starts and engine warm-ups would not provide significant improvement in the CO problem. Manufacturers also stated their belief that local area transportation control measures could provide greater short-term benefits and that fleet turnover to the latest emission control designs would bring most local areas into compliance in the long term.

Representatives of state and local areas stated that, while fleet turnover might significantly improve attainment in the 1990s, gains due to vehicle emission control would then be overcome by growth in vehicle miles traveled and greater congestion. They believe that local area control measures are very expensive and yield limited results. They also maintain that cold CO standards would be very effective for most local areas and are necessary for attaining and maintaining the NAAQS, especially in the long term.

During the workshop, EPA personnel presented cold temperature vehicle test data, recent air quality monitoring data, and air quality projections. These presentations showed that CO concentrations are highly sensitive to meteorological conditions, such as wind speed and inversion height. In addition, EPA showed that growth in vehicle travel is a very important factor in the long-term attainment status for an area.

B. Motor Vehicle Emission Characteristics

Recent model vehicles have substantially improved emission performance compared to vehicles produced twenty years ago. The existing Federal CO standard of 3.4 g/mi represents a more than 90 percent reduction from CO levels produced by vehicles in the late 1960s. However, the existing standard applies only under the standardized test conditions of the Federal Test Procedure (FTP). Significantly for CO, the FTP has a controlled test temperature which can only range from 68 °F to 86 °F, which is generally above the ambient temperatures that are typical during most exceedances of the CO NAAQS. Therefore, proportional improvements in emission performance due to the 3.4 g/mi standard have not necessarily occurred under colder temperature vehicle CO emission performance has not improved as much and further improvements are necessary.

CO emissions from motor vehicles result from the incomplete combustion of fuel. In general, CO emissions are lower when the engine is operated with excess air which helps promote the complete combustion of the fuel. This excess air operating mode is referred to as "lean" operation. In contrast, "rich" operation occurs when excess fuel is added to the combustion process. During rich operation, insufficient oxygen is available to complete the combustion process and CO emissions are higher.

CO emissions from gasoline fueled motor vehicles are strongly influenced by both ambient and engine temperatures. Although gasoline is stored as a liquid fuel, it must be at least partially vaporized prior to combustion. When an engine is "cold" (i.e., has not been run in several hours), there is no engine heat to help promote vaporization. To assure that enough fuel is vaporized to allow the engine to operate properly, extra fuel is introduced during cold start.⁴ While some "extra" fuel is necessary for cold starting and initial cold operation, the resulting rich fuel/air ratio has the undesirable effect of increased emissions from the engine. To compound the problem, during the first few minutes of operation the vehicle's catalyst is not up to operating temperature and, thus, its conversion efficiency is quite low. The high engine-out emission levels coupled with the low efficiency catalyst

⁴ For purposes of this rulemaking, cold start can be defined as the portion of vehicle operation prior to the engine reaching normal operating temperature.

operation result in markedly higher tailpipe emissions. A sample of recent model year properly operating vehicles tested by EPA indicated that 90 percent of the increase in CO emissions at 20 °F compared to CO emissions at 75 °F occurs during the cold start.

While the existing Federal Motor Vehicle Emission Control Program (FMVCP) has achieved significant reductions in CO emissions at cold temperatures, the reduction does not compare with that obtained at warm temperatures. EPA also found in tests of recent model year vehicles that their CO levels were 75 percent lower than those of a group of 1969-1974 model year vehicles when measured at around 75 °F but only 51 percent lower when measured at around 20 °F.⁶ EPA has also found that cold temperature emission performance varies widely, with some vehicles exhibiting very good cold temperature CO performance while others are very poor. For example, EPA has tested recent model year vehicles with 75 °F CO emission levels below the 3.4 g/mi standard but with 20 °F emissions ranging from 2.7 g/mi to 35.9 g/mi.

Some of the differences in cold temperature emission performance are directly linked to the level of technology used by the manufacturers. For example, vehicles equipped with multipoint fuel injection systems benefit from their precise fuel control capabilities, helping explain their often low CO emission levels when tested at cold temperatures. In contrast, vehicles equipped with carburetors or throttle body injection suffer from the less precise manifold fuel distribution system. Cold manifolds tend to reduce fuel vaporization, resulting in fuel collecting on the walls of the manifold, poorer distribution of the fuel and the likely need for richer air/fuel ratios to assure adequate vaporized fuel delivery to all cylinders during cold start and engine warmup. Predictably, carbureted and throttle body injection vehicles tend to have higher cold temperature CO emission levels than multipoint fuel injection vehicles. EPA tested 102 recent model year vehicles in properly operating condition. Although average emissions were about the same at 75 °F, 20 °F emissions of the multipoint fuel injected vehicles averaged 12.4 g/mi, while comparable carbureted and throttle body injection vehicles averaged 15.3 g/mi.

Other reasons for the observed wide variance in cold temperature CO emission control are less well

understood. For example, manufacturers often use timers which delay air injection to the catalyst. Air injection helps promote oxidation of CO in the catalyst, but with high levels of unburned or incompletely burned fuel entering the catalyst (as typically occurs during cold engine warmup), air injection can also cause catalyst temperatures to rise to the extent that catalyst damage could become a concern. For this reason, most manufacturers delay air injection to the catalyst during the initial stages of vehicle operation at cold temperatures. However, controlling catalyst temperatures unfortunately results in increased CO emissions. While the principle behind delaying air injection to protect catalysts is clear, it is not clear why some of the vehicles examined by EPA Delay air injection for up to 15 minutes after a 20 °F cold start (well beyond the time needed for stabilization of vehicle operation) while others delay air injection as little as 5 minutes. Excessive delay in introducing air injection can reduce catalyst efficiency and increase tailpipe CO emissions. Indeed, as discussed further in the section on feasibility of improved emission control, EPA has reduced the time delay for air injection on several vehicles, resulting in substantial reductions in CO emissions while still maintaining acceptable catalyst temperatures. In these cases EPA sees no reason for the long delays in introducing air injection. EPA believes that timely introduction of extra air can substantially improve CO emissions without a change in technology or increased hardware costs.

C. CO Nonattainment Problem

1. Contribution of Cold Start Emissions to the CO Problem

In the past, exceedances of the CO NAAQS were thought to be largely due to very localized conditions within an urban area, such as a particularly congested traffic situation. Correcting these "hot spot" problems then relied on local transportation control measures such as one-way streets and parking restrictions to improve traffic flow. However, evidence is accumulating which indicates that there is an areawide component to CO nonattainment, not just a hot spot problem. To a large degree the CO problem seems to result from elevated levels of CO subsequent to the morning rush hour which are sustained throughout the day and culminate in peak concentrations as cold start

emissions are added by the evening rush hour.⁶

Cold start vehicle operation occurs prior to the vehicle's reaching normal operating conditions. An EPA study on the percentage of vehicles operating in the cold start mode concluded that a relatively large fraction of arterial traffic may be in the cold start mode during late morning, afternoon and early evening hours.⁷ During the evening rush hours, high numbers of vehicles in cold start operation are concentrated together in the downtown areas, resulting in levels of ambient CO that violate NAAQS.⁸

2. Effects of Local Meteorology

Certain meteorological conditions exacerbate the CO problem. Under conditions of calm winds and temperature inversion, cold start as well as hot stabilized emissions contribute to both the day-to-day background levels of CO and the peak CO concentrations.⁹ Inversion conditions occur when the ground level air cools more rapidly than the air immediately above a city. The warmer layer of upper air forms a "lid" above the urban area, trapping the cold air. This inhibits the degree of natural mixing and vertical dispersion of pollutants that would occur under noninversion conditions when warmer surface air rises and displaces cooler upper air. As a result of the decrease in vertical mixing, pollutants can accumulate beneath the lid of warm air and levels of CO will tend to increase with time across a broader geographic area. There is some indication that pollutants migrate during inversion conditions so that mixing occurs horizontally, contributing to the areawide nature of the CO problem.

The intensity of the inversion and its duration can influence the levels of CO in the air shed. The strongest inversions tend to occur during the months of October through March, when temperatures tend to be colder (and vehicle CO emissions are higher). Examination of hourly CO monitoring and weather data for Washington, DC, Phoenix, AZ, and Detroit, MI show that, in general, CO levels increase as mixing height and wind speeds drop to low

⁶ EPA memo from Mark Wolcott to Bob Larson, "Timing of CO Exceedances," January 20, 1987, included in Chapter I, Section B of the regulatory support document.

⁷ EPA 450/3-77-023 "Determining the Percentage of Vehicle Operation in the Cold Start Mode," August 1987.

⁸ Mark Wolcott, "Nature of the CO Problem," presented to the Public Workshop on Cold CO, March, 1988.

⁹ Regulatory support document, Chapter I.

⁶ Robert E. Larson, "Vehicle Emission Characteristics Under Cold Ambient Conditions," SAE Paper 890021, January 9-11, 1989.

levels.¹⁰ In cases where the inversion was sustained over multiple days, background CO levels tended to build and remain high so that the additional emissions from rush hour traffic cause peak CO concentrations which were higher than the previous days. The build-up of background CO levels over a multiple day period makes it more likely that emissions from peak traffic will cause a violation of the NAAQS.

3. Extent of the Nonattainment Problem

The 41 CO nonattainment areas comprise a diverse group ranging in size, geographic location and climatic conditions. Modeling done by the Agency estimating the future attainment status of 34 of the 41 nonattainment areas indicates that 13-24 areas may be out of attainment in 2010 unless further CO controls are implemented.¹¹ An in-depth case study of attainment prospects for 12 nonattainment cities suggests that without the proposed cold temperature standards, as many as 9 of the 12 case study cities could be in nonattainment with the NAAQS for CO in the year 2010.¹² The number of nonattainment areas should reach a low in the 1995-2000 timeframe due to effects of the FMVCP and current control strategies. However, projections indicate that the benefits from the current FMVCP and other control strategies already in place will be overtaken by increasing emissions due to anticipated growth in VMT, and the number of nonattainment areas will begin to grow after 2000. Projections show that application of the proposed cold CO standards will help mitigate the effect of travel growth beyond the year 2000, bringing areas into attainment and reducing CO inventories by 10-18 percent.

D. Industry Proposals

During the March 1988 public workshop, both Ford Motor Company and General Motors Corporation proposed what they termed "voluntary" standards for cold temperature passenger car CO emissions. GM offered to meet an average standard of 12 g/mi at 40 °F, and Ford offered to meet a standard of 14 g/mi at 20 °F on all new passenger cars. Both proposals would have based demonstration of compliance on low mileage development vehicles, with no deterioration factors or in-use enforcement (recall). Of the two proposals, Ford's was the more stringent. At the time, neither Ford nor

GM offered a proposal for light-duty trucks.

On March 15, 1989, the major domestic manufacturers and a number of foreign manufacturers, under the auspices of their trade organizations, the Motor Vehicle Manufacturers Association (MVMA) and the Automobile Importers of America (AIA), offered a new proposal for a voluntary cold CO program. The program contained emission targets more stringent, overall, than the original Ford proposal. The actual numerical level was significantly lower (11 g/mi CO at 20 °F compared to the 14 g/mi level of the original Ford proposal), but up to 10 percent of each manufacturer's production would be exempted from the program. The proposal also recommended a phase-in of the target level over a three-year time frame beginning with the 1992 model year. Target levels were also proposed for light-duty trucks.

As with the earlier industry recommendations, no EPA enforcement was included, either during the preproduction certification program or in-use (i.e., no recall liability). Also, as previously noted, the proposed program would apply only to low mileage emission performance, not through the vehicle's useful life (50,000 miles for LDVs vs. 120,000 miles for light trucks) as with the current standards.

IV. Discussion of Issues and Options

A. Long-Term Air Quality

The Agency considered the option of promulgating technology-forcing cold temperature CO standards to meet all long-term air quality needs. However, this option was rejected due to the additional lead time required to establish and implement such standards. As discussed previously, many areas of uncertainty exist in forecasting the amount of future mobile source CO reductions needed to bring all areas into attainment. Accurately quantifying the amount of reductions needed would significantly delay promulgation of a cold temperature rule. In addition, such technology-forcing long-term standards, if needed, would entail additional lead time after promulgation of the standard for manufacturers to develop needed technology. Given the substantial evidence that cold temperature CO emissions significantly contribute to CO nonattainment in most nonattainment areas, the Agency has concluded that accurately assessing the long-term air quality needs should not delay the implementation of reasonable near term cold CO standards.

B. Test Temperature

CO NAAQS exceedances occur over a wide range of ambient temperatures. Due to their significant role in such exceedances, motor vehicles need to have their CO emission performance effectively controlled over this range of ambient temperatures to assure sufficient emission reduction. Setting the compliance temperature at the lowest level observed when CO air quality problems occur and assuring proportionate CO reduction over the rest of the temperature range would provide the greatest technical assurance of adequate control. As a countervailing consideration, however, the test facility cost tends to increase as the test temperature decreases. Thus, the technical benefits of determining emission performance at low temperature need to be balanced with the cost.

EPA considered two nominal test temperatures - 20 °F and 40 °F. Twenty degrees Fahrenheit represents a practical lower limit for violations of the CO ambient air quality standard. While almost 20 percent of the CO air quality violations in 1981 to 1986 occurred below 20 °F, the only location with exceedances of the NAAQS for CO at an average temperature below 20 °F is Fairbanks, Alaska. (Fairbanks experienced CO violations at an average temperature of -2 °F.) A test temperature of 40 °F was proposed by several manufacturers since, in their opinion, a 40 °F facility would be substantially less expensive and require less lead time to bring online than a facility capable of testing at 20 °F. Although manufacturers have not quantified this incremental cost or lead time requirement, EPA has concluded that the facility cost at 20 °F is higher than at 40 °F (lead time should not differ.) The colder test temperature would clearly require greater cooling capacity and controls to maintain a stabilized test temperature. The subfreezing temperatures may also require more costly facility and equipment designs. Further, the colder test temperature may make the test slightly more difficult to conduct, resulting in somewhat higher costs.

EPA's analysis of the costs associated with testing at 20 °F and 40 °F shows that a cost penalty of \$0.09 to \$0.12 per vehicle produced is incurred at 20 °F compared to the costs of 40 °F testing.¹³

¹³ Reference chapter III in the regulatory support document.

¹⁰ Ibid.

¹¹ Ibid.

¹² Ibid.

EPA has determined that this additional cost does not outweigh the benefits of testing at the colder temperature.

While some manufacturers believe that a demonstration of compliance with a 40 °F standard would indicate satisfactory performance down through 20 °F, EPA is not persuaded. In EPA's evaluation of current technology vehicles, several had significant changes in air pump and fuel control strategy between the current test temperature and 60 °F (for example, long delays in allowing air injection). Such changes can have a significant adverse impact on CO performance. With a 40 °F standard, similar changes below the test temperature would adversely impact vehicle emissions at lower temperatures. If this were to occur, this mobile source control program would provide reduced emission benefit to areas with CO air quality problems at colder temperatures.

Some manufacturers currently have the capability to test at 20 °F. Further, the fact that the standard does not require new technology and will be phased in over three model years should enable all manufacturers to obtain appropriate testing facilities. Finally, the added flexibility provided by EPA is not requiring 20 °F testing by the manufacturer except on one certification vehicle per family should ease the facility cost and capacity burdens on the manufacturer.

C. CO Emissions at Other Temperatures

This rule is intended to reduce CO emissions at all temperatures below the standard Federal Test Procedure (FTP), not just at 20 °F, and in cold temperature driving conditions not exactly duplicated by the FTP driving cycles. CO exceedances occur over a range of operating conditions. Many areas, for example, experience CO exceedances at temperatures between 75 °F (the nominal test temperature of the standard FTP) and 20 °F. For such an area, CO control at the intermediate temperature is most important. EPA is concerned that manufacturers may design vehicles which perform well during the specific test conditions of the FTP and the 20 °F test procedure but which have significantly worse emission performance under other operating conditions, including colder temperatures. EPA currently denies certification of vehicles equipped with emission control defeat devices, as such devices are inconsistent with the intent of the Clean Air Act. Defeat devices are devices designed to promote effective emission control of any system during the test procedures but allow ineffective control during other driving conditions. As evidenced by the need to propose

cold temperature CO emission standards, the Agency's defeat device policy has had limited success in preventing unnecessary emission increases at colder temperatures.

With the proposed adoption of 20 °F cold temperature CO standards, EPA has an opportunity to revise the procedure by which it determines adequate emission control over the full range of colder operating conditions typically found in urban areas during the winter months. For temperature conditions between 68 °F (the lower temperature bound of the current FTP) and 25 °F (the upper temperature bound of the proposed cold temperature FTP),¹⁴ EPA expects that all vehicles should be capable of achieving proportional emission control. No discontinuous, "step" changes in emission level should be necessary. The factors affecting cold start CO emissions gradually become more severe as ambient temperature decreases. Further, in contrast to the mechanical controls and on/off switches commonly used on vehicles ten years ago, the designs now being produced largely rely on electronic controls, monitored and modulated by computer functions, which can be designed to behave in a smooth, continuous function. With these types of controls, no abrupt change in emission performance is necessary.

EPA has insufficient test data to establish the exact form this proportional control should take, whether responding linearly to a change in ambient temperature or following some other continuous function. However, given the gradual, continuous nature of the factors affecting emission control and the electronic sophistication of today's vehicle designs, EPA believes properly designed vehicles should be able to achieve emission levels which increase in a generally linear relation as ambient temperatures decrease toward the nominal 20 °F test condition proposed above. In recommendation that EPA adopt a 40 °F standard as adequate to predict emission levels at colder temperatures, at least some

¹⁴ As in the case of the current FTP, the cold temperature FTP would have a range of acceptable operating temperatures. While 20 °F would be the nominal test temperature, and, presumably, the normal condition for routine compliance testing, any test conducted within the 15 °F–25 °F temperature range would be considered a valid test under the proposed cold temperature test procedures. The proposed test procedures allow variances of up to +/–5 °F in test cell temperatures due to the difficulty of maintaining a precise test temperature. In addition, there should be no significant difference between the technology required to comply with emission standards at 15 °F as compared to 20 °F. Vehicles tested at any of the temperatures within this range would be expected to comply with their cold CO standard.

manufacturers supported this linear relationship between ambient temperatures and CO emission levels of properly designed vehicles. Comments, technical rationale, and any available supporting data are requested on the appropriateness of a linear relationship (or an alternative function) between ambient temperature and CO emission level, given that vehicles are designed to meet the the proposed standard at 20 °F.

