

ILLINOIS POLLUTION CONTROL BOARD
November 27, 1991

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

PROPOSED RULE. SECOND NOTICE.

OPINION AND ORDER OF THE BOARD (by J.D. Dumelle):

On July 19, 1990, this Board adopted an Order which established inquiry hearings regarding diesel smoke. These hearings were held on September 21 and September 28, 1990. As a result of these 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 September 19 and October 3, 1991. The First Notice proposal was in large part an attempt to adapt California's existing diesel vehicle exhaust opacity rule to Illinois. Today's Second Notice proposal significantly revises the First Notice Proposal to reflect concerns expressed at the hearings and in public comments. These revisions are primarily deletions from provisions proposed at First Notice rather than additions of regulatory language. However, because of the significant changes the Board will withhold filing the Second Notice with the Joint Committee on Administrative Rules for a brief period to allow participants to provide input to be received at the Board not later than 4:30 p.m., Friday, December 13, 1991.

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; Glenn Keller, Executive Director of the Engine Manufacturing Association ("EMA"); Fred Serpe and Burness Melton, of the Illinois Trucking Association; Allan Schaeffer, on behalf of the American Trucking Association; Charles Hudson of Navistar Corporation; Ron Burke of the Chicago Lung Association; Steve Adams of the Bosch Corporation; John Snide, President of Westchester; and Rade Cujanovich and Mark Henschel, concerned citizens.

In the October 3rd hearing, testimony was given by: Robert Jasmon, who represented 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; Don Dowdall of Caterpillar Corporation; Berkely Moore of the Illinois Environmental Protection Agency ("Agency"); Steve Adams of Bosch Corporation; James Redlich of the Illinois State Police, and; Eugene Schey of Diesel Injection Service.

In addition to the testimony, 130 public comments were received. Among these commenters were 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; State Representative Barbara Flynn Currie; 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. The Agency comments fully support the Board's actions today. 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.

DISCUSSION

The health effects of diesel smoke were discussed in the First Notice Opinion and Order of July 25, 1991, at pp. 1-2, and need not be repeated here. It is well established that diesel smoke is a health hazard and a public nuisance. The record is persuasive that some level of control is appropriate. However, testimony at hearing is also persuasive that the First Notice Proposal should be substantially reduced in scope. The Board believes that the best approach is to adopt a snap idle test procedure which uses a smokemeter to measure opacity.

Opacity is defined as that fraction of light transmission that is obscured by emissions from a stack and prevented from reaching the observer or instrument receiver. The emissions of concern here are those from a diesel vehicle's exhaust pipe, which contains particles suspended in the gaseous exhaust stream which obscure, reflect and refract light. Opacity is generally expressed as a percent and can be thought of as the difference between 100% light transmission and the percent transmission through the diesel vehicle's exhaust pipe emissions. Although opacity is an objective parameter, its measurement using human eyes (even when trained) is less precise and yields somewhat subjective results. In order to remove the subjective element, an instrumental technique termed the light extinction method can be used to directly measure the fraction of light transmitted (T) through a smoke-obscured path. The opacity (O) expressed in percent, is given by: $O = 100(1 - T)$.

Instruments for the measurement of opacity of diesel vehicle emissions are termed smokemeters or opacimeters. There are two type of opacimeters, either full-flow or the partial-flow/sampling type. In the full-flow type, the opacity of the full smoke plume is measured either within the stack (i.e. in-line) or at the outlet of the stack (end-of-line). In this type, the light source and photocell, separated by a fixed distance or

path length, are located on opposite sides of the smoke plume, either in-line or a few inches from the open end of the exhaust pipe (end-of-line). The light transmitted through the smoke plume is read by the photocell from which signals are sent to the calibrated meter. In the partial-flow/sampling type opacimeter, a portion of the exhaust gas is continuously withdrawn and allowed to flow through a sample tube with a fixed path length. Mr. Adams of Bosch Corporation presented testimony indicating that full-flow opacimeters were not as convenient and easy to use as the partial flow opacimeters. He noted that the full flow opacimeter readings needed much greater operator training and intervention both during the measurement and for the subsequent analysis. This is because of the need for exhaust stack diameter corrections to account for differing path lengths, the need for more frequent cleaning and, with some instruments, physical recording of the results. The price of a full flow opacimeter was stated to be approximately \$4,500. (R.2 at 59; [R.1 denotes the September 19, 1991 hearing, R.2 denotes the October 3, 1991 hearing])

