INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
We make Indiana a cleaner, healthier place to live.

Frank O'Bannon
Governor

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Commissioner

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November 21, 2003

TO: Interested Parties / Applicant

RE: Nucor Steel / PSD/Part 70 SSM 107-16823-00038

FROM: Paul Dubenetzky
Chief, Permits Branch
Office of Air Quality

Notice of Decision: Approval - Effective Immediately

Please be advised that on behalf of the Commissioner of the Department of Environmental Management, I have issued a decision regarding the enclosed matter. Pursuant to IC 13-15-5-3, this permit is effective immediately, unless a petition for stay of effectiveness is filed and granted according to IC 13-15-6-3, and may be revoked or modified in accordance with the provisions of IC 13-15-7-1.

If you wish to challenge this decision, IC 4-21.5-3 and IC 13-15-6-1 require that you file a petition for administrative review. This petition may include a request for stay of effectiveness and must be submitted to the Office of Environmental Adjudication, ISTA Building, 150 W. Market Street, Suite 618, Indianapolis, IN 46204, **within eighteen (18) calendar days of the mailing of this notice**. The filing of a petition for administrative review is complete on the earliest of the following dates that apply to the filing:

(1) the date the document is delivered to the Office of Environmental Adjudication (OEA);
(2) the date of the postmark on the envelope containing the document, if the document is mailed to OEA by U.S. mail; or
(3) The date on which the document is deposited with a private carrier, as shown by receipt issued by the carrier, if the document is sent to the OEA by private carrier.

The petition must include facts demonstrating that you are either the applicant, a person aggrieved or adversely affected by the decision or otherwise entitled to review by law. Please identify the permit, decision, or other order for which you seek review by permit number, name of the applicant, location, date of this notice and all of the following:

(1) the name and address of the person making the request;
(2) the interest of the person making the request;
(3) identification of any persons represented by the person making the request;
(4) the reasons, with particularity, for the request;
(5) the issues, with particularity, proposed for considerations at any hearing; and
(6) identification of the terms and conditions which, in the judgment of the person making the request, would be appropriate in the case in question to satisfy the requirements of the law governing documents of the type issued by the Commissioner.

If you have technical questions regarding the enclosed documents, please contact the Office of Air Quality, Permits Branch at (317) 233-0178. Callers from within Indiana may call toll-free at 1-800-451-6027, ext. 3-0178.

Enclosures
FNPER.dot 8/11/03

Prevention of Significant Deterioration
Part 70 Significant Source Modification

OFFICE OF AIR QUALITY

Nucor Steel
4537 South Nucor Street
Crawfordsville, IN 47933

(herein known as the Permittee) is hereby authorized to construct and operate subject to the conditions contained herein, the emission units described in Section A (Source Summary) of this approval.

This approval is issued in accordance with 326 IAC 2 and 40 CFR Part 70 Appendix A and contains the conditions and provisions specified in 326 IAC 2-7 as required by 42 U.S.C. 7401, et. seq. (Clean Air Act as amended by the 1990 Clean Air Act Amendments), 40 CFR Part 70.6, IC 13-15 and IC 13-17.

This permit is also issued under the provisions of 326 IAC 2-2 (Prevention of Significant Deterioration).

PSD Source Modification No.: 107-16823-00038	
Issued by: Original signed by Paul Dubenetzky Paul Dubenetzky, Branch Chief Office of Air Quality	Issuance Date: **November 21, 2003**

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SECTION A SOURCE SUMMARY

This approval is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ). The information describing the emission units contained in conditions A.1 through A.2 is descriptive information and does not constitute enforceable conditions. However, the Permittee should be aware that a physical change or a change in the method of operation that may render this descriptive information obsolete or inaccurate may trigger requirements for the Permittee to obtain additional permits or seek modification of this approval pursuant to 326 IAC 2, or change other applicable requirements presented in the permit application.

A.1 General Information [326 IAC 2-7-4(c)] [326 IAC 2-7-5(15)]

The Permittee owns and operates a stationary steel mini-mill that produces all grades of carbon and stainless steel, all grades of alloy steel, all grades of ultra low and low carbon steel, flat rolled, hot rolled, cold rolled, galvanized, pickled and oiled steel (slabs, sheets) products.

Source Name:	Nucor Steel
Source Location:	4537 South Nucor Street, Crawfordsville, IN 47933
Mailing Address:	4537 South Nucor Street, Crawfordsville, IN 47933 RR2, Box 311, Crawfordsville, IN 47933
General Telephone Number:	765-364-2323
General Facsimile Number:	765-364-5311
Responsible Official:	General Manager
County Location:	Montgomery
SIC Code:	3312 (Steel Mill)
Source Categories:	1 of 28 Listed Source Categories Major PSD Source Major Source, CAA Section 112

A.2 Emission Units and Pollution Control Equipment Summary [326 IAC 2-7-4(c)(3)] [326 IAC 2-7-5(15)]

This stationary source is approved to construct, modify and operate the following emission units and pollution control devices:

I MELTSHOP

(1) Two (2) Meltshop Electric Arc Furnaces (EAFs) together with the Argon-Oxygen Decarburization (AOD) have a maximum capacity of 502 tons/hour. The EAFs utilize the following emission control technologies:

(i) a direct shell evacuation (DSE) control system (Afourth hole@ duct),
(ii) an overhead roof exhaust system consisting of canopy hoods,
(iii) oxy fuel burners and
(iv) multi compartment reverse air type baghouses (identified as Meltshop EAF Baghouse1 and Meltshop EAF Baghouse2).

(a) Raw materials used are all types of scrap steel, including stainless, DRI, pig iron, HBI, various types of lime, alloys, carbon and various types of metal scrap substitutes.

(b) Each or any combination of the Meltshop EAFs and AOD can independently produce the maximum capacity of 502 tons/hour of steel. Each Meltshop EAF can operate concurrently or independently to achieve this maximum capacity.

(c) Both the Meltshop EAF Baghouse1 and Meltshop EAF Baghouse2 capture the emissions from the Meltshop EAFs, AOD vessel, Desulfurization, Meltshop Continuous Casters. Each Meltshop Baghouse can sufficiently control emissions independently. Each Meltshop EAF Baghouse serves as a back up control to the Meltshop LMFs.

(i) The Meltshop EAF Baghouse1 is a multi compartment positive pressure baghouse, has a air flow rate of 1,527,960 actual cubic foot/min (acf/min) and loading of 0.0018 grains/dry standard cubic foot (gr/dscf). This Meltshop EAF Baghouse1 exhausts to a roof vent/monitor (identified as BH1 vent).

(ii) The Meltshop EAF Baghouse2 is a multi compartment negative pressure baghouse, has a flow rate of 915,000 dscf/min and 1,200,000acf/min and loading of 0.0018 gr/dscf. This Meltshop EAF Baghouse2 exhausts to a stack (identified as BH2 stack).

(d) The fugitive emissions generated during the furnace operations are captured by the Meltshop Roof Canopies or contained within the Meltshop Building.

(e) The Meltshop roof monitors include exhausts from the ladle preheaters, ladle dryers, tundish preheaters, tundish dryers, ladle lancing station, tundish dumping, fugitive emissions from the LMFs, fugitive emissions from the Meltshop Casters and other Meltshop operations.

(2) Argon oxygen decarburization (AOD) vessels, together with the Meltshop EAFs have a total maximum capacity of 502 tons/hour. The AOD vessels and Desulfurization also exhaust to the Meltshop EAF Baghouse1 and Meltshop EAF Baghouse2. Only 1 AOD vessel can operate at a time.

(3) Desulfurization is an additional step in the Meltshop operations that remove sulfur. It has a maximum capacity of 502 tons of metal per hour.

(4) Two (2) Meltshop Continuous Casters with total maximum capacity of 502 tons/hour. These Meltshop Continuous Casters also exhaust to the Meltshop EAF Baghouse1 and Meltshop EAF Baghouse2. The steam from the Meltshop Continuous Casters exhausts directly to the atmosphere.

(5) An EAF dust treatment facility, with a capacity of 50,000 lb/hour or transfer the dust to the existing system which will then be a total of 100,000 lb/hour. Dust transfer will also occur inside the building. Particulate controls are bin vents for the silos, scrubber for dust treatment and baghouse for truck loading.
Options for the dust transfer are:
(i) from silo to truck through a loading spout,
(ii) from silo to railcar through a loading spout,
(iii) from silo to truck through a loading spout to transfer to the existing Meltshop EAF Baghouses. Unloading from the truck at the existing Meltshop EAF Baghouses also occurs in the building, transferring the dust through augers and a bucket elevator to the existing silo. In this option, the existing EAF dust treatment will have a maximum capacity of 100,000 lb/hr.
(iv) treating dust at the new silo and transferring to a truck. No loading spout is necessary because the material is no longer dusty, as treated.

(6) Two (2) Meltshop Ladle Metallurgy Furnaces (LMFs)/Stirring Station have a maximum capacity of 502 tons/hour and controlled by a baghouse, (identified as Meltshop LMF Baghouse), exhausting through a stack . The Meltshop LMF Baghouse has a flow rate of 200,000 acf/min.

(7) Operations in the Meltshop that are not going to be physically modified, but an increase in utilization is expected:
- (a) Ladle Preheat Stations consisting of:
  - (i) 3 units, each rated at 10 MMBTU/hr
  - (ii) 1 unit, rated at 7.5 MMBTU/hr
  - (iii) 1 unit, rated at 15 MMBTU/hr
- (b) Ladle Dryout Station consisting of a low NO_x natural gas fired burner, rated at 5 MMBTU/hour.
- (c) Four (4) Tundish Preheaters consisting of 4 low NO_x natural gas fired heaters, each rated at 6 MMBTU/hour.
- (d) Two (2) Tundish Dryers, rated at 1.5 MMBTU/hour and 9 MMBTU/hour.
- (e) Four (4) Tundish Nozzle Preheaters consisting of a low NO_x natural gas fired Preheaters, each rated at 0.8 MMBTU/hour.
- (f) Tundish Dumping.
- (g) Ladle Dumping.
- (h) Ladle tap hole cleaning and repair.
- (i) Ladle/tundish refractory application and curing.

II HOT MILL

(1) Hot Strip Mill has a maximum capacity of 502 tons/hour consisting of the Tunnel Furnace System, and other rolling mill processes: Shearing, Descaling, Finishing, Rollout Table, Coilers, Skin Pass Mill and Roll Grinders.

(2) Operations in the Hot Mill that are not going to be physically modified, but an increase in utilization is expected:
Tunnel Furnace System (total of 200 MMBTU/hr) consisting of:
- (a) Tunnel Furnace 1 -Natural gas fired 84 MMBTU/hour
- (b) Tunnel Furnace 2 - Natural gas fired 84 MMBTU/hour
- (c) Shuttle Furnaces 1 and 2, each has 13 MMBTU/hour natural gas fired Low NO_x burners
- (d) Snub Furnace - 6 MMBTU/hour

III COLD MILL

(1) Pickle Line 1 and Pickle Line 2 have maximum capacity of 250 tons/hour each, use HCl pickling solution and rinse water, and are equipped with process tanks.

(a) Pickle Line 1 is controlled by a counter flow-packed scrubber and mist eliminators. The PL1 Scrubber has a flow rate of 12,000 acf/min, and loading of 0.01 gr/dscf.

(b) Pickle Line 2 is controlled by a new counter flow tray scrubber and mist eliminators. The new PL2 Scrubber has a flow rate of 9,000 acf/min and loading of 0.01 gr/dscf. This new PL2 Scrubber will replace the existing PL2 Scrubber.

(c) Tank Farm treats the rinse water from Pickle Line1 and Pickle Line 2. These tanks also store spent acid, raw acid, regenerated acid, oily wastewater, and processed water.

(2) Acid Regeneration consisting of two natural gas fueled tangentially fired burners at a total rating of 7.3 MMBTU/hour, and controlled by its own counter flow packed scrubber (identified as AR scrubber) with mist eliminator. The counter flow-packed scrubber has a flow rate of 4,269 acf/min and loading of 0.04 gr/dscf. Propane is used as back up fuel.

(3) Cold Reversing Mill 1 has a maximum capacity of 250 tons/hour, emulsion oil is sprayed in the strip, controlled by hoods mounted on both sides of the mill stand and exhausting through a panel-typed collision mist eliminators at a rate of 84,000 acf/min and 0.01 gr/dscf.

Two (2) natural gas fueled with propane as back up fuel Cold Mill Boilers, each rated at 34 MMBTU/hour. Each Cold Mill Boiler exhausts to its own stack. These 2 Cold Mill Boilers will supply steam to the entire Cold Mill.

(4) Reversing and Tempering (R/T) Mill a.k.a. Cold Reversing Mill 2 has a maximum capacity of 250 tons/hour, emulsion oil is sprayed in the strip, controlled by hoods mounted on both sides of the mill stand and exhausting through a panel-typed collision mist eliminators at a rate of 84,000 acf/min and 0.01 gr/dscf. This mill can reverse and temper. The mist eliminators are operating as controls only when the mill is operating as cold reversing mill.

(5) Alkali Cleaning at the Galvanizing line with mist eliminator as control. The mist eliminator of the Alkaline Cleaning section is increased from 5,000 acf/min to 10,000 acf/min.

(6) Operations in the Galvanizing Line that are not going to be physically modified, but an increase in utilization is expected:
Galvanizing Line/Furnace consisting of:
(a) 36 main burners, each at 1.622 MMBTU/hr,
(b) 3 auxiliary burners, each at 0.1 MMBTU/hr
(c) a galvalum tank, a zinc pot,
(d) 44 burners each at 0.323 MMBTU/hr in radiant tube section
(e) Welding at the Galvanizing line
This Galvanizing Line controlled by SCR/SNCR was recently permitted under PSD 107-14297-00038, issued on June 6, 2002. The existing PSD limits for the Galvanizing Line/Furnace are not being revised.

(7) Natural gas fueled Annealing Furnaces - -consisting of 18 furnaces at 4.8 MMBTU/hr each and have maximum capacity of 200 tons/hour. Emissions exhaust to roof vent.

(8) Slitter/Rewind/Trimmer Line for trimming operations exhausting to roof vent.

IV <u>CASTRIP</u>

(1) The nozzle core milling/drilling operation is going to be controlled by its own baghouse (identified as Castrip Milling/Drilling Baghouse) and exhausting to the atmosphere with backup to the existing Castrip LMS Baghouse, instead of exhausting through the Castrip LMS Baghouse, as previously permitted under MSM 107-15289-00038.

(2) Coils cutting in the Castrip area with the Castrip Milling/Drilling Baghouse or Castrip LMS Baghouse as particulate control.

(3) Operations in the Castrip that are not going to be physically modified, but an increase in utilization is expected:
(a) Castrip LMS, with a maximum capacity of 135 tons/hour, with Castrip LMS

Baghouses as control.

(b) Castrip Caster

(c) Castrip Hot Strip Mill

(d) Castrip Tundish and Ladle Preheaters/Dryers, exhausting to the Castrip Roof monitors.

These operations were recently permitted under PSD 107-12143-00038, issued on January 19, 2001. The existing PSD limits for the Castrip are not being revised.

V MISCELLANEOUS OPERATIONS

(1) Contact and Non-Contact Cooling Towers with maximum designed capacity of 192,352 gal/min and consisting of a total of 54 cells.

Cooling Towers	No. of Cells	Design Capacity (gal/min)
Meltshop Non Contact Cooling	9	60,000
Meltshop Caster Contact Cooling	4	10,000
Meltshop Caster Contact Cooling (expansion)	2	5,000
Hot Mill Contact Cooling	4	16,383
Hot Mill Contact Cooling (expansion)	1	4,000
Hot Mill Non Contact Cooling	4	25,319
Laminar Contact Cooling	3	11,600
Cold Mill Non Contact Cooling	2	10,000
Cold Mill Non Contact Cooling (expansion)	1	5,000
Galvanizing/Annealing Non Contact	2	6,500
Annealing Non Contact Cooling	2	5,000
Castrip Contact Cooling	4	12,000
Castrip Non Contact Cooling	6	12,000
Castrip Compressor Non Contact Cooling	3	2,400
BOC Non Contact Cooling (CT-91A)	1	750
BOC Non Contact Cooling (CT-91B)	2	3,200
Main Compressor Non Contact Cooling	4	3,200
Total	**54**	**192,352**

(2) Scrap Handling and Processing

(3) BOC Gases Plant is an onsite contractor provides gases (oxygen, nitrogen, hydrogen and liquid air), and consists of:

(a) Natural gas fuel with propane as back up fuel BOC Gases Low NO_x Burner Boiler ID no. 306, rated at 15 MMBTU/hour.

(b) This is in addition to the existing BOC Gases Boiler ID no. 1, rated at 9 MMBTU/hr, and BOC Gases Boiler ID no. 2, rated at 15 MMBTU/hr.

(4) Diesel fired generators and air compressors for power outages and emergencies.

(a) Cold Mill generator, rated at 280 HP

(b) Hot Mill NC Cooling Tower generator, rated at 2100 HP

(c) Galv Line Pot generator, rated at 890 HP
(d) MS Cooling Tower Cold Well generator, rated at 2,520 HP
(e) Portable natural gas heaters for winter use.

(5) Operations that are not going to be physically modified, but an increase in utilization is expected:
(a) Quality Control Furnace - Natural gas fired 1 MMBTU/hour
(b) Miscellaneous Storage Tanks for gasoline, diesel fuel, kerosene, oils, pressurized, sodium hypochlorite, sulfuric acid, biocides, sodium nitrate, polymers, boilers chemicals, hydrochloric acids, aluminum sulfate, chromate, corrosion inhibitors, used oil, and cleaners, such as 500 gallon aboveground gasoline tank, 500 gallon aboveground diesel tank, and 5,000 gallon aboveground diesel storage tank.
(c) Slag Handling and Processing

The maximum capacities of the significant operations are:

<table>
<tr><th>Operation</th><th>Maximum Capacity (tons/hour)</th><th>Operation</th><th>Maximum Capacity (tons/hour)</th></tr>
<tr><td>Meltshop EAFs/AOD</td><td rowspan="7">502</td><td>Cold Mill Pickle Line 1</td><td rowspan="5">250</td></tr>
<tr><td>Meltshop LMFs</td><td>Cold Reversing Mill 1</td></tr>
<tr><td>Melt Shop Caster</td><td>Cold Mill Pickle Line 2</td></tr>
<tr><td>Hot Mill Tunnel Furnaces</td><td rowspan="2">Reversing/Temper Mill
aka Cold Reversing Mill 2</td></tr>
<tr><td>Hot Strip Mill</td></tr>
<tr><td>Hot Mill Skin Pass</td><td>Cold Mill Annealing Furnaces</td><td>200</td></tr>
<tr><td></td><td>Cold Mill Acid Regeneration 1</td><td>- -</td></tr>
<tr><td>Castrip LMS</td><td rowspan="3">135</td><td>Tank Farm</td><td>- -</td></tr>
<tr><td>Castrip Caster</td><td>Cold Mill Slitting Line</td><td>60</td></tr>
<tr><td>Castrip Hot Strip Mill</td><td>Cold Mill Galvanizing Line</td><td>140</td></tr>
<tr><td>Slag Processing</td><td>305</td><td>Cooling Towers</td><td>192,352 gal/min</td></tr>
</table>

A.3 Part 70 Permit Applicability [326 IAC 2-7-2]

This stationary source is required to have a Part 70 permit by 326 IAC 2-7-2 (Applicability) because:

(a) It is a major source, as defined in 326 IAC 2-7-1(22);

(b) It is a source in a source category designated by the United States Environmental Protection Agency (US EPA) under 40 CFR 70.3 (Part 70 - Applicability).

SECTION B GENERAL CONSTRUCTION CONDITIONS

B.1 Definitions [326 IAC 2-7-1]

Terms in this permit shall have the definition assigned to such terms in the referenced regulation. In the absence of definitions in the referenced regulation, the applicable definitions found in the statutes or regulations (IC 13-11, 326 IAC 1-2 and 326 IAC 2-7) shall prevail.

B.2 Effective Date of the Permit [IC13-15-5-3]

Pursuant to IC 13-15-5-3, this permit becomes effective upon its issuance.

B.3 Revocation of Permits [326 IAC 2-2-8]

Pursuant to 326 IAC 2-2-8(a)(1), this permit to construct shall expire if construction is not commenced within eighteen (18) months after receipt of this approval, if construction is discontinued for a period of eighteen (18) months or more, or if construction is not completed within a reasonable time. The IDEM may extend the eighteen (18) month period upon satisfactory showing that an extension is justified.

B.4 Significant Source Modification [326 IAC 2-7-10.5(h)]

This document shall also become the approval to operate pursuant to 326 IAC 2-7-10.5(h) when, prior to start of operation, the following requirements are met:

(a) The attached affidavit of construction shall be submitted to the Office of Air Quality (OAQ), verifying that the emission units were constructed or modified as proposed in the application or the permit. The emissions units covered in the Significant Source Modification approval may begin operating on the date the affidavit of construction is postmarked or hand delivered to IDEM if constructed as proposed.

If construction is completed in phases: i.e.: the entire construction is not done continuously, a separate affidavit must be submitted for each phase of construction. Any permit conditions associated with operation start up dates such as stack testing for NSPS shall be applicable for to each individual phase.

(b) If actual construction or modification of the emissions units differs from the construction or modification proposed in the application or the permit in a manner that is regulated under the provisions of 326 IAC 2-2, the source may not begin operation until the source modification has been revised pursuant to the provisions of that rule and the provisions of 326 IAC 2-1.1-6 and an Operation Permit Validation Letter is issued.

(c) If actual construction of the emissions units differs from the construction proposed in the application or the permit in a manner that is not regulated under the provisions of 326 IAC 2-2, the source may not begin operation until the source modification has been revised pursuant to the provisions of that rule and the provisions of 326 IAC 2-7-11 or 326 IAC 2-7-12 and an Operation Permit Validation Letter is issued.

(d) The Permittee shall attach the Operation Permit Validation Letter received from the OAQ.

(e) The changes covered by the Significant Source Modification will be included in the Title V draft.

(f) In the event that the Part 70 application is being processed at the same time as this application, the following additional procedures shall be followed for obtaining the right to operate:

(i) If the Part 70 draft permit has not gone on public notice, then the change/addition covered by the Significant Source Modification will be included in the Part 70 draft.

(ii) If the Part 70 permit has gone through final EPA proposal and would be issued ahead of the Significant Source Modification, the Significant Source Modification will go through a concurrent 45 day EPA review. Then the Significant Source Modification will be incorporated into the final Part 70 permit at the time of issuance.

(iii) If the Part 70 permit has gone through public notice, but has not gone through final EPA review and would be issued after the Significant Source Modification is issued, then the Modification would be added to the proposed Part 70 permit, and the Title V permit will issued after EPA review.

B.5 General Provisions and NSPS Reporting [326 IAC 12-1][40 CFR Part 60, Subpart A]

(a) The provisions of 40 CFR Part 60, Subpart A (General Provisions), which are incorporated by reference in 326 IAC 12-1, apply to the following affected units:
(i) EAF,
(ii) AOD,
(iii) EAF dust handling system, and
(iv) new Cold Mill Boiler, modified Cold Mill Boiler and new BOC Gases Boiler.

(b) Pursuant to the New Source Performance Standards (NSPS), 40 CFR Subpart AAa, and Subpart Dc, the Permittee shall report the following at the appropriate times:

(i) Commencement of construction date (no later than 30 days after such date) of the affected units [40 CFR 60.7a(10];

(ii) Actual start-up date (within 15 days after such date) of the affected units [40 CFR 60.7a(3);

(iii) Date of performance testing (at least 30 days prior to such date), when required by a condition elsewhere in this permit;

(iv) Commencement date of CEMS (no later than 15 days after such date) [40 CFR 60.7a(5)];

(v) Anticipated date for conducting opacity observations (no later than 15 days after such date) [40 CFR 60.7a(6)]; and

(vi) Date the COM data results will be used to determine compliance with the applicable opacity standard (no later than 15 days from such date) [40CFR 60.7a(7)].

Reports are to be sent to:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Quality

100 North Senate Avenue, P. O. Box 6015
Indianapolis, IN 46206-6015

The application and enforcement of these standards have been delegated to the IDEM, OAQ. The requirements of 40 CFR Part 60 are also federally enforceable.

B.6 Physical Modifications

Pursuant to 326 IAC 2-2, the Permittee shall be limited to the following physical modifications:

I Meltshop EAFs

(a) Replace and/or upgrade PLC controls and process equipment.
(b) Install a second Baghouse in addition to the existing Meltshop EAF Baghouses. The new Meltshop EAF Baghouse is a reverse air type multi compartment negative pressure baghouse, with the following specifications: 1,200,000 acf/min and 0.0018 grain/dscf.
(c) Install an arc dust treatment facility, with a capacity of 50,000 lb/hour or transfer the dust to the existing system which will then be a total of 100,000 lb/hour. Dust transfer will also occur inside the building. Options for the dust transfer are:
    (i) from silo to truck through a loading spout,
    (ii) from silo to railcar through a loading spout,
    (iii) from silo to truck through a loading spout to transfer to the existing Meltshop EAF Baghouses. Unloading from the truck at the existing Meltshop EAF Baghouses also occurs in the building, transferring the dust through augers and a bucket elevator to the existing silo. In this option, the existing EAF dust treatment will have a maximum capacity of 100,000 lb/hr.
    (iv) treating dust at the new silo and transferring to a truck. No loading spout is necessary because the material is no longer dusty, as treated.
(d) Upgrade the current conducting arms on the 2 Meltshop EAFs.
(e) Install an automatic machine that sets electrodes at the Meltshop EAFs.
(f) Install additional and or different styles of oxy fuel burners, post burners, post combustion burners, carbon injection system, lances, both oxygen and carbon.
(g) Install an alloy system for direct feeding of alloys, lime and carbon to EAFs.
(h) Install a new conveyor systems to feed raw materials to the EAF charge buckets with outside truck or rail dump.
(i) Install additional charge buckets.

II Meltshop AOD

(a) Install additional and or different styles of oxy fuel burners, post burners, post combustion burners, carbon injection system, oxygen lances, and argon lances.
(b) Install additional lances and tuyerers.
(c) Install additional AOD vessels as spare, and only one at a time will be used.
(d) Install additional rebricking stations.
(e) Install additional spout ladles.

III Meltshop Continuous Casters

(a) Replace and/or upgrade PLC controls and process equipment.
(b) Raise to the top of the roof the steam vents from the casters spray chambers.
(c) Caster spray water and mold water modifications.

IV Meltshop Ladle Metallurgy Furnaces (LMFs) and Stirring Station

(a) Replace and/or upgrade PLC controls and process equipment.
(b) Add a new alloying conveyor system, silos, storage bin, and feed equipment and control.
(c) Install additional argon lances for stirring in the LMFs.
(d) Add porous plugs to ladles for argon stirring.

(e) Add new ladles.
(f) Install new exhausts for the Ladle Preheaters instead of exhausting to roof monitors.
(g) Installation of new or modified operating process control systems and associated equipment at the desulfurization station

V Hot Strip Mill
(a) Replace and/or upgrade PLC controls and process equipment.
(b) Take into account VOC emissions that were not taken into account during the initial review.
(c) Installation of new or modified operating process control systems and associated equipment at the Laminar cooling and both coilers.

VI Cold Mill Pickle Line 1 and Pickle Line 2
(a) Replace the tray type fume scrubber and collection system of Pickle line 2 and increase the flow rate from 4,000 acf/min to 9,000 acf/min.
(b) Replace all process tanks and rinse tanks and auxiliary equipment on both pickle lines. This will allow wider product to be processed and various pickling enhancing products.
(c) Replace and/or upgrade PLC controls and process equipment on both pickle lines 1 and 2.
(d) The use of various concentrations, flows, temperatures, and various pickling enhancer agents of acid at both Pickle lines 1 and 2.

VII Cold Mill Acid Regeneration
(a) Replace and/or upgrade PLC controls and process equipment (valves, dampers).
(b) Install a rail loading facility for acid in the Cold Mill area.

VIII Cold Reversing Mill 1
(a) Replace and/or upgrade PLC controls and process equipment.
(b) Take into account VOC emissions that were not taken into consideration during the initial review of the Cold Reversing Mill 1.
(c) Install a natural gas fired low NO_x burner Cold Mill Boiler, identified as Unit No. 300, rated at 34 MMBTU/hour, with propane as back up fuel.
(d) Modify the burner of the existing Cold Mill Boiler (34 MMBTU/hr) to achieve its permitted capacity.
(e) Install additional cooling tower chillers for motor cooling.
(f) Install a fume collection enclosure.

IX Reversing and Tempering (R/T) Mill a.k.a. Cold Reversing Mill 2
(a) Replace and/or upgrade PLC controls and process equipment.
(b) Take into account VOC emissions from this mill that were not taken into account during the initial review.
(c) Install a fume collection enclosure.

X Cold Mill Galvanizing Line/Furnace
(a) Install new coil transfer system from the Cold Reversing Mills 1 and 2 to Annealing furnace then to the Galvanizing line.
(b) Increase the flow to the mist eliminator on the Alkali Cleaning section from 5,000 acf/min to 10,000 acf/min.
(c) Either modify or add cleaning sections.
(d) Replace and/or upgrade PLC controls and process equipment in the Galvanizing Line and Alkali Cleaning section.

XI Cold Mill Annealing Furnaces

(a) Replace and/or upgrade PLC controls and process equipment.
(b) Install additional heat exchanger capacity on the annealing lip seal closed loop water supply cooling system (this change is not related to the burners/furnaces).

XII Cold Mill Slitter/Rewind/Trimmer Line

Upgrade the Slitter/Rewind/Trimming line.

XIII Castrip

(a) Castrip Nozzle Core Milling/Drilling Baghouse - - to exhaust to the atmosphere.
(b) To be able to cut coils in the Castrip area with the Castrip Nozzle Core Milling/Drilling Baghouse or Castrip LMS Baghouse as particulate control.

XIV Contact and Non-Contact Cooling Towers

(a) Install an additional cooling tower for the Caster at 5,000 gallon per minute, equipped with mist eliminator.
(b) Install an additional cooling tower at the main compressor building, 3,200 gal/min.
(c) Install an additional cooling tower in the Castrip compressor building, 2,400 gal/min.
(d) Replace the annealing noncontact cooling tower, such that the water circulation rate increases from 2,400 gal/min to 5,000 gal/min.
(e) Modify the water cooled ducts, water systems, cooling towers, water treatment facilities and controls to increase water volume and pressure and quality to tower flow design capacities.
(f) Install additional water spray towers using cooling tower water to cool exhaust gases.

XV Scrap Handling and Processing

(a) Add scrap loading of buckets to overhead cranes and truck dumping under roof in the scrap bay area bay or a combination of both.
(b) Add scrap cranes and mobile scrap cranes to the Meltshop scrap.
(c) Modify, upgrade and perform non-routine repairs to the scrap cranes and magnets in the melt shop scrap bay.
(d) Use of ground level mobile cranes to load scrap buckets in conjunction with the existing overhead scrap cranes.
(e) Relocate existing soda ash silo to another location within the steel mill plant.
(f) To allow to store sand.

XVI Miscellaneous Plant Wide Physical Modifications

(a) Upgrade hydraulic, oil and lube systems.
(b) Modify onsite oxygen, argon, nitrogen and hydrogen gas supplier and associated delivery systems (pipes, valves, storage tanks, vaporizers, and controls). The hydrogen gas Plant has a burner rated at 9.98 MMBTU/hr.
(c) Addition, upgrades or modification of transformers, static var systems, reactors, and electrical control and monitoring systems to allow the maximum utilization of production.
(d) Add propane as back up for all natural gas fired units.
(e) Install inline spare to these miscellaneous operations to allow the maximum utilization of production. These are non-emitting spares.
(f) Add non-electrical powered (e.g. natural gas or diesel fueled) air compressors.
(g) Install new cranes.
(h) Modify existing cranes and associated auxiliary equipment plant wide.

B.7 Units Not Physically Modified

Pursuant to 326 IAC 2-2, this permit does not allow any physical modifications to the following, and existing limits were not re-evaluated:

I <u>Meltshop</u>

(a) Ladle Preheat Stations consisting of:
    (i) 3 units, each rated at 10 MMBTU/hr
    (ii) 1 unit, rated at 7.5 MMBTU/hr
    (iii) 1 unit, rated at 15 MMBTU/hr
(b) Ladle Dryout Station consisting of a low NO_x natural gas fired burner, rated at 5 MMBTU/hour.
(c) Four (4) Tundish Preheaters consisting of 4 low NO_x natural gas fired heaters, each rated at 6 MMBTU/hour.
(d) Two (2) Tundish Dryers, rated at 1.5 MMBTU/hour and 9 MMBTU/hour.
(e) Four (4) Tundish Nozzle Preheaters consisting of a low NO_x natural gas fired Preheaters, each rated at 0.8 MMBTU/hour.
(f) Tundish Dumping.
(g) Ladle Dumping.
(h) Ladle tap hole cleaning and repair
(i) Ladle/tundish refractory application and curing

II <u>Hot Strip Mill</u>

Tunnel Furnace System (total 200 MMBTU/hr) consisting of:
(a) Tunnel Furnace 1 -Natural gas fired 84 MMBTU/hour
(b) Tunnel Furnace 2 - Natural gas fired 84 MMBTU/hour
(c) Shuttle Furnaces 1 and 2, each has 13 MMBTU/hour natural gas fired Low NO_x burners
(d) Snub Furnace - 6 MMBTU/hour

III <u>Cold Mill</u>

(a) Galvanizing Line controlled by SCR/SNCR was recently permitted under PSD 107-14297-00038, issued on June 6, 2002.
(b) Flexographic labeling printer

IV <u>Castrip</u>

(a) Castrip LMS, with a maximum capacity of 135 tons/hour, with Castrip LMS Baghouses as control.
(b) Castrip Continuous Caster
(c) Castrip Hot Strip Mill
(d) Castrip Tundish and Ladle Preheaters/Dryers, exhausting to the Castrip Roof monitors. These operations were recently permitted under PSD 107-12143-00038, issued on January 19, 2001.

V <u>Miscellaneous</u>

(a) Quality Control Furnace - Natural gas fired 1 MMBTU/hour
(b) Miscellaneous Markings - - use chalk and decals and is done plant wide.
(b) Miscellaneous Storage Tanks for gasoline, diesel fuel, kerosene, oils, pressurized, sodium hypochlorite, sulfuric acid, biocides, sodium nitrate, polymers, boilers chemicals, hydrochloric acids, aluminum sulfate, chromate, corrosion inhibitors, used oil, and cleaners, such as 500 gallon aboveground gasoline tank, 500 gallon aboveground diesel tank, and 5,000 gallon aboveground diesel storage tank.

VI <u>Slag Handling and Processing</u>

No additional slag pot carrier (truck).

VII The following have been permanently removed from operation and corresponding existing requirements and limits are null and void.

(a) Pickle Line 1 Boilers, (3 units)

(b) Vacuum Degasser
(c) Iron Carbide Handling System
(d) Continuous Blasting System

B.8 Existing Approvals

Any terms and conditions from existing permits not superseded by this permit will remain in effect.

SECTION C GENERAL OPERATION CONDITIONS

C.1 Certification [326 IAC 2-7-4(f)][326 IAC 2-7-6(1)][326 IAC 2-7-5(3)(C)]

(a) Where specifically designated by this permit or required by an applicable requirement, any application form, report, or compliance certification submitted shall contain certification by a responsible official of truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

(b) One (1) certification shall be included, using the attached Certification Form, with each submittal requiring certification.

(c) A responsible official is defined at 326 IAC 2-7-1(34).

C.2 Preventive Maintenance Plan [326 IAC 2-7-5(1),(3) and (13)] [326 IAC 2-7-6(1) and (6)] [326 IAC 1-6-3]

(a) If required by specific condition(s) in Section D of this permit, the Permittee shall prepare, maintain and implement Preventive Maintenance Plans (PMPs) upon start up of the modified emission units, including the following information on each facility:

(1) Identification by jobs or titles of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices;

(2) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions; and

(3) Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

(b) The Permittee shall implement the PMPs, including any required record keeping, as necessary to ensure that failure to implement a PMP does not cause or contribute to an exceedance of any limitation on emissions or potential to emit.

(c) A copy of the PMPs shall be submitted to IDEM, OAQ, upon request and within a reasonable time, and shall be subject to review and approval by IDEM, OAQ. IDEM, OAQ may require the Permittee to revise its PMPs whenever lack of proper maintenance causes or is the primary contributor to an exceedance of any limitation on emissions or potential to emit.

The PMP does not require the certification by the Aresponsible official@ as defined by 326 IAC 2-7-1(34).

(d) To the extent the Permittee is required by 40 CFR Part 60 or 40 CFR 63 to have an Operation, Maintenance, and Monitoring (OMM) Plan for a unit, such Plan is deemed to satisfy the PMP requirements of 326 IAC 1-6-3 for that unit.

C.3 Permit Amendment or Modification [326 IAC 2-7-11] [326 IAC 2-7-12]

(a) Permit amendments and modifications are governed by the requirements of 326 IAC 2-7-11 or 326 IAC 2-7-12 whenever the Permittee seeks to amend or modify this permit.

(b) Any application requesting an amendment or modification of this permit shall be submitted to:

Indiana Department of Environmental Management
Permits Branch, Office of Air Quality
100 North Senate Avenue, P.O. Box 6015
Indianapolis, Indiana 46206-6015

Any such application shall be certified by the responsible official as defined by 326 IAC 2-7-1(34).

(c) The Permittee may implement administrative amendment changes addressed in the request for an administrative amendment immediately upon submittal of the request. [326 IAC 2-7-11(c)(3)]

(d) No permit amendment or modification is required for the addition, operation or removal of a nonroad engine, as defined in 40 CFR 89.2.

C.4 Opacity [326 IAC 5-1]

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this permit:

(a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

(b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

326 IAC 5-1-2 is not federally enforceable.

C.5 Fugitive Dust Emissions [326 IAC 6-4]

The Permittee shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4 (Fugitive Dust Emissions).

326 IAC 6-4-2(4) is not federally enforceable.

C.6 Operation of Equipment [326 IAC 2-7-6(6)]

Except as otherwise provided by statute or rule, or in this permit, all air pollution control equipment listed in this permit and used to comply with an applicable requirement shall be operated at all times that the emission units vented to the control equipment are in operation.

C.7 Stack Height [326 IAC 1-7]

The Permittee shall comply with the applicable provisions of 326 IAC 1-7 (Stack Height Provisions), for all exhaust stacks through which a potential (before controls) of twenty-five (25) tons per year or more of particulate matter or sulfur dioxide is emitted.

The provisions of 326 IAC 1-7-2, 326 IAC 1-7-3(c) and (d), 326 IAC 1-7-4(d), (e), and (f), and 326 IAC 1-7-5(d) are not federally enforceable.

C.8 Asbestos Abatement Projects [326 IAC 14-10] [326 IAC 18] [40 CFR 61, Subpart M]

The Permittee shall comply with the applicable requirements of 326 IAC 14-10, 326 IAC 18, and 40 CFR 61.140.

Testing Requirements [326 IAC 2-7-6(1)]

C.9 Performance Testing [326 IAC 3-6][326 IAC 2-1.1-11]

(a) All testing shall be performed according to the provisions of 326 IAC 3-6 (Source Sampling Procedures), except as provided elsewhere in this permit, utilizing any applicable procedures and analysis methods specified in 40 CFR 51, 40 CFR 60, 40 CFR 61, 40 CFR 63, 40 CFR 75, or other procedures approved by IDEM, OAQ.
A test protocol, except as provided elsewhere in this permit, shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

no later than thirty-five (35) days prior to the intended test date. The protocol submitted by the Permittee does not require certification by the responsible official as defined by 326 IAC 2-7-1(34).

(b) The Permittee shall notify IDEM, OAQ of the actual test date at least fourteen (14) days prior to the actual test date. The notification submitted by the Permittee does not require certification by the responsible official as defined by 326 IAC 2-7-1(34).

(c) Pursuant to 326 IAC 3-6-4(b), all test reports must be received by IDEM, OAQ not later than forty-five (45) days after the completion of the testing. An extension may be granted by IDEM, OAQ, if the source submits to IDEM, OAQ, a reasonable written explanation not later than five (5) days prior to the end of the initial forty-five (45) day period.

Compliance Requirements [326 IAC 2-1.1-11]

C.10 Compliance Requirements [326 IAC 2-1.1-11]

(a) The Commissioner may require stack testing, monitoring, or reporting at any time to assure compliance with all applicable requirements by issuing an order under 326 IAC 2-1.1-11.

(b) Any monitoring or testing shall be performed in accordance with 326 IAC 3 or other methods approved by the commissioner or the US EPA.

Compliance Monitoring Requirements [326 IAC 2-7-5(1)] [326 IAC 2-7-6(1)]

C.11 Compliance Monitoring [326 IAC 2-7-5(3)] [326 IAC 2-7-6(1)]

Except as otherwise provided in Section D, all monitoring and record keeping requirements shall be implemented when operation begins. The Permittee shall be responsible for installing any necessary equipment and initiating any required monitoring related to that equipment.

C.12 Monitoring Methods [326 IAC 3] [40 CFR 60] [40 CFR 63]

Any monitoring or testing required by Section D of this permit shall be performed according to the provisions of 326 IAC 3, 40 CFR 60, Appendix A, 40 CFR 60 Appendix B, 40 CFR 63, or other approved methods as specified in this permit.

C.13 Pressure Gauge and Other Instrument Specifications [326 IAC 2-1.1-11] [326 IAC 2-7-5(3)] [326 IAC 2-7-6(1)]

(a) Whenever a condition in this permit requires the measurement of pressure drop across any part of the unit or its control device, the gauge employed shall have a scale such that the expected normal reading shall be no less than twenty percent (20%) of full scale and be accurate within plus or minus two percent ("2%) of full scale reading.

(b) Whenever a condition in this permit requires the measurement of a (temperature, or flow rate), the instrument employed shall have a scale such that the expected normal reading shall be no less than twenty percent (20%) of full scale and be accurate within plus or minus two percent ("2%) of full scale reading.

(c) The Permittee may request the IDEM, OAQ approve the use of a pressure gauge or other instrument that does not meet the above specifications provided the Permittee can demonstrate an alternative pressure gauge or other instrument specification will adequately ensure compliance with permit conditions requiring the measurement of pressure drop or other parameters.

Corrective Actions and Reasonable Response Steps [326 IAC 2-7-5] [326 IAC 2-7-6]

C.14 Compliance Response Plan - Preparation, Implementation, Records, and Reports. [326 IAC 2-7-5] [326 IAC 2-7-6]

(a) The Permittee is required to prepare a Compliance Response Plan (CRP) for each compliance monitoring condition of this permit.

A CRP shall be submitted to IDEM, OAQ upon request.

The CRP shall be prepared, prior to the start up operation of the modified units, by the Permittee, supplemented from time to time by the Permittee, maintained on site, and comprised of:

(1) Reasonable response steps that may be implemented in the event that a reasonable response step is needed pursuant to the requirements of Section D of this permit; and an expected timeframe for taking reasonable response steps.

(2) If, at any time, the Permittee takes reasonable response steps that are not set forth in the Permittee=s current Compliance Response Plan and the Permittee documents such response in accordance with subsection (e) below, the Permittee shall amend its Compliance Response Plan to include such reasonable response steps taken.

If a Permittee is required to have an Operation, Maintenance and Monitoring (OMM) Plan or Parametric Monitoring Plan and Start-up, Shutdown, and Malfunction (SSM) Plan under 40 CFR 60 or 40 CFR 63 , such plans shall be deemed to satisfy the requirements for a CRP for those compliance monitoring conditions.

(b) For each compliance monitoring condition of this permit, reasonable response steps shall be taken when indicated by the provisions of that compliance monitoring condition as follows:

(1) Reasonable response steps shall be taken as set forth in the Permittee=s current Compliance Response Plan or Operation, Maintenance and Monitoring (OMM)

Plan or Parametric Monitoring Plan and Start-up, Shutdown, and Malfunction (SSM) Plan; or

(2) If none of the reasonable response steps listed in the Compliance Response Plan or Operation, Maintenance and Monitoring (OMM) Plan or Parametric Monitoring Plan and Start-up, Shutdown, and Malfunction (SSM) Plan is applicable or responsive to the excursion, the Permittee shall devise and implement additional reasonable response steps as expeditiously as practical. Taking such additional reasonable response steps shall not be considered a deviation from this permit so long as the Permittee documents such reasonable response steps in accordance with this condition.

(3) If the Permittee determines that additional reasonable response steps would necessitate that the emissions unit or control device be shut down, the IDEM, OAQ shall be promptly notified of the expected date of the shut down, the status of the applicable compliance monitoring parameter with respect to normal, and the results of the actions taken up to the time of notification.

(4) Failure to take reasonable response steps shall be considered a deviation from the permit.

The OMM Plan or Parametric Monitoring and SMM Plan shall be submitted within the time frames specified by the applicable 40 CFR 60 or 40 CFR 63 requirement.

(c) The Permittee is not required to take any further reasonable response steps for any of the following reasons:

(1) A false reading occurs due to the malfunction of the monitoring equipment and prompt action was taken to correct the monitoring equipment.

(2) The Permittee has determined that the compliance monitoring parameters established in the permit conditions are technically inappropriate, has previously submitted a request for a minor permit modification to the permit, and such request has not been denied.

(3) An automatic measurement was taken when the process was not operating.

(4) The process has already returned or is returning to operating within Anormal@ parameters and no reasonable response steps are required.

(d) When implementing reasonable steps in response to a compliance monitoring condition, if the Permittee determines that an exceedance of an emission limitation has occurred, the Permittee shall report such deviations pursuant to Section C-Deviations from Permit Requirements and Conditions.

(e) The Permittee shall record all instances when, in accordance with Section D, reasonable response steps are taken. In the event of an emergency, the provisions of 326 IAC 2-7-16 (Emergency Provisions) requiring prompt corrective action to mitigate emissions shall prevail.

(f) Except as otherwise provided by a rule or provided specifically in Section D, all monitoring as required in Section D shall be performed when the emission unit is operating, except for time necessary to perform quality assurance and maintenance activities.

C.15 Deviations from Permit Requirements and Conditions [326 IAC 2-7-5(3)(C)(ii)]

(a) Deviations from any permit requirements (for emergencies see Section **C** - Emergency Provisions), the probable cause of such deviations, and any reasonable response steps or preventive measures taken shall be reported to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue, P.O. Box 6015
Indianapolis, Indiana 46206-6015

using the attached Quarterly Deviation and Compliance Monitoring Report, or its equivalent. A deviation required to be reported pursuant to an applicable requirement that exists independent of this permit, shall be reported according to the schedule stated in the applicable requirement and does not need to be included in this report.

The Quarterly Deviation and Compliance Monitoring Report does require the certification by the Aresponsible official@ as defined by 326 IAC 2-7-1(34).

(b) A deviation is an exceedance of a permit limitation or a failure to comply with a requirement of the permit.

C.16 Emergency Provisions [326 IAC 2-7-16]

(a) An emergency, as defined in 326 IAC 2-7-1(12), is not an affirmative defense for an action brought for noncompliance with a federal or state health-based emission limitation.

(b) An emergency, as defined in 326 IAC 2-7-1(12), constitutes an affirmative defense to an action brought for noncompliance with a technology-based emission limitation if the affirmative defense of an emergency is demonstrated through properly signed, contemporaneous operating logs or other relevant evidence that describe the following:

(1) An emergency occurred and the Permittee can, to the extent possible, identify the causes of the emergency;

(2) The permitted facility was at the time being properly operated;

(3) During the period of an emergency, the Permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards or other requirements in this permit;

(4) For each emergency lasting one (1) hour or more, the Permittee notified IDEM, OAQ, within four (4) daytime business hours after the beginning of the emergency, or after the emergency was discovered or reasonably should have been discovered;

Telephone Number: 1-800-451-6027 (ask for Office of Air Quality, Compliance Section),
or
Telephone Number: 317-233-5674 (ask for Compliance Section)
Facsimile Number: 317-233-5967

(5) For each emergency lasting one (1) hour or more, the Permittee submitted the attached Emergency Occurrence Report Form or its equivalent, either by mail or facsimile to:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

within two (2) working days of the time when emission limitations were exceeded due to the emergency.

The notice fulfills the requirement of 326 IAC 2-7-5(3)(C)(ii) and must contain the following:

(A) A description of the emergency;

(B) Any steps taken to mitigate the emissions; and

(C) Corrective actions taken.

The notification which shall be submitted by the Permittee does not require the certification by the responsible official as defined by 326 IAC 2-7-1(34).

(6) The Permittee immediately took all reasonable steps to correct the emergency.

(c) In any enforcement proceeding, the Permittee seeking to establish the occurrence of an emergency has the burden of proof.

(d) This emergency provision supersedes 326 IAC 1-6 (Malfunctions). This permit condition is in addition to any emergency or upset provision contained in any applicable requirement.

(e) IDEM, OAQ may require that the Preventive Maintenance Plans required under 326 IAC 2-7-4-(c)(9) be revised in response to an emergency.

(f) Failure to notify IDEM, OAQ, by telephone or facsimile of an emergency lasting more than one (1) hour in accordance with (b)(4) and (5) of this condition shall constitute a violation of 326 IAC 2-7 and any other applicable rules.

(g) If the emergency situation causes a deviation from a technology-based limit, the Permittee may continue to operate the affected emitting facilities during the emergency provided the Permittee immediately takes all reasonable steps to correct the emergency and minimize emissions.

(h) The Permittee shall include all emergencies in the Quarterly Deviation and Compliance Monitoring Report.

C.17 Actions Related to Noncompliance Demonstrated by a Stack Test [326 IAC 2-7-5] [326 IAC 2-7-6]

(a) When the results of a stack test performed in conformance with Section C - Performance Testing, of this permit exceed the level specified in any condition of this permit, the Permittee shall take appropriate response actions. The Permittee shall submit a description of these response actions to IDEM, OAQ, within thirty (30) days of receipt of the test results. The Permittee shall take appropriate action to minimize excess emissions from the affected facility while the response actions are being implemented.

(b) A retest to demonstrate compliance shall be performed within one hundred twenty (120) days of receipt of the original test results. Should the Permittee demonstrate to IDEM, OAQ that retesting in one-hundred and twenty (120) days is not practicable, IDEM, OAQ may extend the retesting deadline.

(c) IDEM, OAQ reserves the authority to take any actions allowed under law in response to noncompliance stack tests.

The response action documents submitted pursuant to this condition do require the certification by the responsible official as defined by 326 IAC 2-7-1(34).

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

C.18 Emission Statement [326 IAC 2-7-5(3)(C)(iii)][326 IAC 2-7-5(7)][326 IAC 2-7-19(c)] [326 IAC 2-6]

(a) The Permittee shall submit an annual emission statement certified pursuant to the requirements of 326 IAC 2-6, that must be received by July 1 of each year and must comply with the minimum requirements specified in 326 IAC 2-6-4. The annual emission statement shall indicate estimated actual emissions of criteria pollutants from the source, in compliance with 326 IAC 2-6 (Emission Reporting);

(b) The annual emission statement covers the twelve (12) consecutive month time period starting January 1 and ending December 31. The annual emission statement must be submitted to:

Indiana Department of Environmental Management
Technical Support and Modeling Section, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015, Indianapolis, Indiana 46206-6015

C.19 General Record Keeping Requirements [326 IAC 2-7-5(3)][326 IAC 2-7-6]

(a) Records of all required monitoring data, reports and support information required by this permit shall be retained for a period of at least five (5) years from the date of monitoring sample, measurement, report, or application. These records shall be physically present or electronically accessible at the source location for a minimum of three (3) years. The records may be stored elsewhere for the remaining two (2) years as long as they are available upon request. If the Commissioner makes a request for records to the Permittee, the Permittee shall furnish the records to the Commissioner within a reasonable time.

(b) Unless otherwise specified in this permit, all record keeping requirements not already legally required shall be implemented within ninety (90) days of permit issuance.

C.20 General Reporting Requirements [326 IAC 2-7-5(3)(C)]

(a) The source shall submit the attached Quarterly Deviation and Compliance Monitoring Report or its equivalent. Any deviation from permit requirements, the date(s) of each deviation, the cause of the deviation, and the reasonable response steps taken must be reported. This report shall be submitted within thirty (30) days of the end of the reporting period.

The Quarterly Deviation and Compliance Monitoring Report shall include the certification by the responsible official as defined by 326 IAC 2-7-1(34).

(b) The report required in (a) of this condition and reports required by conditions in Section D of this permit shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

(c) Unless otherwise specified in this permit, any notice, report, or other submission required by this permit shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ, on or before the date it is due.

(d) Unless otherwise specified in this permit, all reports required in Section D of this permit shall be submitted within thirty (30) days of the end of the reporting period. All reports do require the certification by the responsible official as defined by 326 IAC 2-7-1(34).

(e) The first report shall cover the period commencing on the date of issuance of this permit and ending on the last day of the reporting period.

(f) Reporting periods are based on calendar years.

C.21 Part 2 MACT Application

Pursuant to the application Requirements for Section 112(j) of the Clean Air Act [40 CFR 63.52(e)] [40 CFR 63.56(a)] [40 CFR 63.9(b)] [326 IAC 2-7-12]

(a) The Permittee shall submit a Part 2 MACT Application in accordance with 40 CFR 63.52(e)(1). The Part 2 MACT Application shall meet the requirements of 40 CFR 63.53(b).

(b) Notwithstanding paragraph (a), the Permittee is not required to submit a Part 2 MACT Application if the Permittee no longer meets the applicability criteria of 40 CFR 63.50 by the application deadline in 40 CFR 63.52(e)(1). For example, the Permittee would not have to submit a Part 2 MACT Application if, by the application deadline:

(i) The source is no longer a major source of hazardous air pollutants, as defined in 40 CFR 63.2;

(ii) The MACT standard or standards for the affected source categories included at the source are promulgated.

(c) Notwithstanding paragraph (a), pursuant to 40 CFR 63.56(a), the Permittee shall comply with an applicable promulgated MACT standard in accordance with the schedule provided in the MACT standard if the MACT standard is promulgated prior to the Part 2 MACT Application deadline or prior to the issuance of permit with a case-by-case Section 112(j) MACT determination. The MACT requirements include the applicable General Provisions requirements of 40 CFR 63, Subpart A. Pursuant to 40 CFR 63.9(b), the Permittee shall submit an initial notification not later than 120 days after the effective date of the MACT, unless the MACT specifies otherwise. The initial notification shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue, P.O. Box 6015
Indianapolis, Indiana 46206-6015

and

United States Environmental Protection Agency, Region V
Director, Air and Radiation Division
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

SECTION D.1 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)] **MELTSHOP**

(1) Two (2) Meltshop Electric Arc Furnaces (EAFs) together with the AOD have a maximum capacity of 502 tons/hour. The EAFs utilize the following emission control technologies:

(i) a direct shell evacuation (DSE) control system (Afourth hole@ duct),
(ii) an overhead roof exhaust system consisting of canopy hoods,
(iii) oxy fuel burners, and
(iv) multi compartment reverse air type baghouses (identified as Meltshop EAF Baghouse1 and Meltshop EAF Baghouse2).

(a) Raw materials used are all types of scrap steel, including stainless, DRI, pig iron, HBI, various types of lime, alloys, carbon and various types of scrap substitutes.

(b) Each or any combination of the Meltshop EAFs and AOD can independently produce the maximum capacity of 502 tons/hour of steel. Each Meltshop EAF can operate concurrently or independently to achieve this maximum capacity.

(c) Both the Meltshop EAF Baghouse1 and Meltshop EAF Baghouse2 capture the emissions from the Meltshop EAFs, AOD vessel, Desulfurization, Meltshop Continuous Casters. Each Meltshop Baghouse can sufficiently control emissions independently. Each Meltshop EAF Baghouse serves as a back up control to the Meltshop LMFs.

(i) The Meltshop EAF Baghouse1 is a multi compartment positive pressure baghouse, has a air flow rate of 1,527,960 actual cubic foot/min (acf/min) and loading of 0.0018 grains/dry standard cubic foot (gr/dscf). This Meltshop EAF Baghouse1 exhausts to a roof vent/monitor (identified as BH1 vent).
(ii) The Meltshop EAF Baghouse2 is a multi compartment negative pressure baghouse, has a flow rate of 915,000 dscf/min and 1,200,000acf/min and loading of 0.0018 gr/dscf. This Meltshop EAF Baghouse2 exhausts to a stack (identified as BH2 stack).

(d) The fugitive emissions generated during the furnace operations are captured by the Meltshop Roof Canopies or contained within the Meltshop Building.

(e) The Meltshop roof monitors include exhausts from the ladle preheaters, ladle dryers, tundish preheaters, tundish dryers, ladle lancing station, tundish dumping, fugitive emissions from the LMFs, fugitive emissions from the Meltshop Casters and other Meltshop operations.

(2) Argon oxygen decarburization (AOD) vessels, together with the Meltshop EAFs have a total maximum capacity of 502 tons/hour. The AOD vessels and Desulfurization also exhaust to the Meltshop EAF Baghouse1 and Meltshop EAF Baghouse2. Only 1 AOD vessel can operate at a time.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

SECTION D.1 FACILITY OPERATION CONDITIONS (continuation)

Facility Description [326 IAC 2-7-5(15)] **MELTSHOP**

(3) Desulfurization is an additional step in the Meltshop operations that remove sulfur. It has a maximum capacity of 502 tons of metal per hour.

(4) Two (2) Meltshop Continuous Casters with total maximum capacity of 502 tons/hour. These Meltshop Continuous Casters also exhaust to the Meltshop EAF Baghouse1 and Meltshop EAF Baghouse2. The steam from the Meltshop Continuous Casters exhausts directly to the atmosphere.

(5) An EAF dust treatment facility, with a capacity of 50,000 lb/hour or transfer the dust to the existing system which will then be a total of 100,000 lb/hour. Particulate controls are bin vents for the silos, scrubber for dust treatment and baghouse for truck loading. Dust transfer will also occur inside the building. Options for the dust transfer are:
- (i) from silo to truck through a loading spout,
- (ii) from silo to railcar through a loading spout,
- (iii) from silo to truck through a loading spout to transfer to the existing Meltshop EAF Baghouses. Unloading from the truck at the existing Meltshop EAF Baghouses also occurs in the building, transferring the dust through augers and a bucket elevator to the existing silo. In this option, the existing EAF dust treatment will have a maximum capacity of 100,000 lb/hr.
- (iv) treating dust at the new silo and transferring to a truck. No loading spout is necessary because the material is no longer dusty, as treated.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.1.1 Meltshop EAF Baghouses PSD BACT [326 IAC 2-2]

Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements:

(a) The Meltshop EAF Baghouses (1 and 2) shall capture and control the emissions from the Meltshop EAFs, AOD vessels, Desulfurization station, and Meltshop Continuous Casters.

(b) Steel production shall not exceed 4,397,520 tons of steel poured/tapped per 12-consecutive month period with compliance demonstrated at the end of each month.

(c) The total sulfur dioxide (SO_2) emissions from the Meltshop EAF Baghouses (1 and 2) shall not exceed 0.25 pound per ton of steel produced and 125 pounds of SO_2 per hour, based on a 3-hour block average.

(d) The total nitrogen oxide (NO_x) emissions from the Meltshop EAF Baghouses (1 and 2) shall not exceed 0.35 pounds per ton of steel produced and 175.7 pounds of NO_x per hour.

(e) The total carbon monoxide (CO) emissions from the Meltshop EAF Baghouses (1 and 2) shall not exceed 2 pounds per ton of steel produced and 1,004 pounds of CO per hour, based on a 3-hour block average.

(f) The total volatile organic compound (VOC) emissions from the Meltshop EAF Baghouses (1 and 2) shall not exceed 0.09 pound per ton of steel produced and 45.18 pounds of VOC per hour, based on a 3-hour block average.

(g) Filterable particulate matter (PM) emissions from the Meltshop EAF Baghouses (1 and 2) shall not exceed 0.0018 grains/dscf.

(h) Filterable and condensible PM_{10} emissions from the Meltshop EAF Baghouses (1 and 2) shall not exceed 0.0052 grains/dscf.

(i) The visible emissions from each Meltshop EAF Baghouse shall not exceed 3% opacity, based on a 6-minute average.

(j) Visible emissions from the Meltshop Roof Monitors shall not exceed 5% opacity, based on a 6-minute average.

(k) Fugitive emissions generated at each EAF during each complete cycle from tap to tap shall not exceed 3% opacity when emitted from any roof monitor or building opening, based on a 6-minute average.

(l) Good working practices shall be observed such as following various tapping, melting and refining practices.

D.1.2 Operational Flexibility [326 IAC 2-2]

Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following requirements:

(a) Each or any combination of the Meltshop EAFs and AOD may independently produce the maximum capacity of 502 tons/hour of steel. Each Meltshop EAF can operate concurrently or independently to achieve this maximum capacity.

(b) Only 1 AOD vessel shall operate at a time.

(c) Each Meltshop Baghouse can sufficiently control emissions independently.

(d) The Meltshop EAF Baghouses (1 and 2) can serve as back up to the Meltshop LMF Baghouses.

(e) The Meltshop Continuous Caster can cast molten steel either from the Meltshop LMFs or Castrip LMS.

D.1.3 General Provisions Relating to NSPS [326 IAC 12-1][40 CFR Part 60, Subpart A]

The provisions of 40 CFR Part 60, Subpart A (General Provisions), which are incorporated by reference in 326 IAC 12-1, apply to the EAFs, AOD and EAF Dust Handling system except when otherwise specified in 40 CFR Part 60, Subpart AAa.

D.1.4 Meltshop EAF Baghouses PM and Opacity [40 CFR 60.272a]

(a) Pursuant to 40 CFR 60.272a(a)(1), the particulate matter (PM) emissions from the Meltshop EAFs and AOD vessel, exhausting through the Meltshop EAF Baghouses (1 and 2), shall not exceed 0.0052 gr/dscf. Compliance is determined by using Method 5D.

(b) Pursuant to 40 CFR 60.272a(a)(2), the visible emissions from the Meltshop EAFs and AOD vessel, exhausting through the Meltshop EAF Baghouses (1 and 2), shall not exceed 3% opacity, based on a 6-minute average.

The opacity standard applies to each baghouse.

(c) Pursuant to 40 CFR 60.272a(a)(3), the visible opacity from the Meltshop operations, due solely to the operations of the Meltshop EAFs and AOD that are not exhausting to the Meltshop EAF Baghouses (1 and 2) shall not exceed 6% opacity , based on a 6-minute average.

(d) Pursuant to 40 CFR 60.272a(b), the visible emissions from the EAF Dust Handling System shall not exceed 10% opacity, based on a 6-minute average.

D.1.5 PSD Minor Pollutant [326 IAC 2-2]

The Permittee shall emit less than the following rates from the Meltshop EAF Baghouses (1 and 2):

Pollutant	Emission Rate (lb/hr)	PSD Significant Level (tons/year)
Lead	0.134	0.6
Mercury	0.023	0.1

Compliance by the Permittee with these limitations makes the requirements of 326 IAC 2-2 (Prevention of Significant Deterioration) not applicable.

D.1.6 Meltshop EAF Dust and Alloy Handling/Treatment System PM and Opacity [326 IAC 2-2]

Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements:

(a) Visible emissions from the EAF Dust Handling System and the Treatment System shall each not exceed 10% opacity, based on a 6-minute average.

(b) The AOD vessel alloy handling system emissions shall be captured by the Meltshop Roof Canopy.

D.1.7 Preventive Maintenance Plan [326 IAC 2-7-5(13)]

A Preventive Maintenance Plan, in accordance with Section C - Preventive Maintenance Plan, of this permit, is required for these units and control devices.

Compliance Determination Requirements [326 IAC 2-1.1-11]

D.1.8 Meltshop EAF PSD BACT Control [326 IAC 2-2]

Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements:

(a) Each EAF shall be equipped and operated with oxy fuel burners.

(b) Each EAF shall be controlled by a direct shell evacuation (DSE) system and canopy hoods.

(c) VOC emissions shall be controlled through an extensive scrap management program. The Permittee shall implement the scrap management plan (SMP) attached to this permit.

(i) All grades of scrap charge to the furnaces shall not contain significant observable non-ferrous metals or non-metallics.

(ii) All grades of scrap shall be free of excessive dirt, oil, and grease.

(iii) Heavily oiled scrap shall not be used.

(d) Good working practices shall be observed.

D.1.9 Meltshop EAF Dust Handling System and Dust Treatment System PSD BACT [326 IAC 2-2]

Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements:

(a) The EAF Dust Handling System shall be equipped with bin vents on the silos.

(b) The Dust Treatment System shall be equipped with a scrubber on the dust system and shall incorporate baghouse(s) for evacuation on the truck loading buildings**.**

(c) Options for the dust transfer are:

(i) from silo to truck through a loading spout,

(ii) from silo to railcar through a loading spout,

(iii) from silo to truck through a loading spout to transfer to the existing Meltshop EAF Baghouses. Unloading from the truck at the existing Meltshop EAF Baghouses also occurs in the building, transferring the dust through augers and a bucket elevator to the existing silo. In this option, the existing EAF dust treatment will have a maximum capacity of 100,000 lb/hr.

(iv) treating dust at the new silo and transferring to a truck. No loading spout is necessary because the material is no longer dusty, as treated.

(d) Dust transfer shall occur inside the building.

D.1.10 Particulate Control Equipment Operation [326 IAC 2-2]

(a) Pursuant to 326 IAC 2-2, either or both the Meltshop EAF Baghouses (1 and 2) for particulate control shall be in operation and control emissions at all times that one or all of the EAFs, AOD vessel, Desulfurization station, and Meltshop Continuous Casters are in operation.

(b) Pursuant to 326 IAC 2-2, the following particulate control shall be in operation and control emissions at all times when its corresponding process is in operation:

(i) bin vents for the silos,

(ii) scrubber for dust treatment, and

(iii) baghouse for truck loading building evacuation.

(c) Pursuant to 326 IAC 2-2, fugitive emissions generated during EAFs and AOD vessel operations shall be captured by the Meltshop roof canopies or contained and collected within the Meltshop EAF building.

D.1.11 Testing Requirements [326 IAC 2-7-6(1),(6)] [326 IAC 2-1.1-11] [326 IAC 2-2] [40 CFR 60.275a]

(a) Pursuant to 326 IAC 2-2 (PSD) and 40 CFR 60.270a (Subpart AAa), within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up of the modified EAFs, the Permittee shall perform testing on the Meltshop EAF Baghouses (stack and vent) for the following:

(i) VOC,
(ii) Lead,
(iii) Mercury,
(iv) Filterable PM, and
(v) Filterable and condensible $PM_{10.}$

The 2 Meltshop EAFs shall be operating simultaneously during the tests.

(b) Within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up of the modified EAFs, the Permittee shall perform testing on the EAF Dust Handling System for opacity.

(c) Pursuant to 326 IAC 2-2 (PSD) and 40 CFR 60.275a, the Permittee shall perform a compliance test for opacity on the:

(i) Meltshop EAF Baghouse1 roof monitor,

(ii) Meltshop Roof monitor, and

(iii) EAF Dust Handling System,

within 60 days after achieving maximum capacity, but no later than 180 days after start up of the modified EAFs, utilizing 40 CFR Part 60, Appendix A, Method 9, or other methods as approved by the Commissioner.

(d) The EAF dust shall be sampled and analyzed for Lead content on a monthly basis according to the procedures specified in the EPA publication SW-846-6010B, entitled Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.

(e) The Particulate testing shall utilized 40 CFR Part 60, Appendix A, Method 5, Method 201 or 201A, Method 202 or other methods as approved by the Commissioner.

(f) PM_{10} includes filterable and condensible PM_{10}.

(g) The PM, PM_{10}, VOC, Mercury, and Lead tests shall be repeated at least once every 2.5 years from the date of a valid compliance demonstration.

(h) Any stack which has multiple processes which exhaust to the same stack shall operate all of the processes simultaneously in accordance with 326 IAC 3-6 (Source Sampling Procedures) and 40 CFR 60.275a(b).

(i) These tests shall be performed using methods as approved by the Commissioner.

(j) Testing shall be conducted in accordance with Section C - Performance Testing and 40 CFR Part 60.275a(a) to (j) (as applicable).

D.1.12 CO, SO_2, and NO_x Continuous Emission Rate Monitoring Requirement [326 IAC 2-2] [326 IAC 3-5]

(a) CO, SO_2, and NO_x CEMS

(i) Pursuant to 326 IAC 2-2 (PSD) and 326 IAC 3-5-1(d), the Permittee shall install, calibrate, certify, operate, and maintain continuous emissions monitoring systems (CEMS) for measuring CO, SO_2, and NO_x emissions rates in pounds per hour from the Meltshop EAFs, in accordance with 326 IAC 3-5-2 and 326 IAC 3-5-3.

The Permittee shall comply with the PSD BACT SO_2 and NOx hourly emission rates by averaging the CEMS readings based on the actual hours of operation in a 24-hour period.

(ii) CEMS for Existing Vents
The CEMS installed to measure the emissions through the existing vent shall be calibrated no later than 180 days from the initial start up of the modified Meltshop EAFs.

(iii) CEMS for Baghouse Stack
The CEMS installed to measure the emissions through the EAF baghouses stack shall be calibrated within 180 days of the installation of the new Meltshop EAF Baghouse2.

(iv) The location of these CEMS to measure the Meltshop EAFs emissions shall be approved by OAQ prior to their installation.

(b) The Permittee shall submit to IDEM, OAQ, within ninety (90) days after monitor installation, a complete written continuous monitoring standard operating procedure (CMSOP), in accordance with the requirements of 326 IAC 3-5-4.

(c) The Permittee shall record the output of the systems in pounds per hour and shall perform the required record keeping and reporting, pursuant to 326 IAC 3-5-6 and 326 IAC 3-5-7.

D.1.13 Continuous Opacity Monitoring (COM) [326 IAC 2-2] [326 IAC 3-5] [40 CFR 60.273a]

(a) Pursuant to 326 IAC 2-2 (PSD), 326 IAC 3-5, and 40 CFR 60.273a, the Permittee shall install, calibrate, certify, operate, and maintain a continuous monitoring system to measure opacity from the Meltshop EAF Baghouse2 stack in accordance with 326 IAC 3-5-2 and 326 IAC 3-5-3.

There is no COM in the Meltshop EAF Baghouse1 roof vent.

There is no COM in the EAF Dust Handling System.

(b) This COM shall be calibrated within 180 days from the installation of the new Meltshop EAF Baghouse2.

(c) The Permittee shall submit to IDEM, OAQ, within ninety (90) days after monitor installation, a complete written continuous monitoring standard operating procedure (CMSOP), in accordance with the requirements of 326 IAC 3-5-4.

(d) The Permittee shall record the opacity output of the system and shall perform the required record keeping and reporting, pursuant to 326 IAC 3-5-6, 326 IAC 3-5-7, and 40 CFR Part 60, Subpart AAa.

D.1.14 Daily Opacity Observations [326 IAC 2-2] [40 CFR 60.273a]

Pursuant to 326 IAC 2-2 (PSD) and 40 CFR 60.273a, the Permittee shall have a certified visible emissions reader/observer to conduct, perform and record visible observations of the:

(a) EAF Baghouse1 Roof vent, and

(b) Meltshop Roof Monitor,

once per day, when either one or both the Meltshop EAFs are operating in the melting and refining period, in accordance with 40 CFR 60, Appendix A, Method 9.

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

D.1.15 Total Hydrocarbon Continuous Emission Rate Monitoring Requirement

(a) Pursuant to 326 IAC 2-2 (PSD), 326 IAC 2-7-5(3), and 326 IAC 3-5-1(d), the Permittee shall install, calibrate, certify, operate, and maintain a continuous emissions monitoring system (CEMS) for measuring total hydrocarbons emissions rates in pounds per hour from the Meltshop EAFs, in accordance with 326 IAC 3-5-2 and 326 IAC 3-5-3.

(ii) The calibration of these CEMS shall be no later than 180 days from the initial start up of the modified Meltshop EAFs (for the existing stack/vent) or within 180 days of the installation of the new Meltshop EAF Baghouse.

(iii) The location of these CEMS to measure the Meltshop EAFs emissions shall be approved by OAQ prior to their installation.

(b) The Permittee shall submit to IDEM, OAQ, within ninety (90) days after monitor installation, a complete written continuous monitoring standard operating procedure (CMSOP), in accordance with the requirements of 326 IAC 3-5-4.

(c) The Permittee shall record the output of the system in pounds per hour and shall perform the required record keeping and reporting, pursuant to 326 IAC 3-5-6 and 326 IAC 3-5-7.

(d) When for any one reading of the pound per hour rate of the total hydrocarbons, based on a 3-hour block is higher than the total hydrocarbons concentration corresponding to the VOC emission rate specified in Condition D.1.1(f) using the data during the most recent valid compliance stack test, the Permittee shall take reasonable steps in accordance with Section C - Compliance Response Plan -Preparation, Implementation, Records and Reports. A THC reading that is above the concentration is not a deviation from this permit.

Failure to take reasonable response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports, shall be considered a deviation from this permit.

D.1.16 Maintenance of CEMS [326 IAC 2-7-5(3)(A)(iii)]

(a) In the event that a breakdown of the SO_2, NO_x, CO or total hydrocarbon (THC) continuous emission monitoring systems (CEMS) occurs, the Permittee shall maintain records of all CEMS malfunctions, out of control periods, calibration and adjustment activities, and repair or maintenance activities.

(b) The continuous emissions monitoring system (CEMS) shall be operated at all times the emissions unit or process is operating except for reasonable periods of monitor system downtime due to necessary calibration or maintenance activities or malfunctions. Calibration and maintenance activities shall be conducted pursuant to the standard operating procedures under 326 IAC 3-5-4(a).

(c) Except as otherwise provided by a rule or provided specifically in this permit, whenever a continuous emission monitor system (CEMS) is malfunctioning or will be down for calibration, maintenance, or repairs for a period of four (4) hours or more, the Permittee shall perform supplemental monitoring by using calibrated handheld monitors to measure the SO_2, NO_x, CO and THC emissions on a once per shift basis.

The handheld monitors shall be approved by the IDEM, OAQ.

(d) The Permittee shall keep records in accordance with 326 IAC 3-5-6(b) that includes the following:

(i) All documentation relating to:
(A) design, installation, and testing of all elements of the monitoring system; and
(B) required corrective action or compliance plan activities.

(ii) All maintenance logs, calibration checks, and other required quality assurance activities.

(iii) All records of corrective and preventive action.

(iv) A log of plant operations, including the following:
(A) Date of facility downtime.
(B) Time of commencement and completion of each downtime.
(C) Reason for each downtime.

(e) The Permittee shall keep records that describe the supplemental monitoring implemented during the downtime to assure compliance with applicable emission limitations.

(f) In accordance with 326 IAC 3-5-7(5), the Permittee shall submit reports of continuous monitoring system instrument downtime, except for zero (0) and span checks, which shall be reported separately.

The reports shall include the following:

(i) Date of downtime.

(ii) Time of commencement.

(iii) Duration of each downtime.

(iv) Reasons for each downtime.

(v) Nature of system repairs and adjustments.

(g) Nothing in this permit shall excuse the Permittee from complying with the requirements to operate a continuous emission monitoring system pursuant to 326 IAC 2-2, 326 IAC 3-5, and 40 CFR Part 60.

D.1.17 Maintenance of COM Equipment [326 IAC 2-7-5(3)(A)(iii)]

(a) All COM systems shall meet the performance specifications of 40 CFR 60, Appendix B, Performance Specification No. 1, and are subject to monitor system certification requirements pursuant to 326 IAC 3-5.

(b) In the event that a breakdown of a COM system occurs, the Permittee shall maintain records of all COMS malfunctions, out of control periods, calibration and adjustment activities, and repair or maintenance activities.

(c) The COM system shall be operated at all times the emissions unit or process is operating except for reasonable periods of monitor system downtime due to necessary calibration or maintenance activities or malfunctions. Calibration and maintenance activities shall be conducted pursuant to the standard operating procedures under 326 IAC 3-5-4(a).

(d) Except as otherwise provided by a rule or provided specifically in this permit, whenever a COM system is malfunctioning or will be down for calibration, maintenance, or repairs for a period of four (4) hours or more, the Permittee shall perform the following supplemental monitoring:

(i) Visible emission (VE) notations shall be performed once per hour during daylight operations following the shutdown or malfunction of the primary COM. A trained employee shall record whether emissions are normal or abnormal for the state of operation of the EAF at the time of the reading.

(A) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.

(B) If abnormal emissions are noted during two consecutive emission notations, the Permittee shall begin Method 9 opacity observations within four (4) daylight hours of the second abnormal notation.

(C) VE notations may be discontinued once a COM is online or formal Method 9 readings have been implemented.

(ii) If a COM is not online within twenty-four (24) hours of shutdown or malfunction of the primary COM, the Permittee shall provide certified opacity reader(s), who may be employees of the Permittee or independent contractors, to self-monitor the emissions from the EAF stack.

(A) Visible emission readings shall be performed in accordance with 40 CFR 60, Appendix A, Method 9, for a minimum of three (3) consecutive six (6) minute averaging periods beginning not more than twenty-four (24) hours after the start of the malfunction or down time.

(B) Method 9 opacity readings shall be repeated for a minimum of five (5) consecutive six (6) minute averaging periods at least once every four (4) hours during daylight operations, until such time that a COM is in operation.

(C) Method 9 readings may be discontinued once a COM is online.

(iii) If abnormal emissions are observed, the Permittee shall take reasonable response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records, and Reports. Observation of abnormal emissions that do not violate an applicable opacity limit is not a deviation from this permit. Failure to take reasonable response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records, and Reports, shall be considered a deviation from this permit.

(iv) All of the opacity readings during this period shall be reported with the Quarterly Deviation and Compliance Monitoring Report.

(e) The Permittee shall keep records in accordance with 326 IAC 3-5-6(b) that includes the following:

(i) All documentation relating to:
(A) design, installation, and testing of all elements of the monitoring system; and
(B) required corrective action or compliance plan activities.

(ii) All maintenance logs, calibration checks, and other required quality assurance activities.

(iii) All records of corrective and preventive action.

(iv) A log of plant operations, including the following:
(A) Date of facility downtime.
(B) Time of commencement and completion of each downtime.
(C) Reason for each downtime.

(f) The Permittee shall keep records that describe of the supplemental monitoring implemented during the downtime to assure compliance with applicable emission limitations.

(g) In accordance with 326 IAC 3-5-7(5), the Permittee shall submit reports of continuous monitoring system instrument downtime, except for zero (0) and span checks, which shall be reported separately.

The reports shall include the following:

(i) Date of downtime.

(ii) Time of commencement.

(iii) Duration of each downtime.

(iv) Reasons for each downtime.

(v) Nature of system repairs and adjustments.

(h) Nothing in this permit shall excuse the Permittee from complying with the requirements to operate a COM system pursuant to 326 IAC 2-2, 326 IAC 3-5, and 40 CFR 60.273a.

D.1.18 Bag Leak Detection System (BLDS)

(a) The Permittee shall install and operate continuous bag leak detection systems (BLDS) for the Meltshop EAF Baghouses (1 and 2). The bag leak detection systems shall meet the following requirements:

(i) The bag leak detection systems must be certified by the manufacturer to be capable of detecting particulate matter emissions at concentrations of 0.0018 grains per actual cubic foot or less.

(ii) The bag leak detection system sensor must provide output of relative particulate matter loading.

(iii) The bag leak detection system must be equipped with an alarm system that will alarm when an increase in relative particulate loading is detected over a preset level.

(iv) The bag leak detection system shall be installed and operated in a manner consistent with available written guidance from the U.S. Environmental Protection Agency or, in the absence of such written guidance, the manufacturer's written specifications and recommendations for installation, operation, and adjustment of the system.

(v) The initial adjustment of the system shall, at a minimum, consist of establishing the baseline output by adjusting the sensitivity (range) and the averaging period of the device, and establishing the alarm set points and the alarm delay time.

(vi) In no event shall the sensitivity be increased by more than 100 percent or decreased by more than 50 percent over a 365 day period unless such adjustment follows a complete baghouse inspection which demonstrates the baghouse is in good operating condition.

(vii) The bag detector must be installed downstream of the baghouses.

(b) In the event of a bag leak detection system alarm:

(i) For multi-compartment units, the affected compartments will be shut down immediately until the failed units have been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the emergency provisions of this permit (Section C- Emergency Provisions).

(ii) Within eight (8) business hours of the determination of failure, reasonable response steps according to the timetable described in the Compliance Response Plan shall be initiated. For any failure with corresponding reasonable response steps and timetable not described in the Compliance Response Plan, reasonable response steps shall be devised within eight (8) business hours of discovery of the failure and shall include a timetable for completion. Failure to take reasonable response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports, shall be considered a deviation from this permit.

(c) If operations continue after bag failure is observed and it will be 10 days or more after the failure is observed before the failed units will be repaired or replaced, the Permittee shall promptly notify the IDEM, OAQ of the expected date the failed units will be repaired or replaced. The notification shall also include the status of the applicable compliance monitoring parameters with respect to normal, and the results of any response actions taken up to the time of notification.

D.1.19 Monitoring of Operations [40 CFR 60.274a]

Pursuant to 40 CFR 60.274a, the Permittee shall comply with the following monitoring requirements:

(a) Pursuant to 40 CFR 60.274a(c), when the Permittee is required to demonstrate compliance with the opacity standard and at any other time IDEM, OAQ, or the US EPA may require, that either the control system fan motor amperes and all damper positions or the volumetric flow rate through each separately ducted hood shall be determined during all periods in which a hood is operated for the purpose of capturing emissions from the EAF.

(b) Pursuant to 40 CFR 60.274a(d), the Permittee shall perform monthly operational status inspections of the equipment that is important to the performance of the total capture system (i.e., pressure sensors, dampers, and damper switches). This inspection shall include observations of the physical appearance of the equipment (e.g., presence of holes in ductwork or hoods, flow constrictions caused by dents or accumulated dust in ductwork, and fan erosion). Any deficiencies shall be noted and proper maintenance performed.

D.1.20 Scrubber Monitoring

(a) The Permittee shall continuously monitor the flow rate of the scrubbing liquid.

The Compliance Response Plan for the scrubber shall contain troubleshooting contingency and reasonable response steps for when the flow rate reading is below the normal minimum for any one reading. Failure to take reasonable response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports, shall be considered a deviation from this permit.

(b) The instruments used for determining the flow rate shall comply with Section C - Pressure Gauge and Other Instrument Specifications, of this permit, shall be subject to approval by IDEM, OAQ, and shall be calibrated at least once a year.

D.1.21 Scrubber Inspections

An inspection shall be performed each calendar quarter of the scrubber controlling the emissions of the EAF dust treatment. Inspections required by this condition shall not be performed in consecutive months. All defective scrubber parts shall be replaced.

D.1.22 Scrubber Failure

In the event that scrubber failure has been observed:

(a) The affected process will be shutdown immediately until the failed unit has been replaced. Failure to take reasonable response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports, shall be considered a deviation from this permit.

Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the emergency provisions of this permit (Section C- Emergency Provisions).

(b) Within eight (8) hours of the determination of failure, reasonable response steps according to the time table described in the Compliance Response Plan shall be initiated. For any failure with corresponding reasonable response steps and timetable not described in the Compliance Response Plan, reasonable response steps shall be devised with in eight (8) hours of discovery of the failure and shall include a timetable for completion.

Record Keeping and Reporting Requirement [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.1.23 Record Keeping Requirements

(a) The Permittee shall maintain records required under 326 IAC 3-5-6 at the source in a manner that they may be inspected by the IDEM, OAQ, or the US EPA, if so requested or required.

(b) The Permittee shall maintain records of the amount of steel poured/tapped and make available upon request to IDEM, OAQ, and the US EPA.

(c) The Permittee shall maintain records of the readings of the SO_2, NO_x, CO and THC CEMS in pounds per hour.

(d) The Permittee shall maintain records of the readings of the COM % opacity.

(e) The Permittee shall maintain records of the opacity readings from the Meltshop EAF Baghouse1 Roof vent.

(f) Pursuant to 40 CFR 60.276a(a), the Permittee shall maintain records of the following and make available upon request to IDEM, OAQ, and the US EPA:

(i) either the control system fan motor amperes and all damper positions,

(ii) or the volumetric flow rate through each separately ducted hood during all periods in which a hood is operated for the purpose of capturing emissions from the EAF and

(iii) the monthly operational status inspections of the equipment that is important to the performance of the total capture system (i.e., pressure sensors, dampers, and damper switches).

(g) The Permittee shall maintain records of the following for the EAF Dust Treatment scrubber and make available upon request to IDEM, OAQ, and the US EPA:

(i) Records of the scrubber's flow rate.

(ii) Records of the results of the scrubber's inspections.

(iii) Documentation of all reasonable response steps implemented for every flow rate reading that is outside of the range.

(h) The Permittee shall maintain records of any additional inspections prescribed by the Preventive Maintenance Plan.

(i) Pursuant to 40 CFR 60.276a(a), records of the measurements required in 40 CFR 60.274a, must be retained for at least 2 years following the date of the measurement.

(j) Records necessary to demonstrate compliance shall be available within 30 days of the end of each compliance period.

(k) All records shall be maintained in accordance with Section C - General Record Keeping Requirements of this permit.

D.1.24 Reporting Requirements [326 IAC 2-1.1-11] [40 CFR 60.276a]

(a) The Permittee shall submit a quarterly report of excess emissions, using the Quarterly Deviation and Compliance Monitoring Report or equivalent, of the following:

(i) SO_2, NO_x, CO and total hydrocarbons readings from the CEMS,

(ii) Opacity readings from the COM of the Meltshop EAF Baghouse2 stack,

(iii) Opacity readings from the Meltshop EAF Baghouse1 Roof vent, and

(iv) Opacity readings from the EAF Dust Handling System.

This reporting requirement also satisfies the semi annual exceedance reporting required under 40 CFR 60.276a(b) and (g).

(b) These reports shall be submitted no later than thirty (30) calendar days following the end of each calendar quarter and in accordance with Section C - General Reporting Requirements of this permit.

(c) Pursuant to 40 CFR 60.276a, the Permittee shall furnish to IDEM, OAQ, and the US EPA a written report of the results of the compliance emission tests. This report shall include, at a minimum, the following information:

(1) Facility name and address;

(2) Plant representative;

(3) Make and model of process, control device, and continuous monitoring equipment;

(4) Flow diagram of process and emissions capture equipment including other equipment or process(es) ducted to the same control device;

(5) Rated (design) capacity of process equipment;

(6) The following operating conditions:
(i) List of charge and tap weights and materials;
(ii) Heat times and process log;
(iii) Control device operation log; and
(iv) Continuous monitor or Reference Method 9 data.

(7) Test dates and test times;

(8) Test company;

(9) Test company representative;

(10) Test observers from outside agency;

(11) Description of test methodology used, including any deviation from standard reference methods;

(12) Schematic of sampling location;

(13) Number of sampling points;

(14) Description of sampling equipment;

(15) Listing of sampling equipment calibrations and procedures;

(16) Field and Laboratory data sheets;

(17) Description of sample recovery procedures;

(18) Sampling equipment leak check results;

(19) Description of quality assurance procedures;

(20) Description of analytical procedures;

(21) Notation of sample blank corrections; and

(22) Sample emission calculations.

SECTION D.2 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)] **MELTSHOP**

(1) Two (2) Meltshop Ladle Metallurgy Furnaces (LMFs)/Stirring Station have a maximum capacity of 502 tons/hour and controlled by a baghouse, (identified as Meltshop LMF Baghouse), exhausting through a stack. The Meltshop LMF Baghouse has a flow rate of 200,000 acf/min.

(2) Operations in the Meltshop that are not going to be physically modified, but an increase in utilization is expected:
- (a) Ladle Preheat Stations consisting of:
  - (i) 3 units, each rated at 10 MMBTU/hr
  - (ii) 1 unit, rated at 7.5 MMBTU/hr
  - (iii) 1 unit, rated at 15 MMBTU/hr
- (b) Ladle Dryout Station consisting of a low NO_x natural gas fired burner, rated at 5 MMBTU/hour.
- (c) Four (4) Tundish Preheaters consisting of 4 low NO_x natural gas fired heaters, each rated at 6 MMBTU/hour.
- (d) Two (2) Tundish Dryers, rated at 1.5 MMBTU/hour and 9 MMBTU/hour.
- (e) Four (4) Tundish Nozzle Preheaters consisting of a low NO_x natural gas fired Preheaters, each rated at 0.8 MMBTU/hour.
- (f) Tundish Dumping.
- (g) Ladle Dumping.
- (h) Ladle tap hole cleaning and repair.
- (i) Ladle/tundish refractory application and curing.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-7-5(1)] [326 IAC 2-2-3(a)(3)] [326 IAC 2-4.1-1]

D.2.1 Meltshop LMFs PSD BACT [326 IAC 2-2]

Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements:

(a) The Meltshop LMFs shall be equipped with a side draft hood that evacuates to a baghouse (identified as Meltshop LMF Baghouse) capturing the particulate matter (PM).

(b) The filterable PM emissions from the Meltshop LMF Baghouse shall not exceed 0.0018 gr/dscf. This limit supersedes the 0.0026 gr/dscf limit specified in CP 107-5235-00038, issued on June 20, 1996.

(c) The filterable and condensible PM_{10} emissions from the Meltshop LMF Baghouse shall not exceed 0.0052 gr/dscf.

(d) The visible emissions from the Meltshop LMF Baghouse shall not exceed 3% opacity, based on a 6-minute average.

(e) The NO_x emissions from the Meltshop LMF Baghouse shall not exceed 0.0176 lb/ton of steel produced and 8.8 pounds of NO_x per hour, based on a 3-hour block average.

(f) The SO_2 emissions from the Meltshop LMF Baghouse shall not exceed 0.185 lb/ton of steel produced and 92.87 pounds of SO_2 per hour, based on a 3-hour block average.

(g) The CO emissions from the Meltshop LMF Baghouse shall not exceed 0.07125 lb/ton of steel produced and 35.77 pounds of CO per hour, based on a 3-hour block average.

(h) The VOC emissions from the Meltshop LMF Baghouse shall not exceed 0.0086 lb/ton of steel produced and 4.32 pounds of VOC per hour, based on a 3-hour block average.

D.2.2 Preventive Maintenance Plan [326 IAC 2-7-5(13)]

A Preventive Maintenance Plan, in accordance with Section C - Preventive Maintenance Plan, of this permit, is required for these units and control devices.

Compliance Determination Requirements [326 IAC 2-1.1-11]

D.2.3 Meltshop LMFs PSD BACT Control [326 IAC 2-2]

Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements:

(a) The Meltshop LMF Baghouse shall operate at all times that at least one of the Meltshop LMFs is operating, except during the times that one of the Meltshop EAF Baghouses serves as a back up.

(b) Good working practices shall be observed.

D.2.4 Testing Requirements [326 IAC 2-7-6(1),(6)]

(a) Pursuant to 326 IAC 2-2 (PSD), within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up of the modified Meltshop LMFs, the Permittee shall perform testing on the Meltshop LMF Baghouse for the following:

(i) SO_2,

(ii) Filterable PM,

(iii) Filterable and condensible PM_{10}, and

(iv) CO.

(b) With the submission of the test protocol, at a minimum, the Permittee shall include estimates of the sulfur content of the raw materials to be used in testing and the sulfur content of the raw materials used from previous year.

(c) PM_{10} includes filterable and condensible PM_{10}.

(d) The Particulate testing shall utilized 40 CFR Part 60, Appendix A, Method 5, Method 201 or 201A, Method 202 or other methods as approved by the Commissioner.

(e) The PM, PM_{10}, and SO_2 tests shall be repeated at least once every 2.5 years from the date of a valid compliance demonstration.

(f) Any stack which has multiple processes which exhaust to the same stack shall operate all of the processes simultaneously in accordance with 326 IAC 3-5 (Source Sampling Procedures).

(g) These tests shall be performed using methods as approved by the Commissioner.

(h) Testing shall be conducted in accordance with Section C - Performance Testing.

D.2.5 Sulfur Content

The Permittee shall monitor the sulfur content of the charge carbon and injection carbon added to the LMFs. Vendor certifications or analyses may verify the sulfur content of the charge carbon and injection carbon.

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

D.2.6 Visible Emissions Notations

(a) Visible emission notations of the Meltshop LMF Baghouse stack exhaust shall be performed once per shift during normal daylight operations when exhausting to the atmosphere. A trained employee shall record whether emissions are normal or abnormal.

(b) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time.

(c) In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.

(d) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.

(e) The Compliance Response Plan for this unit shall contain troubleshooting contingency and reasonable response steps for when an abnormal emission is observed. Failure to take reasonable response steps in accordance with Section C - Compliance Response Plan -Preparation, Implementation, Records and Reports, shall be considered a deviation from this permit.

D.2.7 Baghouses Parametric Monitoring

The Permittee shall record the total static pressure drop across the Meltshop LMF Baghouse, at least once per shift, when one or more of the Meltshop LMFs is in operation when venting to the atmosphere. When for any one reading, the pressure drop across the baghouse is outside the range of 1 and 10 inches of water or a range established during the latest stack test, the Permittee shall take reasonable steps in accordance with Section C - Compliance Response Plan -Preparation, Implementation, Records and Reports.

A pressure reading that is outside the above mentioned range is not a deviation from this permit.

Failure to take reasonable response steps in accordance with Section C - Compliance Response Plan -Preparation, Implementation, Records and Reports, shall be considered a deviation from this permit.

The instrument used for determining the pressure shall comply with Section C - Pressure Gauge and Other Instrument Specifications, of this permit, shall be subject to approval by IDEM, OAQ, and shall be calibrated at least once every six (6) months.

The instrument used for determining the pressure shall have a range higher than 10 inches of water to accurately measure the range.

D.2.8 Baghouses Inspections

(a) An inspection shall be performed, each calendar quarter, of the Meltshop LMF Baghouse when venting to the atmosphere.

(b) A baghouses inspection shall be performed within three months of redirecting vents to the atmosphere and every three months thereafter.

(c) Inspections are optional when venting to the indoor.

(d) Inspections required by this condition shall not be performed in consecutive months.

(e) All defective bags shall be replaced or repaired.

D.2.9 Broken or Failed Bag Detection

In the event that bag failure has been observed:

(a) For multi-compartment units, the affected compartments will be shut down immediately until the failed bags have been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the emergency provisions of this permit (Section C- Emergency Provisions).

(b) Within eight (8) business hours of the determination of failure, reasonable response steps according to the timetable described in the Compliance Response Plan shall be initiated. For any failure with corresponding reasonable response steps and timetable not described in the Compliance Response Plan, reasonable response steps shall be devised within eight (8) business hours of discovery of the failure and shall include a timetable for completion. Failure to take reasonable response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports, shall be considered a deviation from this permit.

(c) If operations continue after bag failure is observed and it will be 10 days or more after the failure is observed before the failed units will be repaired or replaced, the Permittee shall promptly notify the IDEM, OAQ of the expected date the failed units will be repaired or replaced. The notification shall also include the status of the applicable compliance monitoring parameters with respect to normal, and the results of any response actions taken up to the time of notification.

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.2.10 Record Keeping Requirements

(a) The Permittee shall maintain records of visible emission notation readings at the Meltshop LMF Baghouse stack and make available upon request to IDEM, OAQ and the US EPA.

(b) The Permittee shall maintain the following and make available upon request to IDEM, OAQ and the US EPA:

(i) Records of the once per shift baghouse pressure drop readings.

(ii) Records of the results of the baghouse inspections.

(iii) Documentation of all reasonable response steps implemented for every pressure drop reading that is outside of the range.

(iv) Records of the sulfur content of the charge carbon and injection carbon added to the LMFs.

(c) The Permittee shall maintain records of any additional inspections prescribed by the Preventive Maintenance Plan and make available upon request to IDEM, OAQ, and the US EPA.

(d) The Permittee shall maintain records of the readings of the SO_2 CEMS in pounds per hour.

(e) Records necessary to demonstrate compliance shall be available within 30 days of the end of each compliance period.

(f) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

SECTION D.3 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)] **HOT MILL**

(1) Hot Strip Mill has a maximum capacity of 502 tons/hour consisting of the Tunnel Furnace System, and other rolling mill processes: Shearing, Descaling, Finishing, Rollout Table, Coilers, Skin Pass Mill and Roll Grinders.

(2) Operations in the Hot Mill that are not going to be physically modified, but an increase in utilization is expected:
Tunnel Furnace System (total of 200 MMBTU/hr) consisting of:
(a) Tunnel Furnace 1 -Natural gas fired 84 MMBTU/hour
(b) Tunnel Furnace 2 - Natural gas fired 84 MMBTU/hour
(c) Shuttle Furnaces 1 and 2, each has 13 MMBTU/hour natural gas fired Low NO_x burners
(d) Snub Furnace - 6 MMBTU/hour

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.3.1 Hot Strip Mill PSD BACT Limit [326 IAC 2-2]

Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements:

(a) The Hot Strip Mill shall comply with the following existing requirements specified in the PSD permit 107-2764-00038, issued on November 30, 1993:

(i) The rolling mill in the Hot Strip Mill shall be operated using water roll cooling sprays with any particulate matter, in solid or liquid form, collected in flumes and transported to the scale pit.

(ii) PM and PM_{10} emissions from the Hot Strip Mill process shall be limited to 0 pound per hour.

(iii) Fugitive emissions generated at the Hot Strip Mill shall not exceed 0% opacity when emitted from any roof monitor or building opening, based on a 6-minute average.

(b) The VOC emissions from the Hot Strip Mill shall not exceed 0.06 lb/ton of steel produced.

Compliance Determination Requirements [326 IAC 2-1.1-11]

D.3.2 Natural Gas Fuel [326 IAC 2-2]

The Permittee shall use pipeline natural gas that is a naturally occurring fluid mixture of hydrocarbons (e.g., methane, ethane, or propane) produced in geological formations beneath the Earth's surface that maintains a gaseous state at standard atmospheric temperature and pressure under ordinary conditions, and which is provided by the supplier through a pipeline.

Natural gas does not include the following gaseous fuels: landfill gas, digester gas, refinery gas, sour gas, blast furnace gas, coal-derived gas, producer gas, coke oven gas, or any gaseous fuel produced in a process which might result in highly variable sulfur content or heating value.

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

None

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

None

SECTION D.4 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)] **COLD MILL**

Pickle Line 1 and Pickle Line 2 have maximum capacity of 250 tons/hour each, use HCl pickling solution and rinse water, and are equipped with process tanks.

(a) Pickle Line 1 is controlled by a counter flow-packed scrubber and mist eliminators. The PL1 Scrubber has a flow rate of 12,000 acf/min, and loading of 0.01 gr/dscf.

(b) Pickle Line 2 is controlled by a new counter flow tray scrubber and mist eliminators. The new PL2 Scrubber has a flow rate of 9,000 acf/min and loading of 0.01 gr/dscf. This new PL2 Scrubber will replace the existing PL2 Scrubber.

(c) Tank Farm treats the rinse water from Pickle Line1 and Pickle Line 2. These tanks also store spent acid, raw acid, regenerated acid, oily wastewater, and processed water.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.4.1 Pickling PSD BACT [326 IAC 2-2]

Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements:

(a) Each pickling line shall be controlled by its own scrubber and with a grain loading of 0.01 gr/dscf.

(b) Each tank shall operate with a closed vent system, covered by lids, maintained under negative pressure, except during loading and unloading.

(c) Loading and unloading shall be conducted either through enclosed lines or each point shall be controlled.

(d) The visible emissions from each pickling line scrubber stack shall not exceed 5% opacity, based on a 6-minute average.

(e) Good working practices shall be observed, such as adjusting damper controls and settings on the fume systems.

D.4.2 General Provisions Relating to HAPs [326 IAC 20-1-1][40 CFR Part 63, Subpart A]

The provisions of 40 CFR Part 63, Subpart A - General Provisions, which are incorporated as 326 IAC 20-1-1, apply to the facility described in this section except when otherwise specified in 40 CFR Part 63, Subpart CCC.

D.4.3 Pickling NESHAP [40 CFR 63, Subpart CCC]

Pursuant to 40 CFR 63, Subpart CCC, the Permittee shall comply with the following:

(a) Each pickling line shall be controlled by its own scrubber.

(b) HCl emissions from each pickling line shall not exceed 6 ppmv in concentration, or HCl emissions shall be controlled by the scrubber at a collection efficiency of equal to or greater than 99%.

(c) Each virgin or regenerated HCl vessel shall provide and operate, except during loading and unloading of acid, with a closed vent system for each vessel.

(d) Loading and unloading shall be conducted either through enclosed lines or each point where the acid is exposed to the atmosphere shall be equipped with a local fume capture system, ventilated through an air pollution control device.

D.4.4 Preventive Maintenance Plan [326 IAC 2-7-5(13)]

A Preventive Maintenance Plan, in accordance with Section C - Preventive Maintenance Plan, of this permit, is required for these units and control devices.

D.4.5 Scrubber Operation and Maintenance Plan [40 CFR 63, Subpart CCC]

(a) The Permittee shall prepare, maintain and implement an Operation, Maintenance, and Monitoring (OMM) Plan for the scrubbers.

(b) To the extent the Permittee is required by 40 CFR Part 63 to have an Operation, Maintenance, and Monitoring (OMM) Plan for the scrubbers, such Plan is deemed to satisfy the PMP requirements of 326 IAC 1-6-3 for the scrubbers.

D.4.6 Start-up, Shutdown, and Malfunction (SSM) Plan [40 CFR Part 63, Subpart CCC] [40 CFR Part 63, Subpart A]

A Start-up, Shutdown, and Malfunction (SSM) Plan, is required for these units and their control devices. The SSM Plan shall be deemed to satisfy the requirements for a CRP for those compliance monitoring conditions.

Compliance Determination Requirements [326 IAC 2-1.1-11]

D.4.7 Scrubber Operation [326 IAC 2-2][40 CFR 63, Subpart CCC]

Pursuant to 326 IAC 2-2 (PSD) and 40 CFR 63, Subpart CCC:

(a) The PL1 Scrubber shall be in operation and control emissions at all times that the Pickle Line 1 is in operation.

(b) The PL2 Scrubber shall be in operation and control emissions at all times that the Pickle Line2 is in operation.

D.4.8 Testing Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-6(6)]

(a) Pursuant to 40 CFR 63, Subpart CCC and 326 IAC 2-2 (PSD), within 60 days after achieving maximum production rate, but no later than 180 days after start-up of the modified pickle lines, the Permittee shall perform testing:

(i) to measure simultaneously the inlet and outlet of each scrubber (PL1 Scrubber and PL2 Scrubber), to determine the collection efficiency of each scrubber; or

(ii) to measure the HCl concentration;

utilizing methods specified in 40 CFR 63, Subpart CCC or other methods as approved by the Commissioner.

(b) Any stack which has multiple processes which exhaust to the same stack shall operate all of the processes simultaneously in accordance with 326 IAC 3-5 (Source Sampling Procedures).

(c) These tests shall be performed using methods as approved by the Commissioner.

(d) These tests shall be repeated at least once every 2.5 years from the date of a valid compliance demonstration.

(e) Testing shall be conducted in accordance with Section C - Performance Testing.

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

D.4.9 Scrubber Monitoring

(a) The Permittee shall continuously monitor the flow rate of the scrubbing liquid.

When for any one reading, the flow rate is outside the minimum rate of 170 gallons per minute or the rate established during the latest stack test, the Permittee shall take reasonable steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports. A flow rate reading that is outside the above mentioned rate is not a deviation from this permit.

Failure to take reasonable response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports, shall be considered a deviation from this permit.

(b) The instruments used for determining the flow rate shall comply with Section C - Pressure Gauge and Other Instrument Specifications, of this permit, shall be subject to approval by IDEM, OAQ, and shall be calibrated at least once a year.

D.4.10 Scrubber Inspections

An inspection shall be performed each calendar quarter of the PL1 and PL2 Scrubbers controlling the pickle lines (Pickle Line 1 and Pickle Line 2).

Inspections required by this condition shall not be performed in consecutive months.

All defective scrubber parts shall be replaced or repaired.

D.4.11 Scrubber Failure

In the event that scrubber failure has been observed:

(a) The affected process will be shutdown immediately until the failed unit has been replaced. Failure to take reasonable response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports, shall be considered a deviation from this permit.

Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the emergency provisions of this permit (Section C- Emergency Provisions).

(b) Within eight (8) hours of the determination of failure, reasonable response steps according to the time table described in the Compliance Response Plan shall be initiated. For any failure with corresponding reasonable response steps and timetable not described in the Compliance Response Plan, reasonable response steps shall be devised with in eight (8) hours of discovery of the failure and shall include a timetable for completion.

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.4.12 Record Keeping Requirements

(a) Permittee shall maintain the following records and make available upon request to IDEM, OAQ and the US EPA:

(i) Records of the flow rate of the scrubbing liquid.

(ii) Records of the results of the scrubber inspections.

(iii) Documentation of all reasonable response steps implemented for every flow rate that is outside of the range.

(b) The Permittee shall maintain records of any additional inspections prescribed by the Preventive Maintenance Plan/Operation, Maintenance, and Monitoring (OMM) Plan and make available upon request to IDEM, OAQ, and the US EPA.

(c) Records necessary to demonstrate compliance shall be available within 30 days of the end of each compliance period.

(d) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

SECTION D.5 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)] **COLD MILL**

Acid Regeneration consisting of two natural gas fueled tangentially fired burners at a total rating of 7.3 MMBTU/hour, and controlled by its own counter flow packed scrubber (identified as AR scrubber) with mist eliminator. The counter flow-packed scrubber has a flow rate of 4,269 acf/min and loading of 0.04 gr/dscf. Propane is used as back up fuel.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.5.1 Acid Regeneration PSD BACT [326 IAC 2-2]

(a) Pursuant to 326 IAC 2-2 (PSD), the acid regeneration shall comply with the following BACT existing limits specified in the PSD permit 107-2764-00038, issued on November 30, 1993:

(i) The two (2) tangentially fired burners shall burn natural gas as primary fuel and propane as back up fuel.

(ii) The gas is cleaned in a cyclone, absorber, and a counter flow-packed scrubber prior to being vented to the atmosphere through the exhaust fan and stack.

(iii) PM and PM_{10} emissions shall be limited to 2.0 pounds per hour and 8.8 tons per year.

(iv) NO_x emissions shall be limited to 100 pounds per million cubic feet of natural gas burned, 0.7 pounds per hour and 3.2 tons per year.

(v) CO emissions shall be limited to 20.0 pounds per million cubic feet of natural gas burned, 0.1 pounds per hour and 0.6 tons per year.

(vi) Volatile organic compound emissions shall be limited to 5.3 pounds per million cubic feet of natural gas burned, 0.05 pounds per hour and 0.2 tons per year.

(b) Pursuant to 326 IAC 2-2, the visible emissions from the acid regeneration scrubber/control system shall not exceed 5% opacity, based on a 6-minute average.

D.5.2 General Provisions Relating to HAPs [326 IAC 20-1-1][40 CFR Part 63, Subpart A]

The provisions of 40 CFR Part 63, Subpart A - General Provisions, which are incorporated as 326 IAC 20-1-1, apply to the facility described in this section except when otherwise specified in 40 CFR Part 63, Subpart CCC.

D.5.3 Acid Regeneration NESHAP [40 CFR Part 63, Subpart CCC]

Pursuant to 40 CFR 63, Subpart CCC, the Permittee shall comply with the following:

(a) HCl emissions from the acid regeneration roaster shall not exceed 12 ppmv in concentration.

(b) Cl_2 emissions from the acid regeneration roaster shall not exceed 6 ppmv in concentration.

(c) The proportion of excess air to the process off gas temperature shall be minimize consistent with producing usable regenerated acid or iron oxide.

D.5.4 Preventive Maintenance Plan [326 IAC 2-7-5(13)]

A Preventive Maintenance Plan, in accordance with Section C - Preventive Maintenance Plan, of this permit, is required for these units and control devices.

D.5.5 Scrubber Operation and Maintenance Plan [40 CFR 63, Subpart CCC]

(a) The Permittee shall prepare, maintain and implement an Operation, Maintenance, and Monitoring (OMM) Plan for the scrubber.

(b) To the extent the Permittee is required by 40 CFR Part 63 to have an Operation, Maintenance, and Monitoring (OMM) Plan for the scrubber, such Plan is deemed to satisfy the PMP requirements of 326 IAC 1-6-3 for the scrubber.

D.5.6 Start-up, Shutdown, and Malfunction (SSM) Plan [40 CFR Part 63, Subpart CCC]

A Start-up, Shutdown, and Malfunction (SSM) Plan, is required for these units and their control devices.

The SSM Plan shall be deemed to satisfy the requirements for a CRP for those compliance monitoring conditions.

Compliance Determination Requirements [326 IAC 2-1.1-11]

D.5.7 Natural Gas Fuel [326 IAC 2-2]

The Permittee shall use pipeline natural gas that is a naturally occurring fluid mixture of hydrocarbons (e.g., methane, ethane, or propane) produced in geological formations beneath the Earth's surface that maintains a gaseous state at standard atmospheric temperature and pressure under ordinary conditions, and which is provided by the supplier through a pipeline.

Natural gas does not include the following gaseous fuels: landfill gas, digester gas, refinery gas, sour gas, blast furnace gas, coal-derived gas, producer gas, coke oven gas, or any gaseous fuel produced in a process which might result in highly variable sulfur content or heating value.

D.5.8 Scrubber Operation

The counter flow-packed scrubber shall be in operation and control emissions at all times that the acid regeneration is in operation.

D.5.9 Testing Requirements [326 IAC 2-7-6(1),(6)]

(a) Pursuant to 40 CFR 63, Subpart CCC and 326 IAC 2-2 (PSD), within 60 days after achieving maximum production rate, but no later than 180 days after start-up of the modified acid regeneration, the Permittee shall perform testing to measure the HCl and Cl_2 concentrations, utilizing methods specified in 40 CFR 63, Subpart CCC or other methods as approved by the Commissioner.

(b) Any stack which has multiple processes which exhaust to the same stack shall operate all of the processes simultaneously in accordance with 326 IAC 3-5 (Source Sampling Procedures).

(c) These tests shall be repeated at least once every 2.5 years from the date of a valid compliance demonstration.

(d) Testing shall be conducted in accordance with Section C - Performance Testing.

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

D.5.10 Scrubber Monitoring

(a) The Permittee shall continuously monitor the flow rate of the scrubbing liquid.

When for any one reading, the flow rate is outside the minimum rate of 80 gallons per minute or the rate established during the latest stack test, the Permittee shall take reasonable steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports. A flow rate reading that is outside the above mentioned rate is not a deviation from this permit.

Failure to take reasonable response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports, shall be considered a deviation from this permit.

(b) The instruments used for determining the flow rate shall comply with Section C - Pressure Gauge and Other Instrument Specifications, of this permit, shall be subject to approval by IDEM, OAQ, and shall be calibrated at least once a year.

D.5.11 Scrubber Inspections

An inspection shall be performed each calendar quarter of the scrubber controlling the acid regeneration. Inspections required by this condition shall not be performed in consecutive months. All defective scrubber parts shall be replaced.

D.5.12 Scrubber Failure

In the event that scrubber failure has been observed:

(a) The affected process will be shutdown immediately until the failed unit has been replaced. Failure to take reasonable response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports, shall be considered a deviation from this permit.

Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the emergency provisions of this permit (Section C- Emergency Provisions).

(b) Within eight (8) hours of the determination of failure, reasonable response steps according to the time table described in the Compliance Response Plan shall be initiated. For any failure with corresponding reasonable response steps and timetable not described in the Compliance Response Plan, reasonable response steps shall be devised with in eight (8) hours of discovery of the failure and shall include a timetable for completion.

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.5.13 Record Keeping Requirements

(a) Permittee shall maintain the following records and make available upon request to IDEM, OAQ and the US EPA:

(i) Records of the flow rate of the scrubbing liquid.

(ii) Records of the results of the scrubber's inspections.

(iii) Documentation of all reasonable response steps implemented for every flow rate that is outside of the range.

(b) The Permittee shall maintain records of any additional inspections prescribed by the Preventive Maintenance Plan/Operation, Maintenance, and Monitoring (OMM) Plan and make available upon request to IDEM, OAQ, and the US EPA.

(c) Records necessary to demonstrate compliance shall be available within 30 days of the end of each compliance period.

(d) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

SECTION D.6 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)] **COLD MILL**

(1) Cold Reversing Mill 1 has a maximum capacity of 250 tons/hour, emulsion oil is sprayed in the strip, controlled by hoods mounted on both sides of the mill stand and exhausting through a panel-typed collision mist eliminators at a rate of 84,000 acf/min and 0.01 gr/dscf.

(2) Two (2) natural gas fueled with propane as back up fuel Cold Mill Boilers, each rated at 34 MMBTU/hour. Each Cold Mill Boiler exhausts to its own stack.

These 2 Cold Mill Boilers will supply steam to the entire Cold Mill.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.6.1 Cold Reversing Mill 1 PSD BACT Limit [326 IAC 2-2]

Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements:

(a) The Cold Reversing Mill 1 shall not exceed its annual maximum capacity of 2,190,000 tons per 12-consecutive month period with compliance demonstrated at the end of each month.

(b) The Cold Reversing Mill 1 shall comply with the following existing requirements specified in the PSD permit 107-2764-00038, issued on November 30, 1993:

(i) PM and PM_{10} emissions from the Cold Reversing Mill 1 shall be captured by hoods mounted on both sides of the mill stand and evacuated to a panel-type media packed collision mist eliminator and filter prior to venting to the atmosphere.

(ii) PM and PM_{10} shall not exceed 0.01 gr/dscf, 7.2 pounds per hour, and 31.5 tons per year.

(c) The VOC emissions from the Cold Reversing Mill 1 shall not exceed 0.06 lb/ton.

(d) The visible emissions from the Cold Reversing Mill 1 stack shall not exceed 5% opacity, based on a 6-minute average.

D.6.2 Cold Mill Boilers PSD BACT Limit [326 IAC 2-2]

Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements upon construction of the new Cold Mill Boiler or modification of the existing Cold Mill Boiler:

(a) The 2 Cold Mill Boilers shall use pipeline natural gas as primary fuel and propane as back up fuel.

(b) Each Cold Mill Boiler shall be equipped and operated with low NO_x burners.

(c) The NO_x emissions from each boiler shall not exceed 0.035 lb/MMBTU.

(d) The CO emissions from each boiler shall not exceed 0.061 lb/MMBTU.

(e) The VOC emissions from each boiler shall not exceed 0.0026 lb/MMBTU.

(f) The SO_2 emissions from each boiler shall not exceed 0.0006 lb/MMBTU.

(g) The filterable and condensible PM_{10} emissions from each boiler shall not exceed 0.0076 lb/MMBTU.

(h) The filterable PM emissions from each boiler shall not exceed 0.0019 lb/MMBTU.

(i) Good combustion shall be practiced.

D.6.3 Preventive Maintenance Plan [326 IAC 2-7-5(13)]

A Preventive Maintenance Plan, in accordance with Section C - Preventive Maintenance Plan, of this permit, is required for the boilers and mist eliminators of the Cold Reversing Mill.

D.6.4 General Provisions Relating to NSPS [326 IAC 12-1][40 CFR Part 60, Subpart A]

The provisions of 40 CFR Part 60, Subpart A (General Provisions), which are incorporated by reference in 326 IAC 12-1, apply to the boilers, except when otherwise specified in 40 CFR Part 60, Subpart Dc.

Compliance Determination Requirements [326 IAC 2-1.1-11]

D.6.5 Mist Eliminators [326 IAC 2-2]

The mist eliminators for particulate control shall be in operation and control emissions at all times that the Cold Reversing Mill 1 is in operation.

D.6.6 Natural Gas Fuel [326 IAC 2-2]

The Permittee shall use pipeline natural gas that is a naturally occurring fluid mixture of hydrocarbons (e.g., methane, ethane, or propane) produced in geological formations beneath the Earth's surface that maintains a gaseous state at standard atmospheric temperature and pressure under ordinary conditions, and which is provided by the supplier through a pipeline.

Natural gas does not include the following gaseous fuels: landfill gas, digester gas, refinery gas, sour gas, blast furnace gas, coal-derived gas, producer gas, coke oven gas, or any gaseous fuel produced in a process which might result in highly variable sulfur content or heating value.

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

None

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.6.7 Record Keeping Requirements

(a) The Permittee shall maintain records of the annual production and make available upon request to IDEM, OAQ and the US EPA.

(b) The Permittee shall maintain the records of the natural gas and propane fuel usage of the boilers and make available upon request to IDEM, OAQ and the US EPA.

(c) The Permittee shall maintain records of any additional inspections prescribed by the Preventive Maintenance Plan and make available upon request to IDEM, OAQ, and the US EPA.

(d) Records necessary to demonstrate compliance shall be available within 30 days of the end of each compliance period.

(e) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

D.6.8 Reporting Requirements

(a) The natural gas boiler certification for the boilers shall be submitted semi-annually to the address listed in Section C - General Reporting Requirements, of this permit, using the reporting form (Semi-Annual Natural Gas Fired Boiler Certification) located at the end of this permit, or its equivalent, within thirty (30) days after the end of the six (6) month period being reported.

(b) The natural gas-fired boiler certification does require the certification by the responsible official as defined by 326 IAC 2-7-1(34).

SECTION D.7 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)] **COLD MILL**

Reversing and Tempering (R/T) Mill a.k.a. Cold Reversing Mill 2 has a maximum capacity of 250 tons/hour, emulsion oil is sprayed in the strip, controlled by hoods mounted on both sides of the mill stand and exhausting through a panel-typed collision mist eliminators at a rate of 84,000 acf/min and 0.01 gr/dscf.

This mill can reverse and temper.

The mist eliminators are operating as controls, only when the mill is operating as cold reversing mill.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.7.1 Reversing and Tempering (R/T) Mill a.k.a. Cold Reversing Mill 2 PSD BACT Limit [326 IAC 2-2]

Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements:

(a) The R/T Mill (Cold Reversing Mill 2) shall not exceed its annual maximum capacity of 2,190,000 tons per12-consecutive month period, with compliance demonstrated at the end of each month.

(b) This R/T Mill (Cold Reversing Mill 2) can reverse and temper.

(c) The R/T Mill (Cold Reversing Mill 2) shall comply with the following existing requirements specified in the PSD permit 107-2764-00038, issued on November 30, 1993:

(i) PM and PM_{10} emissions from the R/T Mill (Cold Reversing Mill 2), only when reversing, shall be captured by hoods mounted on both sides of the mill stand and evacuated to a panel-type media packed collision mist eliminator and filter prior to venting to the atmosphere.

(ii) PM and PM_{10} shall not exceed 0.01 gr/dscf, 7.2 pounds per hour, and 31.5 tons per year.

(d) The VOC emissions from the R/T Mill (Cold Reversing Mill 2) shall not exceed 0.06 lb/ton. This supersedes the condition no. 14(c) of CP-107-3702-00038, issued on March 28, 1995.

(e) The visible emissions from the R/T Mill (Cold Reversing Mill 2) stack shall not exceed 5% opacity, based on a 6-minute average.

D.7.2 Preventive Maintenance Plan [326 IAC 2-7-5(13)]

A Preventive Maintenance Plan, in accordance with Section C - Preventive Maintenance Plan, of this permit, is required for the mist eliminators.

Compliance Determination Requirements [326 IAC 2-1.1-11]

D.7.3 Mist Eliminators [326 IAC 2-2]

The mist eliminators for particulate control shall be in operation and control emissions at all times that the R/T Mill (Cold Reversing Mill 2) is in operation as a cold reversing mill.

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

None

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.7.4 Record Keeping Requirements

(a) The Permittee shall maintain records of the annual production and make available upon request to IDEM, OAQ and the US EPA.

(b) The Permittee shall maintain records of any additional inspections prescribed by the Preventive Maintenance Plan and make available upon request to IDEM, OAQ, and the US EPA.

(c) Records necessary to demonstrate compliance shall be available within 30 days of the end of each compliance period.

(d) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

SECTION D.8 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)] **COLD MILL**

(1) Alkali Cleaning at the Galvanizing line with mist eliminator as control. The mist eliminator of the Alkaline Cleaning section is increased from 5,000 acf/min to 10,000 acf/min.

(2) Operations in the Galvanizing Line that are not going to be physically modified, but an increase in utilization is expected:
Galvanizing Line/Furnace consisting of:
(a) 36 main burners, each at 1.622 MMBTU/hr,
(b) 3 auxiliary burners, each at 0.1 MMBTU/hr
(c) a galvalum tank, a zinc pot,
(d) 44 burners each at 0.323 MMBTU/hr in radiant tube section
(e) Welding at the Galvanizing line.

This Galvanizing Line controlled by SCR/SNCR was recently permitted under PSD 107-14297-00038, issued on June 6, 2002. The existing PSD limits for the Galvanizing Line/Furnace are not being revised.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.8.1 Alkali Cleaning PSD BACT [326 IAC 2-2]

Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements:

(a) The Galvanizing Line Alkaline Cleaning station shall be controlled by mist eliminators and the PM emissions shall not exceed 0.003 gr/dscf.

(b) Visible emissions from the Galvanizing Line Alkaline Cleaning station shall not exceed 10% opacity, based on a 6-minute average.

(c) Good operating practices shall be observed.

D.8.2 Preventive Maintenance Plan [326 IAC 2-7-5(13)]

A Preventive Maintenance Plan, in accordance with Section C - Preventive Maintenance Plan, of this permit, is required for the mist eliminators.

Compliance Determination Requirements [326 IAC 2-1.1-11]

D.8.3 Mist Eliminators [326 IAC 2-2]

The mist eliminators shall be in operation and control emissions at all times that the Galvanizing Line Alkaline Cleaning Station is in operation.

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

None

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.8.4 Record Keeping Requirements

(a) The Permittee shall maintain records of any additional inspections prescribed by the Preventive Maintenance Plan.

(b) All records shall be maintained in accordance with Section C - General Record Keeping Requirements of this permit.

SECTION D.9 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)] **COLD MILL**

(1) Natural gas fueled Annealing Furnaces - -consisting of 18 furnaces at 4.8 MMBTU/hr each and have maximum capacity of 200 tons/hour. Emissions exhaust to roof vent.

(2) Slitter/Rewind/Trimmer Line for trimming operations exhausting to roof vent.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.9.1 Annealing Furnace PSD BACT [326 IAC 2-2]

Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements:

(a) Each annealing furnace shall be equipped and operated with low NO_x burners.

(b) The NO_x emissions from each Annealing Furnace shall not exceed 0.10 lb/MMBTU.

(c) The CO emissions from each Annealing Furnace shall not exceed 0.084 lb/MMBTU.

(d) The Annealing Furnaces shall use pipeline natural gas as primary fuel and propane as back up fuel.

(e) Visible emissions from the Annealing Furnaces shall not exceed 10% opacity, based on a 6-minute average.

Compliance Determination Requirements [326 IAC 2-1.1-11]

D.9.2 Natural Gas Fuel [326 IAC 2-2]

The Permittee shall use pipeline natural gas that is a naturally occurring fluid mixture of hydrocarbons (e.g., methane, ethane, or propane) produced in geological formations beneath the Earth's surface that maintains a gaseous state at standard atmospheric temperature and pressure under ordinary conditions, and which is provided by the supplier through a pipeline.

Natural gas does not include the following gaseous fuels: landfill gas, digester gas, refinery gas, sour gas, blast furnace gas, coal-derived gas, producer gas, coke oven gas, or any gaseous fuel produced in a process which might result in highly variable sulfur content or heating value.

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

None

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

None

SECTION D.10 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)] **CASTRIP**

(1) The nozzle core milling/drilling operation is going to be controlled by its own baghouse (identified as Castrip Milling/Drilling Baghouse) and exhausting to the atmosphere with backup to the existing Castrip LMS Baghouse, instead of exhausting through the Castrip LMS Baghouse, as previously permitted under MSM 107-15289-00038.

(2) To be able to cut coils in the Castrip area, with the Castrip Milling/Drilling Baghouse or Castrip LMS Baghouse as control.

(3) Operations in the Castrip that are not going to be physically modified, but an increase in utilization is expected:

(a) Castrip LMS, with a maximum capacity of 135 tons/hour, with Castrip LMS Baghouse as control.
(b) Castrip Caster
(c) Castrip Hot Strip Mill
(d) Castrip Tundish and Ladle Preheaters/Dryers, exhausting to the Castrip Roof monitors.

These operations were recently permitted under PSD 107-12143-00038, issued on January 19, 2001. The existing PSD limits for the Castrip are not being revised.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.10.1 Castrip Drilling/Milling Opacity [326 IAC 5]

Pursuant to MSM 107-15289-00038, issued on April 16, 2002, the visible emissions from the exhaust stack of the Castrip Milling/Drilling Baghouse shall not exceed 40% opacity, based on a 6-minute average.

D.10.2 Preventive Maintenance Plan [326 IAC 2-7-5(13)]

A Preventive Maintenance Plan, in accordance with Section C - Preventive Maintenance Plan, of this permit, is required for the Castrip Milling/Drilling Baghouse.

Compliance Determination Requirements [326 IAC 2-1.1-11]

D.10.3 Baghouse Operation [326 IAC 2-2]

(a) Pursuant to MSM 107-15289-00038, issued on April 16, 2002, the Castrip Milling/Drilling Baghouse for particulate control shall be in operation and control emissions, at all time, that the Castrip Nozzle Core Milling/Drilling is in operation, except that the Meltshop LMF Baghouse serves as a back up.

(b) Pursuant to 326 IAC 2-2, the Castrip Nozzle Core Milling/Drilling Baghouse or Castrip LMS Baghouse for particulate control shall be in operation and control emissions, at all times, that the coil cutting is operating in the Castrip area, except that the Meltshop LMF Baghouse serves as a back up.

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

None

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.10.4 Record Keeping Requirements

(a) The Permittee shall maintain records of any additional inspections prescribed by the Preventive Maintenance Plan.

(b) All records shall be maintained in accordance with Section C - General Record Keeping Requirements of this permit.

SECTION D.11 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)] **COOLING TOWERS**
Contact and Non-Contact Cooling Towers with maximum designed capacity of 192,352 gal/min and consisting of a total of 54 cells.

Cooling Towers	No. of Cells	Capacity (gal/min)	Cooling Towers	No. of Cells	Capacity (gal/min)
Meltshop Non Contact	9	60,000	Galvanizing/Annealing Non Contact	2	6,500
Meltshop Caster Contact	4	10,000	Annealing Non Contact	2	5,000
Meltshop Caster Contact (expansion)	2	5,000	Castrip Contact	4	12,000
Hot Mill Contact	4	16,383	Castrip Non Contact	6	12,000
Hot Mill Contact (expansion)	1	4,000	Castrip Compressor Non Contact	3	2,400
Hot Mill Non Contact	4	25,319	BOC Non Contact (CT-91A)	1	750
Laminar Contact	3	11,600	BOC Non Contact (CT-91B)	2	3,200
Cold Mill Non Contact	2	10,000	Main Compressor Non Contact	4	3,200
Cold Mill Non Contact (expansion)	1	5,000	(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)		

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.11.1 Cooling Towers PSD BACT [326 IAC 2-2]

Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements:

(a) The drift rate from each cooling tower shall not exceed 0.0005%.

(b) The Permittee shall submit the drift design specification of the cooling towers upon initial start up of the cooling towers.

(c) The visible emissions from each cooling tower shall not exceed 20% opacity, based on a 6-minute average.

D.11.2 Preventive Maintenance Plan [326 IAC 2-7-5(13)]

A Preventive Maintenance Plan, in accordance with Section C - Preventive Maintenance Plan, of this permit, is required for the drift/mist eliminators.

Compliance Determination Requirements [326 IAC 2-1.1-11]

D.11.3 Drift/Mist Eliminators [326 IAC 2-2]

The mist/drift eliminators for particulate control shall be in operation and control emissions at all times that the cooling towers are in operation.

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

None

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.11.4 Record Keeping Requirements

(a) The Permittee shall maintain records of any additional inspections prescribed by the Preventive Maintenance Plan.

(b) All records shall be maintained in accordance with Section C - General Record Keeping Requirements of this permit.

SECTION D.12 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)] Scrap Handling and Processing (The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.12.1 Scrap Handling and Processing

Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements:

(a) Skulls, coils and steel scrap shall be mechanically reduced in size. Any skull, coil, steel scrap not mechanically reduced in size can be lanced out or transported to the steel works building or another suitable building.

(b) Good working practices shall be observed.

(c) Scrap cutting allowed outdoors is limited to scrap items such as furnace roof, railroad cards, ductwork, long pieces of scrap pipe and bar stock, that can not fit in the existing building. Galvanized scrap shall not be cut outdoors. Outdoor means the cutting is done outside of a building.

(d) The visible emissions from the building enclosing the scrap cutting operation shall not exceed 3% opacity based on a 6-minute average.

(e) The visible emissions from the outdoor scrap cutting operation shall not exceed 3% opacity based on a 6-minute average.

Compliance Determination Requirements [326 IAC 2-1.1-11]

None

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

D.12.2 Visible Emissions Notations

(a) Visible emission notations shall be performed once per shift during normal daylight operations when scrap cutting is operating in a building.

(b) Visible emission notations shall be performed when outdoor scrap cutting is operating.

(c) A trained employee shall record whether emissions are normal or abnormal. A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.

(d) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time.

(e) In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.

(f) The Compliance Response Plan for this unit shall contain troubleshooting contingency and reasonable response steps for when an abnormal emission is observed. Failure to take reasonable response steps in accordance with Section C - Compliance Response Plan -Preparation, Implementation, Records and Reports, shall be considered a deviation from this permit.

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.12.3 Record Keeping Requirements

(a) The Permittee shall maintain records of the:

(i) once per shift visible emission notations of the scrap cutting operation and

(ii) visible emission notations of the outdoor scrap cutting operation,

and make available upon request to IDEM, OAQ, and the US EPA.

(b) Records necessary to demonstrate compliance shall be available within 30 days of the end of each compliance period.

(c) All records shall be maintained in accordance with Section C - General Record Keeping Requirements of this permit.

SECTION D.13 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)] **BOC GASES PLANT**

BOC Gases Plant is an onsite contractor, provides gases (oxygen, nitrogen, hydrogen, argon, and liquid air), and consists of:

(a) Natural gas fuel with propane as back up fuel BOC Gases Low NO_x Burner Boiler ID no. 306, rated at 15 MMBTU/hour.

(b) This is in addition to the existing BOC Gases Boiler ID no. 1, rated at 9 MMBTU/hr, and BOC Gases Boiler ID no. 2, rated at 15 MMBTU/hr.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.13.1 BOC Gases Boilers PSD BACT [326 IAC 2-2]

Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements:

(a) The Boiler ID no. 306 shall use pipeline natural gas as primary fuel and propane as back up fuel.

(b) Boiler ID no. 306 boiler shall be equipped and operated with low NO_x burners.

(c) The NO_x emissions from Boiler ID no. 306 shall not exceed 0.035 lb/MMBTU.

(d) The CO emissions from Boiler ID no. 306 shall not exceed 0.061 lb/MMBTU.

(e) The VOC emissions from Boiler ID no. 306 shall not exceed 0.0026 lb/MMBTU.

(f) The SO_2 emissions from Boiler ID no. 306 shall not exceed 0.0006 lb/MMBTU.

(g) The filterable and condensible PM_{10} emissions from Boiler ID no. 306 shall not exceed 0.0076 lb/MMBTU.

(h) The filterable PM emissions from Boiler ID no. 306 shall not exceed 0.0019 lb/MMBTU.

(i) Good combustion shall be practiced.

D.13.2 General Provisions Relating to NSPS [326 IAC 12-1][40 CFR Part 60, Subpart A]

The provisions of 40 CFR Part 60, Subpart A (General Provisions), which are incorporated by reference in 326 IAC 12-1, apply to the boilers, except when otherwise specified in 40 CFR Part 60, Subpart Dc.

D.13.3 Preventive Maintenance Plan [326 IAC 2-7-5(13)]

A Preventive Maintenance Plan, in accordance with Section C - Preventive Maintenance Plan, of this permit, is required for the boilers.

Compliance Determination Requirements [326 IAC 2-1.1-11]

D.13.4 Natural Gas Fuel [326 IAC 2-2]

The Permittee shall use pipeline natural gas that is a naturally occurring fluid mixture of hydrocarbons (e.g., methane, ethane, or propane) produced in geological formations beneath the Earth's surface that maintains a gaseous state at standard atmospheric temperature and pressure under ordinary conditions, and which is provided by the supplier through a pipeline.

Natural gas does not include the following gaseous fuels: landfill gas, digester gas, refinery gas, sour gas, blast furnace gas, coal-derived gas, producer gas, coke oven gas, or any gaseous fuel produced in a process which might result in highly variable sulfur content or heating value.

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

None

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.13.5 Record Keeping Requirements

(a) The Permittee shall maintain records of the natural gas fuel usage of the boilers, and make available upon request to IDEM, OAQ and the US EPA.

(b) The Permittee shall maintain records of any additional inspections prescribed by the Preventive Maintenance Plan.

(c) Records necessary to demonstrate compliance shall be available within 30 days of the end of each compliance period.

(d) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

D.13.6 Reporting Requirements

The natural gas boiler certification for the boilers shall be submitted semi-annually to the address listed in Section C - General Reporting Requirements, of this permit, using the reporting form (Semi-Annual Natural Gas Fired Boiler Certification) located at the end of this permit, or its equivalent, within thirty (30) days after the end of the six (6) month period being reported.

The natural gas-fired boiler certification does require the certification by the responsible official as defined by 326 IAC 2-7-1(34).

SECTION D.14 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)] **EMERGENCY GENERATORS**

(1) Diesel fired generators and air compressors for power outages and emergencies.
   (a) Cold Mill generator, rated at 280 HP

   (b) Hot Mill NC Cooling Tower generator, rated at 2100 HP

   (c) Galv Line Pot generator, rated at 890 HP

   (d) MS Cooling Tower Cold Well generator, rated at 2,520 HP

   (e) Portable natural gas heaters for winter use.

(2) Operations that are not going to be physically modified, but an increase in utilization is expected:

   (a) Quality Control Furnace - Natural gas fired 1 MMBTU/hour

   (b) Miscellaneous Storage Tanks for gasoline, diesel fuel, kerosene, oils, pressurized, sodium hypochlorite, sulfuric acid, biocides, sodium nitrate, polymers, boilers chemicals, hydrochloric acids, aluminum sulfate, chromate, corrosion inhibitors, used oil, and cleaners, such as 500 gallon aboveground gasoline tank, 500 gallon aboveground diesel tank, and 5,000 gallon aboveground diesel storage tank.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.14.1 Emergency Generators PSD BACT [326 IAC 2-2]

Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements:

(a) The emergency generators shall solely provide back up power when electric power is interrupted, or during maintenance or testing of generators.

(b) Each emergency generator shall not operate more than 500 hours per 12- consecutive month period with compliance demonstrated at the end of each month.

(c) The sulfur content of the diesel fuel used shall not exceed 0.05% by weight.

(d) Good combustion practices shall be performed.

Compliance Determination Requirements [326 IAC 2-1.1-11]

None

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

None

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.14.2 Record Keeping Requirements

(a) The Permittee shall maintain records of the hours of operation of each emergency generator and make available upon request to IDEM, OAQ and the US EPA.

(b) Records necessary to demonstrate compliance shall be available within 30 days of the end of each compliance period.

(c) All records shall be maintained in accordance with Section C - General Record Keeping Requirements of this permit.

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY

CERTIFICATION

Source Name: Nucor Steel
Source Location: 4537 South Nucor Street, Crawfordsville, IN 47933
Mailing Address: 4537 South Nucor Street, Crawfordsville, IN 47933
RR2, Box 311, Crawfordsville, IN 47933

This certification shall be included when submitting monitoring, testing reports/results or other documents as required by this approval.

Please check what document is being certified:

9 Test Result (specify) ____________________

9 Report (specify) ____________________

9 Notification (specify) ____________________

9 Affidavit (specify) ____________________

9 Other (specify) ____________________

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Signature:
Printed Name:
Title/Position:
Date:

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE DATA SECTION

QUARTERLY DEVIATION AND COMPLIANCE MONITORING REPORT

Source Name: Nucor Steel
Source Location: 4537 South Nucor Street, Crawfordsville, IN 47933
Mailing Address: 4537 South Nucor Street, Crawfordsville, IN 47933
RR2, Box 311, Crawfordsville, IN 47933

Months: ___________ to ____________ Year: ______________

This report shall be submitted quarterly based on a calendar year. Any deviation from the requirements, the date(s) of each deviation, the probable cause of the deviation, and the reasonable response steps taken must be reported. Deviations that are required to be reported by an applicable requirement shall be reported according to the schedule stated in the applicable requirement and do not need to be included in this report. If no deviations occurred, please specify in the box marked ANo deviations occurred this reporting period@. Additional pages may be attached if necessary.
9 NO DEVIATIONS OCCURRED THIS REPORTING PERIOD.
9 THE FOLLOWING DEVIATIONS OCCURRED THIS REPORTING PERIOD
Permit Requirement (specify permit condition #)
Date of Deviation:
Duration of Deviation:
Number of Deviations:
Probable Cause of Deviation:
Reasonable Response Steps Taken:
Permit Requirement (specify permit condition #)
Date of Deviation:
Duration of Deviation:
Number of Deviations:
Probable Cause of Deviation:
Reasonable Response Steps Taken:

Form Completed By: ________________________________
Title/Position: ________________________________
Date: ________________________________
Telephone: ________________________________

A certification by the responsible official as defined by 326 IAC 2-7-1(34) is required for this report.

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY, COMPLIANCE BRANCH

EMERGENCY OCCURRENCE REPORT

Source Name:	Nucor Steel
Source Location:	4537 South Nucor Street, Crawfordsville, IN 47933
Mailing Address:	4537 South Nucor Street, Crawfordsville, IN 47933 RR2, Box 311, Crawfordsville, IN 47933

9 This is an emergency as defined in 326 IAC 2-7-1(12)

C The Permittee must notify the Office of Air Quality (OAQ), within four (4) business hours (1-800-451-6027 or 317-233-5674, ask for Compliance Section); and

C The Permittee must submit notice in writing or by facsimile within two (2) working days (Facsimile Number: 317-233-5967), and follow the other requirements of 326 IAC 2-7-16.

Address: 100 North Senate Avenue P.O. Box 6015, Indianapolis, Indiana 46206-6015

This EMERGENCY OCCURRENCE REPORT consists of 2 pages.

If any of the following are not applicable, mark N/A

Facility/Equipment/Operation:
Control Equipment:
Permit Condition or Operation Limitation in Permit:
Description of the Emergency:
Describe the cause of the Emergency: Date/Time Emergency started:
Date/Time Emergency was corrected:

Page 2 of 2 of the EMERGENCY OCCURRENCE REPORT
Was the facility being properly operated at the time of the emergency? Y N Describe: Type of Pollutants Emitted: TSP, PM_{10}, SO_2, VOC, NO_x, CO, Pb, other:
Estimated amount of pollutant(s) emitted during emergency:
Describe the steps taken to mitigate the problem:
Describe the corrective actions/ reasonable response steps taken: Describe the measures taken to minimize emissions:
If applicable, describe the reasons why continued operation of the facilities are necessary to prevent imminent injury to persons, severe damage to equipment, substantial loss of capital investment, or loss of product or raw materials of substantial economic value:

Form Completed By: ______________________________
Title/Position: ______________________________
Date: ______________________________
Telephone: ______________________________

A certification by the responsible official as defined by 326 IAC 2-7-1(34) is NOT required for this report.

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE DATA SECTION

SEMI-ANNUAL NATURAL GAS FIRED BOILER CERTIFICATION

Source Name:	Nucor Steel
Source Location:	4537 South Nucor Street, Crawfordsville, IN 47933
Mailing Address:	4537 South Nucor Street, Crawfordsville, IN 47933
	RR2, Box 311, Crawfordsville, IN 47933

9 Natural Gas Only

9 Alternate Fuel Burned

From:_____________ To:_____________

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete. Signature:
Printed Name:
Title/Position:
Telephone: Date:

A certification by the responsible official as defined by 326 IAC 2-7-1(34) is required for this report.

Indiana Department of Environmental Management
Office of Air Quality

Technical Support Document Addendum (TSDA) for a Prevention of Significant Deterioration (PSD) and Part 70 Significant Source Modification (SSM)

Source Background and Description

Source Name:	Nucor Steel
Source Location:	4537 South Nucor Street, Crawfordsville, IN 47933
Mailing Address:	4537 South Nucor Street, Crawfordsville, IN 47933 RR2, Box 311, Crawfordsville, IN 47933
General Telephone Number:	765-364-2323
General Facsimile Number:	765-364-5311
Responsible Official:	General Manager
County Location:	Montgomery
SIC Code:	3312 (Steel Mill)
Source Categories:	1 of 28 Listed Source Categories Major PSD Source Major Source, CAA Section 112
Significant Source Modification:	PSD 107-16823-00038
Permit Writer:	Iryn Calilung
Air Impact Modeler:	Krista Gremos

Public Notification

On September 13, 2003, the Office of Air Quality (OAQ) had a notice published in the Journal Review, stating that Nucor Steel had applied for an air approval to modify their existing mini mill plant.

A public hearing was held on September 30, 2003, in the Southmont High School, 6425 US Highway 231 South, Crawfordsville, IN. The public hearing officer was Paul Dubenetzky. Transcript of the hearing was done by Accurate Reporting of Indiana, Carmel, IN.

The public comment period ended on October 13, 2003.

Public Hearing Participants and Commentators

The following people attended the public hearing and provided oral or written comments:

(1) Judy Goshern, 6836 South Ladoga Road, Ladoga, IN

(2) Jane Truax, 3750 US 136 East, Crawfordsville, IN

(3) Nucor Steel employees

The following people did not attend the public hearing, but provided written comments:

(1) Ethan Chatfield, U.S. Environmental Protection Agency, Air and Radiation Division, 77 West Jackson Blvd., Chicago, IL 60604-3507, (312) 886-5112 (T), (312) 886-5824 (F)

(2) Stephen Loeschner, 2421 Dellwood Drive, Fort Wayne, IN 46803

The comments are re-stated in the following pages with the IDEM responses. The commentator is identified at the end of each comment. The comments have been compiled into similar subject matter. Any changes to the draft permit are shown in ~~strikeout~~ or **bold** fonts to show the difference.

The IDEM does not amend the TSD and its Appendices. The TSD is maintained to document the original review. The TSD Addendum is used to document responses to comments and changes made from the time the permit was drafted until a final decision is made.

Descriptions of the Emission Units
(Sections A and Ds and TSD of the Draft Permit)

There are several changes in the descriptions of the emission units that have been made in Sections A and Ds of the permit. To avoid duplication, the changes are written only once even though the changes have been made in different parts of the permit. The changes are also written after each comment to make sure that each requested change has been accounted for.

(1) In the first sentence of the paragraph in A.1 General Description, "produce" should be "produces." [Nucor Steel]

IDEM Response

IDEM agrees.

A.1 The Permittee owns and operates a stationary steel mini-mill that produce**s** all grades of carbon and stainless steel, all grades of alloy steel, all grades of ultra low and low carbon steel, flat rolled, hot rolled, cold rolled, galvanized, pickled and oiled steel (slabs, sheets) products.

(2) Appendix B Page 65 (a): There appears to be a typo in this item. Please clarify. [USEPA]

IDEM Response

This serves as correction:

Nucor Steel is proposing to do the following modifications to the AOD operations:

a) Maintain the total maximum steel production ~~remains~~ at 502 tons/hour.

There is no change in the draft permit itself due to this comment.

(3) The first sentence in Section A.2(I)(2) simply restates what has been previously stated in Section A.2(I)(1)(b). To help streamline the permit, Nucor requests that the OAQ delete this duplicative sentence. [Nucor Steel]

IDEM Response

There will be no change in this description because the first set of description is intended to emphasize the EAFs, and the second set of description is to emphasize the AOD.

There is no change in the description due to this comment.

A.2(I)(1)(b) Each or any combination of the Meltshop EAFs and AOD can independently produce the maximum capacity of 502 tons/hour of steel. Each Meltshop EAF can operate concurrently or independently to achieve this maximum capacity.

A.2(I)(2) Argon oxygen decarburization (AOD) vessels, together with the Meltshop EAFs have a total maximum capacity of 502 tons/hour. The AOD vessels and Desulfurization also exhaust to the Meltshop EAF Baghouse1 and Meltshop EAF Baghouse2. Only 1 AOD vessel can operate at a time.

(4) For purposes of clarification, Nucor requests that the OAQ specify that there are four Tundish Preheaters consisting of low NOx natural gas fired heaters each rated at 6 MMBtu/hr—in Section A.2(I)(7)(c).

IDEM Response

IDEM agrees.

A.2(I)(7)(c) **Four (4)** Tundish Preheaters consisting of 4 low NO_x natural gas fired heaters, each rated at 6 MMBTU/hour.

(5) Nucor requests that the OAQ delete the descriptive language in Section A.2(I)(7)(f) and (g) for the Tundish Dumping and Ladle Dumping as removing excess molten metal is not the only reason dumping is conducted. [Nucor Steel]

IDEM Response

IDEM agrees.

A.2(I)(7)(f) Tundish Dumping ~~for removal of excess molten metal.~~

A.2(I)(7)(g) Ladle Dumping ~~for removal of excess molten steel and slag.~~

(6) Nucor requests that the OAQ replace "rolling mills" with "rolling mill" in the first sentence of Section A.2(II)(1). [Nucor Steel]

IDEM Response

IDEM agrees.

A.2(II)(1) Hot Strip Mill has a maximum capacity of 502 tons/hour consisting of the Tunnel Furnace System, and other rolling mill~~s~~ processes: Shearing, Descaling, Finishing, Rollout Table, Coilers, Skin Pass Mill and Roll Grinders.

(7) For purposes of clarification, Nucor requests that the OAQ place a comma between "regenerated acid" and "oily wastewater" in Section A.2(III)(1)(c). [Nucor Steel]

IDEM Response

IDEM agrees.

A.2(III)(1)(c) Tank Farm treats the rinse water from Pickle Line1 and Pickle Line 2. These tanks also store spent acid, raw acid, regenerated acid**,** oily wastewater**,** and processed water.

(8) As currently drafted, Section A.2(III)(6) states that "existing PSD

limits for the Galvanizing Line/Furnace are not being revised." Nucor understands that because the Galvanizing Line is not going to be physically modified, no changes in the terms and conditions, not just the limits, specified in PSD Permit No. 107-14297-00038 is required. Nucor requests clarification if this is not the OAQ's intent. [Nucor Steel]

IDEM Response

Nucor's understanding of the condition is correct.

There is no change in the draft permit due to this comment.

A.2(III)(6) This Galvanizing Line controlled by SCR/SNCR was recently permitted under PSD 107-14297-00038, issued on June 6, 2002. The existing PSD limits for the Galvanizing Line/Furnace are not being revised.

(9) Nucor requests that the OAQ add the missing first parenthesis before "identified" in Section A.2(IV)(1). Nucor also requests that the OAQ add "with backup to the existing Castrip LMS Baghouse" after "atmosphere" in Section A.2(IV)(1). [Nucor Steel]

IDEM Response

IDEM agrees.

A.2(IV)(1) The nozzle core milling/drilling operation is going to be controlled by its own baghouse **(**identified as Castrip Milling/Drilling Baghouse) and exhausting to the atmosphere **with backup to the existing Castrip LMS Baghouse**, instead of exhausting through the Castrip LMS Baghouse, as previously permitted under MSM 107-15289-00038.

(10) Nucor requests that the OAQ replace "Ladle Preheater/Dryer" with "Ladle Preheaters/Dryers" in Section A.2(IV)(3)(d). [Nucor Steel]

IDEM Response

IDEM agrees.

A.2(IV)(3)(d) Castrip Tundish and Ladle Preheater**s**/Dryer**s**, exhausting to the Castrip Roof monitors.

(11) Nucor requests that the OAQ replace "maximum capacity" with "maximum designed capacity" or "nominal maximum design capacity" in Section A.2(V)(1) to more accurately reflect how the capacity figure was derived. Capacity values on pieces of equipment are engineering design numbers and do not necessarily reflect a particular unit's precise performance under varying operating conditions. [Nucor Steel]

In the second sentence of the first paragraph on Page 68 and in Table 35 of Appendix B - - PSD BACT Evaluations, add "design" before capacity. Capacity values on pieces of equipment are engineering design numbers and do not necessarily reflect a particular unit's precise performance under varying operating conditions. [Nucor Steel]

For purposes of clarification on page 67 of the TSD, Nucor requests that the OAQ add "design" before "capacity" in the first sentence of the description. Capacity values on pieces of equipment are engineering design numbers and do not necessarily reflect a particular unit's precise performance under varying operating conditions. [Nucor Steel]

IDEM Response

IDEM agrees.

A.2(V)(1) Contact and Non-Contact Cooling Towers with maximum **designed** capacity of 192,352 gal/min and consisting of a total of 54 cells.

(12) For purposes of simplicity, Nucor requests that the OAQ delete the descriptions of the miscellaneous storage tanks in Section A.2(V)(5)(b). If the OAQ will not do so, Nucor requests that the OAQ add "used oil storage tanks" to the enumerated list. [Nucor Steel]

IDEM Response

The descriptions of these tanks were taken from existing permits:

- construction permit PC(54)1742, issued on April 20, 1989 (Operation Condition No. 21),
- CP 107-2764-00038, issued on November 30, 1993 (Operation Condition No. 25) and
- Amendment 107-11154-00038, issued on August 11, 1999.

These tanks are not part of any proposed physical modifications.

A.2(V)(5)(b) Miscellaneous Storage Tanks for gasoline, diesel fuel, kerosene, oils, pressurized, sodium hypochlorite, sulfuric acid, biocides, sodium nitrate, polymers, boilers chemicals, hydrochloric acids, aluminum sulfate, chromate, corrosion inhibitors, **used oil,** and cleaners, such as 500 gallon aboveground gasoline tank, 500 gallon aboveground diesel tank, and 5,000 gallon aboveground diesel storage tank.

Physical Modifications (Condition B.6)

Nucor requests the following corrections to incorporate descriptions that were included in the permit application:

(1) Nucor requests that the OAQ delete "use to transfer molten steel from the AOD to ladles" in Section B.6(II)(e) as this is not the purpose of spout ladles. [Nucor Steel]

For purposes of clarification, Nucor requests that the OAQ delete "use to transfer molten steel from AOD to ladles" from paragraph (I)(2)(e) of Page 5 of the TSD because it could be unnecessarily construed as limiting the function of the spout ladles. [Nucor Steel]

Delete the descriptive language after "spout ladles" in paragraph (f) of Page 65 of Appendix B - - PSD BACT Evaluations. [Nucor Steel]

IDEM Response

This change also serves as correction where this description appears in the TSD and Appendices.

B.6(II)(e) Install additional spout ladles~~, use to transfer molten steel from AOD to ladles~~.

(2) Nucor also requests that the OAQ add "Installation of new or modified operating process control systems and associated equipment at the desulfurization station" to the enumerated list in Section B.6(IV). [Nucor Steel]

IDEM Response

The application received on November 22, 2002 has this proposed change indicated.

B.6IV <u>Meltshop Ladle Metallurgy Furnaces (LMFs) and Stirring Station</u>

(a) Replace and/or upgrade PLC controls and process equipment.
(b) Add a new alloying conveyor system, silos, storage bin, and feed equipment and control.
(c) Install additional argon lances for stirring in the LMFs.
(d) Add porous plugs to ladles for argon stirring.
(e) Add new ladles.
(f) Install new exhausts for the Ladle Preheaters instead of exhausting to roof monitors.
(g) Installation of new or modified operating process control systems and associated equipment at the desulfurization station

(3) In Section B.6(V), add "Installation of new or modified operating process control systems and associated equipment at the Laminar cooling and both coilers."

IDEM Response

The application received on November 22, 2002 has this proposed change indicated.

B.6(V) Hot Strip Mill

(a) Replace and/or upgrade PLC controls and process equipment.

(b) Take into account VOC emissions that were not taken into account during the initial review.

(c) Installation of new or modified operating process control systems and associated equipment at the Laminar cooling and both coilers.

(4) In Section B.6(VI)(d), add "and various pickling enhancer agents" after "temperatures."

IDEM Response:

This new information is added.

B.6(VI)(d) The use of various concentrations, flows ~~and~~ temperatures **and various pickling enhancer agents** of acid at both Pickle lines 1 and 2.

(5) Section B.6(XIV)(e) should be revised to read "Modifications of water cooled ducts, water systems, cooling towers, water treatment facilities, and controls to increase water volume and pressure and quality to tower flow design capacities."

IDEM Response

The application received on November 22, 2002 has this proposed change indicated. However, the application referenced a single cooling tower.

B.6(XIV)(e) Modify the water cooled ducts, water system**s**, ~~and~~ cooling tower**s**, water treatment **facilities and controls to increase water volume and pressure and quality to tower flow design capacities.**

(6) Move the descriptions in Section B.6(XV)(a) and (b) to Section B.6(XVI) as the installation of new cranes and modification of existing cranes and associated auxiliary equipment are miscellaneous plant wide physical modifications.

IDEM Response

The proposal to install new cranes and modify the existing cranes have been moved from B.6(XV)(a) and (b) to B.XVI(g) and (h). Subsequent items under B.6(XV) have been renumbered.

(7) In Section B.6(XV)(c), add "or a combination of both" at the end.

IDEM Response

The application received on November 22, 2002 has this proposed change indicated.

B.6(XV)(~~c~~ **a**) Add scrap loading of buckets to overhead cranes and truck dumping under roof in the scrap bay area **or a combination of both**.

(8) In Section B.6(XVI)(c), "transformer" should be "transformers".

IDEM Response

The application received on November 22, 2002 has this proposed change indicated.

B.6(XVI)(c) Addition, upgrades or modification of transformer**s**, static var systems, reactors, and electrical control and monitoring systems to allow the maximum utilization of production.

Operation Flexibility

In addition to the operational flexibility provisions already included in Condition D.1.2, Nucor requests that the OAQ include the following Operational Flexibility provision (in the permit application, but inadvertently omitted from the permit) as a new Section B.8.

B.8 Permissible Optimization of Production and Emission Control

Permissible optimizations of production and emissions control equipment and practices after plant modifications are complete include changes in the method of operation of the EAFs, AOD, LMFs, Desulfurization process, Casters, Baghouses, Tunnel Furnaces, Rolling Mill, Pickle Lines, Acid Regeneration Plant, Cold Reversing Mill, R/T Mill, Annealing Furnaces, Galvanizing Line and Cranes to optimize production and emissions control, so long as maximum production does not exceed permitted tons per year or tons per hour and emissions comply with the BACT limits specified in this permit. Permissible adjustment include, but are not limited to:

(a) The use of different and varying amounts of scrap and scrap substitutes, concentrations, grades and purities of alloys, lime, charge and injection carbon, oxygen and argon to achieve permitted production rates;

(b) Changes in operations that include the following:
   (1) Flux and alloy additions at various locations in the process;
   (2) Foamy slag practices;
   (3) Slagging practices;
   (4) Scrap additions to the EAFs;
   (5) Damper controls and settings on fume systems;
   (6) Power profile practices;
   (7) Changes in refractories, including style, dimensions and chemical and physical properties;
   (8) Lancing practices; and
   (9) Melting and refining practices.

(c) Increasing casting speeds by improvements to process controls, equipment modifications, additions or replacement, upgrades to systems, new styles of molds, changes in mold powders or lubricants; addition or installation of a magnetic brake system; water system upgrades, and foundation and structural repairs or replacement; and

(d) Modifications of all fans, controls and operating parameters, cleaning parameters, types of bags at the baghouses to maintain permitted efficiency. Changes will not result in excess grain loading or flow through the baghouse in excess of permitted flow rate.

This condition does not authorize any increase in production rate over permitted levels.

This condition basically appears in Nucor Steel’s PSD permit for its

Darlington, South Carolina facility. Nucor respectfully requests that the condition be placed in a new Section B.8. [Nucor Steel]

IDEM Response

This permit allows Nucor Steel to fully utilize its maximum production capacity, as long as applicable emission limitations and standards, monitoring and reporting requirements are followed, however, such general claims mentioned above can not be put in the permit because:

- - some of them can be indicated as part of the preventive maintenance plans or operation and maintenance plans,

- - some are already exempted under the definitions and evaluations of modifications, in existing Indiana air rules,

- - or clearly part of everyday routine methods of operations that are expected in a processing plant .

For example:

- - This flexibility is part of the Scrap Management Plan and everyday working practices.

  (a) The use of different and varying amounts of scrap and scrap substitutes, concentrations, grades and purities of alloys, lime, charge and injection carbon, oxygen and argon to achieve permitted production rates.

- - These practices are part of everyday operations and work practices. They do not need to be indicated in the permit. They can be part of the operation maintenance plan.

  (b) Changes in operations that include the following:
    (1) Flux and alloy additions at various locations in the process;
    (2) Foamy slag practices;
    (3) Slagging practices;
    (4) Scrap additions to the EAFs;
    (5) Damper controls and settings on fume systems;
    (6) Power profile practices;
    (7) Changes in refractories, including style, dimensions and chemical and physical properties;
    (8) Lancing practices; and
    (9) Melting and refining practices.

Nucor Steel has to evaluate any potential change to determine if it needs prior approval before such change can be made.

- - IDEM has concerns about providing this kind of general overall blanket approval not knowing the extent of the changes, replacement and upgrades to be made. IDEM understands that during the debugging and testing periods of this proposed modification that Nucor may make changes during the construction phase to attain maximum capacity, however, any such changes may not be allowed once operation has been established. There are also pending rules that are intended to clarify and provide more flexibility for such changes/replacements/upgrades, to major sources, especially sources who underwent PSD major review.

  (c) Increasing casting speeds by improvements to process controls, equipment modifications, additions or replacement, upgrades to systems, new styles of molds, changes in mold powders or lubricants; addition or installation of a magnetic brake system; water system upgrades, and foundation and structural repairs or replacement.

(d) Modifications of all fans, controls and operating parameters, cleaning parameters, types of bags at the baghouses to maintain permitted efficiency. Changes will not result in excess grain loading or flow through the baghouse in excess of permitted flow rate.

Affidavit of Construction (Condition B.4)

Nucor's permit application is unusual in that Nucor seeks to make a large number of relatively insignificant changes to existing process units so that these units will more consistently and closely attain their peak production rate. This differs from the traditional PSD permit modification, where a source seeks to add an emissions unit or replace or upgrade an existing unit. In Nucor's case, there are a number of minor changes to the various emissions units that may be necessary to achieve Nucor's production goals. Nucor does not know whether all of the requested changes will be necessary.

Similarly, Nucor does not intend to discontinue operations of its existing units while the various minor changes are made. Instead, Nucor anticipates that it will make a change, assess its effectiveness, and the make additional changes if necessary to achieve Nucor's production goals. Nucor does not believe that this is either unusual or controversial. Unfortunately, it is not clear how these changes are to be reconciled with the OAQ's proposed stack testing and/or Affidavit of Construction requirements. Nucor proposes the following:
Because the changes included in the proposed permit are primarily changes to existing operating units that will occur at various times, and not all simultaneously, it is not clear how Nucor is to apply proposed Condition B.4(a). Nucor interprets Condition B.4(a) as requiring Nucor to submit an affidavit of construction each time it makes a change authorized by the permit, but that Nucor does not need to make all authorized changes before operating the unit if the changes are made in compliance with the permit. Accordingly, Nucor will submit an affidavit of construction each time it makes a permitted change. Because of the great number of changes, Nucor respectfully asks that the OAQ allow Nucor to submit such affidavits either weekly or monthly, collecting all changes completed during the week or month, to reduce the administrative burden on the OAQ and Nucor. [Nucor Steel]

IDEM Response

The rules governing preconstruction approvals and approvals to operate for sources that do not yet have Part 70 Operating Permits require that the affidavits must be submitted prior to operating. Condition B.4 of this permit will be reviewed during the issuance of Nucor's Part 70 Operating Permit to establish a more streamlined approval process in that permit.

The condition is being change to add that one of more affidavits of construction can be submitted as necessary.

B.4 This document shall also become the approval to operate pursuant to 326 IAC 2-7-10.5(h) when, prior to start of operation, the following requirements are met:

(a) The attached affidavit of construction shall be submitted to the Office of Air Quality (OAQ), verifying that the emission units were constructed or modified as proposed in the application or the permit. The emissions units covered in the Significant Source Modification approval may begin operating on the date the affidavit of construction is postmarked or hand delivered to IDEM if constructed as proposed.

If construction is completed in phases: (i.e.: the entire construction is not done continuously), a separate affidavit must be submitted for each phase of construction. Any permit conditions associated with operation start up dates such as stack testing for NSPS shall be applicable for to each individual phase.

Preventative Maintenance Plan (PMP)

(1) C.2 PMP

Nucor requests that the OAQ replace "upon start up of the modified emission units' with "for control devices upon startup of the associated modified emissions units" in Section C.2(a) and replace the reference to "unit" in Section C.2(d) with "control device" to clarify that the PMP requirements of 326 IAC 1-6-3 apply only to control devices and not to units.

Nucor understands that the OAQ has recently taken the position that pursuant to 326 IAC 1-6-1 (Applicability), 326 IAC 1-6-3 applies to the owner or operator of any facility required to obtain a permit under 326 IAC 2-1-2 and 326 IAC 2-1-4 and therefore "it is clear from the structure of 326 IAC 1-6-3 that the PMP requirement affects the entirety of the applicable facilities." Nucor respectfully disagrees.

First, 326 IAC 1-6-1 (Applicability) of Indiana's malfunction rule does not provide that 326 IAC 1-6-3 applies to the owner or operator of any facility required to obtain a permit under 326 IAC 2-1-2 and 326 IAC 2-1-4. Rather, 326 IAC 1-6-1 provides that "[t]his rule applies to the owner or operator of any facility required to obtain a permit under 326 IAC 2-5.1 or 326 IAC 2-6.1." 326 IAC 2-5.1 and 326 IAC 2-6.1 refer to the construction of new sources and minor source operating permit program provisions, respectively. As an existing Part 70 source, Nucor is not required to obtain a permit under these provisions. Accordingly, even if 326 IAC 1-6-1 could somehow be read to impose PMP requirements to the entirety of the applicable facilities, Nucor is not an applicable facility under 326 IAC 1-6-1 and therefore the OAQ's position is without merit.

Second, the authority for including a PMP provision in a Part 70 operating permit is not contained in the 326 IAC 1-6 malfunction rule. Indeed, pursuant to 326 IAC 2-7-16(d) (and Section C.16(d) of the draft permit), the Part 70 emergency provision supercedes the 326 IAC 1-6 malfunction rule. The authority for including a PMP provision in a Part 70 operating permit is instead provided under the Part 70 permit content provisions at 326 IAC 2-7-5(13), which requires a permit provision that requires the source to do all of the following:

(A) Maintain on-site the preventative maintenance plan required under 326 IAC 2-7-4(c)(9);
(B) Implement the preventative maintenance plan; and
(C) Forward to the department upon request the preventative maintenance plan.

The PMP required under 326 IAC 2-7-4(c)(9) refers to the Part 70 permit application requirement that the source confirm that it "maintains on-site a preventative maintenance plan ***as described*** in 326 IAC 1-6-3." As 326 IAC 1-6-3 provides:

(a) Any person responsible for operating any facility specified in 326 IAC 1-6-1 shall prepare and maintain a preventive maintenance plan including the following information:
   (1) Identification of the individual(s) responsible for inspecting, maintaining and repairing emission control devices.
   (2) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions.
   (3) Identification and quantification of the replacement parts which will be maintained in inventory for quick replacement.

(b) Preventive maintenance plans shall be submitted to the commissioner upon request and shall be subject to review and approval by the commissioner. As deemed necessary by the commissioner, any person operating a facility shall comply with the requirements of subsection (a) of this section.

Accordingly, because 326 IAC 2-7-4(c)(9) only authorizes that portion of a PMP ***as described*** solely by 326 IAC 1-6-3 an no other provision of 326 IAC 1-6, the only relevant portion of the 326 IAC 1-6 malfunction rule is the description of a PMP in 326 IAC 1-6-3, which is limited to ***emission control devices***. Nevertheless, despite the OAQ's recognition that the PMP as described in 326 IAC 1-6-3 refers only to emission control devices and not to any other facility equipment, the OAQ cites to 326 IAC 1-6-5 for support of its position that a PMP is required for an emissions unit. For the reasons stated above, that interpretation contravenes 326 IAC 2-7-4(c)(9) and is therefore irrelevant for purposes of establishing a PMP provision in a Part 70 operating permit. The OAQ must clarify that PMP requirements are limited solely to emission control devices. [Nucor Steel]

As explained previously, only a PMP ***as described*** by 326 IAC 1-6-3 is authorized by the Part 70 regulations and therefore the only relevant portion of the 326 IAC 1-6 malfunction rule is the description of a PMP in 326 IAC 1-6-3. Accordingly, any description other than the description in 326 IAC 1-6-3 is irrelevant for purposes of establishing a PMP provision in a Part 70 permit. As the OAQ recognizes, the PMP as described in 326 IAC 1-6-3 refers only to "emission control devices" and not to any other facility equipment. As a result, the discussion in paragraph (1)(c) of the TSD and the references to anything other than control devices in paragraph (1)(d) should be deleted. [Nucor Steel]

(2) <u>D.1.7 Meltshop EAF PMP</u>
As explained above, PMPs are applicable to control devices, not units. Nucor therefore requests that the OAQ delete the reference to "units." [Nucor Steel]

(3) <u>D.2.2 LMF PMP</u>
As explained above, PMP requirements can apply only to control devices.

Nucor therefore requests that the OAQ remove the reference to "units." [Nucor Steel]

(4) D.4.4 Pickle Lines PMP
A PMP is unnecessary for the pickle line control device as sufficient requirements are already established under NESHAP Subpart CCC. The OAQ's imposition of additional requirements runs afoul of the holding in ***Appalachian Power***, which prohibits state permitting authorities from using the Part 70 permit system to amend, supplement, alter or expand the extent and requirements already provided by applicable regulations. The cited authority, 326 IAC 2-7-5(13) does not provide otherwise. In any event, as explained above, a PMP can apply only to a control device and therefore the reference to "units" is inappropriate. [Nucor Steel]

(5) D.5.4 Acid Regeneration PMP
As explained above, a PMP is only applicable to a control device and therefore the reference to "units" should be removed. In any event, Section D.5.4 should be removed in its entirety because the Acid Regeneration is adequately addressed by NESHAP Subpart CCC requirements. [Nucor Steel]

(6) D.6.3 Cold Reversing Mill PMP
As explained above, a PMP is only applicable to a control device. Because there are no controls on the boilers, Section D.6.3 should be deleted in its entirety. [Nucor Steel]

(7) D.11.2 Cooling Towers PMP

(a) Drift/mist eliminators on cooling towers are inherent process equipment as they are designed to prevent water loss from the tower cell due to escaping droplets of water in the air stream. Because air must contact water for evaporation to occur, the water in the cooling tower system will naturally capture some airborne contaminants. While a drift/mist eliminator may result in some pollution control benefits due to the retention of captured air contaminants in the retained water droplets, the primary purpose remains prevention of water loss (with associated benefits of reduced water treatment chemicals, reduced operating costs, increased productivity, etc.). Accordingly, a cooling tower's drift/mist eliminator does not constitute an air pollution control device. Because PMP requirements apply only to control devices, Section D.11.2 should therefore be deleted in its entirety. In any event, as the OAQ recognized in the BACT analysis, drift/mist eliminators require very little maintenance and therefore a PMP is unwarranted. [Nucor Steel]

(b) Nucor requests that since the scrubber and mist eliminators are covered under the O&M plan required by 40 C.F.R. ' 63.1160(b)(2), therefore, no PMP is required because all of this equipment is addressed by the O&M or the SSM Plans required by the NESHAP. Finally, no PMP should be required for the drift eliminators at the cooling towers because they are an integral part of the cooling tower. [Nucor Steel]

(8) D.13.3 BOC Gases Plant PMP
As explained above, a PMP is only applicable to a control device and therefore the Section D.13.3 PMP requirement for the boilers should be

deleted in its entirety. [Nucor Steel]

IDEM Response

To date, IDEM has already responded to several objections to the requirements of PMP for the entire facility, instead of the control equipment only. Basically, there are 2 issues regarding these objections:

(a) Authority to Require PMP

IDEM has the authority to require PMPs. A source that is undergoing PSD review is also a Part 70 source, thus the authority to require a source to have PMPs is under the Part 70 program. The Part 70 rules indicate the PMP requirement :

- - 326 IAC 2-7-4(c)(4)(9), which requires the Part 70 application confirms the existence of an on-site PMP
- - 326 IAC 2-7-5(13), which requires the Part 70 permit to have a provision regarding a PMP.

In this case, Nucor is an existing Part 70 source, and thus the authority to have PMPs is under 326 IAC 2-7 (Part 70), not under 326 IAC 2-5.1 (Construction of New Sources) or 326 IAC 2-6.1 (MSOP).

It is not the intent of the PMP requirement that minor sources permitted under 326 IAC 2-5.1 or 326 IAC 2-6.1 to comply with the PMP requirement and exempt the major sources, such as Nucor Steel, from the same requirement. It is the intent and interpretation of the rule to require Permittees with operating permits issued by the State of Indiana to prepare and maintain PMPs.

The Part 70 rule refers back to the PMP as required and described under 326 IAC 1-6-3.

(b) Facility vs. Control Equipment

326 IAC 1-2-26 defines Facility as any one structure, piece of equipment, installation or operation, which emits or has the PTE any air contaminant.

Based on the definition of Facility, the conclusion is that a PMP is required for the facility.

However, this portion [326 IAC 1-6-3 (a)(1)] of the overall PMP requirement is limited. It only requires identification of the personnel in charge of only the emission control equipment, and not any other facility equipment.

This rule did not indicate that the PMP is limited to control equipment only, rather the rule indicates that the PMP shall include this specific information.

There is no change in Condition C.2 due to these comments.

If a Permittee submits explanations of why a PMP is not required for a Facility, because of the nature of the operations or units, IDEM evaluates these on a case by case basis. Nucor Steel did not submit justification. It has to be noted that there are operations in this mill that IDEM has evaluated that the PMP only applies to the controls. This evaluation was taking into account the inspectors input and expertise since they are familiar with the actual operations of the mill.

There are no changes in the PMP requirements in Section Ds due to these comments.

Section C of the Draft Permit

(1) C.4 Opacity Rule Cite

The reference at the end of Section C.4 should be "326 IAC 5-1-2," not "326 IAC 9-1-2."

IDEM response

IDEM makes the change as follows:

C.4 326 IAC ~~9~~ **5**-1-2 is not federally enforceable.

(2) C.11 Compliance Monitoring

For purposes of clarification, Nucor requests that the OAQ replace "If required by" with "Except as otherwise provided in" at the beginning of the first sentence in Section C.11.

IDEM Response

IDEM agrees to make the change because the recommended change means the same as the existing language:

C.11 ~~If required by with~~ **Except as otherwise provided in** Section D, all monitoring and record keeping requirements shall be implemented when operation begins. The Permittee shall be responsible for installing any necessary equipment and initiating any required monitoring related to that equipment.

(3) C.14 Compliance Response Plan

The OAQ lacks authority to require enforceable Compliance Response Plans.

In general, Nucor objects to the OAQ's imposition of Compliance Response Plan (CRP) requirements.

First, the Indiana regulations do not support the CRP requirements. Although the regulations give the OAQ the authority to establish monitoring requirements (e.g., visible emission monitoring, parametric monitoring, etc.) to assure compliance, the regulations do not authorize the requirement to prepare a plan or to dictate that Nucor Steel must follow such a plan upon pain of administrative penalties or other sanctions. In essence, IDEM, OAQ is seeking to create an entirely new regulatory program without following the rulemaking procedures outlined under Indiana law.

The OAQ's cited authority for Section C.18 is 326 IAC 2-7-5 and 326 IAC 2-7-6, which reference the Part 70 permit content and compliance requirements, respectively. This broad citation does not satisfy the 326 IAC 2-7-5(1)(A) requirement that the "Part 70 permit shall specify and reference the origin of and authority for each term or condition and identify any difference in form as compared to the applicable requirement upon which the term is based." Neither 326 IAC 2-7-5 nor 326 IAC 2-7-6 provide any reference to a CRP requirement. Without an associated applicable requirement, there can be no Part 70 permit term or condition. Accordingly, the CRP terms and conditions should be removed in their entirety.

Second, even if the Section C.18 CRP requirements had a basis in the Indiana regulations, which is not apparent, the permit must "identify any difference in form as compared to the applicable requirement upon which the term is based." Because there is no applicable requirement that specifically references a CRP requirement, the CRP term or condition inherently differs in form from any possible applicable requirement. As drafted, the permit neither specifies an identifiable applicable requirement for the CRP terms and conditions nor identifies the difference in form as compared to the unspecified applicable requirement purportedly found under 326 IAC 2-7-5 and 326 IAC 2-7-6. Because the permit does not satisfy the requirements of 326 IAC 2-7-5(1)(A), Section C.18 should be deleted.

Finally, Nucor objects to any required agency approval of a CRP as an inappropriate intrusion into Nucor's management of its own production process. In essence, a facility's duty is to comply with the terms and conditions of the permit, which are essentially emissions limitations and standards. Monitoring and maintenance plans, on the other hand, are simply a means of determining and ensuring a facility's compliance with those emissions limitations and standards, and monitoring and record keeping requirements. There is no obligation to respond to a deviation from a CRP only in a pre-determined manner or way that the OAQ deems appropriate so long as the facility complies with the substantive requirements. The adoption and implementation of such plans should be reserved for facility management due to their familiarity, experience and expertise with the production process. Such business decisions should not be subject to approval and second guessing by agency personnel as to what response steps are "appropriate" or "reasonable." The OAQ should defer to the facility as how to maintain and operate its own equipment and only step in when the facility has demonstrated an inability to maintain and operate its equipment appropriately.

If a facility is unable to comply with an applicable standard, then it ***is*** relevant how the facility maintains its equipment and the burden should be on the facility to persuade the OAQ that the facility acted correctly using whatever records the facility deemed appropriate to keep. If the facility failed to keep sufficient records to reasonably satisfy the OAQ, enforcement may well be appropriate. However, the decision on what records to keep and how to respond should be the facility's and not the OAQ's. In fact, should the OAQ elect to retain these provisions and require Nucor to respond in the pre-selected way set forth in the plan, then Nucor reserves the right to assert as a defense that it was following an OAQ-required plan. It is the facility's obligation to demonstrate compliance and, so long as it does, the OAQ should not interfere with the operation of the facility.

In any event, even if CRP requirements have a basis in the IDEM regulations, which is not apparent, a CRP should be required only when individually determined necessary and therefore the OAQ should specify each piece of equipment for which a CRP is required in Section D of the draft permit.

Nucor will refer back to these principal objections in its discussions of the draft permit and associated documents as set forth below in the order that they appear in the draft documents. In addition, Nucor incorporates all of its previous comments by reference. Supplementary materials are attached to these comments.

Again, Nucor objects to the OAQ's imposition of CRP requirements. Section C.14 should be deleted in its entirety.

In the event a CRP is required, it should be required only when individually determined necessary.

Accordingly, the OAQ should replace "for each compliance monitoring condition of this permit" with "where required by Section D of this permit" in Section C.14(a).

IDEM Response

The central and main goal of the Part 70 program is each Permittee should be able to show their ability to verify compliance with applicable standards and requirements on a continuous basis.

For the past years, IDEM has worked with interested parties such as the
- - Clean Air Act Advisory Council's Permit Committee,
- - Indiana Manufacturing Association,
- - Indiana Chamber of Commerce and
- - individual applicants, such as Nucor Steel

regulating the different plans required to verify continuous compliance.
The plans are fully supported by rules promulgated by the Air Pollution Control Board. These rules may be broad or vague as Nucor Steel claims, however, the requirements to show compliance in a continuous basis is clear.

Unless CEMS and COMS are used, the plans are the mechanism each Permittee will use to verify continuous compliance with its permit and the applicable rules. These plans will form the basis for each Permittee's Annual Compliance Certification.

It is correct that 326 IAC 2-7-5 and 326 IAC 2-7-6 does not have or use the exact term CRP, however, 326 IAC 2-7-6(9) provides the authority for the Commissioner to specify provisions in the Part 70 permit as she may require with respect to compliance.

The CRP's reasonable response steps and schedule requirements are examples of documenting procedures developed from good business practices and the prevention of environmental problems. Permittees already have maintenance schedules and trouble shooting guides that specify the steps to take when the equipment is not functioning correctly. The steps may involve some initial checking of the system to locate the exact cause, and other steps to place the system back into proper working order. Using the trouble shooting guide and the Permittee's own experience with the equipment, the steps are taken in order and as scheduled until the problem is fixed. As Nucor claims, they have the knowledge, expertise and experience on how to operate their mill and IDEM does not impose any specific steps on how to produce steel. The CRP has general means and guidance such that Nucor knows that they have the obligation to show compliance continuously.

Condition C.14 does not impose any general or specific requirements that could interfere with the operation of the mill. The provision provides the Permittee the flexibility and option on how to maintain and implement the plan.

Condition C.14 does not indicate that the CRP has to be approved by IDEM. It requires the Permittee to maintain the plan. Based on this IDEM does not see the reason why Nucor Steel is objecting to a non-existent requirement.

The C.14(a) portion of the condition is not revised as recommended because compliance monitoring does not appear in the Section D of the permit. Other compliance monitoring also appears in the other part of the permit.

C.14(a) The Permittee is required to prepare a Compliance Response Plan (CRP) for each compliance monitoring condition of this permit.

There is no change due to these comments.

(4) Effect of Prior Permits

To clarify the effect of prior permits, Nucor requests that the OAQ add the provision as proposed as new Section C.23 of the permit:

Any terms and conditions from existing permits not superseded by this permit will remain in effect. [Nucor Steel]

IDEM Response

Due to the nature of the PSD modification, clarification has to be made that existing terms and conditions of existing permits applicable to existing units/operations being modified are superseded by this permit. This is also interpreted as any terms and conditions of existing permits for units/process not being modified are still in effect.

IDEM agrees to add another condition, however, the new condition will be in Section B of the permit:

B.8 Existing Approvals

Any terms and conditions from existing permits not superseded by this permit will remain in effect.

EAF SO_2 PSD BACT

(1) EAF SO2 PSD BACT

Nucor objects to the OAQ's proposed SO_2 limit of 0.25 lb/ton of steel produced at the Meltshop EAF Baghouses (1 and 2) in Section D.1.1(c). Put simply, the limit does not incorporate additional emissions at processes (i.e., Desulfurization process) present at Nucor that are also collected by the Meltshop EAF Baghouses. In any event, the OAQ's BACT determination of 0.25 lb/ton is stated for the EAF only. Accordingly, Nucor requests that the OAQ clarify that the BACT determination addresses SO_2 emissions from other processes such as Desulfurization that also exhaust to the Meltshop EAF Baghouses. [Nucor Steel]

The BACT analysis concludes that the BACT limit for the EAF is 0.25 lb/ton, but the proposed permit at Section D.1.1(c) states that SO_2 emissions from the Meltshop EAF Baghouses (1 and 2) shall not exceed 0.25 pound per ton of steel produced. This limit does not appear to address additional emissions from processes other than the EAF that are present at Nucor, which are also collected by the Meltshop EAF Baghouses. [Nucor Steel]

IDEM Response

IDEM has already extensively addressed the Meltshop's SO2 BACT during the initial review process prior to the public notice of the draft permit. The Appendix A - PSD BACT Evaluations - - could attest that numerous discussions and pages have been devoted to its analysis. IDEM did account for the other contributing processes that exhaust together with the EAF through the Meltshop Baghouses 1 and 2 (vent and stack). Nucor's understanding that the BACT limit 0.25 lb/ton is for the EAF only is incorrect. As the most recent PSD permit issued in Indiana could attest, the SO2 BACT limit (0.25 lb/ton) applies to the EAF and other operations exhausting to the same common stack.

IDEM did account for the SO2 emissions from the Desulfurization, which is why the existing SO2 limit was increased from 0.2 lb/ton to 0.25 lb/ton. This has been explained in the Appendix A - PSD BACT Evaluations - - with tables (Tables 5, 6, 7 and 8) to compare with other Indiana sources of similar operations.

Since the analysis is already documented, IDEM is not going to re-state the same evaluations.

There is no change in the draft permit due to these comments.

(2) Carbon

Carbon (C) has been used since time immemorial as a reagent to reduce iron oxides to elemental iron. Nucor has a right to use it in its process. The imposition of a characteristic on a raw material item via permit terms is not a re-engineering of a source. In many permits, where applicants desire to burn oil, DEM has required that its total sulfur content not exceed 0.05 % by weight. ***See, e.g.,*** ftp://ftp2.ai.org/pub/idem/oam/14185f.pdf 165-14185-00022 Condition D.1.3(b), ftp://ftp2.ai.org/pub/idem/oam/12432f.pdf 093-12432-00021

Condition D.3.1(b), and ftp://ftp2.ai.org/pub/idem/oam/14495f.pdf 093-14495-00028 Condition D.1.1(c), all incorporated in their entirety herein by reference.) It is well within DEM's authority to require that the C charge have no more than 0.50 % total S by weight. The absence of permit control of total S process constituents in the draft permit is clear error.
Further, Nucor should specifically be prohibited from adding C beyond that required to have the product contain the desired amount of C (and or to reduce iron oxides to iron). In circumstances where there is relatively low cost O available, EAF steel makers may intentionally charge surpluses of C with the intent of it not taking O from iron oxides, but rather from it combusting with added O for the express purpose of producing process heat at a lower cost than that of the electricity and electrode replacement cost. This activity must be prohibited, as Nucor has no SO_2 control per se and there is a presumption that where the electricity is generated by C combustion, there will be specific SO_2 control. The failure of DEM to specifically disallow the creation of heat by intentionally charged C as an element of EAF SO_2 BACT is clear error and an abuse of discretion. [Stephen Loeschner]

IDEM Response

The SO2 BACT limit for Nucor Steel is as stringent as the most recent PSD permit issued in Indiana for similar operations. It is not necessary to impose a numerical limit on the sulfur content or characteristics of each of the raw materials as long as the operation complies with the short and long term BACT limits. Not specifying individual sulfur content limit will provide the steel mill the flexibility to adjust the composition of the raw materials as long as the short term and over all SO2 limits are not being exceeded.

Nucor Steel is required to demonstrate compliance using a SO2 CEMS.

Companies, such as Nucor Steel, has to take into account availability and cost of raw materials.

(3) Appendix B, Page 4
Typo on SO2 emission limit (0.047 lb/ton not 0.0.47 lb/ton). [USEPA]

IDEM Response

This is a typographical error. The SO2 should be 0.047 lb/ton. There is no change in the SO2 BACT limit or its evaluation due to this comment.

(4) Appendix B. Page 24, last paragraph of (e):
Typo on $ amount. [USEPA]

IDEM Response

The typographical error being refereed to in this comment occurred as follows:

- - The OAQ has evaluated the scrap mixture and cost analysis that Nucor Steel, IN has submitted. Based on the information submitted Nucor Steel, IN, it shows that there is a reduction in pricing of the mixture ($152.00 versus $150.27.00) , thus the OAQ believes that pricing of the scrap mixture is not a contributing factor to grant the relation of the SO_2 BACT limit and that it is not necessary to perform further analysis.

The correct amount should be **$150.27.**

EAF NOx PSD BACT

(1) Lower NOx BACT Limit and Stack Test Result

Appendix B, Page 9: In the EAF BACT analysis for NOx, the Nucor Steel, NC facility was mentioned as a potentially comparable source. In this comparison, the NOx emission limit of 0.27 lb/ton was rejected based on the fact that the facility recently performed a stack test and revised their limit. Based on the information provided, we do not agree that updated stack test data is sufficient justification to reject potential BACT limits. [USEPA]

IDEM Response

The NOx BACT limit for Nucor Steel, IN has been changed from 0.51 lb/ton to a more stringent limit (0.35 lb/ton). This is a also the same NOx BACT limit issued to the most recent PSD permit in Indiana of similar operations (SDI, Hendricks County).

As Table 3 of Appendix B - - PSD BACT Evaluations - - showed, after the limit for Nucor Steel, NC was revised, there were subsequent BACT determinations made, which all have limits equal to or higher that the 0.35 lb/ton limit.

On October 24, 2003, IDEM contacted Nucor Steel, NC (Terry Harrison, 252/356-3700). Nucor Steel, NC had a preliminary PSD meeting with the permitting agency to discuss the re-evaluation of their existing NOx BACT limit because of non-compliance with the limit based on their compliance testing. This time, the proposal will take into account a safety factor to avoid modifications every time the mill has non-compliant test.

IDEM considers BACT to be based on the best available and achievable control, in practice. The proposed BACT limit for Nucor Steel is equivalent to the best limit achieved in practice by similar sources.

There is no change in the draft permit due to this comment.

(2) Low NOx/Oxy Fuel Burners as BACT Control

Appendix B, Page 13 and D.1.8(a): On page 8 of the Appendix B., it is suggested that low-NOx burners, oxyfuel burners or a combination has been considered BACT in the RBLC, however only low-NOx burners were chosen as BACT for this facility according to Page 13 of the Appendix B. This statement appears to be in contrast to Condition D.1.8(a) which states that "Each EAF shall be equipped and operated with low NOx/oxy fuel burners". Please clarify what will be considered BACT for NOx with regards to the EAF. If both low NOX and oxy fuel burners will be considered BACT, it is requested that the permit be modified to state, "...and operated with both low NOx and oxy fuel burners". [USEPA]

IDEM Response

The EAFs in the Nucor plant are existing units and the NOx BACT limits have been changed to a more stringent numerical limit. Nucor can comply with the NOx BACT limit by either using low NOx burners or in combination with oxy fuel burners.

Nucor Steel, IN has been asked to clarify what type of burners the EAFs are equipped with. On October 21, 2003, Nucor Steel confirmed that the burners are oxy fuel burners.

Based on this new information, the following has been changed:

D.1.8(a) Each EAF shall be equipped and operated with ~~low NO_x /~~oxy fuel burners.

(3) NOx BACT Limit Averaging Time

With respect to the NOx limit in Section D.1.1(d), Nucor requests that it be based on a 24-hour block average because PSD is linked to ambient air loading rather than a particular test method. A 24-hour block average provides more than a reasonable assurance of protection of the primary and secondary ambient air quality standards for NO_2, which are based on an ***annual*** arithmetic mean, and an adequate assurance of compliance with the BACT-derived 0.35 pounds per ton of steel limit. This is particularly true where, as here, compliance is monitored through the use of a continuous emissions monitoring system (CEMS). The OAQ has already approved of Nucor's use of a NOx CEMS with a 24-hour block average on Nucor's Galvanizing Line. Nucor requests consistency. [Nucor Steel]

IDEM Response

The draft NOx BACT (lb/hour) limit was specified in a 3-hour block averaging period. This was based on the NOx testing methods as indicated in Appendix A of 40 CFR Part 60. These are performance testing standards that permitting agencies follow. IDEM will retain the lb/hour rate as PSD BACT limit, but IDEM re-evaluated the averaging time to show compliance, and agrees to a longer period. Based on these, the following changes are made:

D.1.1(d) The total nitrogen oxide (NO_x) emissions from the Meltshop EAF Baghouses (1 and 2) shall not exceed 0.35 pounds per ton of steel produced and 175.7 pounds of NO_x per hour~~, based on a 3-hour block average.~~

D.1.12(a)(i) Pursuant to 326 IAC 2-2 (PSD) and 326 IAC 3-5-1(d), the Permittee shall install, calibrate, certify, operate, and maintain ~~a~~ continuous emissions monitoring system**s** (CEMS) for measuring CO, SO_2, and NO_x emissions rates in pounds per hour from the Meltshop EAFs, in accordance with 326 IAC 3-5-2 and 326 IAC 3-5-3.

The Permittee shall comply with the PSD BACT SO_2 and NOx hourly emission rates by averaging the CEMS readings based on the actual hours of operation in a 24-hour period.

(4) Air Products Plants (APP)

Air products plants ("APP," compressed ambient air cryogenic distilleries) are frequently built close to demand. Argon ("Ar"), for liquid steel stirring, is a big product. Liquid N is a substantial expendable refrigerant. O is sold for medical uses, welding, and for removing C from liquid steel. Liquid O may be among the least valuable products of APP and surpluses may be vented when the burden of marketing and or storage of something dangerous exceeds the value of letting it harmlessly blow away. Absent a malfunction, APP are likely going to operate at less than their capacity, as their raw materials consist of free ambient air and expensive electrical energy. They will strive to purchase the lowest cost electricity, which is "off-peak." APP are likely always over-built in that they can produce all of their most salable products in less time than the off-peak electricity is available. As Ar boils at a lower temperature than O, typically, for every ton of Ar that is produced, about 16.8 tons of O will be produced. (Assuming there is about 21 times the diatomic molecular O by volume of Ar in ambient air, and the Ar:O_2 molecular weight ratio is 40:32: 1 x 21 x 32 / 40 = 16.8 tons O per ton of Ar.) As N boils at a lower temperature than Ar, an APP may elect not to make all of the corresponding N that it can—but it probably will. For every ton of Ar that is produced, about 54.6 tons of N may be produced—3.25 times the weight of the O. (Assuming there is about 78 times the diatomic molecular N by volume of Ar in ambient air, and the Ar:N_2 molecular weight ratio is 40:28: 1 x 78 x 28 / 40 = 54.6 tons N per ton of Ar.)

One way to inhibit NO_X emission is to cause combustion in such a way that NO_X is not generated. If a fuel having very low N is burnt with an oxidizing gas (mostly O) that contains very low N, then very little NO_X will be created.

At 200 million Btu per hour, the D.3 TF appears to be the largest combustion emission ***group***. If the gas fuel is methane ("CH_4"), then the consumption would be about 4.37 tons per hour. (Assuming the fuel is about 22,900 Btu per pound: 200 E6 / 22,900 / 2,000 = 4.37 tons fuel per hour.) This combustion will use about 17.48 tons per hour of O. (Assuming total conversion of CH_4 into CO_2 and H_2O and nominal H:C:O atomic weight ratios of 1:12:16: 4.37 / (4 x 1 + 12) x (2 x 16 + 2 x 16) = 17.48 tons O per hour needed by the TF.)
As, for example, the 400 ton per day (total products presumed) Whitley County APP can only produce about 3.87 tons O per hour, ***(See, e.g.***, ftp://ftp2.ai.org/pub/idem/oam/11911f.pdf 183-11911-00032 Praxair Whitley County registration p.1 and 4 incorporated herein in its entirety by reference.
400 x 16.8 / (1 + 16.8 + 54.6) / 24 = 3.87 tons O per hour capacity from a "400 ton per day" APP.) the use of 90+ % O rather than ambient air for such a large use as the TF would not be practical if it was a single emission ***unit***.

As response to comment, state the ton per day capacity of the APP located closest to Nucor and detail that capacity if it is something other than a close approximation of Ar + N + O.
The TF ***is not a single emission unit***—it is a whole series of individual burners having independently valved fuel admissions over many tens of feet of lateral mill floor length. As response to comment, identify the number of independent TF fuel valves. Where there is O available at reasonable cost—as it should be on or near Nucor, DEM has the obligation to consider its use in the top-down BACT analysis process. Generating NO_X at rate considerably less that 20 pounds per billion Btu should be technologically and physically easy; and, if the local APP is operating near an economic surplus of O, it should be economically feasible too.
In fact, there appears no evidence within the draft permit showing any consideration of use of anything other than ambient air for the entire TF. This is clear error. DEM must identify the incremental cost of O at Nucor that is of "combustion air substitute for NO_X generation avoidance" quality ("inexpensive O").

I have no idea what that quality is—I suspect it is something like 90+ % O by volume or by weight. DEM must provide a proper NO_X BACT analysis for use of inexpensive O for part of the TF, and for the myriad smaller combustion emission units.
All available inexpensive O should go toward NO_X emission reduction by the direct reduction of NO_X creation as a BACT obligation as set of federally enforceable permit conditions. This technique is in use as evidenced by text that DEM wrote prior to October 2000: (***See, e.g.,*** ftp://ftp2.ai.org/pub/idem/oam/12405.pdf 089-12405-00032 TSD p. 3 Jupiter Aluminum Lake County permit modification published on or about 1 October 2000 incorporated in its entirety herein by reference.
100 % oxygen enrichment means controlled oxygen supplementation to the natural gas stream sufficient to provide all the oxygen necessary to burn the fuel. This burns hotter, more efficiently, and is economically beneficial to the company. Also, no oxygen is required from the ambient air, which contains 79 % nitrogen and produces nitrogen oxides (NO_X) when used to burn fuel. Negligible nitrogen oxides are emitted after this modification. The only impeachment possibility for this NO_X non-creation technique is that of the cost of the O. Nothing less than the true incremental cost of O to Nucor at Nucor will serve as a part of adequate comment response. [Stephen Loeschner]

IDEM Response

Nucor Steel has its own BOC Gases Boiler and Hydrogen plant on site. PSD limits and compliance monitoring have been specified for the BOC Gas Boiler.

Air Liquide, located in Hendricks County, is the closest APP to the Nucor Steel, IN plant. Air Liquide is an independently owned source from Nucor Steel and not subject to this proposed permit. The operating practices of this APP, such as operating below their capacity or choosing to use electricity during off peak times, are of no impact to this permit.

It has to be noted that the Tunnel Furnace (TF) referenced in the above comment is not planned to be physically modified, thus it is not part of this review.

There is no change in the draft permit due to this comment.

EAF CO PSD BACT

(1) CO BACT Control
In paragraph 5(d) of Page 18 of the TSD, a canopy hood is not a control device for CO and therefore "(DSE and canopy hood)" should be "(DEC)." [Nucor Steel]

(2) CO BACT Limit Comparison
Appendix B, Page 38 Nucor Steel, NC: In the EAF BACT analysis for CO, the Nucor Steel, NC facility was mentioned as a potentially comparable source. In this comparison, the CO emission limit of 1.82 lb/ton was rejected based on the fact that the facility recently performed a stack test and revised their limit. Based on the information provided, we do not agree that updated stack test data is sufficient justification to reject potential BACT limits. [USEPA]

(3) Minimal CO Generation
While there is an expectation of non-linearity, there is the expectation that, in otherwise equal circumstances, if less C is charged into the process, a lower CO airborne emission will result. DEM has the duty to impose conditions to require minimal CO generation—not merely allow an arbitrary emission. The failure of DEM to specifically disallow the creation of heat by intentionally charged C as an element of EAF CO BACT is clear error and an abuse of discretion. [Stephen Loeschner]

IDEM Response

(1) DSE (Direct Shell Evacuation) is also an acceptable term for DEC (Direct Evacuation Control).

(2) Nucor Steel, NC was initially issued a CO BACT limit of 4 lb/ton, which is higher than the 2 lb/ton limit for Nucor Steel, IN. The lower CO BACT limit that is now specified for Nucor Steel, NC was based on their specific compliance testing data. One time testing is not the only factor to be considered in establishing BACT limit. It is also acceptable practice in determining achievable BACT to provide a safety factor for compliance.

The CO BACT limit for Nucor Steel, NC is 1.82 lb/ton. The CO BACT limit for Nucor Steel, IN is 2.0 lb/ton.

Based on a recent communication with Nucor Steel, NC, they are in the process of modifying their BACT limits based on non-compliant test results.

IDEM considers BACT to be based on best available and achievable control demonstrated in practice.

(3) IDEM has sufficiently specified conditions that require Nucor Steel to minimize emissions. The CO numerical limit was based on existing CO BACT limits, not based on an arbitrary emission rate.

There is no change in the draft permit due to this comment.

EAF VOC PSD BACT

(1) VOC BACT Limit and Averaging Time Period

(a) Appendix A

Nucor objects to the revision of its VOC BACT limit of 0.13 lb/ton to 0.09 lb/ton. In the BACT evaluation, the OAQ recognized that the limited facilities identified in the RBLC with the more stringent 0.09 lb/ton either had a unique method of determining compliance or have yet to demonstrate continuous compliance. Accordingly, the VOC BACT limit of 0.13 lb/ton should remain, which is comparable to the majority of existing VOC limits in the RBLC.

Nucor objects to the revision of its VOC BACT limit of 0.13 lb/ton to 0.09 lb/ton in Table 1 of Appendix A. In the BACT evaluation, the OAQ recognized that the limited facilities identified in the RBLC with the more stringent 0.9 lb/ton either had a unique method of determining compliance or have yet to demonstrate continuous compliance. Accordingly, the VOC BACT limit of 0.13 lb/ton should remain, which is comparable to the majority of existing VOC limits in the RBLC. [Nucor Steel]

(b) D.1.1(f)

Nucor requests that the VOC limit in Section D.1.1(f) be based on an 8-hour block average, which provides a reasonable assurance of compliance with the BACT-derived 0.13 pounds per ton of steel limit and protection of the 8-hour ambient air quality standard for ozone. If, on the other hand, the OAQ agrees to drop the VOC CEMS as unnecessary in favor of parametric monitoring or periodic stack testing, as Nucor has recommended, then Nucor would accept a three or four hour averaging period consistent with the stack testing requirement. If a CEMS is required, there is no basis for a different averaging period than the NAAQS period because the CEMS can monitor the appropriate averaging period.

Again, for the reasons stated above, the VOC BACT limit should remain at 0.13 lb/ton as the OAQ initially provided in the BACT evaluation. [Nucor Steel]

IDEM Response

As indicated in Table 9 of the Appendix B - - PSD BACT Evaluations - - there are 4 mills that have VOC limit of 0.09 lb/ton and have shown compliance. In August, 2003, IDEM issued a steel mill with the same VOC limit (SDI, Hendricks County). It is correct that there are also numerous mills with the 0.13 lb/ton VOC BACT limits, however, the Top Down BACT guidance specified that the most stringent established limit has to be considered unless overwhelming justification of differences in raw materials/ operations/units have been established. In Nucor Steel, IN case, the limit was based on the same VOC limit from the a similar source with the most recent issued PSD permit.

The test method that is mentioned as special compliance tool is a combination of using 2 different methods: the first test is to determine the total hydrocarbons, and the second test is to isolate/differentiate the hydrocarbons, to finally determine the volatile. Both of these test methods are approved methods and Nucor Steel may use these methods to show compliance.

Nucor was specified a VOC limit of 0.09 lb/ton and then required to test to determine the total hydrocarbon concentrations at this limit and show continuous compliance by using a THC CEMS that has a compliance range compared to the THC concentrations during the latest VOC compliance test.

(2) D.1.1 VOC BACT Limits
Nucor also requests that the OAQ replace "pounds of per ton" with "pounds per ton" in Section D.1.1(f). [Nucor Steel]

IDEM Response:
IDEM is correcting the typographical error:
D.1.1(f) The total volatile organic compound (VOC) emissions from the Meltshop EAF Baghouses (1 and 2) shall not exceed 0.09 pound~~s~~ ~~of~~ per ton of steel produced and 45.18 pounds of VOC per hour, based on a 3-hour block average.

(3) TSD - - SMP
In paragraph (5)(b) of Page 18 of the TSD Federal Rule Applicability, "plant" should be "plan." [Nucor Steel]

IDEM Response:
This serves as a correction:
The VOC PTE of the EAFs is greater than 100 tons/year, and uses scrap management plan to control emissions.

There is no change in the draft permit due to this comment.

(4) Reference Nucor Steel, Not SDI
Appendix B Page 28, last paragraph on page: The Charter Steel, WI BACT limit is being compared with a 'proposed' SDI, Hendricks. This language was likely copied over from the draft SDI permit recently issued. Please revise accordingly. [USEPA]

IDEM Response
The intent of this comparison is between Nucor Steel, IN and Charter Steel, WI.
IDEM is correcting the error:
Charter Steel, WI has a higher NO_x BACT limit than that was being proposed for ~~SDI, Hendricks,~~ **Nucor Steel,** IN.

There is no change in the CO BACT limit and its evaluations due to this comment.

PM and PM10 and Opacity PSD BACT

(1) Filterable and Condensible Particulate Supporting Data

There is no scientific or technical justification for the proposed filterable and condensible limits imposed by the permit. Compliance should be determined solely on filterable particulate matter until such time as IDEM, OAQ establishes supportable filterable and condensible limits.

Nucor objects to the OAQ's wholly unsupported attempt to impose filterable and condensible limits for PM and PM_{10} at the Meltshop baghouses and elsewhere at the mill. The OAQ has provided no evidence or information showing that such limits are attainable or that condensible emissions bear any consistent relationship to filterable emissions.

The absence of technical data supporting the OAQ's proposed limits is seen as follows:

Test Data

The OAQ has presented no test data showing that EAFs, LMFs or boilers can achieve the proposed filterable and condensible limits.

RBLC Data

The OAQ cites EPA's RACT/BACT/LAER Clearinghouse (The "RBLC") to support its BACT analysis imposing both filterable and filterable and condensible limits. The RBLC provides no support for OAQ's position because the RBLC limits evaluated by the OAQ were all filterable only limits, with the exception of IPSCO Steel, which cannot attain its combined filterable and condensible limit. The RBLC data thus provides no support for OAQ's proposed imposition of filterable and condensible limits.

Ratio Data

Arguably, the OAQ could try to support the imposition of filterable and condensible limits by showing that the condensible fraction bears a relatively constant ratio to the filterable fraction. Unfortunately, the OAQ has presented no evidence of: (1) what the ratio is; and (2) whether the ratio is consistent. Nucor is not aware of any consistent ratio.

AP-42

The OAQ also cited EPA's AP-42 guidance in support of the proposed filterable and condensible limits. Unfortunately, the emissions factors in AP-42 are based strictly on filterable, and not filterable and condensible data. Accordingly, AP-42 provides no support for OAQ's proposed limit.

NSPS

The OAQ argues that because the NSPS limit is 0.0052 gr/dscf, that it supports the imposition of a 0.0052 gr/dscf filterable and condensible limit. However, the NSPS specifies Method 5 (or variant), which only measures filterables. Therefore, NSPS provides no support for the OAQ' proposed filterable and condensible limit.

Indiana law and regulations require that the OAQ's permit limits have a substantial basis in law and technical fact. The proposed filterable and condensible limits have no technical basis supporting them. Accordingly, Nucor objects to these limits and requests that they be deleted from the permit for purposes of determining compliance. Nucor does not object to monitoring for filterables and condensibles and to report such results to the OAQ so that, over time, sufficient information is developed to support filterable and condensible standards. At the present time, however, compliance should only be assessed on filterable emissions. Anything else is purely speculative. Nucor thus requests that the OAQ remove "and condensable" from the following conditions:

Meltshop EAF BACT	(D.1)
Meltshop LMF BACT	(D.2)
Clarify Acid Regen is filterable only	(D.5)
Cold Reversing Mill 1	(D.6)
Cold Mill Boilers	(D.6)
R/T Mill	(D.7)
BOC Gases Plant	(D.13)

As explained previously, Nucor objects to the OAQ's incorporation of filterable and condensible PM_{10} emissions in establishing the 0.0052 grains/dscf limit for the Meltshop EAF Baghouses (1 and 2) based on speculation. The filterable and condensible limit should be deleted and compliance based solely on filterable emissions as filterable emissions are the sole basis for the BACT limit. Again, Nucor is willing to test for filterables and condensibles under this permit and to report such results to the OAQ to develop information that could lead to proper standards in a future permit modification. At the present time, however, compliance should only be assessed on filterable emissions. Accordingly, until such time as appropriate limits can be determined, Nucor requests that the OAQ remove "and condensable" from Section D.1.1(h). [Nucor Steel]

(2) EAF Filterable and Condensible PM10 BACT Analysis

Nucor objects to the OAQ's conclusion that filterable and condensible PM_{10} BACT for the EAF should be 0.0052 grains/dscf because "there is limited information available to determine the filterable and condensible PM_{10}." Having limited information is not a sufficient justification for a BACT limit. Without basis, the OAQ cannot simply assume that BACT for filterable ***and condensible*** PM_{10} is the same as the 0.0052 grains/dscf filterable only limit at the majority of steel mills for purposes of complying with the NSPS Subpart AAa PM standard (note that the test methods specified in Subpart AAa do not measure condensibles). [Nucor Steel]

(3) Testing Requirements for the Filterable and Condensible PM10

Because the OAQ has not provided a justifiable basis for the filterable ***and condensible*** PM_{10} limit, the associated testing requirement is inappropriate and should be deleted. While Nucor does not object to testing for filterables and condensibles under this permit and reporting such results to the OAQ to develop information that could lead to appropriate limits, compliance should only be assessed on filterable emissions at this time. Nucor therefore requests that the OAQ remove "and condensable" from paragraph (1)(a) of Appendix A.

[Nucor Steel]

IDEM Response

In response to the above comments, IDEM itemize the key points why the condensible fraction of PM10 is critical and needs to be taken into account for PSD:

(a) 1 of 28 source categories

A permitting agency, such as IDEM, has the obligation to account all emissions (fugitive and non-fugitive emissions) from a source that is categorized as 1 of the 28 listed source categories undergoing PSD review. A steel mill is one of these source categories.

Condensible particulate forms in the stack due primarily to immediate cooling and air dilution. It quite fine and thus falls primarily within the PM10 fraction. The condensible fractions of PM10 is clearly an emission from a mill and therefore have to be accounted for and evaluated for PSD BACT limits.

(b) PM10 as the Part 70 Regulated Pollutant

PM10 is the particulate fraction that is also considered in the Part 70 program.

For such major source as Nucor Steel, condensible PM10 should always be included in the emission inventory when ever the potential to be emitted is present.

326 IAC 2-2 and 326 IAC 2-7 both clearly take into account the PM10 condensible fraction.

Such accounting of the condensible PM10 may not be necessary if Nucor Steel proves that there are no condensible fraction being emitted.

(c) SDI, IN

There are existing sources in Indiana, which have been required to comply with a filterable and condensible particulate. One of most recent ones is SDI, Whitley, IN.

The PSD permit for SDI, Whitley County, IN, includes the same filterable and condensible particulate BACT limits. A compliance testing was also required. SDI did the testing on February, 2003.

Based on the preliminary review of the test results, SDI complies with the PM and PM10 BACT limits. For more information, Mr. Jarrod Fisher of OAQ, Compliance Branch (317/233-2723) can be contacted.

Another SDI plant (Hendricks, County, IN) was recently issued in 2003 a PSD permit, which also has the filterable and condensible fractions have been specified as PSD BACT limits. Compliance testing was also required.

(d) EAB decision: AES Puerto Rico L.P.

On May 27, 1999, the Environmental Appeals Board (EAB) addressed the issue of condensible PM10 in a PSD permit issued by US EPA Region II. The permit was designed to address both the condensible and non-condensible fractions of PM10. AES requested that the USEPA Region II require testing only by an in-stack test method and not impose a limit for the condensible fraction of PM10. Region II insisted on retaining a limit for PM10 condensibles because it is important to account for the significant condensible fraction of PM10 emissions. Region II acknowledged that there were little guidance and information on the

PM10 condensibles, thus they were left to derive a PM10 limit. The approach used to derive the PM10 (condensible) limit was similar to an existing approach upheld by the EAB. Through the permit, Region II claims that specifying PM10 limits with condensible will yield a more accurate picture of PM10 emissions, and also increases the likelihood that the next source subject to BACT for PM10 will take into account and evaluate the PM10 condensible fractions.

The EAB decided that there is no error on the part of Region II in establishing condensible PM10 limits as part of the BACT.

Comparisons have been made between this case and Nucor Steel, IN:

- - Both operations have the potential to emit condensible PM10.
- - Both permitting agencies specified PM10 BACT limits with condensible taken into account.
- - Both permitting agencies have limited or little guidance to follow, and made a sound decision regarding the achievable limits.
- - Both permitting agencies believes that specifying a clear condensible fractions in the RACT/BACT clearinghouse will provide additional guidance to future permitting.

(e) USEPA Letter dated March 31, 1994

On March 31, 1994, USEPA Region VII issued a letter to the IOWA Department of Natural Resources. This letter was also used as an administrative record in the AES Puerto Rico, L.P. appeal, in which the EAB decided that it is correct to specify PM10 limits that contain condensible fraction.

This letter indicated that the definition of PM10 includes condensible PM10. It further states that since condensible particulate is considered PM10, PSD permits must address condensible fractions if the proposed unit is a potential condensible emitter.

There are 5 sources (not including Nucor Steel, IN) shown in Table 12 of Appendix B -- PSD BACT Evaluations - - that have PM10 BACT limits. Since the EPA letter has been existence prior to the establishment of these PM10 limits, it can be concluded that these PM10 follow the guidance that if PM10 is specified, it consists of filterable and condensible fractions.

(f) Test Methods

Method 202 (Determination of Condensible Particulate Emissions from Stationary Sources) is the method to determine the condensible particulate matter emissions from stationary sources. It is intended to represent condensible matter as material that condenses after passing through a filter and as measured by this method. This method may be used in conjunction with Method 201 or 201A if the probes are glass-lined. Using Method 202 in conjunction with Method 201 or 201A, only the train configuration and analysis is addressed by this method. The sample train operation and front end recovery and analysis shall be conducted according to Method 201 or 201A. This method may also be modified to measure material that condenses at other temperatures by specifying the filter and probe temperature. A heated Method 5 out-of-stack filter may be used instead of the in-stack filter to determine condensible emissions at wet sources.

(g) Test Data

The OAQ electronic database is showing 6 sources whose EAFs have been tested using the Method 202.

(i) Beta Steel, IN

- - tested in 1999.
- - PM10 test result = 0.0045 gr/dscf

(ii) Electric Steel Casting, Marion County
- - tested in 1997, to verify compliance with their FESOP limits.
- - PM test result was specified in lb/hr rate.

(iii) Ertel Manufacturing, Marion County
- - tested in 1998, to verify compliance with 326 IAC 6-1-2
- - PM10 test result = 0.0109 gr/dscf

(iv) Harrison Steel Casting, Fountain County
- - tested in 2002, to verify compliance with PSD and Process weight rules

(v) Kobelco, Jackson County
- - tested in 1998, to verify compliance with NSPS Part 60
- - PM10 test result = 0.0035 gr/dscf

(vi) Nucor Steel, Montgomery County
- - tested in 1997

(vii) Slater Steel, Allen County
- - tested in 1997, to verify compliance with the Part 70 program
- - PM10 test result = 0.0022 gr/dscf

(viii) SDI, Dekalb County
- - tested in 1996 and 1998, to comply with permit and NSPS Part 60 requirements
- - PM10 test result = 0.00299 gr/dscf
- - tested in 1999
- - PM10 test result = 0.00186 gr/dscf

The search of the OAQ database was limited in scope to sources with EAFs.

For more details on these tests, Karen Ampil of the OAQ, Compliance Data Section can be contacted at 317/232-8338.

There is no change in the draft permit due to these comments.

(4) LMF Filterable and Condensible
For the same reasons stated in the Meltshop EAF, Nucor objects to the OAQ's conclusion that the 0.0052 gr/dscf BACT limit includes both filterable and condensible PM_{10} without sufficient information. Because the limits identified in the RBLC do not specify that they include both filterable and condensible PM_{10}, there is no basis for the statement in paragraph (3) that Nucor's proposed limits "are comparable to existing BACT limits in the RBLC for LMF." [Nucor Steel]

IDEM Response

The LMF is a PM10 emitter, thus by definition, the condensible fraction is part of PM10. As previously explained, PM10 includes condensible fraction if there is the possibility that it is being emitted.

The existing PM BACT limit for the LMF was changed from 0.0026 gr/dscf to 0.0018 gr/dscf based on the latest issued PSD permits. This was also clarified that it applies to the filterable fraction only. A separate limit was specified for the PM10 (filterable and condensible) to be the same PM10 BACT limit as the EAF (0.0052 gr/dscf).

Nucor Steel is well aware of IDEM's permitting process because in January, 2003, Nucor Steel was issued a PSD permit (107-12143-00038) for their Strip Caster LMS which specified both filterable and condensible:

- Filterable PM BACT of 0.0018 gr/dscf and
- Filterable and condensible PM10 BACT limit of 0.0052 gr/dscf.

Nucor Steel provided the same objections to why PM10 should not include condensible.

There is no change in the draft permit due to these comments.

(5) Boilers Filterable and Condensible Particulate Limits

Nucor objects to the OAQ's incorporation of filterable and condensible PM_{10} emissions in establishing the 0.0019 lbs/MMBtu limit due to a lack of information. The OAQ's BACT evaluation acknowledges that the RBLC does not make a distinction in most cases between PM and PM_{10} BACT limits. Filterable and condensible PM_{10} limits were not discussed at all. Given this limited information, it is inappropriate for the OAQ to simply assume that the PM_{10} BACT limit is for filterable ***and condensible***. Accordingly, Nucor requests that the OAQ delete "and condensable" from Section D.6.2(h) to clarify that it contains only the filterable component.

Also, as commented previously, Nucor objects to the OAQ's incorporation of filterable and condensible PM_{10} emissions in establishing the 0.0076 lbs/MMBtu limit due to a lack of information. The OAQ's BACT evaluation acknowledges that the RBLC does not make a distinction in most cases between PM and PM_{10} BACT limits. Filterable and condensible PM_{10} limits were not discussed at all. Given this limited information, it is inappropriate for the OAQ to simply assume that the PM_{10} BACT limit is for filterable ***and condensible***. Accordingly, Nucor requests that the OAQ revise the limit by clarifying that it contains only the filterable component. [Nucor Steel]

IDEM Response

The Boilers are PM10 emitters, thus by definition, condensible fraction is part of PM10. As previously explained, PM10 includes condensible fraction if there is the possibility that it is being emitted.

In addition AP-42 (Compilation of Air Pollutants Emission Factors) indicated a separate PM and PM10 emission factors for combustion units.

As indicated on a March 31, 1994 USEPA Region VII letter to the IOWA Department of Natural Resources, PM10 includes condensible PM10.

There is no change in the draft permit due to these comments.

(6) Acid Regeneration PM and PM10 Filterable vs. Condensible

For purposes of clarification, Nucor requests that the OAQ add "filterable" after "PM and PM_{10} " in Condition D.5.3(a)(iii). As discussed previously, the OAQ has insufficient information to justify a filterable and condensible particulate limit. [Nucor Steel]

IDEM Response

Physical modifications are being proposed for the acid regeneration. It is part of this PSD modification. The acid regeneration is equipped with burners and are PM10 emitters, thus by definition, condensible fraction is part of PM10. As previously explained, PM10 includes condensible fraction if there is the possibility that it is being emitted.

There is no change in the draft permit due to this comment.

(7) Meltshop Roof Monitors

Condition A.2(I)(1)(d) says furnace fugitives are "Contained within the Meltshop Building." and conditions A.2(I)(1)(e) and D.1(e) say there are "roof monitors" (controlled dimension vents) in the roof through which uncontrolled emissions may freely pass with no effort to contain or to measure. With the A.2(I)(1)(c) 2.7 million actual cubic feet per minute of baghouse fabric filtration available, there is no justifiable reason for those uncontrolled vents.
Describe in great detail in condition A.2(I)(1)(e) and D.1(e) "roof monitors." This sounds a lot like a rather large roof with rather small vents in it. What is the "floor coverage" area of the roof and what is the effective cross-sectional area of the ducts in it. What will be the average pressure in the Meltshop Building relative to ambient atmospheric? For a short term average, such as a minute, what will be the total roof monitor average cubic foot per minute flow at the maximum expected flow rate? 326 IAC 2-2-1(r), 40 CFR 51.166(b)(20), et al. state:

> ***Fugitive emissions*** means those emissions which could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening.

A roof monitor is obviously a stack, chimney, vent, or other functionally equivalent opening. Emissions from roof monitors are not fugitive and DEM has the obligation to apply a full PM BACT analysis and limit to those emissions accordingly. Failure to notice this fact is clear error. Emissions from the condition A.2(I)(1)(e) and D.1(e)D.2 roof monitors must be limited not less stringently than conditions D.1.1(g) and (h). DEM provided zero rationale as to any allegation that the 0.0018 grain PM per dry scf limit cannot be technically, economically or physically applied to the entirety of those roof monitors. There is nothing in the record showing that DEM considered requiring identical filtration to those roof monitor openings as it did to control the EAF baghouse openings. This is a lack of diligence; it is clear error and abuse of discretion. DEM must require the roof monitor emissions to not exceed the condition D.1.1(g) and (h) limits prior to issuance. Further the roof monitors must be sealed and "roof monitor or" struck from condition D.1.1(k). [Stephen Loeschner]

IDEM Response

The EAF furnace bays are isolated from the casting aisle in the melt shop. The remainder of the meltshop building is where the roof monitors are located. These monitors are used to vent excess heat from the LMFs, casting operations and other heating processes. If heat is not vented, it would create both an unworkable and unsafe working condition for the mill's employees.

Roof monitors are devices that are typically installed at the peak in the roof and generally run the entire length of the roof. They are used for ventilation purposes, which in this case allow the large amount of generated heat from the casting operations to escape the building.

This casting aisle has never had the "pressure" monitored but it is assumed to operate at ambient pressure as there is no mechanical means of removing air from this area. The flow from the roof monitors had been estimated in 1992 at a rate exceeding 1,780,000 ACFM with operational capacity at about 55% of today's production.

The EAFs emissions are controlled by the baghouses.

There is no change in the draft permit due to this comment.

(8) NSPS PM and Opacity

(a) Nucor requests that the OAQ add "as measured by Method 5D" at the end of Section D.1.4(a) to clarify the applicable EPA reference method under NSPS Subpart AAa. [Nucor Steel]

(b) For purposes of clarification, Nucor requests that the OAQ add "each" after "opacity" in Section D.1.4(b).

IDEM Response

40 CFR Part 60.275a(e)(1) specifies that the Permittee shall determine compliance with the PM standards by using Method 5 for negative pressure fabric filters and Method 5D for positive pressure fabric filters. Since the option that Nucor Steel chosen is an approved method, the change is being made:

D.1.4(a) Pursuant to 40 CFR 60.272a(a)(1), the particulate matter (PM) emissions from the Meltshop EAFs and AOD vessel, exhausting through the Meltshop EAF Baghouses (1 and 2), shall not exceed 0.0052 gr/dscf. **Compliance is determined by using Method 5D.**

40 CFR Part 60.272a(a)(2) specifies that exit from a control device shall not exhibit 3% opacity or greater. IDEM agrees with the change.

D.1.4(b) Pursuant to 40 CFR 60.272a(a)(2), the visible emissions from the Meltshop EAFs and AOD vessel, exhausting through the Meltshop EAF Baghouses (1 and 2), shall not exceed 3% opacity, based on a 6-minute average.
The opacity standard applies to each baghouse.

(9) CEMS vs. Testing

Nucor requests that the OAQ insert "not" after "have' in paragraph (1)(c) of Page 25 of the TSD Testing Requirements. [Nucor Steel]

IDEM Response

This serves as a correction:

Nucor Steel, IN is required to install and use continuous emission monitoring systems (CEMS) for SO_2, and NO_x. They are required by a consent decree issued to Nucor Steel. Compliance testing is going to be required for SO_2 and NO_x, if the installation and use of CEMS for these pollutants have not been installed and calibrated prior to the testing schedule .

(10) CEMS for PM

DEM said of continuous emission monitors ("CEM"):

> In most situations continuous emissions monitoring systems (CEMS) are used to document compliance when a control device is used to reduce emissions. If properly operated, maintained and calibrated, CEMS are accurate in showing compliance. The EAFs in Nucor Steel, IN have control devices for CO, VOC and PM only. The OAQ will require CEM systems for CO and VOC to ensure that the DSE air gap is being operated properly. For PM, there are ***no available technologies to directly monitor mass emissions of PM***.... (emphasis added) TSD Appendix B, Page 79.

However, DEM placed no evidence that it made any effort to find available technologies to directly monitor mass emissions of PM. This is clear error. In fact, such technologies, including automated filtration/beta-ray attenuation analysis, do exist as told in 67 FR 76174 (11December 2002). While the 40 CFR 50.6 PM mentioned concentrations are 50 and 150 micrograms per dry standard cubic meter ("dscm"), the Condition D.1.1(g) 0.0018 grains per dry scf ("dscf") is (,119 micrograms per dscm, 0.0018 / 7,000 x 453.59 E6 x (1000 / 25.4 / 12) ^ 3 = 4,119 micrograms per dscm.) it is entirely practical to use automated filtration/beta-ray attenuation analysis as a PM CEM. Failure to consider it is clear error. [Stephen Loeschner]

IDEM Response

IDEM used the following EPA guidance in evaluating if a PM CEMS is feasible and economical to install and maintain.

- Evaluation of PM CEMS, Final Report, Volume I, September 25, 2000
- Current Knowledge of PM CEMS, Final Report, September 8, 2000.

These EPA documents can be found:

- http://www.epa.gov/ttn/emc/cem.html
- http://www.epa.gov/ttn/emc/cem/r4703-02-07.pdf and
- http://www.epa.gov/ttn/emc/cem/pmcemsknowfinalrep.pdf

In these reports, US EPA is considering PM CEMS for use in future standards, however, assessment of their long-term performance has to be done.

At this time, IDEM decided that PM CEMS is not required to verify particulate compliance. However, numerous different methods that will sufficiently show compliance have been specified:

- compliance monitoring (BLDS, pressure drop, baghouse inspections, visible emission notations)
- install and operate a COM or perform Method 9 (on a routine schedule), because opacity serves as a surrogate parameter to verify compliance with the particulate emissions
- compliance testing (PM and PM10 testing on a 2.5-year cycle)
- keep records and report on a quarterly basis.

These are adequate, sufficient and acceptable methods to verify compliance with the PM and PM10 applicable requirements.

There is no change in the draft permit due to this comment.

(11) Roof Monitors Opacity

The IDEM is providing further clarification between the following opacity standards specified:

The Meltshop has several other operations, such as the Caster and AOD, that contribute to the visible emissions. These operations are subject to the 5% opacity standard.

D.1.1(j) Visible emissions from the Meltshop Roof Monitors shall not exceed 5% opacity, based on a 6-minute average.

The fugitive emissions from the EAFs during each complete cycle from tap to tap are subject to a more stringent opacity standard.

D.1.1(k) Fugitive emissions generated at each EAF during each complete cycle from tap to tap shall not exceed 3% opacity when emitted from any roof monitor or building opening, based on a 6-minute average.

PSD Minor Pollutants

(1) PSD Minor Limits: Meltshop vs. Entire Source
Condition D.1.5: Please clarify if these limitations are referring to the entire facility or just the Meltshop. [USEPA]

(2) Lead and Mercury
Although Lead and Mercury are regulated pollutants under Indiana's PSD program, the potential to emit for these pollutants is below PSD significant thresholds and therefore PSD does not apply. ***See*** 326 IAC 2-2. As EPA explains, "[p]ollutants with less than significant emissions are not subject to PSD review requirements." ***NSR Workshop Manual***, at A.31. Furthermore, Nucor is not a synthetic minor, but a true minor, for the pollutants. No synthetic minor limit was requested or needed to make the requirements of 326 IAC 2-2 not applicable. In addition, the authority cited (326 IAC 2-2) does not provide the basis for adopting the proposed limits because 326 IAC 2-2 is not applicable. Accordingly, Nucor objects to Section D.1.5 as unwarranted and illegal. [Nucor Steel]

IDEM Response

The EAFs are the significant units in this steel mill. They are also the units with the most expected Lead and Mercury emissions. The PSD minor limits for Lead and Mercury are applicable to the EAFs. Since the EAFs are the significant emitting units, these limits also make the entire plant a minor source for these 2 pollutants.

Lead and Mercury are specified as criteria pollutants for PSD under 326 IAC 2-2-1(jj))G) and (J) respectively. These 2 pollutants are specifically chosen to be limited because their PTE are closest to the PSD significant levels. These 2 pollutants are also considered HAPs. The other criteria pollutants in 326 IAC 2-2-1(jj) were not limited because IDEM determined that the PTE of each is much lower than the respective PSD significant levels.

Existing permit CP107-2764-00038, issued on November 23, 1993, Operation Condition No. 21 indicated that Lead, Mercury and other criteria pollutants shall not exceed the PSD significant levels. This shows that limiting the PTE of pollutants to assure their minor status is not unique to Nucor Steel.

The following changes were made to provide further clarification:

D.1.5 The Permittee shall emit less than the following rates **from the Meltshop EAF Baghouses (1 and 2)**:

Pollutant	Emission Rate (lb/hr)	PSD Significant Level (tons/year)
Lead	0.134	0.6
Mercury	0.023	0.1

Compliance by the Permittee with these limitations makes the requirements of 326 IAC 2-2 (Prevention of Significant Deterioration) not applicable.

D.1.11(g) The PM, PM_{10}, VOC, **Mercury,** and Lead tests shall be repeated at least once every 2.5 years from the date of a valid compliance demonstration.

(3) Lead PTE

The notice and page 14 of the TSD mention 0.458 tpy of Pb and attention is made in re this being less than the 0.6 tpy Pb 326 IAC 2-2-1(jj) significance. After some litigation in which DEM was ordered to reexamine steel mill EAF Pb, DEM found the 200 tph Whitley County SDI mill limited potential to emit to be 0.241 tpy Pb.(***See*** ftp://ftp2.ai.org/pub/idem/oam/12692f.pdf as published on or about 10 January 2001, incorporated in its entirety herein by reference, TSD p. 11.)Thus: 502 / 200 x 0.241 = 0.605—a LPTE in excess of 0.6 tpy Pb.

While the Condition D.1.5 0.134 pounds Pb per hour x 8,768 / 2,000 = 0.588 tpy limit is less than 0.6 tpy, the D.1.11(a)(ii) and (g) testing does not offer good and sufficient assurance that the annual Pb emission will not exceed 0.6 tpy. To suggest that one test every 2.5 years can be representative in light of the permitted variability of the charge mocks the principle of proof of compliance on a more or less continuous basis. With the Condition A.2(I)(1)(a) allowed charge being:

> Raw materials used are all types of scrap steel, including stainless, DRI, pig iron, HBI, various types of lime, alloys, carbon and various types of metal scrap substitutes.

and there being no Pb content limit on any charge item other than Condition D.1.8(c)(i):

> All grades of scrap shall contain no observable non-ferrous metals or non-metallics.

What technical reasons does DEM have that the total Pb in charge per ton of Nucor product has less Pb content than the total Pb in charge per ton of SDI product? What technical reason does DEM have that for an equal Pb content of charge per ton of product, Nucor will emit less Pb than SDI? And given that charge variability, who gets to play god and declare one test per 2.5 years representative? Pb stack tests must be required quarterly with no more than 110 days between tests in order for Nucor to demonstrate compliance with Condition D.1.5 on a more or less continuous basis. The as-written Condition D.1.11(d) Pb analysis is of no value as it creates no emission surrogate record for the public. A quarterly reporting form and connective permit text is required. (***See In re Tallmadge Generating Station***, PSD Appeal No. 02-12, slip op. at 17 (EAB, 21 May 2003):

> The Board and its predecessors have long held that permit issuers must adequately document their decision making processes. ***See, e.g., In re Steel Dynamics, Inc.***, 9 E.A.D. 165, 191 & n.31 (EAB 2000); ***In re GSX Servs. of S.C., Inc.***, 4 E.A.D. 451, 453-54 (EAB 1992). Specifically, a permit issuer "'must articulate with reasonable clarity the reasons for [its] conclusions and the significance of the crucial facts in reaching those conclusions.'" ***In re Ash Grove Cement Co.***, 7 E.A.D. 387, 417 (EAB 1997) (quoting ***In re Carolina Power & Light Co.***, 1 E.A.D. 448, 451 (Act'g Adm'r 1978)). (emphasis added)

"Crucial facts"—to date, DEM has supplied none in the foundation, rationale, and calculation that produced the 0.458 tpy Pb LPTE allegation. DEM must review ***de novo*** the Pb LPTE and require federally enforceable permit conditions to determine the emission. It is obvious that Nucor does not want to install equipment to meet a 42 USC 7479(3), 40 CFR 51.166(b)(12), 326 IAC 2-2-1(h), et al. Best Available Control Technology ("BACT" a clever legal term wherein best does not mean best) limit—they want a synthetic minor. DEM is obligated to require Nucor to ***prove*** on a more or less continuous basis that its Pb emission is not exceeding and will not exceed 0.6 tpy.

Absent that proof, the production limit of Condition D.1.1(b) must be reduced to: 0.6 / 0.241 x 200 x 8,760 x 0.9 = 3,926,643 tpy. (Given the greater charge options of Nucor ***v***. SDI, a 10 % protective pad is appropriate to assure 326 IAC 2-2-1(jj) non-significance.) The Pb variability shown in TSD Appendix A p. 4 Table 7 is dubious—a 698 % increase in the annual Pb emission from year 2000 to 2001 (with substantially equal production) with zero explanation. (0.05 t Pb per 1,963,318 t product in year 2000 and 0.39 t Pb per 1,917,611 t product in year 2001 100 x (0.39 / 1,917,611 x 1,963,318 / 0.05 - 1) = a 698 % Pb annual emission increase for substantially the same rate of steel production.)

Is the 0.05 tpy Pb way too small? Why? Why has the inaccuracy been tolerated? Omission of the explanation for those rate disparities is omission of the crucial facts the public needs to have to know if DEM's numbers are anything more than dart-board selections.

To put this into perspective it is necessary to examine Nucor's 40 CFR 372 Toxic Release Inventory ("TRI") report. ... The information collected under this part is intended to inform the general public and the communities surrounding covered facilities about releases of toxic chemicals[.] ... 40 CFR 372.1

Expressed as a summation of the air stack and air fugitive Pb compound emissions, Nucor reported: (***See*** http://oaspub.epa.gov/enviro/tris_control.tris_print?tris_id=47933NCRST400SO incorporated herein in its entirety by reference.)

1995	1996	1997	1998	1999	2000	2001	year
0.0430	< 0.0005	0.0045	0.0255	0.0255	0.0405	0.0560	tons
86	0	9	51	51	81	112	pounds.

Thus, for 1996, we are to believe that Indiana had an operating steel mill that dumped less than 1 pound of Pb compounds into our air (because the government report says so).

So DEM says Nucor had a 0.39 ton Pb emission in year 2001 and their DEM and U.S. Environmental Protection Agency TRI "intended to inform the general public and the communities surrounding covered facilities about releases of toxic chemicals" is a mere 0.0560 tons—a 7:1 discrepancy—lying to the People—it doesn't even matter, does it?

As 0.458 tpy Pb was advertised, that must be made a binding limit. The production limit of Condition D.1.1(b) must be reduced to: 0.458 / 0.241 x 200 x 8,760 x 0.9 = 2,996,574 tpy. (Given the greater charge options of Nucor ***v***. SDI, a 10 % protective pad is appropriate to assure 326 IAC 2-2-1(jj) non-significance.) And the Condition D.1.5 limit must be reduced to: 0.458 x 2,000 / 8,768 = 0.104 pounds Pb per hour. [Stephen Loeschner]

IDEM Response

The analysis that since SDI Whitley is rated at 200 tons/hour it will emit 0.241 tons/year of Lead, and an assumption that Nucor Steel, rated at 502 tons/hour, will then emit 0.605 tons/year is a simple, quick, and straightforward analysis, without taking into account different factors such as raw materials or products produced.

SDI Hendricks County, IN and Nucor Steel, IN have the same emission rate (0.134 lb/hour) limitations. Both are also required to perform compliance tests for lead. It is acceptable that sources provide different emission factors for the same criteria pollutants. In case of SDI and Nucor, both came to the conclusion that their mills are minor PSD emitters in terms of Lead. The important key factors are that enforceable emission limits have been specified, the emissions are quantifiable and enforceable in practical manner and adequate monitoring has been required in the permit.

Lead testing will be required in a 2.5-year cycle. In addition, monthly sampling of EAF dust for Lead has been required. These are sufficient compliance tools to verify Lead emission rates. Baghouse monitoring (such as BLDS and inspections) has also been required.

IDEM has the authority to require additional testing if either the 2.5-year cycle is not sufficient or the monthly sampling does not yield sufficient information.

As indicated in the TSD, the Lead actual emission (39 ton/year) for 2001 was based on the annual emission statements that Nucor Steel submitted. It is correct that the US EPA TRI indicates a lower emission rate for Nucor Steel. Performing compliance test to verify the Lead emission rate would help to clarify this inconsistency.

There is no change in the draft permit due to these comment.

CO, SO_2, NOx and THC CEMS and their Maintenance

(1) SO_2 and NOx CEMS Rule Citations
Nucor objects to the invocation of 326 IAC 2-2 and 326 IAC 3-5 as a basis for the CEMS requirement for SO_2 and NOx. The CEMS is required pursuant to the National Consent Decree between Nucor, the United State Environmental Protection Agency, and various states. The OAQ did not undertake a case-by-case review of the CEMS, evaluate whether other electric arc furnaces have CEMS, or consider the costs of the CEMS as required for a proper BACT analysis. Similarly, OAQ did not demonstrate that the CEMS meet the applicability criteria of 326 IAC 3-5-1. Accordingly, there is no basis under either of these rules for the imposition of the CEMS under these rules. Nucor requests that the reference to these rules ***as a basis for imposing the CEMS*** be dropped. Nucor does not object to the procedural requirements of 326 IAC 3-5 as they relate to commissioning and operating the CEMS. Nucor reserves the right to petition the OAQ for removal of the CEMS in the event it is no longer required by the Consent Decree or operating experience shows it is not necessary to provide a reasonable assurance of compliance. [Nucor Steel]

(2) SO_2 and NOx CEMS Removal
In addition, because the requirement to install a CEMS for SO_2 and NOx arises from the National Consent Decree and not pursuant to PSD or the Part 70 permit program, it is inappropriate for the OAQ to require a CEMS "indefinitely." Nucor reserves the right to petition for removal of the CEMS, upon IDEM approval, in the event a CEMS for SO_2 and NOx is no longer required under the Consent Decree. Because the SO_2 and NOx CEMS is required pursuant to the national Consent Decree, not 326 IAC 2-2 and 326 IAC 3-5, Nucor requests that the OAQ clarify that Nucor reserves the right to petition the OAQ for removal of the SO_2 and NOx CEMS in the event they are no longer required by the Consent Decree. [Nucor Steel]

IDEM Response

The EAFs emit a significant amount of SO2 emissions. As the major emitting units in this proposed PSD modification, IDEM has to make sure that compliance is being attained on a continuous basis.

326 IAC 3-5(d)(Continuous Monitoring of Emissions) indicates the authority of IDEM to require CEMS. This specific rule authorizes IDEM to require as a permit condition issued under 326 IAC 2-2, that the Permittee install and maintain a CEMS.

IDEM acknowledged that the SO2 and NOx CEMS were also required by USEPA in a National Consent Decree, however, it does not diminish the IDEM's authority that they are also required under the PSD program.

IDEM has used the following criteria in evaluating if CEMS is an option for compliance determination:

- - PTE before and/or after control (as applicable), each unit/process and or in relation to the entire modification/plant.
- - Permitting level (PSD major).

- - Reliability of the emission factors used in the review.
- - Air quality impact.

Even though the State of Indiana is now SIP approved for the PSD program, USEPA Region 5 still has significant influence on IDEM's PSD permits and IDEM takes their input and recommendations into account. Region 5 agrees that Nucor Steel has to install a SO2 CEMS to verify compliance on a continuous basis.

To require a company, such as Nucor Steel, to install SO2 and NOx CEMS is feasible (technically and economically) and not overly burdensome. Nucor Steel will not be the only Part 70 source in Indiana that will use SO2 and NOx CEMS to comply. The OAQ electronic database shows approximately 42 sources with SO2 CEMS, some of them even have more than 1 SO2 CEMS in a plant. The same data base indicated approximately 53 sources that use NOx CEMS to show compliance.

Since the authority to install SO2 and NOx CEMS are established under the PSD program, any change in these requirements, such as their removal, has to go through PSD review and public participation. There is no need to specify a permit condition that this is the approval process if such request is made by Nucor Steel, because air rules already have specific rules and procedures for such changes.

There is no change in the draft permit due to these comments.

(3) Total Hydrocarbon CEMS

(a) Permit Condition

Nucor objects to the OAQ's proposed CEMS for total hydrocarbons as a surrogate for monitoring VOCs.

There is no legal or technical justification for requiring a total hydrocarbon CEMS on the EAF Baghouses.

As the OAQ explains in Appendix A, "[i]n most situations continuous emissions monitoring systems (CEMS) are used to document compliance when a control device is used to reduce emissions." Accordingly, because the EAFs do not have a control device for VOC, a VOC CEMS is not required.

Nucor objects to the OAQ's proposed continuous emissions monitoring system (CEMS) for total hydrocarbons (THCs) at its EAFs.

First, in previous permitting actions affecting the steel industry, IDEM has taken the position that a CEMS is required only where: (1) a control device is used; (2) information on emissions is limited; and (3) emissions could adversely affect air quality. In the BACT analysis, the OAQ states that "[i]n most situations continuous emissions monitoring systems (CEMS) are used to document compliance when a control device is used to reduce emissions." There is no THC or VOC control device and the baghouse and other systems do not reduce THC or VOC emissions. The OAQ has neither provided a rationale as to why it is now deviating from this longstanding policy nor a justification as to why a CEMS is "essential" to assure compliance.

Second, there are no limits applicable to THC, which belies the OAQ's argument that the CEMS is essential for compliance.

Third, the use of a THC CEMS as a surrogate for monitoring VOC emissions is unsupported. The OAQ has not demonstrated that there is a reasonable and consistent relationship between total hydrocarbons and VOC that would allow THC to serve as a surrogate for VOC.

Fourth, Nucor does not believe that there is adequate justification for the costs and burden of a CEMS for THC or VOCs. Nucor notes that the OAQ did not factor CEMS costs into its BACT analysis, which it must do if it intends to include CEMS as part of the BACT determination. In any event, Nucor reserves the right to install a CEMS for methane/ethane emissions as part of any proposed CEMS for THC/VOCs.

(b) Appendix A
Nucor objects to the proposed continuous emissions monitoring system (CEMS) for VOCs at its EAF as stated in paragraphs (1)(a) through (c) of Appendix A - - PSD BACT Evaluations. Because the EAFs do not rely on add-on controls for VOCs, the limit assumes maximum production, and VOCs are a relatively small portion of EAF emissions, no CEMS should be required. Indeed, IDEM's longstanding position has been that a CEMS is required only where: (1) a control device is used; (2) information on emissions is limited; and (3) emissions could adversely affect air quality. The OAQ has neither provided a rationale as to why it is now deviating from this policy nor a justification as to why a CEMS is "essential" to assure compliance. Accordingly, Nucor does not believe that there is adequate justification for the costs and burden of a CEMS for VOCs. Nucor notes that IDEM did not factor CEMS costs into its BACT analysis, which it must do if it intends to include CEMS as part of the BACT determination.

(c) TSD
Nucor objects to the CEMS requirement for THC/VOCs and therefore requests that the references to CEMS be deleted in paragraph (1)(e) of Page 26 of the TSD Testing Requirements.[Nucor Steel]

IDEM Response

Having a control device is just one of the criteria evaluated to determine if a CEMS is the compliance determination method to be used for a specific process. It is true that majority of processes that have control equipment are better monitored by using CEMS, however, there are processes that do not necessarily have control equipment where CEMS is the best method of compliance verification. Other factors to consider are the reliability of the emission factors, the nature of the operations and the impact to the air quality standards.

In this specific case, IDEM intended to require Nucor Steel to install and maintain VOC CEMS as it has been required for other existing similar operations. However, during the review process, it has come to IDEM's attention that there are non VOC emissions that contribute to the total readings made by the CEMS. To account for these, IDEM revised the VOC monitoring such that Nucor Steel will be required to perform VOC compliance testing and analyze the total hydrocarbon concentration readings during these testing periods. These measurements will then be used as surrogate parameters to verify compliance with the VOC PSD BACT limit. This is an acceptable method for indirect parametric monitoring to be used for compliance verification.

Most VOC emitting sources (such as coating plants) have reliable methods to monitor VOC emissions without the use of a VOC CEMS. These sources have certified MSDS to determine VOC content of the raw materials, and monitor surrogate parameters such as temperature, residence time, etc. for VOC control equipment. These are requirements even for Part 70 sources that are not necessarily PSD major sources. Unlike these sources, Nucor Steel rely on the quality and condition of the scrap and the implementation of it SMP. The SMP is mostly visual inspection to make sure it is acceptable in terms of dirt, oil and non mettalics. Due to the nature of scrap, using VOC or THC CEMS is an excellent compliance tool.

Using a VOC or THC CEMS is technically and economically feasible and not overly burdensome because other existing sources in Indiana used this type of CEMS in their operations to certify compliance. Cost of installing and operating CEMS is not part of the BACT review.

IDEM is initiating the following change to this condition to clarify the intent of the condition:

D.1.15(d) ~~Unless under conditions for which the Compliance Response Plan specified otherwise,~~ **When for any one reading of** the pound per hour rate of the total hydrocarbons, based on a 3-hour block ~~shall be maintained at or~~ **is higher** ~~below~~ **than** the total hydrocarbons concentration corresponding to the VOC emission rate specified in Condition D.1.1(f) using the data during the most recent valid compliance stack test, **the Permittee shall take reasonable steps in accordance with Section C - Compliance Response Plan -Preparation, Implementation, Records and Reports**.

~~The Compliance Response Plan for these units shall contain troubleshooting contingency and response steps for when the pound per hour reading is outside of the range for any reading.~~

A THC reading that is above the concentration is not a deviation from this permit.

Failure to take **reasonable** response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports, shall be considered a ~~violation of~~ **deviation from** this permit.

(4) Maintenance of CEMS

In general, Nucor objects to Section D.1.16 which imposes specific contingency measures in the event of malfunction of monitoring equipment because these provisions have nothing to do with "maintenance." Pursuant to 326 IAC 2-7-5(3)(A)(iii), which the OAQ cites as authority, a Part 70 permit must contain "as necessary, requirements concerning the use, maintenance, and, where appropriate, installation of monitoring equipment or methods." 326 IAC 2-7-5(3)(A)(iii) does not authorize the OAQ to dictate specific malfunction response provisions under the guise of establishing maintenance of monitoring equipment requirements. [Nucor Steel]

(a) Sulfur Monitoring
Even if 326 IAC 2-7-5(3)(A)(iii) did authorize the OAQ to prescribe these "maintenance" provisions, several Section D.1.16 requirements are simply unrealistic and unworkable. For example, Section D.1.16(b) requires monitoring of the sulfur content of scrap in the event the SO_2 CEMS is malfunctioning or will be down for calibration, maintenance, or repairs for four hours or more. Although vendor certifications and analyses are appropriate to verify the sulfur content of charge carbon and injection carbon, similar certifications cannot be provided for scrap. Even high grade, low residual, inspected scrap will have inherent fluctuations in sulfur content and therefore vendors are unwilling to certify sulfur content (other than a generally expected range). [Nucor Steel]

(b) Back up CEMS
Nucor also objects to the Section D.1.16(f) backup CEMS requirement. First, the OAQ did not include the cost of a backup CEMS in its BACT evaluation. As a result, requiring a second CEMS pursuant to 326 IAC 2-2 is without basis. Second, 72 hours is not enough time to bring a properly calibrated second system online (e.g., certification, relative accuracy test audit, etc.). Nucor has no objection to using a handheld monitor to measure SO_2, NOx, and CO once per shift (and total hydrocarbons if the OAQ refuses to eliminate the requirement) as an alternative monitoring strategy in the event the primary CEMS is malfunctioning or will be down for calibration, maintenance, or repairs until the CEMS can be brought back online. Nucor would report lbs/hr based upon the ppm observed from the hand-held monitor and either actual flow rate from the CEMS unit, if available, or system design parameters if the CEMS unit flow rate is not available. [Nucor Steel]

(5) <u>Affirmative Defense</u>
The affirmative defense language in D.1.16 of the draft permit are currently under review by Regional Counsel (ORC), the inclusion of this language before finalization of the permit needs to be discussed. [USEPA]

IDEM Response

As part of the permitting review process, IDEM and the applicant discussed compliance monitoring options when the CEMS is either out of order or down for maintenance. IDEM heavily relies on the source to provide these options, because IDEM acknowledges that the source has the knowledge and expertise to make the recommendations. However, due to permitting time accountability, there are some situations that IDEM has to make recommendations on what are the monitoring options, within the authorized boundary and technical knowledge of the operations. The options proposed in the draft permit have been discussed with Nucor Steel.

326 IAC 2-7-5(3)(A)(iii) clearly authorized IDEM to specify the necessary requirements concerning the use, maintenance and installation of CEMS. The permitting programs also require that compliance has to be confirmed on a continuous basis. If the CEMS is out of order, either due to malfunction or avoidable circumstances, the Permittee has to verify

continual compliance with applicable requirements. The intent of this condition is to clearly identify these back up options because it can be specific for each operation.

As part of this comment, Nucor Steel suggested that handheld monitors may be used. IDEM agrees.

The condition has also been significantly revised to provide clearer and more flexible options for the Permittee. The intent is to consider the realistic operations of these CEMS. Justified downtime of CEMS have to be taken into account as long as approved supplemental compliance monitoring is being followed.

Based on these, the following changes have been:

D1.16 Maintenance of CEMS [326 IAC 2-7-5(3)(A)(iii)]

(a) In the event that a breakdown of the SO_2, NO_x, CO or total hydrocarbon **(THC)** continuous emission monitoring system (CEMS) occurs, The Permittee shall maintain records of all CEMS malfunctions, out of control periods, calibration and adjustment activities, **and** repair or maintenance activities.

(b) The continuous emissions monitoring system (CEMS) shall be operated at all times the emissions unit or process is operating except for reasonable periods of monitor system downtime due to necessary calibration or maintenance activities or malfunctions. Calibration and maintenance activities shall be conducted pursuant to the standard operating procedures under 326 IAC 3-5-4(a).

(c) Except as otherwise provided by a rule or provided specifically in this permit, whenever a continuous emission monitor system (CEMS) is malfunctioning or will be down for calibration, maintenance, or repairs for a period of four (4) hours or more, the Permittee shall perform supplemental monitoring by using calibrated handheld monitors to measure the SO_2, NO_x, CO and THC emissions on a once per shift basis. The handheld monitors shall be approved by the IDEM, OAQ.

(d) The Permittee shall keep records in accordance with 326 IAC 3-5-6(b) that includes the following:
- **(i) All documentation relating to:**
  - **(A) design, installation, and testing of all elements of the monitoring system; and**
  - **(B) required corrective action or compliance plan activities.**
- **(ii) All maintenance logs, calibration checks, and other required quality assurance activities.**
- **(iii) All records of corrective and preventive action.**
- **(iv) A log of plant operations, including the following:**
  - **(A) Date of facility downtime.**
  - **(B) Time of commencement and completion of each downtime.**
  - **(C) Reason for each downtime.**

(e) The Permittee shall keep records that describe the supplemental monitoring implemented during the downtime to assure compliance with applicable emission limitations.

(f) In accordance with 326 IAC 3-5-7(5), the Permittee shall submit reports of continuous monitoring system instrument downtime, except for zero (0)

and span checks, which shall be reported separately. The reports shall include the following:

(i) Date of downtime.
(ii) Time of commencement.
(iii) Duration of each downtime.
(iv) Reasons for each downtime.
(v) Nature of system repairs and adjustments.

~~(b) SO_2 CEMS~~
~~Whenever the SO_2 CEMS is malfunctioning or will be down for calibration, maintenance, or repairs for a period of four (4) hours or more, the Permittee shall monitor the sulfur content of the scrap, charge carbon and injection carbon added to the EAFs. Vendor certifications or analyses shall verify the sulfur content of scrap, charge carbon and injection carbon.~~

~~(c) NO_x CEMS~~
~~Whenever the NO_x CEMS is malfunctioning or will be down for calibration, maintenance, or repairs for a period of four (4) hours or more, The Permittee shall use a calibrated handheld monitor to measure the NOx emissions on a once per shift basis. The handheld monitor shall be approved by the IDEM, OAQ.~~

~~(d) CO CEMS~~
~~Whenever the CO CEMS is malfunctioning or will be down for calibration, maintenance, or repairs for a period of four (4) hours or more, the Permittee shall perform once per shift operational status inspections of the equipment that is important to the performance of the DSE, canopy hood and total capture system (i.e., pressure sensors, dampers, and damper switches). This inspection shall include observations of the physical appearance of the equipment (e.g., presence of holes in ductwork or hoods, flow constrictions caused by dents or accumulated dust in ductwork, and fan erosion). Any deficiencies shall be noted and proper maintenance performed. This requirement does not replace the routine monthly inspections of the same equipment~~

~~(e) Total hydrocarbons CEMS~~
~~Whenever the total hydrocarbons CEMS is malfunctioning or will be down for calibration, maintenance, or repairs for a period of four (4) hours or more, The Permittee shall use a calibrated handheld monitor to measure the VOC or total hydrocarbons emissions on a once per shift basis. The handheld monitor shall be approved by the IDEM, OAQ.~~

~~(f) A calibrated backup SO_2, NO_x, CO or total hydrocarbon CEMS shall be brought online no later than seventy-two (72) hours of shutdown of the primary CEMS, and shall be operated until such time as the primary CEMS is back in operation.~~

(g) Nothing in this permit shall excuse the Permittee from complying with the requirements to operate a continuous emission monitoring system pursuant to 326 IAC 2-2**, 326 IAC 3-5,** and 40 CFR Part 60.

~~(h) A malfunction, out of control period, calibration and adjustment activity, repair or maintenance activity constitutes an affirmative defense for noncompliance with the continuous monitoring requirements of 326 IAC 3-5 if the affirmative defense is demonstrated through properly signed,~~

~~contemporaneous operating logs or other relevant evidence that describe the following:~~

~~(1) A malfunction, out of control period, calibration and adjustment activity, repair or maintenance activity occurred and the Permittee can, to the extent possible, identify the causes of or reasons for the a malfunction, out of control period, calibration and adjustment activity, repair or maintenance activity;~~

~~(2) The permitted facility was at the time being properly operated;~~

~~(3) During the period of a malfunction, out of control period, calibration and adjustment activity, repair or maintenance activity, the Permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards or other requirements in this permit;~~

~~(4) For each malfunction, out of control period, calibration and adjustment activity, repair or maintenance activity lasting one (1) day or more, the Permittee shall include all malfunction, out of control period, calibration and adjustment activity, repair or maintenance activity in the Quarterly Deviation and Compliance Monitoring Report and must include the following:~~

~~(A) A description of the malfunction, out of control period, calibration and adjustment activity, repair or maintenance activity;~~

~~(B) Any steps taken to mitigate the emissions, if necessary; and~~

~~(C) Corrective actions taken.~~

~~(6) The Permittee immediately took all reasonable steps to correct the malfunction or out of control period and completed the calibration and adjustment activity, repair or maintenance activity in a timely manner.~~

~~(i) In any enforcement proceeding, the Permittee seeking to establish the occurrence of an malfunction, out of control period, calibration and adjustment activity, repair or maintenance activity has the burden of proof.~~

~~(j) IDEM, OAQ may require that the Preventive Maintenance Plans (PMPs) required under 326 IAC 2-7-4(c)(9), Operation, Maintenance and Monitoring Plan required under 40 CFR 63 or the Startup, Shutdown and Malfunction plan required under 40 CFR 63.6(e)(3) be revised in response to a malfunction, out of control period, calibration and adjustment activity, repair or maintenance activity.~~

(6) CEMS Calibration

It is Nucor's understanding that the OAQ intended to require calibration of the CEMS within 180 days of the operation of the modified Meltshop EAFs ***and*** the installation of the new Meltshop EAF Baghouse2. To clarify this intent (and to correct typographical errors), Nucor requests that the OAQ revise Section D.1.12(a)(ii) as follows:

(ii) These CEMS shall be calibrated no later than 180 days from the initial startup of the modified Meltshop EAFs (for the existing vent) and within 180 days of the installation of the new Meltshop EAF Baghouse 2, respectively.

Accordingly, calibration would be required only once if conducted within 180 days of both the initial startup of the modified Meltshop EAFs and the installation of the new Meltshop EAF Baghouse 2. Nucor requests clarification if this is not the OAQ's intent. [Nucor Steel]

IDEM Response

The EAFs have 2 different exhausts: the existing vent and the baghouses stack. CEMS have to be installed to these exhausts, as soon as the EAFs have been modified (meaning once only one of the listed physical modifications in Section B.6(I) has been completed and begun operation).

The intent is to install CEMS to monitor the emissions from the EAFs. Installing a new baghouse is not the only physical modification that is planned for the EAFs. Nucor is provided the flexibility when to install the CEMS due to the nature of the modifications.

It is not the intent to install and calibrate the CEMS when all the physical modifications to the EAF are completed and the new baghouse has been installed. As Nucor claims, some of these physical modifications might not all be necessary to be done to attain maximum production capacity. It might be decided that some of the physical modifications are not necessary. In addition, the new baghouse might also be constructed on a different schedule as the other physical modifications.

To make it clearer, the condition has been changed:

D.1.12(a)(ii) **CEMS for Existing Vents**
The CEMS installed to measure the emissions through the existing vent ~~These CEMS~~ shall **be** calibrated no later than 180 days from the initial start up of the modified Meltshop EAFs ~~(for the existing vent) or~~

D.1.12(a)(ii) **CEMS for Baghouse Stack**
The CEMS installed to measure the emissions through the EAF baghouses stack shall be calibrated within 180 days of the installation of the new Meltshop EAF Baghouse2.

(7) Emission Output Rate to be Recorded
For purposes of clarification, Nucor requests that the OAQ replace "system" with "systems in lbs/hour" in Section D.1.12(c). [Nucor Steel]

IDEM Response
IDEM agrees.

D.1.12(c) The Permittee shall record the output of the system**s in pounds per hour** and shall perform the required record keeping and reporting, pursuant to 326 IAC 3-5-6 and 326 IAC 3-5-7.

(8) Appendix B: CEMS
Please review the wording in the second to the last paragraph on Page 79 of Appendix B - - PSD BACT Evaluations. [USEPA]

IDEM Response
IDEM is correcting the grammatical error in the following paragraph:

Upon further discussion with Nucor, since a consent decree required Nucor to install CEMS for SO_2 and NO_x, **these CEMS will** also be ~~installed and~~ used as **compliance methods for the EAFs**. Additional compliance testing and monitoring will not **be** required.

COMS

(1) Continuous Opacity Monitoring (COM)

Neither PSD nor 326 IAC 3-5 supports the proposed COMS requirement for EAF Baghouse #2.

The OAQ has stated that the continuous opacity monitoring system (COMS) is required pursuant to 326 IAC 2-2 and 326 IAC 3-5. This is in error. The Indiana monitoring provisions under 326 IAC 3-5 do not require a continuous monitoring system for this facility, but only a method that provides a reasonable assurance of compliance. Similarly, the PSD regulations do not authorize specific monitoring methods such as a COMS. Indeed, EPA's NSR Workshop Manual requires that that compliance demonstration methods used to monitor PSD compliance pursuant to state law requirements should result in an "effective tool to monitor and enforce source compliance." ***NSR Workshop Manual***, at I.4. As recognized by EPA in the proposed amendments to NSPS Subpart AAa (67 Federal Register 64013 (Oct. 16, 2002)), a COMS is not capable of accurately monitoring opacity emissions from an EAF shop at the 3 percent opacity level. Under the Rose Study, the error of a COMS is approximately ±7.5 percent, while the opacity standard is only 3 percent. As a result of the inherent error range at the established opacity level, the COMS cannot provide accurate information about Nucor's compliance. Accordingly, a COMS neither satisfies 326 IAC 3-5 performance criteria nor conforms to EPA's position that every PSD permit condition should be: "1) reasonable, 2) meaningful, 3) monitorable, and 4) always enforceable as a practical matter." ***NSR Workshop Manual***, at I.6. Requiring a monitor that will operate below its error threshold is simply arbitrary and capricious and violates the Indiana Administrative Procedures Act. Because IDEM cannot require the COMS except for its presence in the NSPS program, Nucor requests that the OAQ delete all 326 IAC 2-2 or 326 IAC 3-5 references as applicable authority for the COMS.

Because the Subpart AAa amendments are still pending, Nucor understands that the condition must remain based on 40 C.F.R. ' 60.275a as currently in effect. Nucor reserves the right, however, to petition for an alternative to the COMS requirement pursuant to 40 C.F.R.' 60.13(i) or upon final promulgation of the Subpart AAa amendments. Indeed, Nucor requests that the COMS condition be predicated on the following additional language:

This condition applies only until such time as the Administrator of EPA grants an alternative monitoring approval for use of a bag leak detection system (BLDS) either on a case-by-case basis pursuant to 40 C.F.R.' 60.13(i) or by amendment to NSPS Subpart AAa to allow substitution of a BLDS and Permittee gives notice of its election to comply with such alternate monitoring regime. If Permittee elects to install a BLDS prior to such approval, compliance with the permit opacity limits shall be evaluated in light of all the evidence, giving due weight to the relative accuracy of the various measurement techniques.

As recognized by EPA in the proposed amendments to NSPS Subpart AAa, a COMS is not capable of accurately monitoring opacity emissions from an EAF shop at the 3 percent opacity level.

Accordingly, a COMS does not satisfy 326 IAC 2-2 or 326 IAC 3-5 performance criteria due to the inherent error range at the established opacity level. Requiring a monitor that will operate below its error threshold is arbitrary. Nucor therefore requests that the OAQ delete all 326 IAC 2-2 or 326 IAC 3-5 references as applicable authority for the COMS. Because only NSPS Subpart AAa provides applicable authority, "in accordance with 326 IAC 3-5-2 and 326 IAC 3-5-3" should be deleted from Section D.12(a), "326 IAC 3-5-6, 326 IAC 3-5-7, and" should be deleted from Section D.1.13(d), and Section D.12(c) should be deleted in its entirety.

Because the Subpart AAa amendments are still pending, Nucor understands that the condition must remain based on 40 C.F.R. ' 60.275a as currently in effect. Nucor reserves the right, however, to petition for an alternative to the COMS requirement pursuant to 40 C.F.R.' 60.13(i) or upon final promulgation of the Subpart AAa amendments. [Nucor Steel]

IDEM Response

Nucor has to confirm compliance with the opacity standard on a continuous basis. The Meltshop operations is one of the significant operations involved in this modification.

The PSD program and 326 IAC 3-5(d) provide authority to require COM. It is correct that the NSPS Part 60, Subpart AAa provides an option to either use a COM or perform Method 9. IDEM understands the position of Nucor in choosing a COM, rather than Method 9, for the stack. Rather than IDEM specifying a different opacity compliance method for the PSD compliance and since COM is an authorized method, IDEM decided to make the method of compliance consistent for both the PSD and NSPS requirements.

The IDEM is aware of the concern that a COM is not capable of accurately measuring opacity emissions from the EAF at the 3% level. Nucor may choose to comply with the opacity standard by performing Method 9 on a once per day basis.

There is no change in the draft permit due to this language.

(2) COM Output

For purposes of clarification, Nucor requests that the OAQ add "opacity" before "output" in Section D.1.13(d). [Nucor Steel]

IDEM Response

IDEM agrees.

D.1.13(d) The Permittee shall record the **opacity** output of the system and shall perform the required record keeping and reporting, pursuant to 326 IAC 3-5-6, 326 IAC 3-5-7, and 40 CFR Part 60, Subpart AAa.

(3) NO COM Statement

It is suggested that the statement that "no COMs are included in the EAF Baghouse 1 roof vent" and "EAF Dust Handling/Treatment System" be removed from the permit (Condition D.1.13) in case the facility wishes to voluntarily install these devices in the future. [USEPA]

IDEM Response

These statements are necessary because it makes it clear that it is not technically feasible to install a COM in the meltshop roof vent or dust handling bin vents, and that the compliance method is Method 9.

There is no change in the draft permit due to this comment.

The OAQ is initiating this change due to Nucor's comments concerning the EAF dust handling and treatment operations.

D.1.13 There is no COM in the Meltshop EAF Baghouse1 roof vent.
There is no COM in the EAF Dust Handling~~/Treatment~~ System.

(4) Maintenance of COM Equipment

Nucor objects to the OAQ's imposition of specific malfunction response provisions under the guise of establishing maintenance of monitoring equipment requirements under 326 IAC 2-7-5(3)(A)(iii). In addition, because a COMS does not satisfy 326 IAC 2-2 or 326 IAC 3-5 performance criteria due to the inherent error range at the established opacity level, the OAQ should remove all Section D.1.17 references to 326 IAC 2-2 and 326 IAC 3-5 as applicable authority for the COMS. Nucor also requests that the OAQ amend these provisions. [Nucor Steel]

Because the NSPS, Subpart AAa amendments are still pending, Nucor understands that the COMS required pursuant to 40 C.F.R. ' 60.273a as currently in effect is subject only to the performance specifications of 40 C.F.R. Part 60, Appendix B, Performance Specification No.1. Furthermore, because the NSPS provisions at 40 C.F.R. ' 60.273a(c) allow ***daily*** visible emissions observations in lieu of a COMS, Nucor requests that the OAQ replace "once per hour" with "once per day" or "once every four hours" in Section D.1.17(c)(i) for alternative visible emission notations in the event of a COMS breakdown. Also, pursuant to the NSPS requirements at 40 C.F.R. ' 60.273a(c), Method 9 opacity readings are taken for a minimum of three six 6-minute periods, not five as stated in Section D.1.17(c)(ii)(B). [Nucor Steel]

(5) Reference COMs

"CEMS" in Section D.1.17(b) should be "COMS." [Nucor Steel]

(6) COMS CRP vs. Deviation

The last sentence of Section D.1.17(c) should be removed as it is inconsistent with Section C.14(b)(4), which states that the failure to take reasonable response steps "shall be considered a deviation from the permit." [Nucor Steel]

(7) Affirmative Defense
The affirmative defense language in D.1.17 of the draft permit are currently under review by Regional Counsel (ORC), we would like to discuss the inclusion of this language before finalization of the permit. [USEPA]

IDEM Response

Nucor was provided an option to perform visible emissions notations once per shift for the first 24 hours when the COM is out of order. Daylight is taken into consideration for this 24-hour period. Then if the COM or a back up COM has not been installed after 24 hours, then Nucor has to perform Method 9.

Visible emissions notations are quick compliance methods. The Permittee does not need a certified operator to comply. It may be performed by a trained employee. IDEM determined that performing visible emissions notations once per shift is justified since there is greater chance of emissions being affected due to change of employees and work practices. It is correct that the NSPS requires opacity readings on a once per day basis, however, it requires Method 9, which is more time consuming and extensive than the visible emissions notations required by Condition D.1.17 for the first 24 hours after the COM goes down.

IDEM is initiating a significant change in this condition to clarify that failure to take reasonable response steps is considered a deviation and to provide realistic flexibility concerning COM downtime.

D.1.17(a) All COM systems shall meet the performance specifications of 40 CFR 60, Appendix B, Performance Specification No. 1, and are subject to monitor system certification requirements pursuant to 326 IAC 3-5.

(b) In the event that a breakdown of a COM system occurs, The Permittee shall maintain records of all ~~CEMS~~ **COMS** malfunctions, out of control periods, calibration and adjustment activities, repair or maintenance activities.

(c) The COM system shall be operated at all times the emissions unit or process is operating except for reasonable periods of monitor system downtime due to necessary calibration or maintenance activities or malfunctions. Calibration and maintenance activities shall be conducted pursuant to the standard operating procedures under 326 IAC 3-5-4(a).

(d) Except as otherwise provided by a rule or provided specifically in this permit, whenever a COM system is malfunctioning or will be down for calibration, maintenance, or repairs for a period of four (4) hours or more, the Permittee shall perform the following supplemental monitoring:
~~(c) Whenever a COM is malfunctioning or will be down for calibration, maintenance, or repairs for a period of one (1) hour or more during EAF operation, compliance with the applicable opacity limits shall be demonstrated by the following:~~

(i) Visible emission (VE) notations shall be performed once per hour during daylight operations following the shutdown or malfunction of the primary COM. A trained employee shall record whether emissions are normal or abnormal for the state of operation of the EAF at the time of the reading.

(A) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.

(B) If abnormal emissions are noted during two consecutive emission notations, the Permittee shall begin Method 9 opacity observations within daylight four (4) hours of the second abnormal notation.

(C) VE notations may be discontinued once a COM is online or formal Method 9 readings have been implemented.

(ii) If a COM is not online within twenty-four (24) hours of shutdown or malfunction of the primary COM, the Permittee shall provide certified opacity reader(s), who may be employees of the Permittee or independent contractors, to self-monitor the emissions from the EAF stack.

(A) Visible emission readings shall be performed in accordance with 40 CFR 60, Appendix A, Method 9, for a minimum of three (3) consecutive six (6) minute averaging periods beginning not more than twenty-four (24) hours after the start of the malfunction or down time.

(B) Method 9 opacity readings shall be repeated for a minimum of five (5) consecutive six (6) minute averaging periods at least once every four (4) hours during daylight operations, until such time that a COM is in operation.

(C) Method 9 readings may be discontinued once a COM is online.

(iii) If abnormal emissions are observed, the Permittee shall take reasonable response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records, and Reports. Observation of abnormal emissions that do not violate an applicable opacity limit is not a deviation from this permit. Failure to take **reasonable** response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records, and Reports, shall be considered a ~~violation of~~ **deviation from** this permit.

(iv) All of the opacity readings during this period shall be reported with the Quarterly Deviation and Compliance Monitoring Report.

(e) The Permittee shall keep records in accordance with 326 IAC 3-5-6(b) that includes the following:

(i) All documentation relating to:

(A) design, installation, and testing of all elements of the monitoring system; and

(B) required corrective action or compliance plan activities.

(ii) All maintenance logs, calibration checks, and other required quality assurance activities.

(iii) All records of corrective and preventive action.

(iv) A log of plant operations, including the following:

(A) Date of facility downtime.

(B) Time of commencement and completion of each downtime.
(C) Reason for each downtime.

(f) The Permittee shall keep records that describe of the supplemental monitoring implemented during the downtime to assure compliance with applicable emission limitations.

(g) In accordance with 326 IAC 3-5-7(5), the Permittee shall submit reports of continuous monitoring system instrument downtime, except for zero (0) and span checks, which shall be reported separately. The reports shall include the following:
(i) Date of downtime.
(ii) Time of commencement.
(iii) Duration of each downtime.
(iv) Reasons for each downtime.
(v) Nature of system repairs and adjustments.

(~~d~~ **h)** Nothing in this permit shall excuse the Permittee from complying with the requirements to operate a COM system pursuant to 326 IAC 2-2, 326 IAC 3-5, and 40 CFR 60.273a.

~~(e) A malfunction, out of control period, calibration and adjustment activity, repair or maintenance activity constitutes an affirmative defense for noncompliance with the continuous monitoring requirements of 326 IAC 3-5 if the affirmative defense is demonstrated through properly signed, contemporaneous operating logs or other relevant evidence that describe the following:~~

~~(1) A malfunction, out of control period, calibration and adjustment activity, repair or maintenance activity occurred and the Permittee can, to the extent possible, identify the causes of or reasons for the a malfunction, out of control period, calibration and adjustment activity, repair or maintenance activity;~~
~~(2) The permitted facility was at the time being properly operated;~~
~~(3) During the period of a malfunction, out of control period, calibration and adjustment activity, repair or maintenance activity, the Permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards or other requirements in this permit;~~
~~(4) For each malfunction, out of control period, calibration and adjustment activity, repair or maintenance activity lasting one (1) day or more, the Permittee shall include all malfunction, out of control period, calibration and adjustment activity, repair or maintenance activity in the Quarterly Deviation and Compliance Monitoring Report and must include the following:~~
~~(A) A description of the malfunction, out of control period, calibration and adjustment activity, repair or maintenance activity;~~
~~(B) Any steps taken to mitigate the emissions, if necessary; and~~
~~(C) Corrective actions taken.~~
~~(5) The Permittee immediately took all reasonable steps to correct the malfunction or out of control period and completed the calibration and adjustment activity, repair or maintenance activity in a timely manner.~~

~~(e) In any enforcement proceeding, the Permittee seeking to establish the occurrence of an malfunction, out of control period, calibration and adjustment activity, repair or maintenance activity has the burden of proof.~~

~~(f) IDEM, OAQ may require that the Preventive Maintenance Plans required under 326 IAC 2-7-4(c)(9), Operation, Maintenance and Monitoring Plan required under 40 CFR 63 or the Startup, Shutdown and Malfunction plan required under 40 CFR 63.6(e)(3) be revised~~

~~in response to a malfunction, out of control period, calibration and adjustment activity, repair or maintenance activity.~~

(8) Daily Opacity Observations and Visible Emissions Notations
The reference in D.1.14 to 326 IAC 2-2 should be deleted because these provisions simply reflect NSPS requirements. There is no BACT analysis to support them. Nucor also requests that the OAQ replace "other Meltshop Roof Monitors" with "Meltshop Roof Monitor" to remain consistent with NSPS Subpart AAa. [Nucor Steel]

IDEM Response

These vents and monitors are exhausts used by the operations in the meltshop. They have to be monitored the same way as the exhaust stacks.

Other options for the vents and roof monitors to be monitored in terms of opacity is for Nucor Steel to perform visible emissions notations on a once per shift basis. However, since the NSPS Part 60 Subpart AAa already requires a once per day Method 9 reading, this was also decided to be the compliance method to satisfy PSD and Part 70 requirements.

D.1.14 Pursuant to 326 IAC 2-2 (PSD) and 40 CFR 60.273a, the Permittee shall have a certified visible emissions reader/observer to conduct, perform and record visible observations of the:

(a) EAF Baghouse1 Roof vent, and

(b) ~~other~~ Meltshop Roof Monitor~~s~~**,**

once per day, when either one or both the Meltshop EAFs are operating in the melting and refining period, in accordance with 40 CFR 60, Appendix A, Method 9.

Testing Requirements

(1) Testing Schedule

Nucor's permit application is unusual in that Nucor seeks to make a large number of relatively insignificant changes to existing process units so that these units will more consistently and closely attain their peak production rate. This differs from the traditional PSD permit modification, where a source seeks to add an emissions unit or replace or upgrade an existing unit. In Nucor's case, there are a number of minor changes to the various emissions units that may be necessary to achieve Nucor's production goals. Nucor does not know whether all of the requested changes will be necessary. Similarly, Nucor does not intend to discontinue operations of its existing units while the various minor changes are made. Instead, Nucor anticipates that it will make a change, assess its effectiveness, and the make additional changes if necessary to achieve Nucor's production goals. Nucor does not believe that this is either unusual or controversial. Unfortunately, it is not clear how these changes are to be reconciled with the OAQ's proposed stack testing and/or Affidavit of Construction requirements. Nucor proposes the following:

In lieu of the existing stack testing requirements "within 60 days of achieving maximum production" and "180 days of initial startup," which is unworkable given the many, individually insignificant changes being made to existing equipment, Nucor proposes the following:

> Permittee shall test the [unit name] within 180 days after making the first modification allowed under this permit and, if testing at that time is at less than 90% of the permitted maximum production rate, Permittee shall retest the affected unit(s) within 90 days of achieving a 15% increase in production rate (based on a quarterly average) over the production rate in the previous stack test, until such time as Permittee achieves 90% of the permitted maximum production rate.

Nucor requests that this change be made to Conditions D.1.11(a), D.1.11(b), D.2.4(a), D.4.8(a) and D.5.9(a). [Nucor Steel]

IDEM Response

The intent of this requirement is for Nucor Steel to perform compliance testing for the specified pollutants no later than 180 days of the start up of the modified EAFs. Nucor can work with IDEM staff involved in compliance testing by submitting test protocols, detailing the schedules, methods, options, and production rates.

Condition B.6l indicates the allowed physical modifications for the EAFs. Nucor Steel has to evaluate which one of these planned modifications will trigger the initial start up of the modified EAFs.

326 IAC 3-6 (Source Sampling Procedures) provide guidance and steps on sampling protocols, emission testing and reporting.

326 IAC 3-6-3(b)(1) indicates emission testing shall be conducted while the facility is operating 95% to 100% of its permitted operating capacity. However, pursuant to 326 IAC 3-6-3(b)(3), request to have a different capacity during the test can be made through the submission of the required test protocol.

The same requirements apply to the other operations involved in the modification that have been required to be tested.

There are no change in the draft permit due to these comments.

(2) NSPS Testing Requirements
The proposed changes to the EAFs are not a NSPS modification because the EAFs are not "existing facilities" as defined by the NSPS regulations. An initial startup can only occur after the initial construction, reconstruction, or modification that subjects the unit to NSPS. The EAFs are currently subject to NSPS and therefore the initial startup has already occurred. As a result, the cited NSPS Subpart AAa authority (40 C.F.R. '' 60.270a and 60.275a) for requiring performance testing after initial startup should be deleted throughout Section D.1.11. Nucor requests that the NSPS test language be replaced with the language suggested in its general comments. Furthermore, to provide consistency with NSPS Subpart AAa, Nucor requests that the OAQ replace "other Meltshop Roof Monitors" with "Meltshop Roof Monitor" in Section D.1.11(c)(ii) and delete "Treatment System" in Section D.1.11(c)(iii) as the treatment system is not a unit subject to NSPS, Subpart AAa. *See* 40 C.F.R. ' 60.270a. [Nucor Steel]

IDEM Response

Nucor's EAFs are already subject to the NSPS 40 CFR Part 60 Subpart AAa. NSPS also applies to any modification of the affected facility if there is an actual increase in emissions on the NSPS pollutant. Since this modification (physical and operational change) still makes the EAFs subject to the NSPS Subpart AAa, the performance testing has to be repeated. To avoid confusion, the word "initial" has been deleted to differentiate it from the first time the opacity test has been required.

D.1.11(c) Pursuant to 326 IAC 2-2 (PSD) and 40 CFR 60.275a, the Permittee shall perform ~~an initial~~ compliance test for opacity on the:
(i) Meltshop EAF Baghouse1 roof monitor,
(ii) ~~other~~ Meltshop Roof monitor~~s~~, and
(iii) EAF Dust Handling~~/Treatment~~ System,
within 60 days after achieving maximum capacity, but no later than 180 days after ~~initial~~ start up of the modified EAFs, utilizing 40 CFR Part 60, Appendix A, Method 9, or other methods as approved by the Commissioner.

(3) Filterable and Condensible PM_{10} Testing Requirement
Based on Nucor's objection to the OAQ's incorporation of filterable and condensible PM_{10} emissions in establishing the limit for the Meltshop EAF Baghouses without adequate information or justification, Nucor

objects to the associated testing requirement in Section D.1.11(a)(iii) (the second (iii) in the enumerated list). The definition of PM_{10} at Section D.1.11(f) also should be removed. [Nucor Steel]

IDEM Response

Since IDEM retained the PM10 (filterable and condensible) PSD BACT limits in the permit, its corresponding compliance testing will also be retained.

There is no change in the draft permit due to this comment.

(4) NSPS Testing - - Methods to be Listed

Condition D.1.11(e): In accordance with 60.275a(e), Method 5 is required for negative pressure baghouses and Method 5D for positive-pressure baghouses, this section of the NSPS does not appear to allow for any alternative test Methods to be deemed acceptable. It is suggested that the other test Methods listed in the permit condition be removed. [USEPA]

IDEM Response

The particulate testing requirement is not limited to satisfy the NSPS requirements. The particulate testing is also required to show compliance with the PSD and Part 70 programs, thus the other testing methods are specified.

There is no change in the draft permit due to this comment.

(5) NSPS Testing Methods and Procedures

(a) It appears that the sampling time and volume requirements are missing from the permit. Please include. [USEPA]

(b) The NSPS requirement to not add gaseous dilutants to the effluent during the performance test(s) in 60.275a(a) appears to be missing from the permit, could you please explain why this requirement was excluded. [USEPA]

(c) Since the Meltshop EAFs will utilize more than one control device during normal operation, it appears that the requirements of 60.275a(e)(2) should apply to this facility. [US EPA]

(d) The NSPS requirement to monitor the specific information during performance test specified in 60.275a(h) appears to be missing from the permit requirements. Please explain how these requirements will be fulfilled or revise the permit accordingly. [USEPA]

IDEM Response

The testing methods and procedures in 40 CFR Part 60.275a were not excluded. Instead of itemizing each and all the requirements of 40 CFR Part 60.275a(a) to (j), the Testing Requirement in the draft permit simply references the general provisions of the rule cites (i.e. Subpart AAa and 40 CFR Part 60.275a). However, to make it clearer, the following statement has been added:

D.1.11(j) Testing shall be conducted in accordance with Section C - Performance Testing **and 40 CFR Part 60.275a(a) to (j) (as applicable).**

(6) EAF Dust Monthly Testing
Nucor questions the requirement in Section D.1.11(d) to sample EAF dust on a monthly basis given the low variability of lead content. Although Nucor does not object to providing the OAQ with baghouse dust lead concentration data, the limited lead content variability does not warrant monthly sampling or even an air permit condition. [Nucor Steel]

Nucor requests clarification from the OAQ as to why monthly lead sampling is required under Section D.1.11(d) of the proposed permit when particulate modeling is deemed sufficient to determine whether ambient lead levels will exceed the federal standard and the federal standard is deemed "safe" as a matter of law. [Nucor Steel]

IDEM Response

Lead is a criteria pollutant under the PSD program, in addition to being a HAP. In addition to the 2.5-year cycle to perform compliance testing, a short term (continuous basis) compliance has to be done.

In 2001, the IDEM has gone through an extensive appeal process concerning Lead in a similar unit/process (SDI Whitley County, IN). One of the solutions to satisfy the remand was to specify provisions that assure that the filterable and condensible fractions of Lead are taken into account. The monthly Lead testing is one of these provisions.

After sufficient data has been established from the monthly Lead sampling that demonstrates the PTE of the Lead is under the PSD significant level, Nucor may request to either decrease the sampling frequency or remove the sampling requirement entirely.

There is no change in the draft permit due to this comment.

(7) LMF Sulfur Content During Testing
While Nucor can provide the OAQ with an average of the sulfur content of raw materials used from the previous year based on vendor information, it is impossible to know the sulfur content of the raw materials to be used during testing (i.e., the grade of steel to be produced is unknown) at the time of the submission of the test protocol. Accordingly, Nucor requests that the OAQ either delete this requirement [D.2.4(b)]or revise it to require Nucor to simply provide a best estimate. [Nucor Steel]

IDEM Response

IDEM is aware of the factors contributing to the difficulty of accurately estimating the sulfur content of the raw materials to be used. The intent of this requirement is for Nucor to provide an estimate of the sulfur content by basing the estimate based on available data. To provide flexibility:

D.2.4(b) With the submission of the test protocol, at a minimum, the Permittee shall include **estimates** ~~the information~~ of **the** sulfur content of the raw materials to be used in testing and the sulfur content of the raw materials used from previous year.

(8) Pickling Lines Compliance Testing

Nucor requests clarification of what is meant by "utilizing other methods as approved by the Commissioner" at the end of Section 4.8(a). Furthermore, because the "initial startup" for the Pickle Lines has already occurred, Nucor has already complied and submitted its initial performance test to the OAQ pursuant to 40 C.F.R. ' 63.7 and 63.1161. Nucor requests that paragraph (a) be revised to begin with "If Permittee's changes to the Pickle Lines constitute "reconstruction" under 40 CFR 63, Subpart CCC, then pursuant to [continue with remainder]" Testing pursuant to this provision should only be required if reconstruction under the NESHAP occurs. Nucor does not object to the regular performance testing schedule set forth in paragraph (d). [Nucor Steel]

IDEM Response

The intent of the condition is for Nucor to perform testing within the specified period. The OAQ database is showing that the Pickling Lines have been tested in 2001. Since the pickling lines are being modified as part of this modification, testing has to be performed again to prove that compliance is still being attained after the modification. To avoid confusion, the condition has been changed to remove the reference to "initial" and to referenced the approved methods in the NESHAP 40 CFR Part 63, Subpart CCC. The option that Nucor Steel can petition another testing method was retained, as long as such petition was approved by IDEM prior to testing. Other test methods can be decided through the submission of the required test protocol.

D.4.8(a) Pursuant to 40 CFR 63, Subpart CCC and 326 IAC 2-2 (PSD), within 60 days after achieving maximum production rate, but no later than 180 days after ~~initial~~ start-up of the modified pickle lines, the Permittee shall perform testing:

(i) to measure simultaneously the inlet and outlet of each scrubber (PL1 Scrubber and PL2 Scrubber), to determine the collection efficiency of each scrubber; or

(ii) to measure the HCl concentration;

utilizing **methods specified in 40 CFR 63, Subpart CCC or** other methods as approved by the Commissioner.

(9) Acid Regeneration HCl and Cl2 Concentration Testing

Nucor requests that the OAQ replace "scrubber control" with "HCl and Cl_2 emission concentrations" in paragraph (6) of Page 26 the TSD, as required by 40 C.F.R. ' 63.1157(b). [Nucor Steel]

IDEM Response

This serves as a clarification:

Compliance testing will be required in the Acid Regeneration to show compliance with the ~~scrubber control~~ **HCl and Cl2 emission concentrations as required by 40 CFR Part 63, Subpart CCC .**

(10) Acid Regeneration Compliance Testing
The "initial startup' for Acid Regeneration has already occurred and Nucor has already complied and submitted its initial performance test to the OAQ pursuant to 40 C.F.R. ' 63.7 and 63.1161. While Nucor does not object to the performance testing schedule, the reference to 'initial' startup should be removed in D.5.9.

Nucor requests that paragraph D.5.9(a) be revised to begin with "If Permittee's changes to the Acid Regeneration constitute "reconstruction" under 40 CFR 63, Subpart CCC, then pursuant to [continue with remainder]" Testing pursuant to this provision should only be required if reconstruction under the NESHAP occurs. Nucor does not object to the regular performance testing schedule set forth in paragraph (d). [Nucor Steel]

(11) Acid Regeneration HCl and Cl2 Concentration Testing
The performance testing requirements to measure collection efficiency in Section D.5.9(a)(ii) should also be removed as HCl and CL_2 concentrations must be measured for Acid Regeneration pursuant to 40 C.F.R. ' 63.1157(b). [Nucor Steel]

(12) Acid Regeneration Approved Test Methods
Nucor also requests that the OAQ remove "utilizing methods as approved by the Commissioner" at the end of Section D.5.9(a)(ii) as it is duplicative of Section D.5.9(c). [Nucor Steel]

IDEM Response

The OAQ database is showing that the last testing performed on the acid regeneration was in 2001. The acid regeneration is planned to be modified, and it is understood that testing is required if the planned physical modification goes through.

- - 40 CFR Part 63.1157(b) deals with the emission standards of existing acid regeneration plant.
  HCl = 25 ppmv
  Cl2 = 6 ppmv
- - 40 CFR Part 63.1158(b) deals with the emission standards of new or reconstructed acid regeneration.
  HCl = 12 ppmv
  Cl2 = 6 ppmv
- - 40 CFR Part 63.1161(a)(1) deals with the performance testing and test methods. The Permittee shall conduct a performance test for each process or control device to:
  (a) either measure simultaneously the mass flows of HCl at the inlet and outlet of the control device (to determine compliance with the applicable collection efficiency standard),

(b) or measure the concentration of HCl and Cl_2 for hydrochloric acid regeneration plant, in gases existing the process or the emission control device (to determine compliance with the applicable emission concentration standard).

Since the standards established for the acid regeneration are in terms of the HCl and Cl_2 concentrations, testing will also be limited to such standards.

The same clarification made to the pickling lines have been made to this condition. IDEM also deleted the duplicative sentence. Subsequent conditions have been re-numbered.

D.5.9(a) Pursuant to 40 CFR 63, Subpart CCC and 326 IAC 2-2 (PSD), within 60 days after achieving maximum production rate, but no later than 180 days after ~~initial~~ start-up of the modified acid regeneration , the Permittee shall perform testing~~:~~
~~(i) to measure simultaneously the inlet and outlet of each scrubber (PL1 Scrubber and PL2 Scrubber), to determine the collection efficiency of each scrubber; or~~
~~(ii)~~ to measure the HCl and Cl_2 concentrations;
utilizing **methods specified in 40 CFR 63, Subpart CCC or** other methods as approved by the Commissioner.

~~D.5.9(c) These tests shall be performed using methods as approved by the Commissioner.~~

NSPS Reporting Requirements

(1) NSPS Reporting Applicability : New Units vs. Modified Units

The 40 C.F.R. ' 60.7(a) notification requirements specified under Section B.5(b) pursuant to the NSPS General Provisions apply only when a unit initially becomes subject to NSPS. Because the existing EAF, AOD, and EAF dust handling system have previously triggered NSPS requirements, these units are not again subject to initial notification requirements. A change to a unit already subject to NSPS does not require the owner or operator to again submit initial notifications.

A "modification" under NSPS can occur only to a unit that has yet to trigger NSPS requirements. A "modification" is defined as "any physical change in, or change in the method of operation of, an ***existing facility*** which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted." 40 C.F.R. ' 60.2 (emphasis added). An "existing facility" is defined as "any apparatus of the type for which a standard is promulgated under this part, and construction or modification of which was commenced before the date of proposal of that standard; or any apparatus which could be altered in such a way as to be of that type." ***Id.*** Accordingly, because the existing EAF, AOD, and EAF dust handling system are already subject to NSPS, they are not "existing facilities" as defined by NSPS and therefore no NSPS modification can occur. Instead, these units are "affected facilities," which are defined as "any apparatus to which a standard is applicable." Because these units are affected facilities, notification requirements apply only upon the commencement of construction (or reconstruction) and initial startup. The changes proposed for these affected facilities do not constitute construction or initial startup and therefore notification requirements do not apply. Accordingly, Nucor requests that the OAQ revise Section B.5(b) to clarify that the NSPS notification requirements apply only to the new Cold Mill Boiler and the new BOC Gases Boiler.

To provide clarification, Nucor suggests that the OAQ delete "Subpart AAa, and" and add "for the new Cold Mill Boiler and new BOC Gases Boiler" at the end of Section B.5(b). In addition, neither a CEMS nor a COMS is required pursuant to NSPS Subpart Dc and therefore 40C.F.R." 60.7(a)(5) and 60.7(a)(6) do not apply. As a result, Section B.5(b)(iv) and (v) should be deleted.

As explained previously, the 40 C.F.R. ' 60.7(a) notification requirements apply only when a unit initially becomes subject to NSPS via the commencement of construction (or reconstruction) of an affected facility. A physical modification to an existing affected facility is of no consequence. In fact, a "modification" as defined by the NSPS regulations can only occur to an "existing facility," which by definition can occur only to a unit that has yet to trigger NSPS requirements. Accordingly, Nucor requests that the OAQ revise paragraph (1)(c) of the TSD to clarify that the milestones required to be reported are applicable only to the new boilers. [Nucor Steel]

IDEM Response

It is correct that the EAFs, AOD, and EAF dust handling system are already subject to the NSPS 40 CFR Part 60, Subpart AAa. However, whenever a physical modification is done on these affected facilities, the requirements are re-evaluated . The reporting and testing requirements have to be fulfilled after the physical modification are made. NSPS modification provisions are triggered by an increase in emissions to the atmosphere of any NSPS pollutant, when such increase results from a physical or operational change to the facility.

No USEPA written guidance is found that indicates that these notifications requirements are only required for modified facilities that become subject to the NSPS due to the modification.

No USEPA written guidance is found that indicates that these notifications requirements are not required after modification of an affected facilities.

IDEM has been requiring these notifications every time an affected facility undergoes permitting review.

There is no change in the draft permit due to this comment.

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(2) Method 9 vs. COMS

40 C.F.R. ' 60.7(a)(7) requires notification if a facility ***elects*** to use COMS data results during a performance test in lieu of a Method 9 observation as allowed by 40 C.F.R. ' 60.11(e)(5). Because Subpart Dc requires neither a Method 9 observation nor an opacity limit, Nucor will never make such an election. Thus, Section B.5(b)(vi) should be deleted as well. [Nucor Steel]

IDEM Response

The EAF is an affected facility under 40 CFR Part 60, Subpart AAa. At this time, Nucor does not use a COMS to comply with the opacity standards specified in this specific NSPS. Under the proposed modification, a COMS is technically feasible to be installed and will be used as compliance tool in the baghouse stack. Nucor has to make the required notification of the start of using the COMS data as compliance with the applicable requirements.

There is no change in the draft permit due to this comment.

(3) NSPS General Provision

This section D.1.3 simply restates what has been previously stated in Section B.5(a). To help streamline the permit, Nucor requests that the OAQ delete the duplicative section either here or in Section B.5. [Nucor Steel]

IDEM Response

The NSPS requirements in Section B are different requirements from the NSPS requirements specified in Section D.

- - Condition B. 5 deals with the notification and reporting requirements to be fulfilled after finishing construction and start of operation.
- - Section D deals with the on going applicable emission limits and standards, and compliance monitoring.

It may look a duplication, however, the intent is to cite the general provisions whenever a different set of requirements appear at different sections of the permit.

There is no change in the draft permit due to this comment. However, IDEM is making the following change based on other Nucor's comment.

D.1.3 The provisions of 40 CFR Part 60, Subpart A (General Provisions), which are incorporated by reference in 326 IAC 12-1, apply to the EAFs, AOD and EAF Dust Handling~~/Treatment~~ system except when otherwise specified in 40 CFR Part 60, Subpart AAa.

(4) NSPS Subpart AAa: EAF Dust Treatment Not Subject

In paragraph (7) of Page 26 of the TSD Testing Requirements, "treatment" should be removed as the treatment system is not a unit subject to NSPS Subpart AAa. [Nucor Steel]

IDEM Response

This serves as a correction:

Compliance testing will be required at the EAF dust handling/treatment system to verify compliance for opacity. This EAF dust handling~~/treament~~ system is subject to NSPS 40 CFR 60 Subpart AAa, and requires an opacity compliance testing.

(5) NSPS Monitoring Device

Condition D.1.19: The monitoring device requirements included in 60.274a(b) appear to be missing from specified permit conditions. Please demonstrate how this NSPS requirement will be fulfilled. [USEPA]

IDEM Response

40 CFR Part 60.274a(b) is not required if shop opacity observations are performed by a certified visible emission observer [40 CFR Part 60.273a(d)]

Nucor is complying with the opacity standards by observing opacity performed by a certified operator.

There is no change in the draft permit due to this comment.

Scrap Management Plan

(1) Scrap Management Plan Revision

As drafted, Section D.1.8(c) could be construed as requiring a permit modification in the event there is ever a change in the current scrap management plan (SMP). Indeed, Nucor is submitting a revised SMP to the OAQ. Although BACT requires a SMP, the SMP itself is not part of the permit.

Accordingly, Nucor requests that the OAQ either delete the second sentence or replace 'attached to" with "required by" to clarify that the attached scrap management plan is for reference only and is not part of the permit subject to permit revision requirements under either 326 IAC 2-2 or 326 IAC 2-7. [Nucor Steel]

IDEM Response

Implementing the scrap management plan (SMP) is a BACT option, and it is part of the permit. SMP, similar to the fugitive dust plan (FDP), is part of the permit. The SMP should specify, at a minimum, the basic general specifications of scrap, steps and procedures in inspecting, accepting or rejecting a batch of scrap.

There is no change in the draft permit due to this comment.

(2) Non-ferrous or Non-metallics Scrap

Section D.1.8(c)(i) could be construed as requiring Nucor to ensure that all grades of scrap ***never*** contain non-ferrous or non-metallics (i.e., small amounts could be overlooked, but still considered "observable"). This is inconsistent with the commercial practice and intent of the provision. Nucor therefore requests that the OAQ revise Section D.1.8(c)(i) as follows:

(i) All grades of scrap shall contain no more than insignificant quantities of observable non-ferrous metals or non-metallics. [Nucor Steel]

IDEM Response

IDEM agrees with the recommended change. In addition, IDEM is clarifying that this applies to the scrap charged into the furnaces, because there might be instances where the small pieces of copper, plastic, or wood in the storage pile might still be present and then removed before the charge.

IDEM also clarifies that free does not necessarily mean totally zero. However, it is in the company's advantage to inspect and accept only loads of scrap that are as visually free of oil, grease, non-ferrous materials, asbestos, chemical containers, fuel, lead and tin, as humanly possible. It has to be accepted that there might be loads now and then that might have these unwanted materials, however, in all scrap loads, the Permittee still has to comply with their PSD BACT limits at all times.

D1.8(c)(i) All grades of scrap **charge to the furnaces** shall **not** contain **significant** ~~no~~ observable non-ferrous metals or non-metallics.

(3) Scrap Pipe
In Section D.12.1(c), "scarp pipe" should be "scrap pipe." [Nucor Steel]

IDEM Response

The typographical error is corrected.

D.12.1(c) Scrap cutting allowed outdoors ~~are~~ **is** limited to scrap items such as furnace roof, railroad cards, ductwork, long pieces of ~~scarp~~ **scrap** pipe and bar stock, that can not fit in the existing building. Galvanized scrap shall not be cut outdoors. Outdoor means the cutting is done outside of a building.

(d) The visible emissions **from the building enclosing** ~~during~~ the scrap cutting operation ~~in a building~~ shall not exceed 3% opacity based on a 6-minute average.

(e) The visible emissions **from** ~~during~~ the outdoor scrap cutting operation shall not exceed 3% opacity based on a 6-minute average.

(4) Indoor Scrap Cutting Opacity Limit
Because the OAQ's BACT analysis does not establish an opacity limit for indoor scrap cutting, Nucor requests that the OAQ delete Section D.12.1(d). [Nucor Steel]

IDEM Response

Nucor's scrap cutting that is done inside their 3-walled building, vents to the EAFs' baghouses. The EAFs baghouses are limited to 3% opacity as BACT. Based on this, the opacity limit for scrap cutting is also 3%.

Nucor also has other particulate emitting operations that are controlled by baghouses, and have 3% opacity limit, such as blasting.

There is no change in the draft permit due to this comment.

(5) Outdoor Scrap Cutting Opacity Limit
Nucor requests that the opacity limit for outdoor scrap cutting be revised from 3% to 20%, which is still more stringent than the general 40% opacity limit specified in 326 IAC 5-1-2. The OAQ' BACT evaluation neither identifies a similar source with a 3% opacity limit nor provides a rationale for such a stringent limit. Indeed, Nucor's proposed 20% limit is consistent with that provided by the Indiana regulations for steel mills cutting scrap in nonattainment areas. ***See e.g.***, 326 IAC 6-1-10.1(p)(F) (iii) (setting forth a 20% opacity limit for steel scrap cutting activities at steel mills in the Lake County nonattainment area). Furthermore, Nucor's outdoor scrap cutting is limited to those items that cannot fit inside the existing building. [Nucor Steel]

The OAQ's BACT evaluation neither identifies a similar source with a 3% opacity limit nor provides a rationale for such a stringent limit for outdoor scrap cutting. Accordingly, Nucor requests that the OAQ revise the opacity limit for outdoor scrap cutting to 20%, which is still more stringent than the general 40% opacity limit specified in 326 IAC 5-1-2. Nucor's proposed 20% limit is also consistent with that provided by the Indiana regulations for steel mills cutting scrap in nonattainment areas. ***See e.g.***, 326 IAC 6-1-10.1(p)(F) (iii) (setting forth a 20% opacity limit for steel scrap cutting activities at steel mills in the Lake County nonattainment area). Furthermore, Nucor's outdoor scrap cutting is limited to those items that cannot fit inside the existing building. [Nucor Steel]

(6) Scrap Cutting VE
Due to the nature of these operations, there is little likelihood that significant visible and particulate emissions will be generated, let alone ever escape beyond the property line. Therefore, Nucor requests that the OAQ remove the visible emissions notations requirements. No CRP is required for the reasons stated previously. [Nucor Steel]

Again, because the incidence of visible emissions from scrap cutting is minimal, Nucor requests that the OAQ remove the visible emissions notations and the associated record keeping requirements in Section D.12.3(a). [Nucor Steel]

IDEM Response

The BACT for scrap cutting is using an enclosed suitable building. If Nucor prefers to cut scrap outside their existing 3-walled building, then it has to comply with the BACT opacity limit of 3%. Compliance with this opacity standard may be accomplished by using a baghouse. The scrap cutting operation is not considered insignificant activity because the PTE is not minimal and there is no enforceable restrictions on the amount of scrap or hours of operation.

Table 37 (BACT Scrap Handling and Processing of Similar Sources) in Appendix B - - PSD BACT Evaluations- - does not show operations with 20% limits. Processes required to use baghouse have 3% opacity. Even roads, that are controlled by water/chemical suppressant have 3% opacity limit.

It is technically feasible to operate a baghouse when scrap cutting even when it is done outside the 3-walled building. Nucor has to provide economical analysis why such operation of a baghouse is not feasible. If the cost analysis was based on limited amount or hours of operation, such criteria will be made enforceable requirements in the permit.

SDI Hendricks County, IN recently issued permit specified a BACT limit of 3%.

In response to Nucor's verbal comment:

- - Can a contractor do the outside scrap cutting and get their own permit?
  A separate contractor may perform the scrap cutting for Nucor, however, since the contractor will be considered as 1 source with Nucor, it will still be the same requirements.
- - How about if the contractor is going to be located 10 miles away from the Nucor plant?
  IDEM will evaluate if the contractor is going to be one source with Nucor, based on the location, ownership and support criteria. The distance, in this case, plays a significant factor in making the source determination.

There is no change in the draft permit due to these comments. However, IDEM is making the following changes based on other Nucor's comments.

D.12.2(f) The Compliance Response Plan for this unit shall contain troubleshooting contingency and **reasonable** response steps for when an abnormal emission is observed. