

ILLINOIS POLLUTION CONTROL BOARD  
September 25, 1986

IN THE MATTER OF: )  
 )  
PROPOSED AMENDMENTS TO )  
35 Ill. Adm. Code 212.443 ) R85-33  
By-Product Coke Plants )

ADOPTED RULE.    FINAL ORDER.

OPINION AND ORDER OF THE BOARD (by J. Theodore Meyer):

This matter comes before the Board upon a December 19, 1985 proposal for regulatory change filed by the Illinois Environmental Protection Agency (Agency), Citizens for a Better Environment (CBE) and various steel companies. This proposal represents the proposed settlement arising out of a lawsuit filed by CBE in Federal District Court against the Agency and various steel companies for failure to revise Illinois' coke-battery and casthouse rules. First Notice was adopted on January 23, 1986 and published at 10 Illinois Register 3731, February 21, 1986. Hearings were held on March 10 and 11, 1986, in Chicago and Granite City, Illinois, respectively. On May 8, 1986, the Department of Energy and Natural Resources issued a Negative Declaration for this proceeding stating that the net economic impact of the regulation is favorable and the cost of compliance are small or are borne entirely by the proponents of the regulations, and the Economic and Technical Advisory Committee concurred with this finding at its June 20, 1986, meeting. Second Notice was adopted on June 11, 1986, and submitted to the Joint Committee on Administrative Rules (JCAR). JCAR determined that no objection would be issued to this proposed rulemaking provided certain modifications were made to the rules to enhance clarity. The Board has agreed to make these modifications and they appear in the Final Order. The following is a brief history of this proceeding.

In 1979, the Agency submitted to USEPA proposed revisions to Illinois' State Implementation Plan (SIP) which included rules governing coke oven charging and pushing operations. These rules are presently codified at 35 Ill. Adm. Code 212.443(b) and (c). Both of these rules were disapproved for inclusion in Illinois' SIP by USEPA. In connection with this disapproval, CBE sued the Administrator of USEPA in federal court (CBE v. Thomas, No. 80-C-0003). As a result of settlement negotiations arising out of that suit, the Agency, CBE and various steel companies have proposed coke oven charging and pushing rules for adoption by the Board in lieu of federal promulgation of these rules. An explanation of these rules follows.

The joint regulatory proposal submitted by the Agency, CBE and various steel companies includes emission limitations as well as inspection and compliance procedures for coke oven charging and pushing operations. (R1 p. 12).<sup>\*</sup> There are currently three coke plants operating in Illinois to which these rules are applicable; Interlake, Inc., LTV Steel and Granite City Steel Corporation, a Division of National Steel Corporation. (Id.)

### Charging Operations

Section 212.443(b) regulates coke oven charging operations and is divided into two subsections. Section 212.443(b)(1) establishes an opacity limitation applicable to fugitive emissions during charging operations and Section 212.443(b)(2) establishes a particulate matter emission limitation and an opacity limitation applicable to charging emissions control equipment.

#### Section 212.443(b)(1)

Mr. Anton Telford of the Agency testified that approximately 1200 pounds of steel coke is needed to make one ton of blast furnace iron. In order to make steel coke, the proper blend of coals must be introduced (i.e., charged) into the coke oven in which the coal is converted to coke by baking the coal at approximately 2400° F in the complete absence of air during a period of about 16 hours. (R1 pp. 16-17).

In general, a charge can be defined as constituting the transfer of the blended coal into the coke oven from the larry car, the larry car being the equipment used to bring the coal from the coal hopper into a position on top of the oven. Section 212.443(b)(1)(A) defines a charging operation as the time from the first introduction of coal into the first charge port of the coke oven via the larry car to the replacement of the final charge port lid. Mr. Telford testified that the addition of a definition of charging operations to the Illinois regulations remedies a deficiency which was cited by the USEPA as one of the bases for disapproval of the present charging rule. (R1 p. 19).

