

ILLINOIS POLLUTION CONTROL BOARD  
February 27, 1992

IN THE MATTER OF: )  
 )  
DIESEL VEHICLE EXHAUST ) R90-20  
OPACITY LIMITS ) (Rulemaking)

ADOPTED RULE. FINAL NOTICE.

OPINION AND ORDER OF THE BOARD (by J. Anderson)<sup>1</sup>:

On July 19, 1990, the Board adopted an Order establishing inquiry hearings regarding the possible regulation of diesel smoke. These hearings were held on September 21 and September 28, 1990. As a result of those hearings the Board proposed a rule for First Notice on July 25, 1991. The proposed rule was published on August 30, 1991 at 15 Ill. Reg. 12109. Hearings were held on the First Notice Proposal on September 19 and October 3, 1991.

On November 27, 1991, the Board voted to send the proposal, significantly revised as a result of public comments received, to Second Notice. Due to the significant changes in the proposal to be submitted for Second Notice, the Board withheld submission of the Second Notice to the Joint Committee on Administrative Rules (JCAR) to allow for public comments on the revised proposal. On December 19, 1992, as a result of comments received, the Board again revised the proposal in a Supplemental Opinion and Order and directed that the revised proposal proceed to JCAR.

The rule being sent to Final Notice today is substantively the same proposal submitted for Second Notice. Minor nonsubstantive changes were made in response to comments from JCAR.

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<sup>1</sup> The Board wishes to express its appreciation for the contribution of Mr. Jacob Dumelle to this rulemaking. Mr. Dumelle initiated this proceeding prior to his retirement from the Board at the end of 1991. Mr. Dumelle had directed this proposal through the Second Notice Supplemental Opinion and Order.

The Board also acknowledges the contribution of Mr. Timothy Dwyer, who as Mr. Dumelle's attorney assistant, acted as hearing officer and assisted Mr. Dumelle in the preparation of the First and Second Notice Opinions and Orders. The Board also recognizes the contribution of Ms. Marie Tipsord as the Board attorney assisting Board Member Anderson in finalizing this rulemaking. In addition, the Board expresses its appreciation to Dr. Harish Rao and Ms. LouAnn Burnett of the Board's Scientific and Technical Section.

This rulemaking generated testimony from many different groups. In the September 19th hearing, the Board received testimony from Representative Clem Balanoff and Senator Judy Barr Topinka. In addition testimony was given by the Executive Director of the Engine Manufacturing Association ("EMA") and the Mr. John Sinde, President of the Village of Westchester. Also presenting testimony were representatives of the Illinois Trucking Association, the American Trucking Association, Navistar Corporation, the Chicago Lung Association, the Bosch Corporation, and concerned citizens.

In the October 3rd hearing, testimony was given by a representative of the Midwest Truckers Association, the Illinois Petroleum Marketers Association, the Illinois Truck Stop Association, the Illinois Movers Association, the Associated Contractors of Illinois, the Feed and Grain Association of Illinois and the Illinois Lumber Dealers Association. In addition, representatives from Caterpillar Corporation, the Illinois Environmental Protection Agency ("Agency"), Bosch Corporation, the Illinois State Police, and the Diesel Injection Service testified.

In addition to the testimony, 130 public comments were received. Among the comments received was a comment by State Representative Barbara Flynn Currie. In addition the following entities presented comments: the Village of LaGrange, the Skokie Board of Health and the Skokie Department of Public Health, the DuPage Mayors and Managers Conference, the City of Chicago, the Regional Transportation Authority, the Center for Neighborhood Technology, the Illinois Farm Bureau, the Department of Commerce and Community Affairs, the Department of Energy and Natural Resources, the United States Environmental Protection Agency, the Illinois Environmental Regulatory Group and the Chicago Lung Association. Further, over 100 letters were received from individual citizens. Although too numerous to mention individually, the Board thanks all those who wrote as well as those who participated at hearing.

During the period between the Board's voting a Second Notice Proposal and proceeding with that proposal the Board received 5 comments. The commenters included Detroit Diesel Corporation (DDC), Engine Manufacturers Association (EMA), Illinois Environmental Protection Agency (Agency), Regional Transportation Authority, (RTA), and the Chicago Lung Association and the Illinois Chapter of the Sierra Club (CLA/ICSC).

## DISCUSSION

### A. Today's Rule

The Board today sends to Final Notice a rule which is significantly different from the rule proposed at First Notice;

however, the changes from the existing regulation are not extensive. The Board has adopted an opacity standard based on a snap idle procedure and described the methodology to be used in performing the procedure. The Board has also eliminated the use of visual opacity as an enforcement tool as the record clearly indicates that the Board's visual opacity standard has been and is very difficult to apply and enforce against a mobile source. The remaining changes from the existing regulation relate to the use of the snap idle procedure. The following discussion delineates the changes between the First Notice proposal and today's rule and the reasoning behind the changes.