On the other hand, the newer, more modern opacimeters, particularly those utilizing partial-flow with a fixed length measurement chamber are extremely fast and are capable of measuring and recording opacity continuously with readings being recorded sometimes as quickly as every 50 milliseconds (i.e., 0.05 second). The partial flow opacimeter extracts a sample from inside the exhaust stack and is conveyed to the measurement chamber and is not affected by wind, light conditions, etc. In addition, a fully computerized system costs about \$7,500 and has the capability of recording and integrating readings to give 0.5 second-averaged readings which are similar to what the human eye sees. These instruments are self calibrating, easy to use and operate and allow a complete snap idle test to be completed in 10-15 minutes.

The use of the 0.5 second-averaged values is specified in order to establish a consistent method for measuring opacity. Although the sampling type instrument is capable of extremely fast response times, a 0.5 second-averaged value is closest to what the human eye would see. Shorter averaging times will detect short-term (i.e., lasting less than 0.5 second) opacity peaks but are not of concern since the standard that is being established is a visual standard that is measured with an opacity meter. The ready availability, low cost and accuracy of these instruments convince the Board that they provide the best method for a reliable test to enforce diesel opacity standards.

Structurally, this Second Notice rule would represent only a minor modification of the Board's existing standard of 30% opacity by visual observation. 35 Ill. Adm. Code 240.122(b). That regulation provides a standard only for engines manufactured prior to 1970; while today's proposal regulates all engines of

past, present or future manufacture. That regulation provides for compliance determinations by visual inspection; today's proposal provides for compliance determination by smokemeter. The opacity compliance standard is also changed by today's proposal.

The record supports a standard of 55% peak opacity not to be exceeded during a snap idle test for all engines certified prior to 1991. For engines certified in 1991 or thereafter a 40% peak opacity will apply. This dual standard of 55/40% using a snap idle test appears technically feasible and economically reasonable. All of the potentially regulated participants viewed the 55/40% standard to be fair and attainable. Testimony at hearing shows that tampering or improper maintenance are the most likely reasons for the vast majority of trucks which will be unable to meet this standard. Consequently, the Board will proceed to Second Notice with this standard and test method.

For the reasons outlined above, the Board today proposes an update of the existing standard only. Accordingly, many of the sections proposed at First Notice will be deleted. The proposed inspection programs, the visual opacity test, and the penalty provisions, along with many of the accompanying definitions, will be scrapped. The only remaining sections will be 240.140 and 240.141. Also, Section 240.107 will be added to incorporate by reference the specifications necessary for the opacimeters.

CHANGES FROM FIRST NOTICE

The Board has made significant changes from the July 25, 1991 First Notice Opinion and Order. These changes have been grouped into several conceptual segments.

A. Opacity Standards

The Board outlined two standards in our proposal: the snap idle test procedure for measurement of opacity and the visual opacity reading. The snap idle test procedure (which uses a smokemeter to measure opacity) is clearly more precise due to its repeatability. Visual opacity was inserted to insure that enforcement could occur outside the area of prearranged inspection sites. At hearing, however, most of the regulated community stated that visual opacity was too subjective to be relied upon as the basis for issuing a citation to a moving truck. Various road, weather and environmental conditions would impose difficult obstacles to visual readings absent smoke training and experience.

There are merits to visual readings when conducted by trained and certified smoke readers (R.2 at 29-50). However, in this proceeding the Board will drop the 20% visual opacity

standard. The primary reason for this action is the portable opacity test devices which are currently available on the market. Steve Adams of Robert Bosch Corporation testified that portable opacity meters, which require virtually no training, are readily available today. (R.2 at 60). These devices measure opacity, are capable of measuring the engine's revolutions per minute during the test to insure testing accuracy, and print out the results. Because this equipment is portable and testing would not require extensive manual labor, potential exists for enforcement throughout the state.