Given a linear relationship, a vehicle tested at some in-between temperature would be expected to have CO emissions no higher than a linear interpolation between the engine family emission limit at 25 °F and the FTP CO standard at 68 °F (for example a LDV tested at 40 °F with existing 3.4 g/mi FTP standard and a standard of 10.0 g/mi at 20 °F would work out to be about 7.7 g/mi). Vehicles which achieved such proportional emission reductions would satisfy EPA's concern with the cold temperature performance of the vehicle under FTP-type driving conditions. EPA could choose to conduct tests at these intermediate temperatures and compare the test results with the levels predicted by the line to assure proportional reductions are achieved.

EPA is considering two alternative methods for assuring this proportional control objective is achieved and will consider other options recommend by comment to this notice. The first and most straightforward method would establish a straight line (or some other continuous function) between the cold temperature CO standard plotted at 25 °F and the warm temperature CO standard plotted at 68 °F and use this line as an actual compliance standard which varies over the temperature range. Due to the ability to directly compare emission performance to a precise standard, this method is easily enforceable and thus tends to provide assurance of fully adequate emission control. Under this option, EPA's full enforcement program (including Selective Enforcement Audit program testing and in-use compliance program testing as well as certification program testing) could be applied at any temperature between the lower end of the cold temperature FTP temperature range (15 °F) and the upper end of the current FTP temperature range (86 °F). For any given compliance test, the stabilized temperature of the vehicle at the start of the test (as measured by the oil temperature) would be used to determine the pass/fail level from the line function standard. EPA recognizes that requiring manufacturers to conduct Selective Enforcement Audit (SEA) program testing at various temperatures

might have facility or cost impacts. EPA requests comment on these impacts and on the alternative of restricting SEA testing to only certain temperature conditions.

The second option identified by EPA would explicitly define devices or control strategies as defeat devices if they result in emission levels higher than the line described above. In addition to EPA's current policy on defeat devices, this option would use the line between 68 °F and 25 °F to create a specific performance test guideline describing how EPA will determine if the vehicle contains a cold temperature defeat device. Vehicles failing to meet emission levels set by these special performance tests would not face the same penalties as vehicles not complying with official emission standards. For example, marginally higher emissions on the special performance test would not necessarily prevent certification or, in the case of in-use vehicles, subject the manufacturer to potential recall simply on the basis of noncomplying test results. However, manufacturers would have the burden of proving to EPA's satisfaction why emission levels above the interpolated line on a special performance test are reasonable, do not result in unnecessary excess emissions, and, therefore, should not be considered the result of defeat device use. EPA requests comments as to the advantages this second option might have over the first option described above.

In addition to these two specific options, EPA solicits recommendations for alternative methods to assure appropriate CO emission control between the nominal 75 °F and 20 °F test procedure temperature conditions.

EPA expects this proportional control to continue for temperature conditions below the 20 °F FTP conditions (with 15 °F as the lower bound). EPA could extrapolate the line in some fashion to determine general target levels of acceptable emission performance below 15 °F. However, recognizing the implications of testing at temperatures lower than the 20 °F FTP conditions (in particular, potential facility design impacts), EPA would prefer not to conduct tests below 15 °F. Therefore, comments are solicited as to the best method of assuring continuous control below 15 °F without requiring FTP-type emission testing. For example, one approach could have EPA determine any device or strategy to be a defeat device if it involves a sudden nonproportional change in operating characteristics below 15 °F which could result in a significant increase in emissions and

which is not technologically necessary. The performance of the most advanced technology could be considered in determining what emission increases might be technologically necessary.

Regardless of which approach is ultimately selected, EPA will continue to evaluate designs for their performance at colder temperatures under driving conditions other than an FTP-type driving schedule. This is consistent with the practice currently in place wherein EPA evaluates vehicles for defeat devices over the wide range of ambient temperatures and driving schedules typically found in-use. Today's rulemaking is not intended to change this aspect of EPA's defeat device program.

EPA requests comments on the specific methods described above and alternative recommendations for dealing with CO emissions across the range of temperatures. In particular EPA requests that comments quantify and contrast the environmental, cost, and administrative advantages of any of the options.

D. Industry Voluntary Cold CO Proposal

There were a number of valuable features in the industry proposal for a voluntary cold CO program (outlined in section III.D., Industry Proposals). The suggested implementation schedule was more aggressive, initially, than is possible when promulgating regulations. The proposal also suggested that the standards be phased in over a period of three years, a concept which has been adopted in this NPRM with slight modification. Also considered by EPA, but not incorporated in this NPRM, was the proposal to allow manufacturers to submit to EPA a statement of compliance with cold CO standards without providing vehicle test data. EPA is soliciting comments on the appropriateness of allowing the manufacturers to submit such a statement, if the Agency reserves the right to confirmatory testing of any emission data vehicle at 20 °F at its own facility.

Despite the positive aspects of the industry proposal, EPA has decided not to pursue the industry proposal for a voluntary cold CO program. This is because of concerns in three areas. The first two are general concerns with any voluntary program. The last is specific to the MVMA/AIA proposal.

The first general concern with voluntary programs is the inability to enforce uniform compliance across the industry. If some manufacturers do not comply with a voluntary standard, or make only token efforts to comply, this could have two effects. First, manufacturers which expend their

resources to comply may find themselves at a competitive disadvantage compared to manufacturers who have expended their resources elsewhere. Not only would this be unfair to those manufacturers who comply, but it could economically pressure all manufacturers to expend less effort on cold CO compliance. Second, the effectiveness of the program could be seriously undermined if a significant number of vehicles are produced by manufacturers who are not complying with the voluntary standards.

Our second general concern with voluntary programs is the lack of assembly line and post production enforcement. The preproduction certification program is very effective at ensuring that vehicles have been designed to meet the emission standards. However, follow-up enforcement is also important to ensure that production vehicles are actually built as designed and that emission control systems do not deteriorate too quickly under in-use driving conditions. The lack of any SEA or in-use enforcement could reduce much of the potential benefits.

The concern specific to the MVMA/AIA proposal is the exemption of 10 percent of vehicles from the standards. A significant number of current technology vehicles emit 2 to 3 times the proposed standard for CO emissions at 20 °F. Exempting such vehicles could significantly degrade the overall benefits of the program. Also, some local areas may have significantly higher sales of such exempted vehicles than the 10 percent national average, and this could potentially have an adverse impact on local air quality.

EPA has not currently determined any effective method of addressing these concerns with voluntary programs. Therefore, the Agency has decided to proceed with rulemaking. This does not mean that the Agency has dismissed any consideration of additional voluntary cold CO program proposals. Other voluntary program proposals submitted in response to this NPRM will be considered as part of this rulemaking process.

E. Standards

EPA is proposing 20 °F standards of 10.0 g/mi for LDVs, 12.0 g/mi for LDT1s, and 15.0 g/mi for LDT2s. These levels were chosen based upon EPA's analysis of the results of several cold temperature testing programs. To approximate the projected 1993 and later model year vehicle fleets, only current technology vehicles were used in the analysis (i.e., 1983 and later model

year, closed-loop, fuel injected or 4-cylinder carbureted vehicles). To approximate the requirement that the cold CO standards would apply to properly used and maintained vehicles, only vehicles which were projected to meet the 75 °F CO standard at 50,000 miles were used. For this analysis 97 LDVs, 21 LDT1s, and 21 LDT2s met these criteria when tested by EPA at its Motor Vehicle Emission Laboratory in Ann Arbor, Michigan. Also used in the analysis were 11 LDVs tested by the National Institute of Petroleum and Energy Research (NIPER) under contract from EPA and 9 LDVs tested by EPA's office of Research and Development.

An evaluation of the relationship of CO emissions to cold start fuel enrichment and of feasible reductions in cold start fuel enrichment at cold temperatures projects that 70-80 percent of 4-cylinder multiple point injections (MPI), 65-75 percent of 6-cylinder MPI, and 10-15 percent of 4-cylinder throttle body injection (TBI) LDVs could meet a 10.0 g/mi level simply with improved cold start fuel enrichment strategies. The remainder of the 4-cylinder and 6-cylinder LDVs are projected to be able to comply with a 10.0 g/mi level with some combination of improved cold start fuel enrichment strategy, improved closed-loop control strategy, air pumps, aspirators, or adoption of MPI. Each of these technologies is in common use on many current production vehicles.

Eight-cylinder vehicles could have greater difficulty than smaller vehicles in meeting the proposed standards, since the average current 20 °F CO emissions of these vehicles are very high, even for those vehicles already equipped with MPI and air pumps. However, most of these vehicles delay air injection for significant periods of time (i.e., more than 5 minutes) during cold starts at cold temperature. To evaluate the potential CO reductions that could be achieved with additional air injection, reduced fuel enrichment or both, EPA conducted a test program on five large displacement engines. The first part of this program involved injecting supplementary air during 20 °F cold starts. Catalyst temperatures were monitored and the air injection strategy modified to prevent excessive catalyst temperatures. The second part involved reducing the fuel delivered to the engine during the first 3 minutes of the test. The third part consisted of modifying both air and fuel strategies. The results of this program were, typically, 20-30 percent reductions in cold temperature CO emissions for either injecting supplemental air during cold starts or reducing cold start fuel enrichment.

These reductions were accomplished without excessive catalyst temperatures or any indication of driveability problems. The results of modifying both fuel and air strategies simultaneously were more variable, but typically resulted in CO reductions greater than the sum of the individual reductions. Several vehicles had emissions below 10 g/mi at 20 °F.

While this test program did not represent the full range of temperature and driving conditions with which manufacturers must be concerned, it served to demonstrate that large reductions in cold temperature CO emissions are reasonably available on large engines using existing technology. The feasibility of large engines complying with the proposed standards is further supported by test data on the Ford 300 CID LDT engine with MPI. Four of these vehicles were tested as part of our test program and generated average 20 °F CO emissions of 8 g/mi at low mileage, without modification. While this Ford engine is a six-cylinder engine, it is virtually the same size as most of the 8-cylinder engines on the market and so provides some indication of the potential performance of similar large block engines. While it may not be reasonable to expect that every engine can be reduced to less than 10.0 g/mi with the simple modifications used by EPA, a level of 10.0 g/mi for even large 8-cylinder engines appears achievable.

The Agency's analysis also indicates that, for a given fuel system type and engine size, light trucks have cold CO emissions comparable to those of passenger cars. However, the LDV standard is only applicable for 50,000 miles, while the useful life of LDTs is set at 120,000 miles. Assuming that cold temperature deterioration is linear to 120,000 miles, EPA has calculated that a 50,000 mile standard of 10.0 g/mi is equivalent to a 120,000 mile level of 12.6 g/mi.

In addition to useful life considerations, the fleet mix also affects the determination of equivalent stringency standards for light trucks. The difficulty in controlling cold temperature CO emission performance appears to be closely related to the size of the engine. As discussed earlier, smaller engines are easier to control than the larger engines.¹⁵ Thus, applying

¹⁵ One manufacturer has pointed out that vehicle weight also affects cold CO emissions. While EPA agrees weight can have some impact on cold CO emissions, vehicle weight and engine size are closely related for most of the vehicle fleet. This makes it difficult to separate the effects of each parameter on cold CO emissions. Regressions run on the available cold temperature data indicate engine size is a significantly better predictor of cold

the same technology to each, we expect small displacement engines to exhibit better cold temperature CO performance than larger engines. Trucks less than 3,750 loaded vehicle weight (LDT1) are typically equipped with four-cylinder and small six-cylinder engines. In comparison to the LDV class, which includes vehicles of comparable weight but some large displacement as well as small displacement engines, the LDT1 class of vehicles should be capable of slightly better low mileage emission CO performance than the average LDV. Therefore, EPA believes that the LDT1 vehicles should be able to meet a 120,000 mile standard of 12.0 g/mi at 20 °F.

The LDT2 class, on the whole, is comprised of vehicles designed to handle larger loads than passenger cars and small trucks. To accomplish the handling of these larger loads, LDT2s generally are heavier and have higher ratios of engine speed to vehicle speed, larger frontal areas, worse aerodynamics, and larger engines. These factors result in inherently higher emission levels. Therefore, the Agency believes that a 120,000 standard of 15.0 g/mi is appropriate for LDT2s to avoid compromising the load handling capability of these vehicles or requiring the use of new technology. This approach (i.e., higher standards for LDT2s) is similar to recent rulemaking promulgated by both EPA (e.g., NOx standards for LDTs, March 15, 1985, 50 FR 10606) and the California ARB.

F. Optional Averaging Program

EPA requests comments on whether manufacturers should be permitted to demonstrate compliance with the cold CO standards through emissions averaging, trading and/or banking. Averaging allows some engine families to emit at levels above the standard, as long as other engine families produced by the manufacturer can offset these higher emissions by emitting at levels below the standard. Trading, an extension of the averaging concept, allows different manufacturers to average their emissions with one another. Banking, also an extension of the averaging concept, allows manufacturers to produce emission credits and save them for future use within an averaging or trading program. These programs allow manufacturers to optimize emission control systems and

CO emissions than vehicle weight. Thus, the Agency has used engine size, rather than vehicle weight, in conjunction with fuel system type to conduct its analyses.

reduce costs while maintaining the same degree of emissions reduction.

EPA is aware that its authority to permit mobile source averaging, trading and banking has been an issue in the ongoing Congressional effort to amend the CAA (see S. 1630 as passed by the Senate on April 3, 1990 and by the House on May 23, 1990, and accompanying reports). Provided that EPA retains this authority, EPA will issue a supplemental notice proposing such programs before finalizing this rule.

EPA solicits specific comment on the appropriate structure of any such programs and on what restrictions should be established. (The Agency expects that any program would likely be modeled after the light-duty vehicle particulate averaging program.)

G. Lead Time/Technology

1. Emission Control System Redesign

The amount of lead time needed to comply with the proposed requirements in this NPRM would vary by engine family. One of the most effective methods of reducing CO emissions is to improve the fuel enrichment calibrations during cold starts at cold temperatures. While this requires some development time and cost, it does not require any hardware changes and should have no adverse effect on the durability of the emission control system. Therefore, lead time is necessary only for calibration development, which the Agency estimates to be 6 to 9 months.

Manufacturers generally finalize their engine calibrations for each model year (MY) approximately 6 to 9 months prior to production, or roughly January 1 of the preceding calendar year. For example, calibrations for the 1993 MY will be generally finalized by January 1, 1992, or a little less than one year after the anticipated date of publication of the final rule. Therefore, the 1993 MY provides sufficient lead time only for vehicles which will be able to comply simply with recalibration.

The Agency has estimated that up to 50 percent of the 1993 and later MY LDV fleet will require more extensive modifications, such as conversion to MPI or provision of additional air to the catalyst for oxidation during cold starts.¹⁶ (This percentage may go down as manufacturers adopt more extensive use of these technologies in response to other pressures such as future more stringent hydrocarbon standards or higher fuel economy standards.) These systems are in common use now and by

the mid 1990s all major manufacturers should have had experience with such systems and, thus, require minimal lead time to design any modifications. However, there will be some lead time necessary for retooling and/or purchase of system components to expand use of such systems to other parts of a manufacturer's product line. Therefore, vehicles that require conversion to MPI or the addition of air pumps or aspirators may require an additional one to two years of lead time (i.e., 1994 or 1995 MY). Further, vehicles with existing air pumps may need to have their calibration strategies modified to provide additional air at cold temperatures. While this does not involve any hardware changes and should take less than a year for design modification, the addition of supplemental air can cause excessive catalyst temperatures and deterioration if improperly done. To mitigate any such problems, the Agency believes that manufacturers should be allowed an additional year to investigate the effect of the additional air on catalyst durability. EPA estimates that up to 50 percent of the 1993 and later MY LDV fleet may require these more extensive modifications, most of which could be accomplished by the 1994 MY with the remainder reasonably in place by the 1995 MY.

The results of EPA's testing program indicate that large 8-cylinder engines may have additional problems complying with the proposed standards, due, at least in part, to the larger amount of metal which needs to be heated and the higher exhaust mass flow during warmup. These vehicles, which comprise roughly 12 percent of the LDV fleet, may require an additional one to two years of development and evaluation of cold CO control strategies to comply with the standards (i.e., 1994 or 1995 MY).

The proposed LDT1 cold CO standard was chosen to be comparable in stringency to the LDV standard. These vehicles are similar in weight and use similar technology to LDVs. In addition, the LDT1 contains a much smaller number of large, 8-cylinder engines. Therefore, EPA believes that LDT1s should follow the same phase-in schedule as LDVs.

LDT2s are heavier and use larger engines, on average, than LDVs or LDT1s. However, this difference was taken into account for the proposed LDT2 cold CO standards. The numerically higher standard will allow many designs in the LDT2 class to comply with minimal hardware changes,

as well as making it feasible for others to comply with less lead time.

2. Facility Lead Time

Based upon comments supplied by manufacturers and estimates supplied by contractors, EPA has estimated that construction of a new 20 °F emission testing cell will take from one to two years. As the final rule on cold CO is expected to be promulgated at least one year prior to finalization of engine calibrations for the 1993 MY, cold temperature facility availability is expected to be a concern only for the 1993 MY.

Some cold temperature testing capacity already exists in the industry. At least three European, five Japanese, and one domestic manufacturer have existing facilities for 20 °F emission testing. In addition, one more domestic manufacturer has the capability of testing down to 35 °F and at least two domestic independent labs offer 20 °F testing on a contract basis. Given that only 40 percent of the manufacturers' fleet must comply in 1993, coupled with the exemption for small-volume manufacturers, EPA does not believe that facility lead time should have any impact on the feasibility of the proposed phase-in schedule. EPA also expects that prudent manufacturers will seek to assure adequate test capacity prior to promulgation of final rules, including initiating additional facility construction or arranging for contracted cold CO testing as the manufacturer deems appropriate.

H. Phase-In

A manufacturer may exempt up to 60 percent of its production or 10,000 units, whichever is greater, in model year 1993. The percentage exemption decreases gradually until 1995 when all vehicles must comply. Given the lead time constraints discussed above, this three year phase-in of cold temperature CO emission standards should provide ample time for manufacturers to apply technology in an orderly fashion across their product lines. The phase-in schedule is slightly less aggressive than might be indicated by the overall lead time needed by the industry to allow for variations in fleet mix between manufacturers (i.e., some manufacturers' fleets may have a higher proportion of harder-to-control engines than the industry average on which the phase-in schedule is based).

The current Clean Air Act has been interpreted to require four years of lead time for trucks over 6,000 pound GVWR. Therefore, standards for these vehicles would not take effect until the 1995 MY

¹⁶ Ref. chapter II in regulatory support document. The phase-in schedule for this proposed rule is slightly less aggressive than might be indicated by the overall lead time needed by industry.

when sufficient lead time will allow 100 percent of these vehicles to comply. However, the same technological constraints apply to these larger trucks as to the smaller trucks and LDVs. Without the current Clean Air Act's four-year lead time mandate, trucks with greater than 6,000 pounds GVWR should be able to follow the same phase-in schedule as the other trucks and LDVs. Should the Clean Air Act be amended to remove this mandated four-year lead time, trucks with over 6,000 pounds GVWR are proposed to be included with other trucks and meet the same phase-in schedule.