The charging operation itself involves a precise sequence of events called stage charging. Stage charging involves the charging of a coke oven from one larry car at a time while simultaneously exhausting the coke oven gas, organic material, water and tar released from the coke oven being charged by a

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<sup>\*</sup>There were two separate hearings conducted in this proceeding. The March 10, 1986 hearing transcripts will be designated "R1" and the March 11, 1986 hearing transcript will be designated "R2".

steam jet into one or two large pipes which conduct the gases and other materials to the by-products plant. The total charging time is normally four to five minutes, and the leakage of visible particulate emissions to the ambient air during this time is subject to the charging rule. (R1 p. 17).

Section 212.443(b)(1)(A) provides that visible particulate emissions from coke oven charging operations shall not exceed a total of 125 seconds over 5 consecutive charges with the exception that one charge out of any 20 consecutive charges may be deemed an uncountable charge. Under this procedure, a total of at least 6 charges must be observed and recorded and another charge may not be disregarded until after the 21st charge has been completed. (R1. p. 20). The Agency states that it is their belief that this standard constitutes reasonably available control technology (RACT) for coke oven charging operations in Illinois (R1 p. 21). This opinion is based on the fact that USEPA stated in its final rulemaking on the present charging rule that such a standard constitutes RACT. (R1 pp. 21-22).

Section 212.443(b)(1)(B) establishes the procedures for determining compliance with the visible emissions limitation for charging operations. Mr. Cezary Krzynowski of the Agency testified that the addition of procedures for determining compliance with the visible emissions limitation remedies another deficiency which was cited by the USEPA as one of the bases for its disapproval of the present charging rule. (R1 p. 46).

The inspection procedures of Section 212.443(b)(1)(B) require that a qualified observer who is certified to read visible emissions pursuant to 35 Ill. Adm. Code 230. Appendix A (40 CFR 60, Appendix A, Method 9) position himself on the top side of the coke oven battery with a cumulative stopwatch so that an unobstructed view can be obtained of the charging larry car and charging ports and that the visible emissions from these sources can be timed during a charge. The qualified observer then determines and records the total number of seconds of visible emissions timed for that oven and battery, including the start and stop time for the charging operation. This procedure continues for five consecutive charges unless the observer deems one an uncountable charge in which case the procedure would continue until at least five consecutive charges are observed. (R1 pp. 46-47).

#### 212.443(b)(2)

Section 212.443(b)(2) establishes standards applicable to emissions from charging emissions control equipment. Mr. Telford testified that the Agency is only aware of one coke plant in Illinois which uses control equipment to capture charging emissions and that facility is operated by LTV Steel; LTV's charging emissions control equipment operates by exhausting the

coke oven through the larry car, the larry car fugitive gas igniter and subsequently to a stationary venturi scrubber.

Section 212.443(b)(2)(A) provides that a mass emission limitation of 0.020 grains per dry standard cubic foot be applicable to particulate matter emissions from charging emissions control equipment. Compliance with this mass emission limitation shall be determined pursuant to the procedures set out in 35 Ill. Adm. Code 230, Appendix A, Methods 1 through 5 which are the procedures specified for stack testing.

Section 212.443(b)(2)(B) provides that the opacity of emissions from charging emissions control equipment shall not exceed an average of 20%, averaging the total number of readings taken at 15-second intervals during a charge. Compliance with this limitation shall be determined pursuant to 35 Ill. Adm. Code 230, Appendix A (40 CFR 60, Appendix A, Method 9) except for the number of readings or observations required. Mr. Krzynowski testified that this exception for the number of readings required refers to the requirement in Section 2.4 of Method 9 that a minimum of 24 observations be made and that opacity be determined as an average of 24 consecutive observations recorded at 15-second intervals. This exception is necessitated by the fact that a charge generally lasts less than 6 minutes and the intent of the regulation is that compliance with the 20% opacity standard be determined as an average of the total number of readings taken at 15-second intervals over the duration of a charge. (R1. pp. 48-49).

Lastly, Section 212.443(b)(2)(C) requires that the opacity readings from the charging emissions control equipment be taken concurrently with the observations of fugitive particulate matter. Two qualified observers shall take these readings.

#### Pushing Operations

Section 212.443(c) regulates coke oven pushing operations and is divided into two subsections. Section 212.443(c)(1) establishes an opacity limitation applicable to fugitive emissions during pushing operations and Section 212.443(c)(2) establishes a particulate matter and an opacity limitation applicable to pushing emissions control equipment.