The Board opened this docket in 1990 to assess the need for regulations concerning emissions from mobile diesel sources. The inquiry hearings in this proceeding, which led to First Notice, were primarily concerned with ascertaining the health effects of diesel smoke and obtaining information in regards to a viable opacity standard. Although conflicting testimony arose regarding the seriousness of the potential health hazards, there is no disagreement that diesel smoke is a health problem. (See In the Matter of Diesel Vehicle Exhaust Opacity Limits, July 25, 1991, p. 1-2 and R.1 at 55-56). When the Board proceeded to First Notice the proposal was adapted from the California rule. The Board incorporated substantial portions of the California rule and presented the proposal for public comment. As a result of the extensive comments received the Board made numerous changes to the proposal, which are reflected in today's rule.

#### B. Testing Procedures

The Board's First Notice Proposal set forth two testing procedures for determining diesel smoke opacity: the snap idle test procedure for measurement of opacity and the visual opacity reading. The snap idle test procedure uses a smokemeter to measure opacity while the vehicle is in neutral with the engine running. This test would require a vehicle stop to perform the test. The snap idle test is clearly more precise due to the fact that the test can be repeated several times and the opacity is measured by a machine. Visual opacity testing takes place by a certified smoke reader examining the smoke being emitted against the sky to determine opacity. Visual opacity was included in the proposal to allow for enforcement outside the area of inspection sites. In addition, the proposal allowed for the truck to be tested by the snap idle procedure within five days of a citation being issued by visual opacity if requested by the violator.

However, at hearing, several concerns were raised by the regulated community concerning visual opacity insofar as it was too subjective to be relied upon as the basis for issuing a

citation to a moving truck. (R.1 at 51<sup>2</sup>). One concern expressed was regarding the ability to visually determine opacity from diesel vehicles which emit smoke from a horizontal pipe. Specifically, Mr. Alan Schaeffer, with the American Trucking Association, stated that it "would be very difficult to get an accurate reading at that (sic) ground level". (R.1 at 121).

In addition, concern that visually determining opacity in a moving vehicle would be difficult was raised. Mr. Berkely Moore, testifying on behalf of the Agency in support of visual opacity testing did agree that the more frequently a test is performed the more accurate the readings. Mr. Moore stated that the USEPA Method 9, adopted by the USEPA for evaluating stationary sources, requires multiple readings of opacity, "specifically 24 readings at 15 second intervals over a six minute time period. And that six minute time period seems incompatible with a moving source." (R. 2 at 38).

The trucking community also noted that using a snap idle test after the issuance of a citation on the basis of a visual opacity reading would verify the visual reading. However, it also attacked the practicality of such a measure. (R.1 at 163-164). Specifically, the Illinois Trucking Association pointed out that a vehicle engaged in interstate commerce would not easily be able to return in order to be tested. Mr. Schaeffer stated that the provision would not be very workable when the industry is a "just-in-time delivery" business. (R.1 at 125).

The Agency and CLA/ICSC both submitted comments on the revised proposal urging the retention of the visual opacity standard as an enforcement mechanism. The Agency correctly states that it was the only participant in this proceeding that presented a qualified witness to discuss visual opacity, including both the certification of opacity readers in Illinois and the historical accuracy of the method. (P.C. #133, p. 1). While the Board carefully considered this testimony, the Board is convinced that, while visual opacity might be useful as a screening mechanism, the underlying methodology for determining visual opacity is not appropriate for use as an enforcement mechanism for mobile sources.

For example, a great deal of the Agency's testimony centered on the "Method 9" procedure. This test method uses only certified smoke readers and was initially adopted for evaluating stationary sources. (R.2 at 40.) In fact, Mr. Berkely Moore, testifying for the Agency, stated that:

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<sup>2</sup> The transcripts of the hearing are cited at "R.1" for the September 19, 1991 hearing and "R.2" for the October 3, 1991 hearing.

Use of the Method 9 procedure in its entirety with no changes, however, would likely be precluded for the opacity limitations which are being considered in this proceeding because Method 9 itself requires multiple readings, I should say specifically 24 readings at 15 second intervals over a six minute time period. And that six minute time period seems incompatible with the nature of a moving source.

In fact, it may be practical to limit the opacity readings to one only. In which case, no citation should be given unless the reading is somewhat above the standard.

I might say in this connection that of the average positive error, and by positive error, I mean an overestimate of opacity as recorded by a visual observation compared to that which an instrument would show, never exceeds -- virtually never exceeds seven and a half percent for 25 readings. But if it is limited to one reading, it could be as high as 15 percent, but usually is less than 15 percent.

(R.2 at 38.)

Upon further questioning, Mr. Moore testified that the existing diesel opacity regulation was not enforced by the Agency because the Agency was not structured to do so and, further, that he knows of no other entity enforcing the standard. (R.2 at 47.) Moreover, the record indicated that the "Method 9" procedure would be difficult to apply to a rapidly moving vehicle over the course of a ten-second timespan. (R.2 at 43-45.) Finally, the availability of modern smokemeters its ease of use and its ability to provide fast, accurate and reproducible opacity readings convince us that the snap idle test using these meters is superior to the visual opacity test. (In the Matter of Diesel Vehicle Exhaust Opacity Limits, November 27, 1991, p. 2-5.)