EPA believes this phase-in approach for compliance will yield greater air quality improvements more quickly and at lower cost than the traditional approach of implementing the requirements no sooner than the first year in which all vehicles could be made to comply. Because the necessary lead times for different vehicle types vary, this phase-in approach should be particularly useful for a manufacturer with a diverse product line, since it can plan an orderly approach to full compliance.

I. High-Altitude

Several high-altitude areas, including Denver, CO; Provo, UT; and Reno, NV, experience significant violations of the CO NAAQS. The combined effect of cold temperatures and high-altitude appears to be affecting CO violations in these areas.

CO emissions are strongly influenced by the amount of air available for fuel combustion. At high-altitude, the air is less dense than at low-altitude. Without compensation, a low-altitude vehicle driven in a high-altitude area will use the same amount of fuel but will have less oxygen delivered to the engine. With the resulting increase in the fuel/air ratio, the fuel will combust less completely, resulting in increased CO emissions. While most current technology vehicles are now equipped with oxygen sensors which measure the amount of oxygen in the exhaust stream and can compensate at least in part for air oxygen content, these systems are unable to function until the vehicle is warm. Therefore, CO emissions during vehicle warm-up can substantially increase at high-altitude.

EPA has regulations in place which require all LDVs to meet emission standards under both low- and high-altitude conditions. As a result of this "all-altitude" requirement, essentially all LDVs have devices installed which automatically compensate for changes in barometric pressure and altitude.

In a limited test program conducted by the Coordinating Research Council (CRC), vehicles with automatic altitude compensation had average cold temperature emissions at high-altitude that were 30-40 percent lower than at low-altitude.¹⁷ This indicates that altitude compensation devices function effectively at all temperatures.

Therefore, EPA is proposing that the existing regulations requiring all LDVs to meet the emission standards at all altitudes be extended to cold temperature CO requirements.

LDTs currently come under less rigorous provisions. LDTs must meet separate and less stringent high-altitude emission standards. However, automatic high-altitude compensation similar to current LDV requirements are included in the President's proposed CAA amendments of 1989. Therefore, at this time, EPA anticipates that LDTs will be required to meet the same emission standards at high- and low-altitude when tested under the current FTP at warm temperatures.

EPA is proposing to make the high-altitude LDT cold CO emission standards consistent with the anticipated warm temperature high-altitude provisions in the President's proposed CAA amendments. Thus, LDTs would be required to comply with the same numeric cold temperature CO standards at both high- and low-altitudes.

J. Enforcement

EPA's current manufacturer compliance program relies on three complementary elements: Preproduction certification, selective enforcement auditing (SEA) conducted at the end of the assembly line, and in-use enforcement. Each of these serves unique functions and together they offer a strong program capable of assuring adequate manufacturer compliance with emission requirements. In developing these cold temperature CO regulations, EPA considered whether modifications to the basic approach to enforcement were warranted. Specifically, EPA considered the level of oversight appropriate for monitoring the manufacturer's decisions and the level and timing of enforcement action necessary to assure compliance.

As mentioned earlier, the major industry associations recommended a specific, voluntary compliance proposal. As described in section III.D., the

MVMA/AIA proposal relied entirely on the voluntary commitment of manufacturers to comply with certain emission performance targets at low mileage. Under that proposal, EPA would have no enforcement authority should it determine that a manufacturer was not meeting its performance commitment.

The primary advantages of voluntary enforcement are potentially lower costs for cold temperature testing and compliance demonstration and perhaps increased flexibility for the manufacturer in demonstrating compliance. The disadvantages, as discussed in detail in section IV.D., are the risk of all manufacturers not making good-faith efforts to comply and the lack of assembly line and in-use enforcement.

The Agency believes that these are significant risks which could result in substantial reductions in the effectiveness of the standards. Also, as outlined in chapter VI of the regulatory support document, the costs of mandatory enforcement programs, on a per vehicle basis, are estimated to be only \$0.02 per vehicle. For these reasons, EPA believes a regulatory approach is appropriate.

1. Preproduction Certification Options

The current preproduction certification program requires the manufacturer to conduct emission tests on all of its certification test vehicles and supply this data to EPA. EPA then has the option to perform confirmatory tests on any or all of the manufacturer's test vehicles. Typically, EPA performs such confirmatory tests on less than half of the manufacturers' certification test vehicles. This confirmatory testing is conducted at EPA's laboratory test facility. EPA's experience has shown that this level of testing has been effective in enforcing proper testing by manufacturers.

For this proposal, EPA considered two certification testing options. The first would require each manufacturer to test the emission data vehicle from each engine family which is determined to be the worst case for cold CO compliance, with EPA retaining the right to test for confirmation any emission or fuel economy data vehicle. The second would be patterned after the current program's requirements, as described above.

The first option would reduce the testing and lead time burden on the manufacturer. Since CO is the only pollutant of concern at cold temperature, EPA does not believe it is necessary for manufacturers to test as many vehicles

¹⁷ Coordinating Research Council, "Preliminary Report on Winter CO Emissions Using Gasoline/Oxygenated Blends," Presentation for the 4th Annual Mobile Sources/Clean Air Conference, Sept. 12, 1988.

as at 68 °F–86 °F, where CO, hydrocarbon and NO_x emissions are all of concern. Testing of one emission data vehicle per engine family at 20 °F should provide sufficient mandatory data to determine compliance with the cold CO standards.

To ensure that the manufacturers have done a credible job of evaluating their vehicles, the Agency would reserve the right to perform confirmatory testing of any emission (or fuel economy) vehicle at its own facility at 20 °F. (A description of how this would work was presented in section II.B.5., above.) EPA is expanding its cold testing facilities and will have sufficient capacity to test at 20 °F some of every manufacturer's product line every model year, and all of any manufacturer's emission vehicles should the need be demonstrated. This option, combined with extensive test capacity, would give EPA the flexibility to increase or decrease its level of confirmatory testing as manufacturer compliance rates warrant.

The advantages of this option are that it would ensure that all manufacturers design their vehicles to meet the cold CO standard while minimizing the manufacturers' cost of compliance testing. Manufacturers would have some flexibility to determine that their vehicles meet the standard by means they believe appropriate, while EPA's ability to approve alternative demonstration and confirm the emission compliance data vehicles by 20 °F testing would ensure that manufacturers were using appropriate methods.

The second option would test vehicles at cold temperatures using the same procedures used for 68 °F–86 °F compliance demonstrations. In this case manufacturers would be required to test each emission and fuel economy vehicle under 20 °F test conditions to demonstrate that it meets the cold temperature CO standard prior to submitting the vehicle for possible confirmatory testing by EPA. The advantage of this approach would be that it requires the manufacturers to demonstrate compliance on more vehicles per engine family to ensure they have been designed to pass the 20 °F CO standard. As in the case of the existing program, the availability of manufacturer data may reduce the need for the Agency to test all of the vehicles, possibly reducing testing costs to the government. The disadvantage is increased manufacturer costs due to potentially substantial increases in the number of 20 °F tests and increased cold temperature test capacity and facility lead time burden to accommodate the increased number of tests.

EPA is recommending an enforcement program which combines SEA and in-use enforcement with a 20 °F confirmatory test program for certification.¹⁸ This combination of enforcement program elements provides significant risk to the manufacturer who has an inadequately designed vehicle. The Agency believes that the incremental control benefits of requiring the manufacturer to test all of its data vehicles at 20 °F do not outweigh the industry cost and lead time disadvantages. Therefore, this full testing option is not being proposed as EPA's primary option. However, EPA requests comments on the incremental costs and benefits of requiring manufacturers to test all certification and fuel economy vehicles at 20 °F prior to submitting these vehicles for potential confirmatory testing. If indicated by the comments or EPA's further analysis, EPA may adopt in the final rule a requirement that the manufacturer test each emission vehicle at 20 °F and, as a separate decision, the requirement that the manufacturer test each fuel economy vehicle at 20 °F.

2. High-Altitude Enforcement

Section 207(c)(1) of the Clean Air Act, 42 U.S.C. 7641 (c)(1), clearly gives EPA the authority to conduct in-use enforcement testing on high-altitude vehicles. Previous rulemaking packages have documented the Agency's policy of foregoing SEA testing at high-altitude locations (e.g., 48 FR 7395, February 18, 1989). The Agency is proposing similar high-altitude provisions for cold temperature CO emissions, i.e., vehicles will be subject to in-use enforcement at high-altitude at 20 °F but exempt from SEA testing at high-altitude locations.

The Agency is also proposing to extend the high-altitude certification procedures first established in 46 FR 23053, April 23, 1981, to 20 °F high-altitude certification. Consistent with the proposed certification procedures in this rule, EPA would also specifically reserve the right to perform a confirmatory test, prior to granting certification, of any data vehicle at high-altitude at either 20 °F or standard FTP temperatures.

K. Safety

This rule has been fully coordinated with the Department of Transportation's National Highway Traffic Safety Administration (DOT) (NHTSA). They had no comments related to vehicle

safety. EPA believes that there are no adverse safety impacts.

L. Test Procedure Issues

CO emissions at cold temperatures have not been regulated in the past. Therefore, the Agency has never established official test procedures for cold temperature testing. At the cold CO workshop held by EPA in March 1988, the manufacturers emphasized the need for cold test procedures that would ensure repeatable test results and correlation between different test facilities. The Agency concurred with this need and began developing such test procedures soon after the workshop.

The proposed test procedures are modeled after the current, FTP,¹⁹ with changes made as required to conduct testing at colder ambient temperatures and to better represent cold temperature vehicle operation. In December 1988, a draft of EPA's cold temperature test procedures was circulated throughout industry and to other interested parties to obtain comments. These comments have been reviewed and incorporated into the proposed procedure. A summary and analysis of these comments are contained in chapter IV of the regulatory support document.

A number of proposed changes to the standard FTP were made in response to the comments received, in addition to those changes made initially. The following is an outline of these proposed changes for the three major areas of the test:

1. Vehicle Prep

- A requirement that the fuel be at the nominal test temperature before the start of the prep cycle was added.
- The fuel type was changed to be representative of regular unleaded gasoline available in the winter months.
- The requirement that tire pressure be measured at the nominal test temperature was deleted.

¹⁹ The FTP is a test procedure that collects emissions under transient driving conditions, including acceleration, deceleration, stop and go, and constant speed driving modes. The FTP also includes "loaded" conditions where the test vehicle is subjected to simulated operation loads that represent proper test vehicle weight, aerodynamic drag, and other frictional forces. The FTP exhaust test cycle begins after the test vehicle has been "soaked" (i.e., placed in the controlled ambient environment of an enclosed room with all vehicle power systems turned off for twelve hours minimum) to ensure that all vehicle systems start the test at the same baseline temperature. The actual test starts with one cold start driving cycle followed by one hot transient driving cycle, and finishes with one hot start driving cycle. Emissions are collected from each cycle in a separate enclosed collection medium known as an emission bag. FTP emissions are based on a weighted average of emissions from all three emission bags.

¹⁸ Note that EPA is also considering enforcement options at other temperatures. See section IV. C. of this preamble.

d. The 10 percent extra loading requirement for vehicles with air conditioning was deleted.

e. The allowance of heater and defroster usage during the emissions test (in any combination) was added.

f. The specification that the test cell temperature be measured at the intake of the fixed speed cooling fan was added.

g. The temperature ranges and tolerances were modified.

2. Vehicle Soak

a. An alternative method was specified for cooling the vehicle to the nominal test temperature before the test which included a forced-cooldown.

b. Temperature tolerances were modified for the standard soak procedure.

3. Emissions Test

a. The fuel fill and heat build prior to the emissions test were deleted.

b. The time between the dynamometer warm-up and the start of the emissions test was shortened.

c. A requirement was added that, if a vehicle stabilized at 20 °F was brought through a warm area prior to the emissions test, the vehicle must be restabilized at 20 °F in the test cell prior to the start of the test.

d. The requirement that tire pressure be measured at the nominal test temperature was deleted.

e. The 10 percent extra loading requirement for vehicles with air conditioning was deleted.

f. The allowance of heater and defroster usage during the emissions test (in any combination) was added.

g. The specification that the test cell temperature be measured at the intake of the fixed speed cooling fan was added.

h. The temperature ranges and tolerances were modified.

i. Humidity limits were deleted.

j. The requirement to couple the rolls on twin-roll dynamometers was added.

The test conditions specified in the proposed regulations pertain to a nominal 20 °F test. For tests conducted at other test temperatures (see section IV.C.), EPA is proposing to adopt similar temperature tolerances around the alternative nominal test temperature.

EPA is soliciting additional comments and information on several cold temperature test procedures issues. These are:

(1) *Dynamometer warmup.* The NPRM specifies a 5-10 minute period between the dynamometer warmup and the beginning of the test as appropriate to ensure the dynamometer remains warm, but limited data indicates that warming

the dynamometer before the test may not have a significant effect on dynamometer frictional horsepower, which in turn may not significantly effect vehicle emissions.²⁰ Comments are solicited on the need for dynamometer warmup.

(2) *Fuel temperature.* The NPRM proposes that the fuel in the vehicle must be at the nominal test temperature ± 10 °F before the start of the prep to account for the potential effect of fuel property changes with temperature. Comments are solicited as to whether the benefits of stringent fuel temperature specifications justify the likely higher costs.

(3) *Fuel Specifications.* EPA is concerned about the effect fuel properties such as RVP may have on cold temperature CO emission test results. Therefore, the Agency is proposing that vehicles be capable of complying with the cold temperature standard when tested using fuel determined by the Administrator to be reasonably representative of regular unleaded gasoline without oxygenates sold during winter months, as characterized by nationwide fuel surveys such as those conducted by the Motor Vehicle Manufacturers Association and the National Institute for Petroleum and Energy Research. To facilitate confirmatory testing, EPA will specify a specific reference fuel which will be used for a period of time. Prior to each model year, the Administrator will specify the fuel survey which will determine the fuel used for confirmatory testing and will also specify the ranges of acceptable fuel properties. These specifications would be used for all subsequent compliance testing for that model year, including SEA and in-use compliance testing. An alternative approach for specifying the fuel would be to specify, when this proposed rulemaking is published as a final rule, the survey and a method of determining the range of acceptable fuel values from the yearly surveys. While the Agency would prefer to specify the fuel survey and resulting fuel properties each year, comments are requested about the feasibility of each approach.

Commenters supporting the alternative approach are also encouraged to submit recommendations about the best fuel survey.

EPA recognizes that using a different fuel for cold temperature testing than for warm temperature testing will likely place some extra burden on both manufacturers and EPA. Also, some

information available to EPA²¹ suggests that the fuel used for standard FTP testing may result in a representative evaluation of cold CO emission performance. The Agency would consider using the fuel specified for standard FTP testing if conclusive information were submitted demonstrating that the use of the standard FTP fuel did not affect cold temperature CO emissions.

As noted in Section IV.C., above, EPA is considering options for assuring emission reductions at temperatures between the nominal 20 °F and 75 °F test conditions. The appropriate test fuel across this range of test temperatures is an issue. If EPA adopts a winter specification test fuel for 20 °F testing, EPA is proposing this fuel be used for all emission tests conducted at test temperatures up to 50 °F. For 50 °F and higher test temperatures, the standard FTP test fuel would be used. EPA requests comment on the appropriateness of limiting winter grade test fuel to this discrete temperature range.

(4) *Road Load Power.* As part of the standard FTP, the dynamometer is adjusted to simulate the road load power requirements of the test vehicle. This road load power is normally determined by evaluating a vehicle's design using a road coastdown procedure conducted at warm temperatures.²² Of concern is the potential unrepresentativeness of a base road load power value for simulating cold ambient emission tests conducted at test temperatures up to 50 °F. Using the current guidance for determining dynamometer power adjustment (OMS Advisory Circular Number 55C), EPA estimates the impact of the greater air density alone to result in a decrease in the target coastdown time of approximately 5 percent compared to the value used for setting the dynamometer power absorber at the standard FTP temperature conditions of 68 °F to 86 °F. An appropriate cold temperature dynamometer load adjustment could be determined by

²¹ "The Influence of Ambient Temperature on Tailpipe Emissions from Late Model Light-Duty Gasoline Motor Vehicles," ORD Journal Article, September 1987.

Also, "Emissions and Vehicle Performance with Lower RVP Fuel," Dennis McClement, American Petroleum Institute, Jan. 27, 1988.

Also, "The Influence of Ambient Temperature on Tailpipe Emissions from 1985-1987 Model Year Light-Duty Gasoline Motor Vehicles—Part II," ORD Journal Article, September 1988.

²² EPA Office of Mobile Sources Advisory Circular Number 55C, "Determination and Use of Alternative Dynamometer Power Absorber Setting," December 12, 1986.

²⁰ Memo from C. Don Paulsell, EPA, to John German, "Dynamometer Warmup Procedure," October 17, 1989.

coasting a vehicle down on the road under cold temperature conditions (i.e., approximately 20 °F). However, EPA recognizes the difficulty in conducting repeatable coastdown tests at such a cold temperature and expects that such testing would be quite expensive. As an alternative, EPA is considering using a standardized adjustment factor, such as a 10 percent decrease in target coastdown time, to compensate for the effect of colder ambient conditions on vehicle power requirements. EPA requests comments on the basic issue of the effects of colder ambient conditions on road load power requirements and the need to compensate for those effects when measuring cold temperature CO performance. Additionally, should such compensation be deemed appropriate, EPA requests comments on which method is best to use: Cold ambient vehicle coastdown or a temperature correction factor such as 10 percent subtracted from the warm ambient coastdown time.

(5) *Engine Compartment Cooling.* During standard FTP testing, a single speed fan is directed at the engine compartment and the hood is raised to prevent over temperature operation and to promote engine cooling more representative of in-use operations. EPA is proposing to continue this practice for the cold temperature test procedure. However, some commenters to our draft recommended cold temperature test procedure asked that the Agency consider the alternative of using a variable speed fan and conducting the test with the hood down, which they believed was more representative of actual in-use operation. The Agency requests comments on these alternatives and may choose to adopt them in the final rule if it concludes that such revisions to the test procedure are administratively and technically appropriate.

(6) *Temperature Tolerances.* As included in the draft regulations accompanying this notice, EPA is proposing to adopt the same test temperature tolerances for the vehicle prep phase of the cold temperature FTP as required during the actual exhaust emission test. However, EPA would consider relaxing the temperature tolerances during vehicle prep if, in doing so, the cost of the total test sequence would be appreciably less and if the Agency can determine that no adverse impact on emission test measurement is likely to result. Comments on this issue are requested.