Finally, the visual opacity test proposed at First Notice made allowance, should the violator request, for the truck to be tested by the snap idle procedure within five days. Although the trucking community noted the theoretical merit of this provision, it also attacked the impracticality 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.

Another main concern of the industry involved the 55% versus the 40% opacity standard. At First Notice, the Board proposed 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 others 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 the snap idle test for all engines certified prior to 1991 should be 55%. Likewise, all those certified in 1991 or subsequent years should be tested against a 40% standard. (See Generally, R.1 at 53-54, 123, 207, 295-96. R.2 at 16, 24). They asserted that all engines are tested and certified according to federal standards using a dynamometer test rather than the snap idle procedure, the industry maintains that two different procedures are used to measure the same event; and because one test is for certification and the other is for enforcement, the opacity standards based on these two procedures should comport with one another. An engine which was designed for one standard should therefore not have to perform above that standard ten years thereafter.

In order to insure that our standard correlates with federal certification requirements, the trucking industry has urged that a 55% opacity be imposed for all engine families prior to 1991. At hearing, Glenn Keller of the EMA testified in support of this standard. (R.1 at 76-78). This position was reiterated by Navistar, Caterpillar, the Illinois Trucking Association and the American Trucking Association. Mr. Keller felt that if a more stringent standard was necessary, it could be adopted at a later time after the existing program has had time to stabilize. (R.1

at 79-80). Even with this standard, under a worst case scenario, Navistar alleges that 2-1/2% of the existing vehicles would still fail the test.

In reviewing the entire record, we have concluded that 55% opacity is the appropriate standard for pre-1991 engines using the snap idle test. Accordingly, the Board will change the proposal to reflect that all pre-1991 engines will be subject to the 55% standard. In the future, if this Board is provided with information which justifies an amendment, the standard can be modified. There is some indication federal standards may be made more stringent in 1994¹.

As a final note with regard to opacity, there seems to be a general misunderstanding of what the 55% standard represents. The Board wishes to emphasize that the opacity measurement used for comparison with the 55% opacity standard articulated in the rule is not that which a citizen would see on the street, but is instead that which is detected via an opacimeter during a snap idle procedure. Using this test, a driver "guns" the engine three times and opacity is measured as the average of the peak opacity recorded during each of the three snap idle cycles. Thus it is very different from normal emissions. Many of the public comments also misunderstood the 55% standard. It is important to note that any truck that is continuously emitting more than 20% opacity will almost certainly fail the 55% snap idle procedure. In effect, this represents a more stringent change from the Board's present 30% opacity standard.

B. Enforcement Structure

In our First Notice proposal, the Board placed inspection and enforcement authority with the Illinois State Police. This was done for two reasons. First, our inquiry hearings, 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. Second, our proposal attempted to incorporate many parts of the California rule. Accordingly, we did not focus on enforcement at the inquiry stage. As we pointed out in our First Notice Opinion, the Agency and the Illinois State Police were inserted, but the extent of their participation was, at that point, largely unknown.

In our hearings following the proposal, both the State Police and the Agency participated. Stating that regulations in

¹Mr. Keller testified that the federal certification standards in effect for 1991 were tighter than those between 1974 and 1990. Mr. Keller further testified that those standards will be even tighter by 1994. (R.1 at 63.)

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). According to Mr. Redlich, however, the State Police should not be a listed enforcement entity. The State Police therefore requested that we remove its name from the regulation. For this reason, in addition to the fact that any person can bring an enforcement action (Ill. Rev. Stat., ch. 111 1/2, para. 1031), we will delete any specific reference to inspection and enforcement mechanisms.

The Board believes that today's proposal can be enforced in several different ways. First, any regulations, including diesel opacity can be enforced by any entity filing an enforcement action before this 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 could use the technical standards articulated in this rule to take whatever action is authorized under their own controlling statutes. Third, the new regulatory language may provide a technical basis for local governments to adopt standards that could be enforced through the municipal legal system. We note that the Board makes no pronouncements on local government or municipal powers. 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.