Visual readings when conducted by trained and certified smoke readers are commonly used in air enforcement for stationery sources and can be reliable. (R.2 at 29-50.) Visual opacity readings for mobile sources might be accomplished as the Agency asserts. However, as Mr. Moore indicated in responding to question by Toby Frevert, using visual readings on a mobile source could be difficult.

Toby Frevert, from the Agency: . . . is it possible for a trained smoke reader to make observations of the diesel vehicle moving down the highway if he is traveling parallel fashion in an alternate vehicle?

Mr. Moore: I would think so.

Mr. Frevert: That would give some ability to deal with the time increment considerations?

Mr. Moore: yes. (R. 2 at 45).

We also note, as discussed later in the Opinion, the testing method for the visual opacity standard has uncertain correlation, at best, with federal certification. The Board also notes that six states do have a 20 per cent visual opacity standard; however, one of the states has gone to fleet self-certification using an objective smoke testing. (R.1 at 157). Also of note is that California uses visual opacity for screening only, not for issuance of a citation. (R.1 at 153).

The Board also notes that any entity which wishes to enforce this rule may use a visual test to screen possible violators. However, the Board must adopt standards which can be enforced. The Board cannot adopt a voluntary test used only as an indicator of a possible violation. We have concluded that using the visual opacity testing methodology for mobile sources is either too inexact or too difficult for enforcement, and that mandating it for any other purpose, such as a screening device, is unnecessary.

The Board has determined that the record supports the use of smokemeters and opacimeters to determine violation of the standards. However, due to the noted difficulties of use of visual opacity standards on moving sources, the Board has deleted that provision.

### C. Opacity Standard

Another main concern expressed by the trucking industry involved the First Notice standard proposed by the Board that vehicle engines which had a federal peak opacity certification value over 35% would have to meet a snap idle opacity value of 55%. All other engines would have to meet a snap idle opacity of 40%. This meant, in effect, that nearly all vehicle engines would be required to meet the more stringent 40% snap idle opacity standard.

Representatives of the EMA, Caterpillar, Navistar and the Bosch Corporation all testified that all engines are tested and certified according to federal standards using a dynamometer test. A dynamometer test requires the engine (sans vehicle) to be mounted on a dynamometer stand (a dynamometer is an apparatus for measuring the force or power of a mechanical device, in this case, the diesel engine). The dynamometer basically drives the engine, controlling speed and temperature. A state-of-art smoke meter is used to measure the emissions from the engine. The engine is put through various modes (lug, acceleration, etc.) so that a complete charting of its performance is made. The federal certification is based upon this "laboratory" performance. The

industry maintains that under the First Notice proposal two different procedures would be used to measure the same event and, because one test is for certification under the federal standard and the other is for enforcement under the proposal, the engine could fail the enforcement test while passing the certification test. Thus, the industry argued that the snap idle test for all engines certified prior to 1991 should be 55 % and all those certified in 1991 or subsequent years should be tested against a 40 % standard in order to insure that the Board's standard correlates with federal certification requirements. (See Generally, R.1 at 53-54, 123, 207, 295-96; R.2 at 16, 24).

In support of that position, Mr. Glenn Keller of the EMA testified at hearing that based on limited evidence seen through internal data run by member companies, EMA has found that 55 per cent is the appropriate correlation to the federal standard. (R.1 at 76-78).

Mr. Charles Hudson of Navistar also testified at hearing. Mr. Hudson presented several charts and graphs illustrating the differences between federal certification testing results and smoke opacity results. (See Exhibit ). Mr. Hudson also stated that "because of these differences in tests, a significant difference between the peak opacity values required during in-use snap acceleration tests may exist." (R.1 at 206). Caterpillar, the Illinois Trucking Association and the American Trucking Association also testified in support of adopting this standard.

In the interest of avoiding public concern regarding the stringency of the snap idle test, the Board first wishes to emphasize that the 55/40 % opacity standard will certainly address the objectionable opacity levels of diesel smoke observed by citizens on the street. In effect this test represents a more stringent standard than the Board's present 30 % visual opacity standard. The snap idle testing procedure, for which the 55/40 % standard is established attempts to measure the smoke from an engine in peak mode, which normally occurs when the vehicle is accelerated from a full stop. (R.1 at 99). For a diesel engine to perform its intended function during acceleration, a certain amount of over-fueling is required to cause the engine speed to increase. (R.1 at 113). Thus, emissions are at the highest in this mode. Properly maintained diesel vehicles operated in other modes should emit opacity levels of 20 % visual opacity or less, levels barely visible to an onlooker. (R.1 at 99). A vehicle emitting smoke at greater than 20 % opacity in continuous operation will almost certainly fail the snap idle test.

Mr. Robert Jasmon also testified on behalf of several organizations (see R.2 at 2-3) concerning the proposal. Mr. Jasmon stated that even if the Board were to go with the snap idle test and drop the visual opacity measure, he would have problems with the rule. (R.2 at 16). First, Mr. Jasmon was of

the opinion that any regulation with regard to diesel opacity should be federally promulgated. Second, he was concerned about the safety aspect of stopping and testing trucks.