EPA is also considering additional dynamometer or cold room specifications to reduce test variability

and improve lab correlation. These specifications would include requiring the use of a rigid horizontal force to restrain the vehicle and coupled dynamometer rolls if a dual roll dynamometer is used. Additional information on these issues can be found in chapter IV of the regulatory support document. The Agency solicits comments on the relative benefits of these laboratory procedural changes and the desirability of implementing them.

V. Environmental Benefits

A. In-Use CO Reductions

The Agency believes that these standards should reduce CO emissions from mobile sources an additional 20–29 percent at 20 °F compared to the expected benefits of the existing FMVCP. The expected additional benefit at 40 °F is estimated to be 17–23 percent. These reductions, averaged over the nationwide distribution of VMT by temperature, can amount to annual reductions of 2.6–3.1 million tons by the year 2000 and 5.8–7.7 million tons after complete fleet turnover.

These emissions reductions are expected to result in improved air quality. An analysis of the ambient CO concentrations for the 12 cities modeled using area specific air quality modeling inputs showed an 11–18 percent reduction in expected second-highest 8-hour ambient CO concentrations in 2010. These are significant reductions that have the potential to bring additional areas into attainment by offsetting the increase in VMT.

B. Greenhouse Gas Reductions

The cold temperature CO emission reduction would also have an overall beneficial effect on greenhouse gases. Fuel economy reduction due to decreases in cold start fuel consumption and conversion to MPI are expected to yield corresponding reductions in carbon dioxide (CO₂) emissions. Partially offsetting these reductions is an increase in CO₂ due to increased oxidation of CO. (CO₂ is the end product in the oxidation of CO.) While the overall reduction in CO₂ emissions is not large, the rule is expected to have a directionally beneficial effect on CO₂ emissions.

This rule is also expected to have a significant impact on overall motor vehicle CO emissions. CO has been shown to have a negative impact on the decomposition of methane, another greenhouse gas. Thus, decreases in CO emissions should benefit methane decomposition. While the effect on global warming of decreased CO

emissions is expected to be relatively small, it may not be insignificant. EPA requests comment on the magnitude and importance of this potential benefit from this proposed regulation.

C. Effect on Hydrocarbon Emissions

The reductions in fuel enrichment and increased oxidation during cold starts will also cause substantial reductions in exhaust hydrocarbon (HC) emissions at cold temperatures. However, most of these reductions will occur at temperatures below those where ozone exceedances typically occur. EPA has not quantified the exhaust HC reductions associated with this rule because of the less understood benefit of reducing HC emissions at colder temperatures. However, the rule will have a beneficial effect on ozone.

This rule is not anticipated to have any effect on evaporative HC emission.

D. Effect on Emissions of Oxides of Nitrogen (NO_x)

This proposed rule is primarily directed at reducing CO emissions during cold starts at cold temperatures, when fuel mixtures are rich and engines are cold. NO_x emissions are primarily formed under conditions of high combustion temperature and/or lean air/fuel ratios. (While this action should reduce cold start fuel enrichment, it will not eliminate it.) Therefore, this rule is not expected to have any significant effect on NO_x emissions.

E. Effect on Vehicle Deterioration

This proposed rule is not anticipated to significantly affect the operation of the vehicle after it reaches normal operating temperatures. Therefore, any effect on the deterioration of the emission control system would be caused only by changes in cold start calibration strategies or by changes in hardware prompted by the standards.

The potential does exist for higher catalyst temperatures due to increased air injection during cold start fuel enrichment. If air injection calibrations are improperly determined, the reaction of the extra oxygen injected in the exhaust with the excess unburned fuel could cause temperatures high enough to permanently damage the catalyst. However, there are several factors which should prevent damage to the catalyst due to high exhaust temperature. The cold CO reduction strategies used to comply with this rule will cause reductions in fuel enrichment during cold starts, reducing the amount of fuel available to be burned in the catalyst during the first few minutes after cold startup. Also, recent

improvements in catalyst formation have made catalysts more resistant to thermal degradation.²³ Based on EPA's testing, manufacturers may adopt strategies with earlier use of supplemental air without risk of catalyst overheating. Should a manufacturer desire a "fail-safe" mechanism to cover unusual driving modes, an available option would be to install catalyst temperature sensors in catalysts to divert air injection, should the catalyst begin to approach potentially damaging temperatures. While EPA does not envision that such sensors will be required to meet the standards for any vehicle, the technology is readily available and may be simpler to use than assessing catalyst temperatures under every possible scenario of ambient temperature and driving conditions. Finally, in many cases, manufacturers can opt to avoid the use of additional air injection by converting carbureted or TBI vehicles to MPI.

F. Effect on 68 °F-86 °F Emissions

This proposed rule is likely to have little effect on 68 °F-86 °F emissions. What effect it does have is expected to be favorable, due to conversion of some vehicles to MPI and possible benefits, on some vehicles, due to generally improved adaptive memory and feedback control strategies (such as use of heated oxygen sensors).

VI. Economic Impacts

Cost estimates are broken down into five separate costs: Development costs, which include design work, development testing costs, and calibration costs; emission control hardware costs; compliance demonstration costs; test facility costs; and annual costs, which include certification testing and reporting costs, testing of recalibrated engine families, and testing of in-use and assembly line vehicles. Costs are presented both in terms of manufacturer costs and the cost to the consumer, or retail price equivalent (RPE).

The enforcement options chosen are assumed to have no impact on hardware or development costs. Cost estimates for compliance demonstration and cold temperature test facilities are presented separately for the proposed program of certification confirmations and the option of full certification testing. A complete analysis of these costs can be found in chapter VI of the regulatory support document.

A. Variable Cost of Emission Control Hardware

EPA analyzed the 20 °F CO emission performance of current technology vehicles and has assessed the impact of cold start fuel and air injection recalibration strategies on cold start CO emissions. These analyses indicate that 65-70 percent of the LDV fleet should be able to comply with the proposed rule with recalibration of existing hardware, assuming that all vehicles use heated oxygen sensors. Approximately 15 percent of the LDV fleet could require the addition of pulse air injection. The remainder of the LDV fleet, approximately 15-20 percent, would likely require the addition of air pumps or MPI (but not both) to achieve the standards. EPA believes that MPI offers many advantages in terms of reduced fuel consumption, better driveability and performance, and improved vehicle deterioration that would make it more desirable than using air pumps. However, MPI is significantly more costly to the manufacturer than air pumps. Since EPA cannot confidently predict which option manufacturers are more likely to pursue, hardware costs (and fuel economy benefits) have been calculated for two different scenarios. Scenario I assumes that air pumps are used wherever possible. Scenario II assumes that vehicles convert to MPI where needed. The total estimated hardware costs under each scenario, amortized over the entire fleet, are:

MANUFACTURER VARIABLE COSTS

	Scenario I	Scenario II
LDV.....	\$9.98	\$15.68
LDT1.....	9.13	36.26
LDT2.....	31.95	43.03

Another possible cost could be catalyst temperature sensors. As discussed in section V.A.5., above, EPA does not anticipate that such sensors would be required to meet the standard. However, some manufacturers could elect to include them on some large engines with air pumps as insurance against catalyst deterioration under all possible in-use driving conditions. Assuming that 25 percent of large engines (about 2-3 percent of the fleet) use catalyst temperature sensors, the incremental costs, amortized over the entire fleet, are estimated to be \$0.36 per LDV and \$1.34 per LDT2 (LDT1s are not projected to include large 8-cylinder engines.)

B. One-Time Fixed Costs

1. Development Costs

Since the proposed standards are not expected to require any new technology, it is reasonable to expect that there would be little or no need for technology research. It is expected that some vehicles will have to be redesigned to incorporate more advanced fuel control systems, air injection, or a combination of the two. Associated with any new design would be vehicle testing to prove the mechanical integrity and emission durability of the redesigned system. It is also expected that all engine families would undergo partial recalibration of the engine control systems. Grouping these costs together and amortizing them at 10 percent annual interest over an assumed 5-year engine family life results in an estimated cost to the manufacturer for development of:

	Scenario I	Scenario II
LDV.....	\$0.66	\$0.56
LDT1.....	1.65	1.20
LDT2.....	0.29	0.24

2. Test Facility Costs

These are the costs for construction and/or expansion of cold temperature test facilities. Some manufacturers already have test facilities capable of conducting the proposed cold temperature test procedures. The additional facility costs for each enforcement option, amortized over 10 years, are estimated to be:

Option	Manufacturer test facility costs per vehicle
Base program.....	\$0.46
Option with full certification testing.....	0.65

The facility costs are higher for the optional full-testing program because this option would require more test and vehicle soak capacity for conducting more extensive certification testing.

3. Compliance Demonstration Costs to Manufacturers

The estimated costs for compliance demonstration with the proposed standards (i.e., initial certification testing and durability vehicle mileage accumulation) are:

	Scenario I	Scenario II
LDV.....	\$0.06	\$0.07
LDT1.....	0.33	0.38

²³ N. Miyoshi, S. Matsumoto, M. Ozawa, M. Kimura, Toyota, "Development of Thermal Resistant Three-Way Catalysts," SAE 891970, September, 1989.

	Scenario I	Scenario II
LDT2.....	0.14	0.16

C. Annual Fixed Costs

These costs include annual certification testing and reporting, testing of recalibrated engine families and SEA testing. Only the costs for certification testing and reporting will vary by enforcement option with the option for full certification testing requiring more extensive testing and reporting and, consequently, higher costs.

Grouping these costs together and amortizing them over the fleet results in the cost estimates shown below:

Option	Manufacturer annual fixed costs		
	LDV	LDT1	LDT2
Base program.....	\$0.13	\$0.16	\$0.08
Option with full certification testing.....	0.27	0.35	0.16

Option	Total manufacturer costs LDV	
	Scenario I	Scenario II
Base program.....	\$11.29	\$17.90
Option with full certification testing.....	11.62	18.23

Option	LDT1	
	Scenario I	Scenario II
Base program.....	\$11.73	\$38.46
Option with full certification testing.....	12.11	38.84

Option	LDT2	
	Scenario I	Scenario II
Base program.....	\$32.92	\$43.97
Option with full certification testing.....	33.19	44.24

D. Retail Price Equivalent

The retail price equivalent (RPE) is the estimated retail price increase that will be charged to purchasers of new motor vehicles. Details on how RPE is calculated can be found in chapter VI of the RSD. The estimated RPE increases due to the proposed rule are:

	RPE per vehicle (proposed program)	
	Scenario I	Scenario II
LDV.....	\$15.06	\$22.86
LDT1.....	15.62	47.88
LDT2.....	41.93	55.68
Overall ²⁴	18.74	31.49

²⁴ LDV, LDT1, and LDT2 costs weighted by their respective projected yearly sales volumes of 10.304 million, 2.538 million, and 1.975 million, as determined in Chapter VI of the regulatory support document.

E. Operating Costs

Any impact of the proposed rule on I/M programs and consumer maintenance cost is likely to be minor. Some changes, such as conversion to MPI or use of heated oxygen sensors, may reduce maintenance costs while others, such as the addition of air injection, may increase maintenance costs, leaving the net result ambiguous. However, consumers can expect to realize a fuel economy benefit from the proposed rule.

Overall discounted nationwide fuel consumption savings for LDVs of \$14.15 per vehicle were calculated for Scenario I (air pump strategies) and \$27.56 for Scenario II (MPI strategies). Similar calculations for LDT1s yielded discounted lifetime fuel savings of \$12.69 and \$82.45 per vehicle under Scenarios I and II, respectively. LDT2s would achieve discounted lifetime fuel savings of \$57.41 and \$78.54 per vehicle under Scenarios I and II, respectively. The methodology used to calculate these fuel consumption reductions is contained in chapter VI of the RSD.

The estimated total cost increases of the proposed rule to consumers, including fuel economy benefits, are:

	Total Cost to Consumer (RPE—fuel economy benefit)	
	Scenario I	Scenario II
LDV.....	\$0.91	—\$4.70
LDT1.....	2.93	—34.57
LDT2.....	15.48	—23.08
Overall ²⁵	0.93	—12.27

²⁵ Ibid.

F. Cost to the Government

EPA will need to improve its cold test facilities as a result of this rule. Amortizing the estimated \$1.5 million to upgrade the Agency's cold testing facilities over 10 years at 10 percent interest yields an annual facility cost increase of about \$245,000. Additional costs would also be incurred to conduct certification confirmation, SEA, and in-use enforcement testing and to review

certificates of conformity and oversee the in-use enforcement programs. The total increase in EPA expenses are estimated to be no more than about \$880,000 per year, or about \$0.06 per vehicle.

VII. Cost-Effectiveness

A. Cost per Ton CO Emission Reduced Without Fuel Economy Benefit

The costs per ton of CO emissions reduced, without considering the fuel economy benefit, are shown below. The low and high figures are based on the different strategies that may be adopted by the manufacturers to comply with the proposed rule. For example, improvements in closed-loop fuel control would lead to proportionately lower CO emissions over a wide range of vehicle conditions and operation. Such strategies would yield relatively higher emissions reduction benefits and relatively lower costs per ton. A strategy emphasizing reductions in cold-start fuel enrichment, for example, would produce lower overall in-use CO emissions benefits. Additional information on cost effectiveness may be found in the regulatory support document, chapter VII.

Fleet	High	Low
Manufacturer Cost per ton:		
Scenario I.....	\$102.52	\$73.83
Scenario II.....	179.14	129.02
RPE Costs per ton:		
Scenario I.....	134.82	97.10
Scenario II.....	226.55	163.16

B. Cost per Ton CO Emissions Reduced With Fuel Economy Benefit

When the fuel economy benefit is taken into account, the net consumer cost per ton CO reduced would be:

Fleet	High	Low
Net Consumer Cost:		
Scenario I.....	\$4.82	\$6.69
Scenario II.....	63.56	88.27

VIII. Public Participation

A. Comments and the Public Docket

EPA welcomes comments on any aspect of this proposed rulemaking. Commenters are especially encouraged to provide suggestions for modification of any aspects of the proposal that they find objectionable. All comments should be directed to the Air Docket, Docket No. A-89-01 (see "Addresses" above). Commenters desiring to submit proprietary information for

consideration should clearly distinguish such information from other comments to the greatest possible extent and label it as "Confidential Business Information." Submissions containing such proprietary information should be sent directly to the contact person listed above, and not to the public docket, to ensure that proprietary information is not inadvertently placed in the docket. If a commenter wants EPA to base the final rule in part on a submission labeled as confidential business information, then a nonconfidential version of the document which summarizes the key data or information should be placed in the public docket. Information covered by a claim of confidentiality will be disclosed by EPA only to the extent allowed and by the procedures set forth in 40 CFR part 2. If no claim of confidentiality accompanies the submission when it is received by EPA, it may be made available to the public without further notice to the commenter.

B. Public Hearing

Any person desiring to present testimony regarding this proposal at the public hearing (see "DATES") should, if possible, notify the contact person listed above of such intent at least seven days prior to the opening day of the hearing. The contact person should also be given an estimate of the time required for the presentation of the testimony and notification of any need for audio/visual equipment. Testimony will be scheduled on a first come, first serve basis. A sign-up sheet also will be available at the registration table the morning of the hearing for scheduling testimony.

EPA suggests that approximately 50 copies of the statement or material to be presented be brought to the hearing for distribution to the audience. In addition, EPA would find it helpful to receive an advance copy of any statement or material to be presented at the hearing at least one week before the scheduled hearing date, in order to give EPA staff adequate time to review such material before the hearing. Such advance copies should be submitted to the contact person listed above.

The official records of the hearing will be kept open for 30 days following the hearing to allow submission of rebuttal and supplementary testimony. All such submittals should be directed to the Air Docket, Docket No. A-89-01 (see "ADDRESSES").

Mr. Richard D. Wilson, Director of the Office of Mobile Sources, is hereby designated Presiding Officer of the hearing. The hearing will be conducted informally, and technical rules of evidence will not apply. A written

transcript of the hearing will be placed in the above docket for review. Anyone desiring to purchase a copy of the transcript should make individual arrangements with the court reporter recording the proceeding.

C. Administrative Designation and Regulatory Analysis

Under the Executive Order 12291, EPA must judge whether a regulation is "major" and, therefore subject to the requirement that a Regulatory Impact Analysis (RIA) be prepared. Since EPA has determined that this regulation is not major, an RIA has not been prepared.

This regulation was submitted to the Office of Management and Budget (OMB) for review as required by Executive Order 12291. Any written comments from OMB and any EPA response to those comments are in the public docket for this rulemaking.

D. Reporting and Recordkeeping Requirements

All of the information collection requirements contained in this proposed rule have been approved by the OMB under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, and have been assigned OMB Control Number 2060-0104. The information collection provisions relating to the measurement and reporting of cold temperature emissions have been submitted for approval to OMB. Comments on these requirements should be submitted to the Office of Information and Regulatory Affairs of OMB marked Attention: Desk Officer for EPA. The final rulemaking package will respond to any OMB or public comments.

E. Impact on Small Entities

The Regulatory Flexibility Act of 1980 requires federal agencies to identify potentially adverse impacts of federal regulations upon small entities. In instances where significant impacts are possible on a substantial number of these entities, agencies are required to perform a Regulatory Flexibility Analysis (RFA). EPA has determined that the regulations proposed today will not have a significant impact on a substantial number of small entities. This regulation will affect only manufacturers of motor vehicles and motor vehicle engines, a group which does not contain a substantial number of small entities. Further, small motor vehicle manufacturers typically purchase emission control components developed by larger organizations. As explained earlier in this notice, technology is available to meet the proposed standards, so small

manufacturers should not be adversely affected. Further, since all manufacturers are permitted to exempt a minimum of 10,000 units until the 1995 MY, the smaller manufacturers will have adequate lead time to employ available technology.

Therefore, as required under section 605 of the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.* I certify that this regulation does not have a significant impact on a substantial number of small entities.

IX. Authority

Legal Authority

The promulgation of these standards is authorized by section 202(a) of the Clean Air Act, 42 U.S.C. 7521 (a), which directs the Administrator to prescribe and revise standards applicable to any class or classes of new vehicles or engines which in his judgment cause air pollution and may reasonably be expected to endanger the public health. Revision of the existing standards is needed because CO emissions from vehicles continue to contribute to the unacceptable CO air quality, and the exceedance of NAAQS level for CO in many urban areas. The Agency has previously reduced CO levels, as required by CAA section 202(b)(1), to 90 percent of the emissions allowable in model year 1970 when the emissions are determined under existing test procedures in a temperature range of 68 °F-86 °F, 40 CFR 86.081-8. The present proposal under CAA section 202(a) would further reduce CO emissions, as determined at a temperature of 20 °F, to provide added protection with respect to the public health concerns posed by CO emissions.