#### Section 212.443(c)(1)

Mr. Telford also described what constitutes a "push." He testified that after the coal has cooked sufficiently, the end doors on the coke ovens are removed and the cooked coal is pushed out of the oven by a pushing machine. The cooked coal which is now coke exits the coke oven on the opposite side from the pushing machine through a piece of duct called a coke guide which interfaces with the oven on one side and the coke receiver car on

the other side and falls into a hooded receiver car. After the coke falls into the receiver car, which is on a track, the car moves down to the quench tower or quench device at which the coke is cooled with water to reduce its temperature from 2,000°F to approximately 400°F. A push takes about one and a half minutes from the time the coke falls into the receiver or until the car enters the quench tower or quench device. (R1 pp. 24-25).

Section 212.443(c)(1)(A) provides that emissions of fugitive particulate matter from pushing operations shall not exceed an average of 20% opacity for four consecutive pushes considering the highest average of six consecutive readings in each push. Mr. Telford testified that this procedure allows a brief surge of visible particulate emissions during the pushing of the coke into the receiver car to be mitigated by less emissions during the movement of the receiver car to the quenching tower or device. (R1 pp. 26-27). Mr. Telford also testified that all of the coke facilities in Illinois can meet this standard and that this standard constitutes RACT. He based this latter conclusion on the fact that USEPA stated in its final rulemaking on the Indiana Steel State Implementation Plan that such an opacity standard constitutes RACT. (R1 p. 27).

Section 212.443(c)(1)(B) sets forth the procedures to be followed by the qualified observer when conducting opacity readings of fugitive emissions during pushing operations. The procedures account for the fact that opacity readings are taken over the duration of a push including readings as the receiving car travels to the quench tower or device by requiring that the qualified observer position himself so that the entire pushing operation can be observed. The procedures also require that emissions from the receiving car and associated equipment, the coke oven and the stand pipe on the coke side of the oven being pushed be read. (R1 p. 52). The observation procedures are to be conducted pursuant to (40 CFR 60, Appendix A, Method 9) except that Section 2.5 for data reduction shall be used. This exception to Method 9 procedures is necessary to account for the fact that a push lasts less than six minutes. (R1 p. 53).

#### Section 212.443(c)(2)

Section 212.443(c)(2) establishes standards applicable to emissions from pushing emissions control equipment. Mr. Telford testified that two types of pushing emissions control systems are in use in Illinois, a mobile hood receiver connected to a stationary emissions collector and a mobile hooded receiver car equipped with a mobile emissions collector. (R1 p. 33).

Section 212.443 (c)(2)(A) establishes a mass emission limitations of 0.040 pounds of particulate matter per ton of coke pushed. Mr. Telford testified that all the coke facilities in Illinois are capable of meeting this standard and such standard

constitutes RACT. (R1 pp. 35-36). He based this latter conclusion on the fact that for those systems using mobile collectors, the standard is identical to the lowest achievable emission rate limit currently applicable to such a system. Also, for those systems using stationary collectors, the Agency believes that 0.040 pounds of particulates per ton of coke pushed constitutes an appropriate RACT limitation since 0.030 pounds of particulate per ton of coke pushed has been determined to be the best available control technology for such systems. (R1 p. 36).

Section 212.443(c)(2)(B) establishes an opacity limitation for the pushing emissions control system. The rule states that the opacity from such control equipment shall not exceed 20%. For a push of less than six minutes, the number of 15-second readings shall be averaged. Again, Method 9 of 40 CFR 60, Appendix A governs the observation procedures and Section 2.5 for data reduction shall not apply for pushes less than six minutes in duration.

As a final note, on August 15, 1986, the Board received JCAR's formal certification that no objection will be issued on this rulemaking provided that the Board make some non-substantive modifications to the rules as submitted for Second Notice. The modifications suggested by JCAR relate to the opacity reading procedure and the Board has agreed to clarify that all observers conducting opacity reading be qualified pursuant to 40 CFR 60, Appendix A, Method 9 (35 Ill. Adm. Code 230. Appendix A).