With respect to a federal rule, the Board is not aware of any opacity standard for vehicles as they operate on the roads of the nation. The federal government does issue peak smoke opacity certifications that are only applicable to newly manufactured engines. An engine family will pass or fail that certification based upon laboratory dynamometer testing. In terms of safety, the availability of portable smokemeters will greatly simplify the process enumerated in the First Notice Proposal to nothing more than a routine traffic stop. Since trucks are stopped as a matter of course for other reasons, the Board does not anticipate that this will be a problem. Finally, since any initial enforcement will necessarily take place on a local scale, the Board is confident that those local authorities will be in a better position to adequately assess the safety issues.

The record clearly supports the adoption of a 55/40 % standard. Therefore, the Board adopts the 55/40 % standard in the rule.

#### D. Enforcement Structure

The Board's First Notice proposal included placing inspection and enforcement authority with the Illinois State Police. As noted in the First Notice Opinion (In the Matter of Diesel Vehicle Exhaust Opacity Limits, July 25, 1991, p. 7), this measure was included because other programs of other states have done so. In addition, as previously stated, the Board was proposing the California regulation so as to assess whether its provisions in whole or in part, would be adaptable for Illinois. This provision was a part of the California regulation. Also, the inquiry hearings had focused on the health effects of diesel smoke, not enforcement of a standard. Thus, the Board was not sure how the State Police and Agency in particular viewed this provision.

In the Board's hearings following the First Notice proposal, both the State Police and the Agency participated. Stating that regulations in the area appear both appropriate and necessary, the State Police commended the Board for its efforts to address the health and environmental issues relating to diesel engine exhaust. (R.2 at 72). Jim Redlich, testifying on behalf of the State Police, supported the concept that opacity standards must be established and enforced. (R.2 at 72). However, Mr. Redlich stated that the listing of the State Police as an enforcement entity is "counterproductive". (R.2 at 72). Mr. Redlich maintained that the State Police lacked the resources to carry out inspections and that using existing structures such as weigh stations would not work. (R.2 at 73-74). In addition, the



citation procedures included in the First Notice proposal are significantly different from the type of citations generally issued by the State Police, in that the proposal used a civil penalty basis whereas current State Police citations are issued on a criminal basis. The State Police therefore recommended that the "it be deleted or [the proposal] be rewritten with the participation of the law enforcement community." (R.2 at 78). Therefore, the Board deleted the provision when revising the proposal at Second Notice.

The Board notes that today's rule can be enforced in several different ways. First, any entity may file an enforcement action under the Act before the Board. For example, local governments doing truck stop inspections could make violation determinations and file actions before this Board. Second, any agency of state government using the technical standards articulated in this rule may take whatever action is or may be authorized under their own controlling statutes. Third, the new regulatory language may provide a technical basis for local governments to adopt standards that might be enforced through the municipal legal system. The Board is not making pronouncements on the scope of local government or municipal powers. And it is up to the local government to do by ordinance what its ordinance dictates. However, if a local government chooses to adopt a standard using today's Board action as a technical justification, it should adopt the standard articulated by the Board today.

The Board did receive a comment from CLA/ICSC objecting to the Board's reliance on local government, other state agencies or the legislature to secure enforcement of the standard. In addition, the CLA/ICSC maintained that the Board's Second Notice proposal lacked guidance as to what types of enforcement mechanisms would be most effective. In this regard, CLA/ICSC asserted that the Second Notice proposal should outline the Board's expectations of the Agency or any other state agencies that need to be involved. The comment concluded by stating that the proposal will discourage local government, state agencies or the state legislature from taking the necessary action to enforce the revised opacity standard.

The CLA/ICSC comment states that "the Board lacks the authority to require an inspection and enforcement program" (P.C. 135 at 1). In this context we agree. For enforcement, here, we turn to the powers in the enabling statutes of the various agencies.

The Board notes that at hearing several entities expressed an interest in enforcing the Board standard. Mr. John Sinde, President of Westchester and the immediate past president of the West Central Municipal Conference (WCMC), testified that he was sure that the communities would be willing to take the time and spend whatever monies were necessary to train personnel and to

purchase equipment to enforce the rule. (R.1 at 34-35). In addition, Senator Topinka indicated that she believes that "once this type of a program gained impetus, I am sure that you would see the [municipal] conferences working at large and they would be a tremendous network to put something like this together for you." (R.1 at 36).

Although the enforcement mechanisms discussed here are theoretically possible, the Board notes that the enforcement of diesel opacity poses some unique problems. The enforcement of today's rule requires that vehicles be detained in order to be tested. Consequently, the Board does not anticipate citizen enforcement actions such as those the Board sees with respect to some of the Board's other standards (e.g. noise). Even assuming that there is no question of statutory authority the Agency must decide whether alone or in conjunction with other entities it is equipped to undertake a program so different in scope relative to its existing operation. The record clearly indicates that enforcement of today's regulation would be most effective if those entities already engaged in traffic stops of motor vehicles were involved. In this regard, it is possible that the Board's promulgation of an updated standard may provide a basis for action by the General Assembly as it pertains to enforcement mechanisms.

#### E. Penalty Provisions

At First Notice the Board proposed a civil penalty schedule. Many comments were received on this issue. (e.g., Comment 127 by the Illinois Environmental Regulatory Group). The commenters questioned the Board's authority to impose by rule a penalty for violation of rules. The proposal was adapted from the California rules, and this provision is a part of the California rules which the Board sought comment on.