Under CAA 202(a)(2), any regulations under section 202(a)(1) is to take effect after such period as the Administrator finds "necessary to permit the development and application of the requisite technology giving appropriate consideration to the cost of compliance within such period." That section calls for a determination that the technology needed for compliance will be available when the standard takes effect. In *Natural Resources Defense Council (NRDC) v. U.S.*, 655 F.2d 318 (D.C. Cir.), cert. denied 454 U.S. 1017 (1981) the court found that the legislative history indicates that Congress intended the Agency to project future advances in pollution control capability, and it was "expected to press for the development and application of improved technology rather than be limited by that which exists." 655 F.2d at 328, citing S. Rep. No. 91-1196 91 Cong., 2d Sess. 24 (1970) reprinted in Legislative History 424. The

Agency must be able to provide a reasoned basis for believing that its projection is reliable, and it must provide a "reasonable basis for belief that a new technology will be available and economically achievable." 655 F.2d at 328, and 331. The time period for compliance that would be established by the regulation has been established in light of the factors relevant under paragraph (b), as discussed elsewhere in this proposal.

List of Subjects in 40 CFR Part 86

Administrative practice and procedure, Air pollution control, Gasoline, Motor vehicles, Motor vehicle pollution, Reporting and recordkeeping requirements.

Dated: September 11, 1990.

William K. Reilly,
Administrator.

For the reasons set out in the preamble, part 86 of title 40 of the Code of Federal Regulations is proposed to be amended as follows:

PART 86—CONTROL OF AIR POLLUTION FROM NEW MOTOR VEHICLES AND NEW MOTOR VEHICLE ENGINES: CERTIFICATION AND TEST PROCEDURES

1. The authority citation for part 86 continues to read as follows:

Authority: Secs. 202, 203, 206, 207, 208, 215, 301(a), Clean Air Act, as amended (42 U.S.C. 7521, 7522, 7524, 7525, 7541, 7542, 7549, 7550, and 7601(a)), unless otherwise noted.

2. A new section 86.093-8 is added to read as follows:

§ 86.093-8 Emission standards for 1993 model year light-duty vehicles.

(a) to (i) [Reserved]

(j)(1) For gasoline-fueled light-duty vehicles, cold temperature carbon monoxide exhaust emissions shall not exceed 10.0 grams per vehicle mile as measured and calculated under the provisions set forth in subpart C; this standard applies at both low and high altitude.

(2) A manufacturer may elect, by entire engine families, to exempt vehicles from the standard in paragraph (j)(1) of this section. The total number of vehicles exempted from the standards in paragraph (j)(1) and § 86.093-9 (h)(1) shall not exceed the greater of:

(i) 60% of the manufacturers combined production of light-duty vehicles and light-duty trucks with a gross vehicle weight rating of less than 6,001 lbs., or

(ii) 9,999 units

3. A new § 86.093-9 is added to read as follows:

§ 86.093-9 Emission standards for 1993 model year light-duty trucks.

(a) to (g) [Reserved]

(h)(1)(i) Cold temperature CO emissions measured and calculated in accordance with subpart C shall not exceed:

(A) For gasoline-fueled light-duty trucks with a loaded vehicle weight of 3,750 lbs. and less, 12.0 grams per vehicle mile.

(B) For gasoline-fueled light-duty trucks with a loaded vehicle weight greater than 3,750 lbs., 15.0 grams per vehicle mile.

(ii) The standards in paragraph (h)(1)(i) of this section apply at both low and high altitude.

(2) A manufacturer may elect, by entire engine families, to exempt vehicles from the standard in paragraph (h)(1) of this section. The total number of vehicles exempted from the standards in paragraph (h)(1) and in § 86.093-8 (j)(1) shall not exceed the greater of:

(i) 60% of the manufacturers combined production of light-duty vehicles and light-duty trucks with a gross vehicle weight rating of less than 6,001 lbs., or

(ii) 9,999 units

(3) Vehicles with a gross vehicle weight rating greater than 6,000 lbs. are exempt from the standards in paragraph (j)(1) of this section.

4. A new § 86.093-16 is added to read as follows:

§ 86.093-16 Emission performance, intermediate temperature conditions.

(a) For the specific combination of vehicle startup temperature between 25 °F and 68 °F and FTP operating modes, vehicles shall not have CO emissions levels greater than the levels determined by a linear interpolation of the cold CO standard at 25 °F and the CO standard applicable at 68 °F. The temperature used for calculating the interpolated CO comparison value will be the vehicle bulk oil temperature at the start of the test.

5. A new § 86.093-21 is added to read as follows:

§ 86.093-21 Application for certification.

(a) to (f) [Reserved]

(g) The manufacturer shall identify those families which will be exempt from compliance with cold temperature carbon monoxide standards.

6. A new § 86.093-24 is added to read as follows:

§ 86.093-24 Test vehicles and engines.

(a) [Reserved]

(b)(1)(i) to (b)(1)(x) [Reserved]

(xi) For cold temperature CO exhaust emission compliance for each engine family, the Administrator will select for

testing the vehicle expected to emit the highest emissions from the vehicles selected in accordance with § 86.093-24 (b)(1) (i), (ii), (iii), and (iv) of this section. This vehicle shall be tested by the manufacturer in accordance with the test procedures in subpart C or with alternative procedures requested by the manufacturer and approved in advance by the Administrator.

7. A new § 86.093-35 is added to read as follows:

§ 86.093-35 Labeling.

(a)(1)(i) to (a)(1)(iii)(H) [Reserved]

(I) If applicable, a statement that the vehicle is exempt from cold temperature carbon monoxide standards.

(a)(2)(i) to (a)(2)(iii)(K) [Reserved]

(L) If applicable, a statement that the vehicle is exempt from cold temperature carbon monoxide standards.

(a)(3) to (g) [Reserved]

8. A new § 86.094-8 is added to read as follows:

§ 86.094-8 Emission standards for 1994 model year light-duty vehicles.

(a) to (i) [Reserved]

(j)(1) For gasoline-fueled light-duty vehicles, cold temperature carbon monoxide exhaust emissions shall not exceed 10.0 grams per vehicle mile as measured and calculated under the provisions set forth in subpart C; this standard applies at both low and high altitude.

(2) A manufacturer may elect, by entire engine families, to exempt vehicles from the standard in paragraph (j)(1) of this section. The total number of vehicles exempted from the standards in paragraph (j)(1) and in § 86.094-9 (h)(1) shall not exceed the greater of:

(i) 20% of the manufacturers combined production of light-duty vehicles and light-duty trucks with a gross vehicle weight rating of less than 6,001 lbs., or

(ii) 9,999 units.

9. A new § 86.094-9 is added to read as follows:

§ 86.094-9 Emission standards for 1994 model year light-duty trucks.

(a) to (g) [Reserved]

(h)(1)(i) Cold temperature CO emissions measured and calculated in accordance with subpart C shall not exceed:

(A) For gasoline-fueled light-duty trucks with a loaded vehicle weight of 3,750 lbs. and less, 12.0 grams per vehicle mile.

(B) For gasoline-fueled light-duty trucks with a loaded vehicle weight greater than 3,750 lbs., 15.0 grams per vehicle mile.

(ii) The standards in paragraph (h)(1)(i) of this section apply at both low and high altitude.

(2) A manufacturer may elect, by entire engine families, to exempt vehicles from the standard in paragraph (h)(1) of this section. The total number of vehicles exempted from the standards in paragraph (h)(1) and in § 86.094-8 (j)(1) shall not exceed the greater of:

(i) 20% of the manufacturers combined production of light-duty vehicles and light-duty trucks with a gross vehicle weight rating of less than 6001 lbs., or

(ii) 9,999 units.

(3) Vehicles with a gross vehicle weight rating greater than 6,000 lbs are exempt from the standards in paragraph (h)(1) of this section.

10. A new § 86.095-8 is added to read as follows:

§ 86.095-8 Emission standards for 1995 and later model year light-duty vehicles.

(a) to (i) [Reserved]

(j)(1) For gasoline-fueled light-duty vehicles, cold temperature carbon monoxide exhaust emissions shall not exceed 10.0 grams per vehicle mile as measured and calculated under the provisions set forth in subpart C; this standard applies at both low and high altitude.

(2) [Reserved]

11. A new § 86.095-9 is added to read as follows:

§ 86.095-9 Emission standards for 1995 and later model year light-duty trucks.

(a) to (g) [Reserved]

(h)(1)(i) Cold temperature CO emissions measured and calculated in accordance with subpart C shall not exceed:

(A) For gasoline fueled light-duty trucks with a loaded vehicle weight of 3,750 lbs. and less, 12.0 grams per vehicle mile.

(B) For gasoline-fueled light-duty trucks with a loaded vehicle weight greater than 3,750 lbs. 15.0 grams per vehicle mile.

(ii) The standards in paragraph (h)(1)(k) of this section apply at both low and high altitude.

(2) [Reserved]

(3) [Reserved]

12. A new subpart C is added to read as follows:

Subpart C—Emission Regulations for 1993 and later model year new light-duty vehicles and new light duty trucks; cold temperature test procedures.

Sec.

86.201 General applicability.

86.202 Definitions.

86.203 Abbreviations.

86.204 Section numbering; construction.

Sec.

86.205 Introduction; structure of subpart.

86.206-93 Equipment required; overview.

86.207 [Reserved]

86.208-93 Dynamometer.

86.209-93 Exhaust gas sampling system; gasoline-fueled vehicles.

86.210 [Reserved]

86.211-93 Exhaust gas analytical system.

86.212 [Reserved]

86.213-93 Fuel specifications.

86.214-93 Analytical gases.

86.215-93 EPA urban dynamometer driving schedule.

86.216-93 Calibrations, frequency and overview.

86.217-93 [Reserved]

86.218-93 Dynamometer calibration.

86.219-93 CVS calibration.

86.220-93 [Reserved]

86.221-93 Hydrocarbon analyzer calibration.

86.222-93 Carbon monoxide analyzer calibration.

86.223 [Reserved]

86.224-93 Carbon dioxide analyzer calibration.

86.225 [Reserved]

86.226-93 Calibration of other equipment.

86.227-93 Test Procedures; overview.

86.228-93 Transmissions.

86.229-93 Road load power, test weight and inertia weight class determination.

86.230-93 Test Sequence; general requirements.

86.231-93 Vehicle Preparation.

86.232-93 Vehicle Preconditioning.

86.233 [Reserved]

86.234 [Reserved]

86.235-93 Dynamometer procedure.

86.236-93 Engine starting and restarting.

86.237-93 Dynamometer test run, gaseous emissions.

86.238 [Reserved]

86.239 [Reserved]

86.240-93 Exhaust sample analysis.

86.241 [Reserved]

86.242-93 Records required.

86.243-93 [Reserved]

86.244-93 Calculations; exhaust emissions.

86.245 [Reserved]

Subpart C—Emission Regulations for 1993 and Later Model Year New Light-Duty Vehicles and New Light Duty Trucks; Cold Temperature Test Procedures.

§ 86.201 General applicability.

(a) The provisions of this subpart are applicable to 1993 and later model year new gasoline-fueled light-duty vehicles and light-duty trucks at a nominal test temperature of 20 °F.

(b) Provisions of this subpart apply to 20 °F temperature tests performed by both the Administrator and motor vehicle manufacturers for tests required under subpart A of 40 CFR part 86.

§ 86.202 Definitions.

The definitions in subpart A apply to this subpart.

§ 86.203 Abbreviations.

The abbreviations in subpart A apply to this subpart.

§ 86.204 Section numbering; construction.

The model year of initial applicability is indicated by the section number. The two digits following the hyphen designate the first model year for which a section is effective. A section remains effective until superseded.

Example. Section 86.211-93 applies to the 1993 and subsequent model years until superseded. If a § 86.211-96 is promulgated it would take effect beginning with the 1996 model year; § 86.211-93 would apply to model years 1993 through 1995.

§ 86.205 Introduction; structure of subpart.

(a) This subpart describes the equipment required and the procedures to follow in order to perform gaseous exhaust emission tests on light-duty vehicles and light-duty trucks. Subpart A sets forth testing requirements and test intervals necessary to comply with EPA certification procedures.

(b) Three topics are addressed in this subpart. Sections 86.206 through 86.215 set forth specifications and equipment requirements; §§ 86.216 through 86.226 discuss calibration methods and frequency; test procedures and data requirements are listed (in approximate order of performance) in §§ 86.227 through 86.245.

§ 86.206-93 Equipment required; overview.

(a) This subpart contains procedures for exhaust emissions tests on gasoline-fueled light-duty vehicles and light-duty trucks. Equipment required and specifications are as follows:

(1) *Exhaust emission tests.* Exhaust from gasoline-fueled vehicles is tested for gaseous emissions, using the Constant Volume Sampler (CVS) concept (§ 86.209). Equipment necessary and specifications appear in §§ 86.208 through 86.214.

(2) *Fuel, analytical gas, and driving schedule specifications.* Fuel specifications for exhaust emissions testing and for mileage accumulation for gasoline-fueled vehicles are specified in § 86.213. Analytical gases are specified in § 86.214. The EPA Urban Dynamometer Driving Schedule (UDDS) for use in gasoline-fueled emissions tests is specified in § 86.215 and appendix I.

§ 86.207 [Reserved]

§ 86.208-93 Dynamometer.

(a) The dynamometer shall have a power absorption unit for simulation of

road labor power and flywheels or other means of simulating the inertia weight as specified in § 86.229.

(b) The dynamometer shall have a roll or shaft revolution counter or other means for determination of distance driven.

(c) The dynamometer shall utilize twin rollers that are 20.0 inches in diameter with a nominal spacing of 24 inches. Roll speeds shall be synchronized by use of a mechanical coupling device. Dynamometers with other roll specifications may be used if the total simulated road load horsepower can be shown to be equivalent, and if approved in advance by the Administrator.

§ 86.209-93 Exhaust gas sampling system; gasoline-fueled vehicles.

The provisions of § 86.109 apply to this subpart, except that paragraph (c)(4) of § 86.109 has been modified to the following:

The piping configuration, flow capacity of the CVS, and the temperature and specific humidity of the dilution air (may be different than the vehicle combustion air source) shall be controlled to virtually eliminate water condensation in the system. (300 to 350 cfm (0.142 to 0.165 m³/s) is sufficient for most vehicles.)

§ 86.210 [Reserved]

§ 86.211-93 Exhaust gas analytical system.

The provisions of § 86.111 apply to this subpart except that measurement of NO_x is optional.

§ 86.212 [Reserved]

§ 86.213-93 Fuel specifications.

The test fuel used shall be representative of regular-grade winter-time commercial unleaded fuel without oxygenates. The Administrator will specify the range of acceptable fuel properties for each model year prior to certification. Such specifications will be based upon nationwide survey(s) of winter-time fuel properties, as determined by the Administrator.

§ 86.214-93 Analytical gases.

The provisions of § 86.114 apply to this subpart.

§ 86.215-93 EPA urban dynamometer driving schedule.

The provisions of § 86.115 apply to this subpart.

§ 86.216-93 Calibrations, frequency and overview.

The provisions of § 86.116 apply to this subpart.

§ 86.217-93 [Reserved]

§ 86.218-93 Dynamometer calibration.

The provisions of § 86.118 apply to this subpart.

§ 86.219-93 CVS calibration.

The provisions of § 86.119 apply to this subpart.

§ 86.220-93 [Reserved]

§ 86.221-93 Hydrocarbon analyzer calibration.

The provisions of § 86.121 apply to this subpart.

§ 86.222-93 Carbon monoxide analyzer calibration.

The provisions of § 86.122 apply to this subpart.

§ 86.223 [Reserved]

§ 86.224-93 Carbon dioxide analyzer calibration.

The provisions of § 86.124 apply to this subpart.

§ 86.225 [Reserved]

§ 86.226-93 Calibration of other equipment.

The provisions of § 86.126 apply to this subpart.

§ 86.227-93 Test procedures; overview.

The provisions of § 86.127 paragraphs (a), (b), and (e) apply to this subpart.

§ 86.228-93 Transmissions.

The provisions of § 86.128 apply to this subpart.

§ 86.229-93 Road load power, test weight and inertia weight class determination.

The provisions of § 86.129 apply to this subpart, except that dynamometer settings shall not be increased to simulate the effects of air conditioning.

§ 86.230-93 Test sequence; general requirements.

The test sequence in figure C93-1 shows the steps encountered as the test vehicle undergoes the procedures subsequently described, to determine conformity with the standards set forth. Ambient temperature levels encountered by the test vehicle shall average 20 °F ± 5 °F and shall not be less than 10 °F (-14 °C) nor more than 30 °F (-1 °C). The ambient temperature reported shall be a simple average of the test cell temperatures measured at constant intervals no more than one minute apart. In addition, the temperature may not exceed 25 °F or fall below 15 °F for more than three consecutive minutes. The test cell temperatures monitored during testing must be measured at the intake of the fixed speed cooling fan (§ 86.235(b)).

The vehicle shall be approximately level during all phases of the test sequence to prevent abnormal fuel distribution.

§ 86.231-93 Vehicle preparation.

The provisions of § 86.131 apply to this subpart.

§ 86.232-93 Vehicle preconditioning.

(a) The vehicle shall be moved to the test area and the following operations performed:

(1) The fuel tank(s) shall be filled to approximately the prescribed "tank fuel volume" with the specified test fuel § 86.213. If the existing fuel in the fuel tank(s) does not meet the specifications contained in § 86.213, the existing fuel must be drained prior to the fuel fill. The test fuel shall be at a temperature less than or equal to 60 °F. For the above operations the evaporative emission control system shall neither be abnormally purged nor abnormally loaded.

(2) The drive wheel tires shall be inflated up to a gauge pressure of 45 psi for a vehicle stabilized at ambient temperatures corresponding to the standard FTP temperatures of 88 °F to 86 °F. Alternatively, the drive wheel tires may be inflated to a gauge pressure of 40 psi if the vehicle has stabilized at ambient temperatures corresponding to the cold CO test temperature of 20 °F. The drive wheel tire pressures shall be reported with the test results.

(3) The fuel in the vehicle shall be stabilized at 20 °F ± 10 °F prior to the start of the driving cycle.

(4) The vehicle shall be placed, either by being driven or pushed, on a dynamometer and operated through one Urban Dynamometer Driving Schedule test procedure; see § 86.115 and appendix I. A test vehicle may not be used to set dynamometer horsepower.

(5) Before the driving cycle may begin, the test cell temperature shall be 20 °F ± 3 °F, as measured at the intake of the fixed speed cooling fan.