#### ORDER

The Board hereby adopts the following amendments to 35 Ill. Adm. Code 212.443:

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

PART 212  
VISUAL AND PARTICULATE MATTER EMISSIONS

Section 212.443 By-Product Coke Plants

- a) Subpart B shall not apply to by-product coke plants.
- b) Charging: No person shall cause or allow the emission of visible particulate matter from any coke even charging operation when coal is being charged; except for a total of no more than 170 seconds over 5

consecutive oven charges, or in the case of existing five meter coke batteries having three charging parts, for a total of no more than 200 seconds over 5 consecutive oven charges.

1) Uncaptured Emissions

A) No person shall cause or allow the emission of visible particulate matter from any coke oven charging operation, from the introduction of coal into the first charge port, as indicated by the first mechanical movement of the coal feeding mechanism on the larry car, to the replacement of the final charge port lid for more than a total of 125 seconds over 5 consecutive charges; provided however that 1 charge out of any 20 consecutive charges may be deemed an uncountable charge at the option of the operator.

B) Compliance with the limitation set forth in subsection (A) shall be determined in the following manner:

i) Observation of charging emissions shall be made from any point or points on the topside of a coke oven battery from which a qualified observer can obtain an unobstructed view of the charging operation

ii) The qualified observer shall time the visible emissions with a stopwatch while observing the charging operation. Only emissions from the charge port and any part of the larry car shall be timed. The observation shall commence as soon as coal is introduced into the first charge port as indicated by the first mechanical movement of the coal feeding mechanism on the larry car and shall terminate when the last charge port lid has been replaced. Simultaneous emissions from more than one emission point shall be timed and recorded as one emission and shall not be added individually to the total time.

iii) The qualified observer shall determine and record the total number of seconds that charging emissions are visible during the charging of coal to the coke oven.

- iv) For each charge observed, the qualified observer shall record the total number of seconds of visible emissions, the clock time for the initiation and completion of the charging operation and the battery identification and oven number.
- v) The qualified observer shall not record any emissions observed after all charging port lids have been firmly seated following removal of the larry car, such as emissions occurring when a lid has been temporarily removed to permit spilled coal to be swept into the oven.
- vi) In the event that observations from a charge are interrupted the data from the charge shall be invalidated and the qualified observer shall note on his observation sheet the reason for invalidating the data. The qualified observer shall then resume observation of the next consecutive charge or charges and continue until a set of five charges has been recorded. Charges immediately preceding and following interrupted observations shall be considered consecutive.

2) Emissions from Control Equipment

- A) Emissions of particulate matter from control equipment used to capture emissions during charging shall not exceed 0.046 gm/dscm (0.020 gr/dscf). Compliance shall be determined in accordance with the procedures set forth in 35 Ill. Adm. Code 230.Appendix A (40 CFR 60, Appendix A, Methods 1-5).
- B) The opacity of emissions from control equipment shall not exceed an average of 20%, averaging the total number of readings taken. Opacity readings shall be taken at 15-second intervals from the introduction of coal into the first charge port as indicated by the first mechanical movement of the coal feeding mechanism on the larry car to the replacement of the final charge port lid. Compliance shall be determined in accordance with 35 Ill. Adm. Code 230.Appendix A (40 CFR 60, Appendix A, Method 9), except for the number of readings required.



- C) Opacity readings of emissions from control equipment shall be taken concurrently with observations of fugitive particulate matter. Two qualified observers shall be required.
- 3) Qualified observers referenced in subsection (b) shall be certified pursuant to 35 Ill. Adm. Code 230.Appendix A (40 CFR 60, Appendix A, Method 9).
- c) Pushing: All coke facilities shall be equipped with pushing systems with particulate control equipment which shall be designed to capture at least 90% of all particulate emissions from pushing operations. The particulate control equipment shall be operated and maintained in a manner to achieve the design efficiency. If a stationary hood system is used, the particulate emissions from the outlet of said particulate control equipment shall not exceed 70 mg/dsem (0.03 gr/dsef). If a closely hooded mobile system is used in connection with the operation of an existing coke oven battery with the emissions exhausted directly to the particulate control equipment, the particulate emissions from the outlet of said particulate control equipment shall not exceed 140 mg/dsem (0.06 gr/dsef).

1) Uncaptured Emissions

- A) Emissions of fugitive particulate matter from pushing operations shall not exceed an average of 20% opacity for 4 consecutive pushes considering the highest average of six consecutive readings in each push. Opacity readings shall be taken at 15-second intervals, beginning from the time the coke falls into the receiving car or is first visible as it emerges from the coke guide whichever occurs earlier, until the receiving car enters the quench tower or quenching device. For a push of less than 90 seconds duration, the actual number of 15-second readings shall be averaged.
- B) Opacity readings shall be taken by a qualified observer located in a position where the oven being pushed, the coke receiving car and the path to the quench tower are visible. The opacity shall be read as the emissions rise and clear the top of the coke battery gas mains. The qualified observer shall record opacity readings of emissions originating at

the receiving car and associated equipment and the coke oven, including the standpipe on the coke side of the oven being pushed. Opacity readings shall be taken in accordance with the procedures set forth in 35 Ill. Adm. Code 230. Appendix A (40 CFR 60, Appendix A, Method 9), except that Section 2.5 for data reduction shall not be used. The qualified observer referenced in this subsection shall be certified pursuant to 35 Ill. Adm. Code 230. Appendix A (40 CFR 60, Appendix A, Method 9).

2) Emissions from Control Equipment

A) The particulate emissions from control equipment used to control emissions during pushing operations shall not exceed 0.040 pounds per ton of coke pushed. Compliance shall be determined in accordance with the procedures set forth in 35 Ill. Adm. Code 230. Appendix A (40 CFR 60, Appendix A, Methods 1-5) and shall be based on an arithmetic average of three runs (stack tests) and the calculations shall be based on the duration of a push as defined in subsection (c)(1)(A).

B) The opacity of emissions from control equipment used to control emissions during pushing operations shall not exceed 20%. For a push of less than six minutes duration, the actual number of 15-second readings taken shall be averaged. Compliance shall be determined in accordance with 35 Ill. Adm. Code 230. Appendix A (40 CFR 60, Appendix A, Method 9), except that Section 2.5 for data reduction shall not be used for pushes of less than six minutes duration.

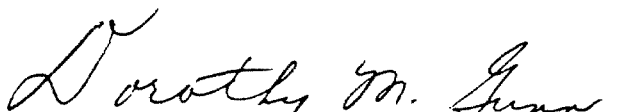
d) Coke Oven Doors:

- 1) No person shall cause or allow visible emissions from more than 10% of all coke oven doors at any time. Compliance shall be determined by a one pass observation of all coke oven doors on any one battery.
- 2) No person shall cause or allow the operation of a coke oven unless there is on the plant premises at all times an adequate inventory of spare coke oven doors and seals and unless there is a readily available coke oven door repair facility.

- e) Coke Oven Lids: No person shall cause or allow visible emission from more than 5% of all coke oven lids at any time. Compliance shall be determined by a one pass observation of all coke oven lids.
- f) Coke Oven Offtake Piping: No person shall cause or allow visible emissions from more than 10% of all coke oven offtake piping at any time. Compliance shall be determined by a one pass observation of all coke oven offtake piping.
- g) Coke Oven Combustion Stack: No person shall cause or allow the emission of particulate matter from a coke oven combustion stack to exceed 110 mg/dscm (0.05 gr/dscf).
- h) Quenching: All coke oven quench towers shall be equipped with grit arrestors or equipment of comparable effectiveness. The make-up water shall not directly include coke by-product plant effluent. Total dissolved solids concentrations in the make-up water shall not exceed 1500 mg/l. Provided however that the limitations on the quality of quench make-up water shall not apply where the operator employs an equivalent method of control as determined by the Agency.
- i) Work Rules: No person shall cause or allow the operation of a by-product coke plant except in accordance with operating and maintenance work rules approved by the Agency.

IT IS SO ORDERED.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 25<sup>th</sup> day of September, 1986 by a vote of 6-0.

  
Dorothy M. Gunn, Clerk  
Illinois Pollution Control Board