The Board finds merit in the comments regarding this provision and will accordingly delete the civil penalty schedule. Absent statutory amendments the Board will rely on its existing powers to assess civil penalties under Title VIII of the Act.

#### F. Adjusted Standard

The Detroit Diesel Corporation (DDC) submitted a comment after the Board revised the proposal at Second Notice. DDC, while supporting the rule, alleges that an anomaly has been discovered during the California Roadside Smoke program that makes it likely that the entire family of DDC's 1987-1990 series 50 engines will fail the 55% opacity snap acceleration test. Indeed, DDC claims that the engine family will fail any opacity standard less than about 85%. DDC asserts, however, that the engines which emitted 89% over the snap acceleration test emitted only 13%-18% over the EPA federal smoke test, and that the

engines have very low smoke levels under most other operating conditions.

DDC states that, while the engines can be recalibrated, it requires connecting each engine to a computer for reprogramming, a "logistically difficult" task for all existing engines. (P.C. #131, p. 1.) DDC notes that, for 1991, this anomaly has been corrected with revisions to the engine control software.

DDC proposes that the Board add the language that the California Air Resources Board adopted to address this problem. The language DDC proposed is as follows:

Exemptions from the opacity standards in Paragraph (a)(2) may be granted for engine families that cannot meet the standard because of inherent engine design characteristics or nonadjustable fuel metering parameters. Exemptions may be based on the voluntary submission of technical information by engine or vehicle manufacturers. Such technical information may include certification test and/or snap idle test opacity data. Alternative opacity standards would thereupon be established for the exempted engine families. (P.C. #131, p. 2.)

The Board first notes that DDC's submittal is significantly at odds with the prior testimony in this proceeding of the EMA, which DDC states in its comment that it helped prepare and fully supports. However, DDC's comments also appear to be asserting that it has only recently discovered its problem, and the Board's following discussion and proposed amendment are based on this assumption.

The Board declines to accept the amendment proposed by DDC. The language is much too broad, and DDC fails to justify the sweeping language. The amendment, as drafted, is not tailored to DDC's 660 series problem. It does not even provide that the problem be recently discovered. Rather, it sets up a mechanism of standard by exception, with rather loose justifications, of general applicability to all pre-1991 engine families. In other words, exemptions from the 55% standard may be granted, and alternative standards established, for "engine families that cannot meet the standard because of inherent engine design characteristics or nonadjustable fuel metering parameters". The record of this proceeding already fully supports the Board's conclusion that the standard was overwhelmingly supported by, and justified for, the engine families generally, and the Board declines to, in essence, open up this standard at the back end of this rulemaking. The Board notes that under the Illinois system there are relief mechanisms available for asserting special circumstances should they occur after these regulations are adopted.

However, DDC arguably has timely placed its own newly discovered problem in the record of this proceeding for Board consideration. The problem is that DDC has not provided enough information at this juncture for the Board to even consider its request for relief, much less act upon it.

On balance, the Board believes that the best way to solve this problem is to add to the regulation at Section 240.141 a new subsection (d). This subsection utilizes the adjusted standard procedure found at Section 28.1(b) of the Act and establishes levels of justification in the rule of general applicability. Section 28.1(b) states:

In adopting a rule of general applicability, the Board may specify the level of justification required of a petitioner for an adjusted standard consistent with this Section.

The Board notes that the new subsection (d) requires information addressing the uniqueness of the problem, submittal of all test data regarding USEPA certification and the snap idle test, economic and technical data regarding logistical problem such as those noted by DDC above, the alternative opacity standard proposed, and the environmental effects.

Finally, the Board strongly advises DDC to file for an adjusted standard promptly; Section 28.1(e) of the Act provides for a stay of the applicability of the regulation only if "any person files a petition for an individual adjusted standard...within 20 days after the effective date of the regulation."

The comment submitted by EMA seeks to implement the same language as proposed by DDC. (P.C. #132, p. 1-2.) For the aforementioned reasons, the Board declines to adopt this provision. While EMA does not refer to DDC specifically, it sets forth an identical example. Absent more specification the Board declines to further address the issue in this proceeding.

#### G. Other Concerns

Mr. Fred Serpe of the Illinois Trucking Association raised the issue of the effective date of the rules. Mr. Serpe was concerned that some lead time be established. (R.1 at 108-109.) Citing storm water run-off regulations now applicable to most trucking firms, Mr. Serpe was troubled by the possibility that the industry may not know how the proposed rule would apply to them. (R.1 at 140-142.) Mr. Serpe stated that many companies are not even aware they fall under the storm water regulations and the same could be true for the diesel rule without lead-time in conjunction with an outreach program. The Board finds this argument to be unpersuasive. First, any vehicle emission which

comports with federal requirements should not exceed 55% opacity in a snap idle test. This is universally accepted by the regulated community. (R.1 at 73.) Second, the regulation articulated today conforms to the existing Illinois regulatory framework, with numerical limitations that substantially comport with federal requirements; thus the need for an extended effective date is minimized or eliminated. In sum, the industry should have ample time to conform to what is essentially an already existing standard. Further, the EMA indicated that adoption of the 55% opacity standard for pre-1991 vehicles "will minimize' inappropriate citation of well maintained vehicle", (R. 1 at 53).