(6) During operation of the vehicle through the driving cycle, ambient temperature levels encountered by the test vehicle shall average 20 °F ± 5 °F and shall not be less than 10 °F (-14 °C) nor more than 30 °F (-1 °C). The ambient temperature reported shall be a simple average of the test cell temperatures measured at constant intervals no more than one minute apart. In addition, the temperature may not exceed 25 °F or fall below 15 °F for more than three consecutive minutes. The test cell temperatures monitored during testing must be measured at the intake of the fixed speed cooling fan (§ 86.235(b)).

(7) During operation of the vehicle through the driving schedule, the heater and defroster may be used at any temperature and fan settings.

(8) For those unusual circumstances where additional preconditioning is desired by the manufacturer, such preconditioning may be allowed with the advance approval of the Administrator.

(9) The Administrator may also choose to conduct additional preconditioning. The additional preconditioning shall consist of one or more driving cycles of the UDDS, as described in paragraph (a)(4) of this section.

(b) Within five minutes of completion of preconditioning, the vehicle shall be shut off. During this five minute period, the vehicle shall not experience ambient temperatures less than 10 °F nor more than 30 °F.

(c) One of the following two methods shall be utilized to stabilize the vehicle before the emissions test:

(1) The vehicle shall be stored for not less than 12 hours not for more than 36 hours prior to the cold start exhaust test. The ambient temperature (dry bulb) during this period shall be maintained at an average temperature of 20 °F ± 5 °F during each hour of this period and shall not be less than 10 °F nor more than 30 °F. The ambient temperature reported shall be a simple average of the test cell temperature measured at constant intervals no more than one minute apart. In addition, the temperature may not exceed 25 °F or fall below 15 °F for more than three consecutive minutes.

(2)(i) The vehicle shall be stored for no more than 36 hours prior to the cold start exhaust test. The vehicle shall not be stored at ambient temperatures which exceed 86 °F during this period.

(ii) Vehicle cooling may be accomplished by either force-cooling or force-warming the vehicle to the test temperature. If cooling is augmented by fans, the fans shall be placed in a vertical position for maximum drive train and engine cooling, not primarily oil pan cooling. Fans shall not be placed under the vehicle.

(iii) The ambient temperature need only be stringently controlled after the vehicle has been cooled to 20 °F ± 3 °F, as determined by a representative bulk oil temperature. A representative bulk oil temperature is the temperature of the oil measured near the middle of the oil, not at the surface or at the bottom of the oil pan. If two or more diverse locations in the oil are monitored, they must all meet the temperature requirements.

(iv) The vehicle must be stored for at least one hour after it has been cooled to 20 °F ± 3 °F prior to the cold start

exhaust test. The ambient temperature (dry bulb) during this period shall average 20 °F ± 5 °F and shall not be less than 10 °F nor more than 30 °F. In addition, the temperature may not exceed 25 °F or fall below 15 °F for more than three consecutive minutes.

(d) If the vehicle is stabilized at 20 °F in a separate area and is moved through a warm area to the test cell, the vehicle must be restabilized in the test cell for at least six times the period the vehicle is exposed to warmer temperatures. The ambient temperature (dry bulb) during this period shall average 20 °F ± 5 °F and shall not be less than 10 °F nor more than 30 °F. In addition, the temperature may not exceed 25 °F or fall below 15 °F for more than three consecutive minutes. The maximum time for moving a vehicle through a warm area shall be 10 minutes.

§ 86.233 [Reserved]

§ 86.234 [Reserved]

§ 86.235-93 Dynamometer procedure.

(a) Overview—The emission sampling is completed over two test sequences, a "cold" start test after a minimum 12-hour and a maximum 36-hour soak according to the provisions of § 86.232 and a "hot" start test following the "cold" start test by 10 minutes. Engine startup, operation over the UDDS and engine shut-down make a complete cold start test. Engine startup and operation over the first 505 seconds of the driving schedule complete the hot start test. The exhaust emissions are diluted with ambient air and a continuously proportional sample is collected for analysis during each phase. The composite samples collected in bags are analyzed for hydrocarbon, carbon monoxide, carbon dioxide, and, optionally, oxides of nitrogen. A parallel sample of the dilution air is similarly analyzed for hydrocarbon, carbon monoxide, and, optionally, oxides of nitrogen.

(b) During dynamometer operation, a fixed speed cooling fan shall be positioned so as to direct cooling air to the vehicle in an appropriate manner with the engine compartment cover open. In the case of vehicles with front engine compartments, the fan shall be squarely positioned within 12 inches (30.5 centimeters) of the vehicle. In the case of vehicles with rear engine compartments (or if special designs make the normal front engine positioning impractical), the cooling fan shall be placed in a position to provide sufficient air to maintain vehicle cooling. The fan capacity shall normally not exceed 5,300 cfm (2.50 cubic meters per second). If, however, the manufacturer showed (as provided in § 86.135(b)) that

additional cooling is necessary, the fan capacity may be increased or additional fans used if approved in advance by the Administrator.

(c) The vehicle speed as measured from the coupled dynamometer rolls shall be used.

(d) As long as an emission sample is not taken, practice runs over the prescribed driving schedule may be performed at test point for the purpose of finding the minimum throttle action to maintain the proper speed-time relationship or to permit sampling system adjustment.

(e) Humidity should be set low enough to prevent condensation on the dynamometer rolls.

(f) The dynamometer shall be warmed as recommended by the dynamometer manufacturer, and using procedures or control methods that assure stability of the residual frictional horsepower.

(g) The time between dynamometer warming and the start of the emissions test shall be no longer than 10 minutes if the dynamometer bearings are not independently heated. If the dynamometer bearings are independently heated, the emissions test shall begin no longer than 20 minutes after dynamometer warming.

(h) If the dynamometer horsepower must be adjusted manually, it shall be set within one hour prior to the exhaust emissions test phase. The test vehicle shall not be used to make the adjustment. Dynamometer using automatic control of preselectable power settings may be set anytime prior to the beginning of the emissions test.

(i) Before the driving cycle may begin, the test cell temperature shall be 20 °F ± 3 °F, as measured at the intake of the fixed speed cooling fan.

(j) During operation of the vehicle through the driving schedule, the heater and defroster may be used at any temperature and fan setting.

(k) The driving distance, as measured by counting the number of dynamometer roll or shaft revolutions, shall be determined for the transient cold start, stabilized cold start, and transient hot start phases of the test. The revolutions shall be measured on the same roll or shaft used for measuring the vehicle's speed.

(l) Four-wheel drive vehicles will be tested in a two-wheel drive mode of operation. Full time four-wheel drive vehicles will have one set of drive wheels temporarily disengaged by the vehicle manufacturer. Four-wheel drive vehicles which can be manually shifted to a two-wheel drive mode will be tested in the normal on-highway two-wheel drive mode of operation.

§ 86.236-93 Engine starting and restarting.

The provisions of § 86.136 apply to this subpart.

§ 86.237-93 Dynamometer test run, gaseous emissions.

(a) General—The complete dynamometer test consists of a cold start drive of 7.5 miles (12.1 kilometers) and simulates a hot start drive of 7.5 miles (12.1 kilometers). The vehicle is allowed to stand on the dynamometer during the ten minute time period between the cold and hot start test. The cold start test is divided into two periods. The first period, representing the cold start "transient" phase, terminates at the end of the deceleration which is scheduled to occur at 505 seconds of the driving schedule. The second period, representing the "stabilized" phase, consists of the remainder of the driving schedule, including engine shutdown. The hot start test, similarly, consists of two periods. The first period, representing the hot start "transient" phase, terminates at the same point in driving schedule as the first period of the cold start test. The second period of the hot start test, "stabilized" phase, is assumed to be identical to the second period of the cold start test. Therefore, the hot start test terminates after the first period (505 seconds) is run.

(b) The provisions of § 86.137 paragraph (b) apply to this subpart.

§ 86.238 [Reserved]**§ 86.239 [Reserved]****§ 86.240-93 Exhaust sample analysis.**

The provisions of Section 86.140 apply to this subpart.

§ 86.241 [Reserved]**§ 86.242-93 Records required.**

The provisions of § 86.142 apply to this subpart.

§ 86.243 [Reserved]**§ 86.244-93 Calculations; exhaust emissions.**

The provisions of § 86.144 apply to this subpart, except that NOx measurements are optional.

§ 86.245 [Reserved]

18. Section 86.608-88 is amended by revising paragraphs (a) introductory text and (a)(1) and adding a new paragraph (a)(3) to read as follows:

§ 86.608-88 Test Procedures.

(a) The prescribed test procedures are contained in subpart B and/or subpart C of this part 86. For purposes of Selective Enforcement Audit testing, the manufacturer shall not perform any of

the test procedures in subpart B of this part relating to evaporative emission testing, except as specified in paragraph (a)(2) of this section.

(1) The Administrator may, on the basis of a written application by a manufacturer, prescribe test procedures other than those in subpart B and/or subpart C of this part for any motor vehicle which he determines is not susceptible to satisfactory testing using the procedures in subpart B and/or subpart C or this part.

(3) The following exceptions to the test procedures in subpart C of this part are applicable to Selective Enforcement Audit testing:

(i) The manufacturer may measure the temperature of the test fuel at other than the approximate mid-volume of the fuel tank, as specified in paragraph (a) of § 86.231, and may drain the test fuel from other than the lowest point of the fuel tank as specified in paragraph (b) of § 86.231, provided an equivalent method is used. Equivalency documentation shall be maintained by the manufacturer and shall be made available to the Administrator upon request.

(ii) In performing exhaust sample analysis under § 86.240, the manufacturer shall exercise care to prevent moisture from condensing in the sample collection bags.

(iii) The manufacturer need not comply with § 86.242 since the records required therein are provided under other provisions of subpart G of this part.

(iv) In addition to the requirements of subpart C of this part, the manufacturer shall prepare gasoline-fueled vehicles as follows prior to exhaust emission testing:

(A) The manufacturer shall inspect the fuel system to ensure the absence of any leaks of liquid or vapor to the atmosphere by applying a pressure of 14.5 ± 0.5 inches of water to the fuel system allowing the pressure to stabilize and isolating the fuel system from the pressure source. Following isolation of the fuel system, pressure must not drop more than 2.0 inches of water in five minutes. If required, the manufacturer shall perform corrective action in accordance with paragraph § 86.608(d) and report this action in accordance with paragraph § 86.609(d).

(B) When performing this pressure check, the manufacturer shall exercise care to neither purge nor load the evaporative emission control system.

(C) The manufacturer shall not modify the test vehicle's evaporative emission control system by component addition, deletion or substitution, except if

approved in advance by the Administrator, to comply with paragraph (a)(3)(i) of this section.

19. Section 86.1008-88 is amended by revising paragraph (a)(3) and adding a new paragraph (a)(6) to read as follows:

§ 86.1008-88 Test procedures.

(a) * * *

(3) For light-duty trucks, the prescribed test procedure is the Federal Test Procedure and described in subparts B, P, and/or C of this part. The manufacturer shall not perform the evaporative emission test procedure contained in subpart B.

(6) When testing light-duty trucks, the following exceptions to the test procedures in subpart C are applicable:

(i) The manufacturer may measure the temperature of the test fuel at other than the approximate mid-volume of the fuel tank as specified in paragraph (a) of § 86.231 and may drain the test fuel from other than the lowest point of the fuel tank as specified in paragraph (b) of § 86.231 provided an equivalent method is used. Equivalency documentation shall be maintained by the manufacturer and shall be made available to the Administrator upon request.

(ii) In performing exhaust sample analysis under § 86.240, the manufacturer shall exercise care to prevent moisture from condensing in the sample collection bags.

(iii) The manufacturer need not comply with § 86.242 since the records required therein are provided under other provisions of subpart K of this part.

(iv) In addition to the requirements of subpart C of this part, the manufacturer shall prepare gasoline-fueled vehicles as follows prior to exhaust emission testing.

(A) The manufacturer shall inspect the fuel system to ensure the absence of any leaks of liquid or vapor to the atmosphere by applying a pressure of 14.5 ± 0.5 inches of water in the fuel system allowing the pressure to stabilize and isolating the fuel system from the pressure sources. Following isolation of the fuel system, pressure must not drop more than 2.0 inches of water in 5 minutes. If required, the manufacturer shall perform corrective action in accordance with paragraph § 86.608(d) and report this action in accordance with paragraph § 86.609(d).

(B) When performing this pressure check, the manufacturer shall exercise care to neither purge nor load the evaporative emission control system.

(C) The manufacturer shall not modify the test vehicle's evaporative emission control system by component addition, deletion or substitution, except if approved in advance by the Administrator to comply with paragraph (a)(6)(i) of this section.

20. Section 86.1009-84 is amended by revising paragraph (c)(1) to read as follows:

§ 86.1009-84 Calculation and reporting of test results.

(c) *Final deteriorated test results.* (1) The final deteriorated test results for each heavy-duty engine or light-duty truck tested according to subpart B, C, D, N, or P of this part are calculated by multiplying the final test results by the appropriate deterioration factor derived from the certification process for the engine family-control system

combination and model year for the selected configuration to which the test engine or vehicle belongs. If the deterioration factor computed during the certification process is less than one that deterioration factor will be assumed to be one.

[FR Doc. 90-21896 Filed 9-14-90; 8:45 am]

BILLING CODE 6560-50-M

Federal Register

**Monday
September 17, 1990**

Part VIII

Department of Commerce

**National Institute of Standards and
Technology**

15 CFR Part 290

**Regional Centers for Transfer of
Manufacturing Technology; Final Rule
and Notice**

DEPARTMENT OF COMMERCE

National Institute of Standards and Technology

15 CFR Part 290

[Docket No. 900109-1068]

RIN 0693-AA62

Regional Centers for the Transfer of Manufacturing Technology

AGENCY: National Institute of Standards and Technology, Commerce.**ACTION:** Final rule.

SUMMARY: On May 1, 1990 the National Institute of Standards and Technology published a notice of proposed rulemaking in the *Federal Register* (55 FR 18124) which provided a description of a program for establishing Regional Centers for the Transfer of Manufacturing Technology in accordance with the Omnibus Trade and Competitiveness Act of 1988. The objective of the Centers is to enhance productivity and technological performance in United States manufacturing through the transfer of manufacturing technology and techniques developed at NIST and the dissemination of scientific, engineering, technical and management information to manufacturing companies. The purpose of that notice was to solicit written comments on the proposed rule for the selection and establishment of the Regional Centers. The purpose of this notice is to provide an analysis of the comments received in response to the proposed rule and sets forth policies and procedures for the program.

EFFECTIVE DATE: September 17, 1990.

FOR FURTHER INFORMATION CONTACT: Dr. Philip Nanzetta, Director, NIST Manufacturing Technology Centers Program, Room B-112, Metrology Building, National Institute of Standards and Technology, Gaithersburg, MD 20899. Telephone: (301) 975-3414. Fax: (301) 963-6556.

SUPPLEMENTARY INFORMATION:**Background**

Pursuant to Public Law 100-418, the National Institute of Standards and Technology (NIST) has developed a program to establish Regional Centers for the Transfer of Manufacturing Technology. The objective of the Centers is to enhance productivity and technological performance in United States manufacturing through the transfer of manufacturing technology and techniques developed at NIST, and through them, to manufacturing companies throughout the United States.

On May 1, 1990, NIST published a notice of proposed rulemaking for the selection and establishment of Regional Centers (55 FR 18124). The purpose of that notice was to solicit public comment on the proposed rule. This notice provides an analysis of the comments received by NIST, an outline of the actions taken by NIST in response to each comment, and the final rule to be incorporated in the Code of Federal Regulations (CFR).

The final rule is to be included in the CFR so that all affected parties shall have a widely-distributed public source of information describing how the Centers Program will operate and outlining the criteria for Center qualification, application, selection, and establishment.

Analysis of Comments on Proposed Rule

NIST received 27 comments from nine colleges and universities, five non-manufacturing enterprises, four manufacturing enterprises, four state agencies, four technology related consortiums, and one professional society.

Of the 27 responses, 11 offered supportive comments about both the program and the proposed rule, with no recommendations for change. One response set forth an issue not related to the program or the rulemaking. The remaining 15 responses collectively provided 33 comments concerning the proposed rule.

Analysis of Comments by Section

Section 290.3—(14 comments). Six of the 14 comments on this section were targeted specifically at wording in the rule which placed emphasis on transferring NIST Automated Manufacturing Research Facility (AMRF) technology as a priority of the Centers program. The comments indicated that the program should directly address the needs of the client manufacturers, that the apparent priority of transferring AMRF technology should be reexamined, that a program focus on transferring primarily AMRF technology could place unnecessary constraints on developing the best possible solutions for the target firms, that most of the legislatively targeted firms require as a first step the application of "best practices" rather than individual implementation of AMRF technology, that small vendors are not in a position to implement the sophisticated technology that is being developed in the AMRF, and that AMRF technology is exceptional in the laboratory. The real needs of the target population of smaller manufacturers are

answered best by proven, off-the-shelf technology. The legislation specifically states that the objective of the Centers is to enhance productivity in United States manufacturing through the transfer of manufacturing technology and techniques developed at NIST. This will become less of an emphasis for the Centers as they increasingly become financially self-sufficient.

Four comments indicated a lack of clarity in the rule's description of the regional character of the Manufacturing Technology Centers Program. A section has been added to the rule to clarify the Centers' anticipated regional impact.

Two additional comments on this section concern the statement that, "A Center should avoid *ad hoc* solutions to individual company's problems, but rather should carry out projects which offer a prospect for generalization to concerns of other companies." The respondents stated that frequently the solution to a given client's problem will have a degree of uniqueness to that client and that the rule, as stated, would restrict Center involvement. Wording in the rule has been clarified to emphasize that while projects should be tailored to a particular company's manufacturing problem, the Center should be mindful of the leveraging aspects of each project it undertakes.

An additional concern (two comments) with this section was that it described only the transfer of hardware and software; respondents argued that Centers should also employ world-class manufacturing technology such as just-in-time production, statistical process control, total quality management, etc. The rule has been revised accordingly.

Comments recommending tighter restriction on the loaning of equipment resulted in the lending provisions being strengthened to the extent permissible under the law. Another comment recommended that the rule include a statement requiring that the Centers explicitly document their activities in order that other organizations may benefit from the lessons learned. NIST recognizes the merit of this comment and appropriate changes have been made to the rule.

The remaining two comments applicable to this section were interpretational in nature and required no changes to the proposed rule.

Section 290.4—(3 comments). One respondent did not understand what is meant by "Host Contribution." A minor revision clarifies the wording. A second respondent suggested that the maximum amount of NIST contribution during the first year should be allowed to exceed 50%, contrary to the governing

legislation. A final respondent expressed concern that funding commitments which predate selection as a Center would not be allowed as the host contribution even if the funds will be used for purposes fully congruent with NIST objectives. This is a misinterpretation of the rule. Existing funding sources, programmed for activities "fully congruent" with the NIST objectives would be considered appropriate as part of the host contribution or match.