Although the enforcement mechanisms mentioned above are theoretically possible, the Board notes that the enforcement of diesel opacity poses some unique problems. The enforcement of today's proposal requires that vehicles be detained in order to be tested. Consequently, the Board does not anticipate citizen enforcement actions such as those we see with respect to some of our other standards (e.g. noise). There is also a question as to whether the Agency has the power to stop vehicles. Assuming that it does, however, the Agency may simply not be equipped to undertake a program so different in scope relative to its existing operation. Ideally, 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.

C. Penalty Provisions

TEXT FROM HERE ON NOT MODIFIED

C. 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 Board finds merit in those comments and will accordingly delete the civil penalty schedule. The Board notes that civil penalty determinations can be made utilizing the existing statutory and regulatory framework.

D. Other Concerns

Mr. Robert Jasmon testified 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 are operating on the roads of the nation. The federal government does issue peak smoke opacity certifications which 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 smoke meters 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, we are confident that those local authorities will be in a better position to adequately assess the safety issues.

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. We find 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.

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 which meet manufacturers' requirements for training. This the Board declines to do. While we are sympathetic to these concerns, we will not endorse certain mechanics over others. Apart from the legality of such a rule, our 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. We agree. Accordingly, we have added the requested language so as to clarify the provision.

DELAY PRIOR TO SECOND NOTICE SUBMISSION

Today's action represents a substantial reduction in scope from that proposed at first notice. The Board believes that today's action represents a resolution of nearly all conflicts identified in testimony and comments received during the First Notice period. Today's action is in substantial conformity with the existing regulations, but updates those regulations for standards and test protocols. As a result, the Board believes an additional First Notice is not necessary.

Nonetheless, this regulatory language does represent a change from First Notice such that the Board would benefit from review by the participants. Accordingly, the Board will withhold sending this matter to the Joint Committee on Administrative Rules until December 19. Any person who identifies an error or problem with the present regulatory language is free to file a written statement with the Board. That written statement must be received in the Board's office not later than 4:30 p.m. on Friday, December 13, 1991. Any such written statement should clearly articulate the proposed regulatory language of concern, specify the difficulty, and suggest alternative language or concepts to be employed that will remedy the problem.

ORDER

The Board directs the Clerk to file these amendments and additions with the Joint Committee on Administrative Rules for Second Notice.

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
240.105	Penalties
240.106	Determination of Violation
<u>240.107</u>	<u>Incorporations by Reference</u>

SUBPART B: EMISSIONS

Section	
240.121	Smoke Emissions
240.122	Diesel Engine Emission Standards <u>for Locomotives</u>
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

<u>Section</u>	
<u>240.140</u>	<u>Applicability</u>
<u>240.141</u>	<u>Heavy Duty Diesel Smoke Opacity Standards and Test Procedures</u>

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 ___ Ill. Reg. _____, effective _____.

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. 1985⁹, ch. 95 1/2, par. 1-146).

~~"Opacity": A condition which renders material partially or 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 ___ 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 ___ 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 (c)(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.
- C)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 ___ 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' 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 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.

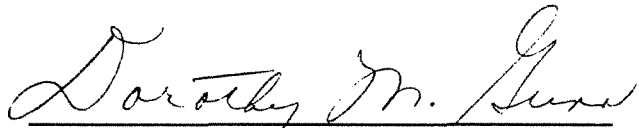
A) The smoke opacity shall be measured during the preconditioning and testing phases with an opacimeter meeting the requirements of subsection (b) and shall be recorded continuously on the recorder during each snap idle cycle. The maximum 0.5 second averaged value recorded during each snap idle cycle 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).

(Source: Added at ___ Ill. Reg. _____, effective _____.)

IT IS SO ORDERED.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby testify that the above Opinion and Order was adopted on the 27th day of November, 1991 by a vote of 4-0.



Dorothy M. Gunn, Clerk
Illinois Pollution Control Board