In terms of repairs, Mr. Adams of Bosch and Mr. Schey of Diesel Injection Service advocated that repair centers be designated. They found troublesome the possibility that unqualified technicians might benefit from working on vehicles which violated the standard. They urged the Board to designate qualified stations that meet manufacturers' requirements for training. This the Board declines to do. While the Board is sympathetic to these concerns, the Board will not endorse certain mechanics over others. Apart from the legality of such a rule, the Board's main emphasis remains that trucks in violation come into compliance. Accordingly, this request will not be incorporated into the rule.

Finally, the EMA, the RTA, the Illinois Steel Group and the John Deere Company all commented as to whether the Board's intent was to regulate off-road vehicles. Citing Section 240.140, these commenters pointed out that "on-road" should be inserted to avoid the potential regulation of farm implements and other machinery which was not intended to be regulated. The Board agrees and adds the requested language so as to clarify the provision.

Finally, the RTA commented that Section 240.241(c) should be modified to indicate that testing should occur at the normal operating temperature of the engine. This section is revised in order to make this clear.

#### CONCLUSION

The Board sends this rule to Final Notice in a substantially different from than when first proposed. The Board has eliminated the civil penalties schedule as well as the visual opacity standard. In addition, the Board adopted a 55/40 % standard for diesel engines. The health effects of diesel smoke have been thoroughly discussed in this proceeding. The enforcement of the standard adopted today will hopefully ameliorate those effects. The record clearly supports the Board's actions today.

ORDER

The Board hereby adopts for Final Notice the following amendments to 35 Ill. Adm. Code 215. The Clerk of the Board is hereby directed to cause the publication of these amendments in the Illinois Register and to cause the filing of these amendments with the Administrative Code Unit of the Secretary of State's Office:

TITLE 35: ENVIRONMENTAL PROTECTION  
 SUBTITLE B: AIR POLLUTION  
 CHAPTER I: POLLUTION CONTROL BOARD  
 SUBCHAPTER k: EMISSION STANDARDS AND LIMITATIONS  
 FOR MOBILE SOURCES

PART 240  
 MOBILE SOURCES

SUBPART A: DEFINITIONS AND GENERAL PROVISIONS

Section  
 240.101 Preamble  
 240.102 Definitions  
 240.103 Prohibitions  
 240.104 Inspection  
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SUBPART B: EMISSIONS

Section  
 240.121 Smoke Emissions  
 240.122 Diesel Engine Emission Standards for Locomotives  
 240.123 Liquid Petroleum Gas Fuel Systems  
 240.124 Vehicle Exhaust Emission Standards  
 240.125 Compliance Determination

SUBPART C: HEAVY-DUTY DIESEL SMOKE OPACITY STANDARDS AND  
 TEST PROCEDURES

Section  
 240.140 Applicability  
 240.141 Heavy Duty Diesel Vehicle Smoke Opacity Standards and  
 Test Procedures

240.Appendix A Rule into Section Table  
 240.Appendix B Section into Rule Table

AUTHORITY: Implementing Sections 9, 10 and 13 and authorized by Section 27 of the Environmental Protection Act (Ill. Rev. Stat. 1989, ch. 111-1/2, pars. 1009, 1010, 1013 and 1027).

SOURCE: Adopted as Chapter 2: Air Pollution, Part Vii: Mobile Sources, filed and effective April 14, 1972; codified at 7 Ill. Reg. 13628; amended in R85-25, at 10 Ill. Reg. 11277, effective June 16, 1986; amended in R90-20 at 16 Ill. Reg. \_\_\_\_\_, effective \_\_\_\_\_.

NOTE: Capitalization denotes statutory language.

#### SUBPART A: DEFINITIONS AND GENERAL PROVISIONS

##### Section 240.102 Definitions

All terms which appear in this Part have the definitions specified in this Part and 35 Ill. Adm. Code 201 and 211. Where conflicting definitions occur the definitions of this Section apply in this Part.

"Diesel Engine": All types of internal-combustion engines in which air is compressed to a temperature sufficiently high to ignite fuel injected directly into the cylinder area.

"Diesel Locomotive": A diesel engine vehicle designed to move cars on a railway.

"Driver": The same meaning as defined in the Illinois Vehicle Code, Ill. Rev. Stat. 1989, ch. 95-1/2, par. 116.1.

"Fleet": Five or more vehicles.

"Full Power Position": The throttle position at which the engine fuel delivery is at maximum flow.

"Heavy Duty Vehicle": ~~A motor vehicle rated at more than 8000 pounds gross vehicle weight~~ A vehicle with 8,000 pounds or greater manufacturer's maximum gross vehicle weight rating (GVWR).

"High Idle": That portion of a two-speed idle test conducted with the engine operating at a speed of approximately 2500 PRM.

"Idle Mode": That portion of a vehicle emission test procedure conducted with the engine disconnected from an external load and operating at minimum throttle.

"Light Duty Truck": A motor vehicle rated at 8000 pounds gross vehicle weight or less, which is designed for carrying

more than 10 persons or designed for the transportation of property, freight or cargo, or is a derivative of such a vehicle.

"Light Duty Vehicle": A passenger car designed to carry not more than 10 persons.

"Model Year": The year of manufacture of a motor vehicle based upon the annual production period as designated by the manufacturer and indicated on the title and registration of the vehicle. If the manufacturer does not designate a production period for the vehicle, then "model year" means the calendar year of manufacture.

"Motor Vehicle": As used in this section "motor vehicle" shall have the same meaning as in the Illinois Vehicle Code (Ill. Rev. Stat. 1985<sup>9</sup>, ch. 95 1/2, par. 1-146).

~~"Opacity": A condition which renders material partially of wholly impervious to the transmittance of light, and causes the obstruction of an observer's view~~That fraction of light, expressed in percent, which when transmitted from a source through a smoke-obscured path, is prevented from reaching the observer or instrument receiver.

~~"Persons Liable": All persons owning, operating or in charge or control of any equipment who shall cause or permit or participate in any violation of these rules and regulations either as owner, operator, lessee or lessor.~~

"Smokemeter or Opacimeter": An optical instrument designed to measure the opacity of smoke or diesel exhaust gases using the light extinction method.

"Snap idle Cycle": Rapidly depressing the accelerator pedal from normal idle to the full power position, holding the pedal in the position for no longer than ten seconds or until the engine reaches maximum speed, and fully releasing the pedal so that the engine decelerates to normal idle.

"Test Procedure": The preparation, preconditioning sequence and smoke opacity measurement processes using the snap idle cycle for determining compliance with Section 240.141.

"Two-Speed Idle Test": A vehicle emission test procedure consisting of the measurements of exhaust emission in high idle and idle modes.

(Source: Amended at 16 Ill. Reg. \_\_\_\_\_, effective \_\_\_\_\_.)



Section 240.107      Incorporations by Reference

The following materials are incorporated by reference and include no later editions or amendments:

- a) Society of Automotive Engineers (SAE), 400 Commonwealth Drive, Warrendale, PA 15096: Report J255a Diesel Engine Smoke Measurement (August, 1978).
- b) International Standards Organization (ISO), Case Postale 56, 1211 Geneve 20, Switzerland: ISO 393 (Working Draft, January 1991). Also available from American National Standards Institute (ANSI), 11 West 42nd Street, New York, NY 10036.

(Source: Added at 16 Ill. Reg. \_\_\_\_\_, effective \_\_\_\_\_.)

## SUBPART B: EMISSIONS

Section 240.122      Diesel Engine Emission Standards for Locomotives

- ~~a) The visible emission standard in Section 240.121 shall not apply to diesel engines.~~
- ~~b) With the exception of subsection (e), diesel engines manufactured before January 1, 1970, shall not be operated in such a manner as to emit smoke which is equal to or greater than 30% opacity except for individual smoke puffs. Individual puffs of smoke shall not exceed 15 seconds in duration.~~
- e)
  - ~~1) Diesel engines shall be operated only on the specific fuels as specified in the engine manufacturers' specifications for that specific engine, or on fuels exceeding engine manufacturers' specifications.~~
  - ~~2) Persons liable for operating diesel engine fleets wholly within standard metropolitan statistical areas shall furnish to the Environmental Protection Agency, once each year, proof that the fuel purchased and used in their operations conform to subsection (e)(1).~~
- ~~d) All diesel engines operated on public highways in Illinois coming from out of the State shall conform to subsection (b).~~

e)

~~1~~a) No person shall cause or allow the emission of smoke from any diesel locomotive in the State of Illinois to exceed thirty percent (30%) opacity.

~~2~~b) Subsection ~~(e)-(1)~~(a) shall not apply to:

A)1) Smoke resulting from starting a cold locomotive: for a period of time not to exceed 30 minutes.

B)2) Smoke emitted while accelerating under load from a throttle setting other than idle to a higher throttle setting: for a period of time not to exceed 40 seconds.

~~E~~3) Smoke emitted upon locomotive loading following idle: for a period of time not to exceed 2 minutes.

~~D~~4) Smoke emitted during locomotive testing, maintenance, adjustment, rebuilding, repairing or breaking in: for a period of time not to exceed 3 consecutive minutes and an aggregate of 10 minutes in any 60 minute period.

~~E~~5) Smoke emitted by a locomotive which because of its age of design makes replacement or retrofit parts necessary to achieve smoke reduction unavailable. These locomotives shall be retired at the earliest possible time.

(Source: Amended at 16 Ill. Reg. \_\_\_\_\_, effective \_\_\_\_\_.)

SUBPART C: HEAVY-DUTY DIESEL SMOKE OPACITY STANDARDS AND TEST PROCEDURES

Section 240.140      Applicability

This Subpart applies to all on-road diesel-powered vehicles with a 8,000 pounds or greater manufacturer's maximum gross vehicle weight rating (GVWR) operating in the State of Illinois.

(Source: Added at \_\_\_ Ill. Reg. \_\_\_\_\_, effective \_\_\_\_\_.)