Section 290.5—(2 comments). Two respondents ask that the 25 page limit on proposals be increased to 50 pages. Since the rule allows appendices of relevant supplementary attachments and tabular material and in view of the fact that only two respondents expressed this concern, NIST considers the current page limitation of 25 pages plus attachments to be appropriate.

Section 290.6—(4 comments). Four respondents expressed concern over the clarity of the proposed rule as it relates to "geographical location" and "service region." Specific changes have been made to further clarify these phrases.

Section 290.7—(3 comments). One respondent recommended reordering the selection criteria by moving *Technology delivery mechanisms* to the first item based on its relative importance. Since the order does not imply any weighting of the election criteria, no change was made. One respondent recommended that NIST adopt a finer-grained weighting of the selection criteria. NIST believes that a finer-grained statement of the selection criteria would inappropriately constrain the creativity of the proposer. No change was made. A final comment in this section suggests that the 60 day timeframe for proposal preparation is too short. NIST views the 60 days timeframe as an adequate lower limit.

General Interest Comments

A number of comments were made in the general interest of the program without reference to a particular section. An analysis of these comments is provided in the following:

Three respondents recommended an increase and perhaps mandatory involvement of state technology extension services—in particular those included in the Omnibus Trade Act (15 U.S.C. 2781). NIST does not think that this is necessary since all proposals will be judged according to the selection criteria "Technology Delivery Mechanisms" which may involve industry, universities or state governments.

One respondent suggested that the rule discriminates against applicants in

rural and small population states because of the substantial matching fund requirement. NIST, notes, however, that the matching requirement is set by law. The program does provide services to firms in low population states through linkages and direct service from a Center located nearer to a concentration of manufacturing firms.

Effective Date of the Final Rule

This final rule relating to grants, benefits and contracts is exempt under section 553(a)(2) from the delayed effective date requirement of the Administrative Procedure Act (5 U.S.C. 553) and, therefore, is being made effective immediately without a 30-day delay in effective date.

Classification

Executive Order 12291

This document is not a major rule requiring a regulatory impact analysis under Executive Order 12291 because it will not have an annual impact on the economy of \$100 million or more, nor will it result in a major increase in costs or prices for any group, nor have a significant adverse effect on competition, employment, investment, productivity, innovation, or on the ability of U.S.-based enterprises to compete with foreign-based enterprises in domestic or export markets.

Regulatory Flexibility Act

The General Counsel of the Department of Commerce certified to the Chief Counsel for Advocacy of the Small Business Administration at the time this rule was proposed that, if it were adopted as proposed, it would not have a significant economic effect on a substantial number of small entities requiring a flexibility analysis under the Regulatory Flexibility Act. This is because the program is entirely voluntary for the participants that seek funding.

National Environmental Policy Act

This rule will not significantly affect the quality of the human environment. Therefore, an environmental assessment or Environmental Impact Statement is not required to be prepared under the National Environmental Policy Act.

Paperwork Reduction Act

This rule contains a collection of information requirements subject to the Paperwork Reduction Act which have been approved by the Office of Management and Budget under control number 0693-0005 for use through July 31, 1991.

Executive Order 12372

The Regional Technology Centers Program does not involve the mandatory payment of any matching funds from a state or local government, and does not affect directly any state or local government. Accordingly, the Technology Administration has determined that Executive Order 12372 is not applicable to this program.

Executive Order 12612

This rule does not contain policies with Federalism implications sufficient to warrant preparation of a Federalism assessment under Executive Order 12612.

List of Subjects in 15 CFR Part 290

Grant programs, Science and technology, Cooperative agreements.

John W. Lyons,

Director.

For reasons set forth in the preamble, title 15 of the Code of Federal Regulations is amended by adding part 290 to read as follows:

PART 290—REGIONAL CENTERS FOR THE TRANSFER OF MANUFACTURING TECHNOLOGY

Sec.

290.1 Purpose.

290.2 Definitions.

290.3 Program description.

290.4 Terms and schedule of financial assistance.

290.5 Basic proposal qualifications.

290.6 Proposal evaluation and selection criteria.

290.7 Proposal selection process.

290.8 Reviews of centers.

290.9 Intellectual property rights.

Authority: 15 U.S.C. 278k.

§ 290.1 Purpose.

This rule provides policy for a program to establish Regional Centers for the Transfer of Manufacturing Technology as well as the prescribed policies and procedures to insure the fair, equitable and uniform treatment of proposals for assistance. In addition, the rule provides general guidelines for the management of the program by the National Institute of Standards and Technology, as well as criteria for the evaluation of the Centers, throughout the lifecycle of financial assistance to the Centers by the National Institute of Standards and Technology.

§ 290.2 Definitions.

(a) The phrase *advanced manufacturing technology* refers to new technologies which have recently been developed, or are currently under development, for use in product or part

design, fabrication, assembly, quality control, or improving production efficiency.

(b) The term *Center* or *Regional Center* means a NIST-established Regional Center for the Transfer of Manufacturing Technology described under these procedures.

(c) The term *operating award* means a cooperative agreement which provides funding and technical assistance to a Center for purposes set forth in § 290.3 of these procedures.

(d) The term *Director* means the Director of the National Institute of Standards and Technology.

(e) The term *NIST* means the National Institute of Standards and Technology, U.S. Department of Commerce.

(f) The term *Program* or "Centers Program" means the NIST program for establishment of, support for, and cooperative interaction with Regional Centers for the Transfer of Manufacturing Technology.

(g) The term *qualified proposal* means a proposal submitted by a nonprofit organization which meets the basic requirements set forth in § 290.5 of these procedures.

(h) The term *Secretary* means the Secretary of Commerce.

(i) The term *target firm* means those firms best able to absorb advanced manufacturing technologies and techniques, especially those developed at NIST, and which are already well prepared in an operational, management and financial sense to improve the levels of technology they employ.

§ 290.3 Program description.

(a) The Secretary, acting through the Director, shall provide technical and financial assistance for the creation and support of Regional Centers for the Transfer of Manufacturing Technology. Each Center shall be affiliated with a U.S.-based nonprofit institution or organization which has submitted a qualified proposal for a Center Operating Award under these procedures. Support may be provided for a period not to exceed six years. The Centers work with industry, universities, nonprofit economic development organizations and state governments to transfer advanced manufacturing technologies, processes, and methods as defined in § 290.2 to small and medium sized firms. These technology transfer efforts focus on the continuous and incremental improvement of the target firms. The advanced manufacturing technology which is the focus of the Centers is the subject of research in NIST's Automated Manufacturing Research Facility (AMRF). The core of AMRF research has principally been

applied in discrete part manufacturing, including electronics, composites, plastics, and metal parts fabrication and assembly. Centers will be afforded the opportunity for interaction with the AMRF and will be given access to research projects and results to strengthen their technology transfer. Where elements of a solution are available from an existing source, they should be employed. Where private-sector consultants who can meet the needs of a small- or medium-sized manufacturer are available, they should handle the task. Each Center should bring to bear the technology expertise described in § 290.3(d) to assist small- and medium-sized manufacturing firms in adopting advanced manufacturing technology.

(b) *Program objective.* The objective of the NIST Manufacturing Technology Centers is to enhance productivity and technological performance in United States manufacturing. This will be accomplished through:

(1) The transfer of manufacturing technology and techniques developed at NIST to Centers and, through them, to manufacturing companies throughout the United States;

(2) The participation of individuals from industry, universities, State governments, other Federal agencies, and, when appropriate, NIST in cooperative technology transfer activities;

(3) Efforts to make new manufacturing technology and processes usable by United States-based small- and medium-sized companies;

(4) The active dissemination of scientific, engineering, technical, and management information about manufacturing to industrial firms, including small- and medium-sized manufacturing companies; and

(5) The utilization, when appropriate, of the expertise and capability that exists in Federal laboratories other than NIST.

(c) *Center Activities.* The activities of the Centers shall include:

(1) The establishment of automated manufacturing systems and other advanced production technologies based on research by NIST and other Federal laboratories for the purpose of demonstrations and technology transfer;

(2) The active transfer and dissemination of research findings and Center expertise to a wide range of companies and enterprises, particularly small- and medium-sized manufacturers; and

(3) Loans, on a selective, short-term basis, of items of advanced manufacturing equipment to small

manufacturing firms with less than 100 employees.

(d) *Center Organization and Operation.* Each Center will be organized to transfer advanced manufacturing technology to small and medium sized manufacturers located in its service region. Regional Centers will be established and operated via cooperative agreements between NIST and the award-receiving organizations. Individual awards shall be decided on the basis of merit review, geographical diversity, and the availability of funding.

(e) *Leverage.* The Centers program must concentrate on approaches which can be applied to other companies, in other regions, or by other organizations. The lessons learned in assisting a particular target firm should be documented in order to facilitate the use of those lessons by other target firms. A Center should build on unique solutions developed for a single company to develop techniques of broad applicability. It should seek wide implementation with well-developed mechanisms for distribution of results. Leverage is the principle of developing less resource-intensive methods of delivering technologies (as when a Center staff person has the same impact on ten firms as was formerly obtained with the resources used for one, or when a project once done by the Center can be carried out for dozens of companies by the private sector or a state or local organization.) Leverage does not imply a larger non-federal funding match (that is, greater expenditure of non-federal dollars for each federal dollar) but rather a greater impact per dollar.

(f) *Regional impact.* A new Center should not begin by spreading its resources too thinly over too large a geographic area. It should concentrate first on establishing its structure, operating style, and client base within a manageable service area.

§ 290.4 Terms and schedule of financial assistance.

(a) NIST may provide financial support to any Center for a period not to exceed six years, subject to the availability of funding and continued satisfactory performance. Awards under this program shall be subject to all Federal and Departmental regulations, policies, and procedures applicable to Federal assistance awards. NIST may not provide more than 50 percent of the capital and annual operating and maintenance required to create and maintain such Center. Allowable capital costs may be treated as an expense in the year expended or obligated.

(b) *NIST Contribution.* The funds provided by NIST may be used for capital and operating and maintenance expenses. Each Center will operate on one-year, annually renewable cooperative agreements, contingent upon successful completion of informal annual reviews. Funding can not be provided after the sixth year of support. A formal review of each Center will be conducted during its third year of operation by an independent Merit Review Panel in accordance with § 290.8 of these procedures. Centers will be required to demonstrate that they will be self-sufficient by the end of six years of operation. The amount of NIST investment in each Center will depend upon the particular requirements, plans, and performance of the Center, as well as the availability of NIST funds. NIST may support the budget of each Center on a matching-funds basis not to exceed the Schedule of Financial Assistance outlined in Table 1. The remaining portion of the Center's funding shall be provided by the host organization.

TABLE 1.—SCHEDULE OF NIST MATCHING FUNDS

Year of center operation	Maximum NIST share (percent)
1-3	50
4	40
5	30
6	20

(c) *Host Contribution.* The host organization may count as part of its share:

- (1) Dollar contributions from state, county, city, industrial, or other sources;
- (2) Revenue from licensing and royalties;
- (3) Fees for services performed;
- (4) In-kind contributions of full-time personnel;
- (5) In-kind contribution of part-time personnel, equipment, software, rental value of centrally located space (office and laboratory) and other related contributions up to a maximum of 45 percent of the host's annual share.

Allowable capital expenditures may be applied in the award year expended or in subsequent award years. These restrictions on host contribution apply to all awards issued or extended after September 30, 1990.

§ 290.5 Basic proposal qualifications.

(a) NIST shall designate each proposal which satisfies the qualifications criteria below as "qualified proposal" and subject the qualified proposals to a merit review. Applications which do not meet the

requirements of this section will not receive further consideration.

(1) *Qualified Organizations.* Any nonprofit institution, or group thereof, or consortium of nonprofit institutions, including entities which already exist or may be incorporated specifically to manage the Center.

(2) *Proposal Format.* Proposals for Center Operating Awards shall:

(i) Be submitted with a Standard Form 424 to the above address;

(ii) Not exceed 25 typewritten pages in length for the basic proposal document (which must include the information requirements of paragraph (a)(3) of this section); it may be accompanied by additional appendices of relevant supplementary attachments and tabular material. Basic proposal documents which exceed 25 pages in length will not be qualified for further review.

(3) *Proposal Requirements.* In order to be considered for a Center Operating Award, proposals must contain:

(i) A plan for the allocation of intellectual property rights associated with any invention or copyright which may result from the involvement in the Center's technology transfer or research activities consistent with the conditions of § 290.9;

(ii) A statement which provides adequate assurances that the host organization will contribute 50 percent or more of the proposed Center's capital and annual operating and maintenance costs for the first three years and an increasing share for each of the following three additional years. Applicants should provide evidence that the proposed Center will be self-supporting after six years.

(iii) A statement describing linkages to industry, government, and educational organizations within its service region.

(iv) A statement defining the initial service region including a statement of the constituency to be served and the level of service to be provided, as well as outyear plans.

(v) A statement agreeing to focus the mission of the Center on technology transfer activities and not to exclude companies based on state boundaries.

(vi) A proposed plan for the annual evaluation of the success of the Center by the Program, including appropriate criteria for consideration, and weighting of those criteria.

(vii) A plan to focus the Center's technology emphasis on areas consistent with NIST technology research programs and organizational expertise.

(viii) A description of the planned Center sufficient to permit NIST to

evaluate the proposal in accordance with § 290.6 of these procedures.

§ 290.6 Proposal evaluation and selection criteria.

(a) In making a decision whether to provide financial support, NIST shall review and evaluate all qualified proposals in accordance with the following criteria, assigning equal weight to each of the four categories.

(1) *Identification of Target Firms in Proposed Region.* Does the proposal define an appropriate service region with a large enough population of target firms of small- and medium-sized manufacturers which the applicant understands and can serve, and which is not presently served by an existing Center?

(i) *Market Analysis.* Demonstrated understanding of the service region's manufacturing base, including business size, industry types, product mix, and technology requirements.

(ii) *Geographical Location.* Physical size, concentration of industry, and economic significance of the service region's manufacturing base.

Geographical diversity of Centers will be a factor in evaluation of proposals; a proposal for a Center located near an existing Center may be considered only if the proposal is unusually strong and the population of manufacturers and the technology to be addressed justify it.

(2) *Technology Resources.* Does the proposal assure strength in technical personnel and programmatic resources, full-time staff, facilities, equipment, and linkages to external sources of technology to develop and transfer technologies related to NIST research results and expertise in the technical areas noted in these procedures?

(3) *Technology Delivery Mechanisms.* Does the proposal clearly and sharply define an effective methodology for delivering advanced manufacturing technology to small- and medium-sized manufacturers?

(i) *Linkages.* Development of effective partnerships or linkages to third parties such as industry, universities, nonprofit economic organizations, and state governments who will amplify the Center's technology delivery to reach a large number of clients in its service region.

(ii) *Program Leverage.* Provision of an effective strategy to amplify the Center's technology delivery approaches to achieve the proposed objectives as described in § 290.3(e).

(4) *Management and Financial Plan.* Does the proposal define a management structure and assure management

personnel to carry out development and operation of an effective Center?

(i) *Organizational Structure.*

Completeness and appropriateness of the organizational structure, and its focus on the mission of the Center. Assurance of full-time top management of the Center.

(ii) *Program Management.*

Effectiveness of the planned methodology of program management.

(iii) *Internal Evaluation.* Effectiveness of the planned continuous internal evaluation of program activities.

(iv) *Plans for Financial Matching.*

Demonstrated stability and duration of the applicant's funding commitments as well as the percentage of operating and capital costs guaranteed by the applicant. Identification of matching fund sources and the general terms of the funding commitments. Evidence of the applicant's ability to become self-sustaining in six years.

(v) *Budget.* Suitability and focus of the applicant's detailed one-year budget and six-year budget outline.

§ 290.7 Proposal selection process.

Upon the availability of funding to establish Regional Centers, the Director shall publish a notice in the *Federal Register* requesting submission of proposals from interested organizations. Applicants will be given an established time frame, not less than 60 days from the publication date of the notice, to prepare and submit a proposal. The proposal evaluation and selection process will consist of four principal phases: Proposal qualification; Proposal review and selection of finalists; Finalist site visits; and, Award determination. Further descriptions of these phases are provided in the following:

(a) *Proposal qualification.* All proposals will be reviewed by NIST to assure compliance with § 290.5 of these procedures. Proposals which satisfy these requirements will be designated qualified proposals; all others will be disqualified at this phase of the evaluation and selection process.

(b) *Proposal review and selection of finalists.* The Director of NIST will appoint an evaluation panel to review and evaluate all qualified proposals in accordance with the criteria set forth in section 290.6 of these procedures, assigning equal weight to each of the four categories. From the qualified proposals, a group of finalists will be selected based on this review.

(c) *Finalist Site Visits.* NIST representatives will visit each finalist organization. Finalists will be reviewed and assigned numeric scores using the criteria set forth in § 290.6 of these procedures assigning equal weight to

each of the four categories. NIST may enter into negotiations with the finalists concerning any aspect of their proposal.

(d) *Award Determination.* The Director of NIST or his designee shall select awardees for Center Operating Awards based upon the rank order of applicants, the need to assure appropriate regional distribution, and the availability of funds. Upon the final award decision, a notification will be made to each of the proposing organizations.

§ 290.8 Reviews of centers.

(a) *Overview.* Each Center will be reviewed at least annually, and at the end of its third year of operation according to the procedures and criteria set out below. There will be regular management interaction with NIST and the other Centers for the purpose of evaluation and program shaping. Centers are encouraged to try new approaches, must evaluate their effectiveness, and abandon or adjust those which do not have the desired impact.

(b) *Annual Reviews of Centers.* Centers will be reviewed annually as part of the funding renewal process using the criteria set out in § 290.8(d). The funding level at which a Center is renewed is contingent upon a positive program evaluation and will depend upon the availability of federal funds and on the Center's ability to obtain suitable match, as well as on the budgetary requirements of its proposed program. Centers must continue to demonstrate that they will be self-supporting after six years.

(c) *Third Year Review of Centers.* Each host receiving a Center Operating Award under these procedures shall be evaluated during its third year of operation by a Merit Review Panel appointed by the Secretary of Commerce. Each such Merit Review Panel shall be composed of private experts, none of whom shall be connected with the involved Center, and Federal officials. An official of NIST shall chair the panel. Each Merit Review Panel shall measure the involved Center's performance against the criteria set out in § 290.8(d). The Secretary shall not provide funding for the fourth through the sixth years of such Center's operation unless the evaluation is positive on all grounds. As a condition of receiving continuing funding, the Center must show evidence at the third year review that they are making substantial progress toward self-sufficiency. If the evaluation is positive and funds are available, the Secretary of Commerce may provide continued funding through the sixth year at

declining levels, which are designed to insure that the Center no longer needs financial support from NIST by the seventh year. In no event shall funding for a Center be provided by the NIST Manufacturing Technology Centers Program after the sixth year of support.

(d) *Criteria for Annual and Third Year Reviews.* Centers will be evaluated under the following criteria in each of the annual reviews, as well as the third year review:

(1) The program objectives specified in § 290.3(b) of these procedures;

(2) Funds-matching performance;

(3) The extent to which the target firms have successfully implemented recently developed or currently developed advanced manufacturing technology and techniques transferred by the Center;

(4) The extent to which successes are properly documented and there has been further leveraging or use of a particular advanced manufacturing technology or process;

(5) The degree to which there is successful operation of a network, or technology delivery mechanism, involving the sharing or dissemination of information related to manufacturing technologies among industry, universities, nonprofit economic development organizations and state governments.

(6) The extent to which the Center can increasingly develop continuing resources—both technological and financial—such that the Centers are finally financially self-sufficient.

§ 290.9 Intellectual property rights.

(a) Awards under the Program will follow the policies and procedures on ownership to inventions made under grants and cooperative agreements that are set out in Public Law 96-517 (35 U.S.C. chapter 18), the Presidential Memorandum on Government Patent Policy to the Heads of Executive Departments and Agencies Dated February 18, 1983, and part 401 of title 37 of the Code of Federal Regulations, as appropriate. These policies and procedures generally require the Government to grant to Centers selected for funding the right to elect to obtain title to any invention made in the course of the conduct of research under an award, subject to the reservation of a Government license.

(b) Except as otherwise specifically provided for in an Award, Centers selected for funding under the Program may establish claim to copyright subsisting in any data first produced in the performance of the award. When claim is made to copyright, the funding

recipient shall affix the applicable copyright notice of 17 U.S.C. 401 or 402 and acknowledgment of Government sponsorship to the data when and if the data are delivered to the Government, are published, or are deposited for registration as a published work in the U.S. Copyright Office. For data other than computer software, the funding recipient shall grant to the Government,

and others acting on its behalf, a paid up, nonexclusive, irrevocable, worldwide license for all such data to reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, by or on behalf of the Government. For computer software, the funding recipient shall grant to the Government, and others acting on its behalf, a paid up,

nonexclusive, irrevocable, worldwide license for all such computer software to reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, by or on behalf of the Government.

[FR Doc. 90-21906 Filed 9-14-90; 8:45 am]

BILLING CODE 3510-13-M

DEPARTMENT OF COMMERCE

National Institute of Standards and Technology

[Docket No. 900781-0181]

Regional Centers for the Transfer of Manufacturing Technology

AGENCY: National Institute of Standards and Technology (NIST), Commerce.

ACTION: Notice of the availability of funding; notice of meeting.

SUMMARY: In accordance with the provisions of the Omnibus Trade and Competitiveness Act of 1988, the National Institute of Standards and Technology is announcing the availability of funds and requesting proposals to establish two additional Regional Centers for the Transfer of Manufacturing Technology. In addition, NIST is announcing a public briefing for potential applicants to further discuss the program and answer questions concerning the application and selection process. (Catalog of Federal Domestic Assistance No. 11.611 "Manufacturing Technology Centers Program.")

DATES:

1. Closing Date. Proposals must be received at the address below by November 16, 1990.

2. The applicants' briefing will begin at 9:30 on October 5, 1990.

ADDRESSES:

1. Applicants must submit one signed original plus fourteen (14) copies of their proposal along with the Standard Form 424 to: Director, NIST Manufacturing Technology Centers Program, Room B-112, Metrology Building, National Institute of Standards and Technology, Gaithersburg, MD 20899. Plainly mark on the outside of the package that it contains an "MTC Proposal."

2. The applicants' briefing will be held in the Administration Building, National Institute of Standards and Technology, Gaithersburg, MD.

FOR FURTHER INFORMATION CONTACT: Kevin Carr at (301) 975-5020 (voice) or (301) 963-6556 (fax).

SUPPLEMENTARY INFORMATION:**Background**

The National Institute of Standards and Technology (NIST) shall provide assistance for the creation and support of Regional Centers for the Transfer of Manufacturing Technology. Such Centers shall be affiliated with any United States-based nonprofit institution or organization, or group thereof, that applies for and is awarded financial assistance in accordance with the procedures set forth in 15 CFR part

290. Individual awards shall be decided on the basis of merit review.

The objective of the Centers is to enhance productivity and technological performance in United States manufacturing through:

(1) The transfer of manufacturing technology and techniques developed at the Institute to Centers and, through them, to manufacturing companies throughout the United States;

(2) The participation of individuals from industry, universities, State governments, other Federal agencies, and, when appropriate, the Institute in cooperative technology transfer activities;

(3) Efforts to make new manufacturing technology and processes usable by United States-based small- and medium-sized companies;

(4) The active dissemination of scientific, engineering, technical, and management information about manufacturing to industrial firms, including small- and medium-sized manufacturing companies; and

(5) The utilization, when appropriate, of the expertise and capability that exists in Federal laboratories other than the Institute.

Regional Centers will be established and operated via cooperative agreements between NIST and the award-receiving organizations. To date, NIST has awarded funding for its first three (3) Centers. These Centers are the Southeast Manufacturing Technology Center (SMTTC) in Columbia, South Carolina, the Great Lakes Manufacturing Technology Center (GLMTC) in Cleveland, Ohio, and the Northeast Manufacturing Technology Center (NEMTC) in Troy, New York. The technology emphasis of the first three Centers is focused primarily in the area of metal parts fabrication.

Request for Proposals

NIST currently has available the funding to establish two (2) new Centers with a maximum NIST funding level of \$1.5 million each in the first year. Second year NIST funding level will be contingent upon the availability of funds but will not exceed \$3 million per year for each of the Centers. Future or continued funding will not exceed \$3 million per year for each of the Centers and will be at the discretion of NIST based on such factors as satisfactory performance and the availability of funds.

The competition is open to proposals based on any of the major discrete part manufacturing technology disciplines in which NIST has technical expertise (for example, mechanical parts, electronics assembly, composites). Geographical

location, physical size, concentration of industry, and economic significance of the service region's manufacturing base will be factors in the evaluation of new proposals. A proposal for a Center located near an existing Center may be considered only if the proposal is unusually strong and the population of manufacturers and the technology to be addressed justify it.

NIST will provide all qualified proposals to a Merit Review Panel organized by the National Research Council (NRC) which will evaluate the proposals in accordance with the evaluation and selection criteria from 15 CFR part 290. NIST will consider the findings of the NRC Merit Review Panel in its final selection. NIST anticipates making the selection and announcement of the award receiving Centers by February 1991.

Applicant's Briefing

NIST will conduct a public meeting to present an overview of the Program and to allow interested parties and potential applicants to discuss program issues with Institute staff. Representatives from existing NIST Centers will be available at the briefing to answer any questions concerning their respective programs. The meeting will be held at the Institute at the location and time shown above. The advanced registration or fee for attendance is required.

Proposal Requirement Highlights

Applicants should refer directly to 15 CFR 290, which contains the guidelines for the application, qualification, selection and establishment of Centers. Applicants should particularly note:

- There is a 25 page limitation on the basic proposal text;
- The applicant is required to contribute 50 percent or more of the proposed Center's capital and annual operating and maintenance costs for the first three years and an increasing share of 60, 70, and 80 percent in years 4, 5, and 6, respectively;
- At least 55% of the applicant's share must consist of cash from various sources or in-kind contributions of full-time personnel;
- The Center must focus its activities on transferring new manufacturing technology rather than on performing research and development;
- Each Center shall be affiliated with a U.S.-based nonprofit institution or organization which has submitted a qualified proposal for a Center Operating Award under these procedures; and,
- Support may be provided by NIST for a period not to exceed six years.

Supporting Information Packet

NIST has prepared a supplementary information packet which contains: a copy of 15 part CFR 290; background information on the existing Centers and the NIST Automated Manufacturing Research Facility, Center for Electronics and Electrical Engineering, and the Materials Science and Engineering Laboratory; Standard Form 424; and OMB Circular A-110. Information packets are available upon request from the information contact above.

Other Requirements, Requests, and Provisions

Applicants who have outstanding accounts receivable with the Federal Government may not be considered for Regional Centers Program funding until the debts have been paid or arrangements satisfactory to the Department are made to pay the debt.

The Regional Technology Centers Program does not involve the mandatory payment of any matching funds from a state or local government, and does not affect directly any state or local government. Accordingly, the Technology Administration has determined that Executive Order 12372 is not applicable to this program.

Section 319 of Public Law 101-121 prohibits recipients of Federal contracts, grants, cooperative agreements and loans from using appropriated funds for lobbying the Executive or Legislative Branches of the Federal Government in connection with a specific contract, grant, cooperative agreement or loan. A "Certification for Contracts, Grants, Loans, and Cooperative Agreements" is required to be submitted with any application for funding under the Regional Centers program. Applicants for funding are subject to Government-

wide Debarment Suspension (Nonprocurement) requirements as stated in 15 CFR part 26. In accordance with the Drug-Free Workplace Act of 1988, each applicant must make the appropriate certification as a "prior condition" to receiving a grant or cooperative agreement. A false statement on any application for funding under the Regional Centers program may be grounds for denial or termination of funds and grounds for possible punishment by a fine or imprisonment. Awards under the Regional Centers program shall be subject to all Federal and Departmental regulations, policies, and procedures applicable to Federal assistance awards.

John W. Lyons,

Director, National Institute of Standards and Technology.

[FR Doc. 90-21907 Filed 9-14-90; 8:45 am]

BILLING CODE 3510-13-M

Register Federal Register

**Monday
September 17, 1990**

Part IX

**Office of
Management and
Budget**

**Cumulative Report on Rescissions and
Deferrals; Notice**

OFFICE OF MANAGEMENT AND BUDGET**Cumulative Report on Rescissions and Deferrals**

September 1, 1990.

This report is submitted in fulfillment of the requirement of section 1014(e) of the Congressional Budget and Impoundment Control Act of 1974 (Pub. L. 93-344). Section 1014(e) requires a monthly report listing all budget authority for this fiscal year for which, as of the first day of the month, a special message has been transmitted to Congress.

This report gives the status, as of September 1, 1990, of 28 deferrals and

eleven rescission proposals contained in seven special messages for FY 1990. These messages were transmitted to Congress on October 2, 1989, January 29, 1990, February 6, 1990, April 18, 1990, April 23, 1990, June 26, 1990 and June 28, 1990.

Rescissions (Table A and Attachment A)

As of September 1, 1990, eight rescission proposals totalling \$327.4 million were pending before Congress.

Deferrals (Table B and Attachment B)

As of September 1, 1990, \$2,300.5 million in budget authority was being deferred from obligation. Attachment B shows the history and status of each deferral reported during FY 1990.

Information from Special Messages

The special messages containing information on deferrals and rescissions that are covered by this cumulative report are printed in the **Federal Register** as cited below:

54 FR 41410, Friday, October 6, 1989
55 FR 3860, Monday, February 5, 1990
55 FR 5388, Wednesday, February 14, 1990

55 FR 17364, Tuesday, April 24, 1990
55 FR 18276, Tuesday May 1, 1990
55 FR 27974, Friday, July 6, 1990
55 FR 28584, Wednesday, July 11, 1990

Richard G. Darman,
Director.

BILLING CODE 3110-01-M

TABLE A
STATUS OF FY 1990 RESCISSIONS

	Amounts (In millions of dollars)
Rescissions proposed by the President.....	554.3
Accepted by the Congress.....	0
Funding made available.....	-45.1
Funding never withheld.....	-181.8
Pending before the Congress.....	327.4

TABLE B
STATUS OF FY 1990 DEFERRALS

	Amounts (In millions of dollars)
Deferrals proposed by the President.....	11,071.5
Routine Executive releases through September 1, 1990 (OMB/Agency releases of \$8,807.0 million, partly offset by cumulative positive adjustments of \$36.0 million.)	8,771.0
Overtaken by the Congress.....	0
Currently before the Congress.....	2,300.5

Attachments

ATTACHMENT A
Status of FY 1990 Rescissions
(Amounts in thousands of dollars)

As of September 1, 1990 Agency/Bureau/Account	Rescission Number	Amount		Date of Message	Amount Rescinded	Amount Made Available	Date Made Available	Congressional Action
		Previously Considered by Congress	Currently before Congress					
DEPARTMENT OF AGRICULTURE								
Agricultural Research Service Buildings and facilities.....	R90-1	4,075		04-23-90		4,075	06-18-90	
Cooperative State Research Service Buildings and facilities.....	R90-2	41,008		04-23-90		41,008	06-18-90	
DEPARTMENT OF COMMERCE								
Economic Development Administration Economic development assistance program.....	R90-3	181,800		04-23-90		(See note below.)		
DEPARTMENT OF DEFENSE, MILITARY								
Military Construction, Army.....	R90-4		155,745	06-28-90				
Military Construction, Navy.....	R90-5		6,200	06-28-90				
Military Construction, Air Force.....	R90-6		27,290	06-28-90				
Military Construction, Defense Agencies Family Housing, Army.....	R90-7		68,119	06-28-90				
Family Housing, Navy.....	R90-8		12,664	06-28-90				
Family Housing, Air Force.....	R90-9		11,037	06-28-90				
Family Housing, Defense Agencies.....	R90-10		46,020	06-28-90				
	R90-11		300	06-28-90				
TOTAL, RESCISSIONS PROPOSED...		226,883	327,375					45,083

NOTE: The \$181.8 million proposed for rescission in Rescission Proposal No. 90-3 was never withheld from obligation. Therefore, there was no need to release the funds.

ATTACHMENT B
Status of FY 1990 Deferrals - As of September 1, 1990
(Amounts in thousands of dollars)

Agency/Bureau/Account	Deferral Number	Amounts Transmitted		Date of Message	Releases(-)		Amount Deferred as of 9-1-90
		Original Request	Subsequent Change (+)		Cumulative OMB/ Agency	Congressionally Required Congressional Action	
FUNDS APPROPRIATED TO THE PRESIDENT							
International Security Assistance	D90-1	271,000		10-02-89			
Economic support fund.....	D90-1A		1,798,079	01-29-90			
	D90-1B		19,831	04-18-90			
	D90-1C		383,950	06-26-90	2,071,694		401,165
Foreign military financing.....	D90-8	4,156,642		01-29-90	4,110,588		46,054
International military education and training.....	D90-9	23,293		01-29-90	23,293		0
DEPARTMENT OF AGRICULTURE							
Forest Service							
Expenses, brush disposal.....	D90-2	138,680		10-02-89	52,726		135,954
Cooperative work.....	D90-3	410,189		10-02-89			
	D90-3A		367,148	01-29-90	322,896	36,000	490,441
DEPARTMENT OF DEFENSE - MILITARY							
Aircraft Procurement, Army.....	D90-10	16,000		02-06-90	16,000		0
Procurement of Ammunition, Army...	D90-11	310,000		02-06-90	310,000		0
Procurement of Ammunition, Army...	D90-12	90,000		02-06-90	90,000		0
Other Procurement, Army.....	D90-13	11,000		02-06-90	11,000		0

ATTACHMENT B
Status of FY 1990 Deferrals - As of September 1, 1990
(Amounts in thousands of dollars)

Agency/Bureau/Account	Deferral Number	Amounts Transmitted		Date of Message	Releases(-)		Amount Deferred as of 9-1-90
		Original Request	Subsequent Change (+)		Cumulative OMB/Agency	Congressional Required Action	
Aircraft Procurement, Navy.....	D90-14	200,000		02-06-90	200,000		0
Weapons Procurement, Navy.....	D90-15	13,900		02-06-90	13,900		0
Shipbuilding and Conversion, Navy..	D90-16	592,398		02-06-90	592,398		0
Shipbuilding and Conversion, Navy..	D90-17	324,800		02-06-90	324,800		0
Aircraft Procurement, Air Force.....	D90-18	181,700		02-06-90	181,700		0
Missile Procurement, Air Force.....	D90-19	131,000		02-06-90	131,000		0
Other Procurement, Air Force.....	D90-20	70,000		02-06-90	70,000		0
National Guard and Reserve							
Equipment, Defense.....	D90-21	40,900		02-06-90	40,900		0
Research, Development, Test and							
Evaluation, Air Force.....	D90-22	100,000		02-06-90	100,000		0
Research, Development, Test and							
Evaluation, Defense Agencies.....	D90-23	21,000		02-06-90	21,000		0
Military Construction, Army.....	D90-24	3,200		02-06-90	3,200		0
Military Construction, Army.....	D90-25	16,150		02-06-90	16,150		0
Military Construction, Army National							
Guard.....	D90-26	18,301		02-06-90	18,301		0
Military Construction, Air National							
Guard.....	D90-27	36,841		02-06-90	36,841		0
Military Construction, Army Reserve...	D90-28	16,660		02-06-90	16,660		0
DEPARTMENT OF DEFENSE - CIVIL							
Wildlife Conservation, Military							
Reservations							
Wildlife conservation, Defense.....	D90-4	1,047		10-02-89			1,450
	D90-4A		450	04-18-90	47		

ATTACHMENT B
Status of FY 1990 Deferrals - As of September 1, 1990
(Amounts in thousands of dollars)

Agency/Bureau/Account	Deferral Number	Amounts Transmitted		Date of Message	Releases(-)		Amount Deferred as of 9-1-90
		Original Request	Subsequent Change (+)		Cumulative OMB/ Agency Required	Congres- sional Action	
DEPARTMENT OF HEALTH AND HUMAN SERVICES							
Social Security Administration							
Limitation on administrative expenses (construction)	D90-5	7,078		10-02-89			7,127
	D90-5A		49	04-18-90			
DEPARTMENT OF STATE							
Bureau for Refugee Programs							
United States emergency refugee and migration assistance fund, executive....	D90-6	44		10-02-89			42,879
	D90-6A		49,785	01-29-90			
	D90-6B		25,000	06-26-90	31,950		
DEPARTMENT OF TRANSPORTATION							
Federal Aviation Administration							
Facilities and equipment (Airport and airway trust fund)	D90-7	502,361		10-02-89			1,175,425
	D90-7A		673,064	01-29-90			
TOTAL, DEFERRALS.....		7,754,185	3,317,355		8,807,043	0	2,300,496

The above totals may not add due to rounding.

[FR Doc. 90-21941 Filed 9-14-90; 8:45 am]
BILLING CODE 3110-01-C