Section 240.141      Heavy-Duty Diesel Vehicle Smoke Opacity Standards and Test Procedures

a) The standard for heavy-duty diesel vehicle smoke opacity is as follows:

1) No 1991 or later model year heavy-duty diesel-powered vehicle with a federal peak smoke engine certification operating on the roadways within the

State of Illinois shall exceed forty percent (40%) peak smoke opacity when tested in accordance with subsections (b) and (c).

2) Except for subsection (a)(1), no heavy-duty diesel-powered vehicle operating on the roadways within the State of Illinois shall exceed fifty-five percent (55%) peak smoke opacity when tested in accordance with subsections (b) and (c).

b) The smoke opacity measurement shall be carried out using a light-extinction type opacimeter capable of measuring and recording opacity continuously during the snap idle testing cycle. A strip chart recorder or an equivalent or better recording device shall be used in concert with the opacimeter to record opacity continuously, including peak values. The opacimeter shall be capable of providing opacity readings with sufficient resolution to obtain 0.5 second-averaged values. The peak 0.5 second-averaged value shall be used for showing compliance with the standard in subsection (a). Where the response time of the instrument is such that opacity is being measured at smaller than 0.5 second intervals, the meter shall have the capability of providing or allowing the calculation of 0.5 second-averaged values.

1) The opacimeter shall be either an in-line full-flow opacimeter; end-of-line or plume type full-flow opacimeter; or a sampling type partial flow opacimeter. The opacimeter and recording devices shall be calibrated according to manufacturers's specifications. Corrections for the effect of exhaust stack diameter shall apply to opacity measurements made using an end-of-line full-flow opacimeter; and

2) The opacimeter and recorder shall comply with specifications in the International Standards Organization ISO 393 and in Society of Automotive Engineers (SAE) report number J255a entitled "Diesel Engine Smoke Measurement", incorporated by reference in Section 240.107.

c) The test procedure using the snap idle cycle shall occur under when the engine is at normal operating temperature. The test shall consist of preparation, preconditioning, and testing phases.

1) In the preparation phase, the vehicle shall be placed at rest, the transmission shall be placed in neutral, and the vehicle wheels shall be

properly restrained to prevent any rolling motion. In the event of a roadside test, it shall be acceptable under this Section for the driver to apply the brakes during the test.

- 2) In the preconditioning phase, the vehicle shall be put through a snap idle cycle three or more times until successive measured smoke opacity readings are within ten percent (10%) of each other. The opacimeter shall be rechecked prior to the preconditioning sequence to determine that its zero and span setting are adjusted to manufacturer's specifications.
- 3) In the testing phase, the vehicle shall be put through the snap idle cycle three times.
  - A) The smoke opacity shall be measured during the preconditioning and testing phases with an opacimeter meeting the requirements of subsection (b) and shall be recorded continuously on the recorder during each snap idle cycle. The maximum 0.5 second averaged value recorded during each snap idle cycle shall be the smoke opacity reading.
  - B) The average of the three smoke opacity readings shall be used to determine compliance with the opacity standard in subsection (a).
- d) Pursuant to Section 28.1(b) of the Act and 35 Ill. Adm. Code 106.Subpart G, any person petitioning for an adjusted standard from the 55% peak smoke opacity standard in paragraph (a)(2) for DDC 1987-1990 Series 60 engines shall establish its justifications by providing the following information at a minimum:
  - 1) The specific characteristics common only to all the 1987-1990 Series 60 engines that result in noncompliance with the 55% opacity standard.
  - 2) All USEPA certification and snap/idle test data.
  - 3) Economic and technical data related to the logistical or other perceived difficulties encountered or that may be encountered if the existing 1987-1990 Series 60 engine software were to be reprogrammed so as to come into compliance.
  - 4) The alternative opacity standard proposed and supporting data.

- 5) Supporting data showing that THE REQUESTED STANDARD WILL NOT RESULT IN ENVIRONMENTAL OR HEALTH EFFECTS SUBSTANTIALLY AND SIGNIFICANTLY MORE ADVERSE THAN THE EFFECTS CONSIDERED BY THE BOARD IN ADOPTING THE RULE OF GENERAL APPLICABILITY. (Section 28.1(c)(3) of the Act).

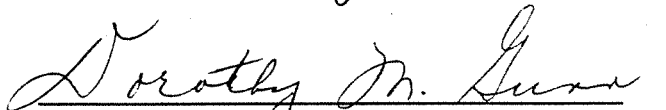
(Source: Added at 16 Ill. Reg. \_\_\_\_\_, effective \_\_\_\_\_.)

IT IS SO ORDERED.

R. C. Flemal dissented.

Section 41 of the Environmental Protection Act (Ill. Rev. Stat. 1990 supp., ch. 111 1/2, par. 1041) provides for appeal of final Orders of the Board within 35 days. The Rules of the Supreme Court of Illinois establish filing requirements.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby testify that the above Opinion and Order was adopted on the 27<sup>th</sup> day of February, 1992 by a vote of 6-1.

  
Dorothy M. Gunn, Clerk  
Illinois Pollution Control Board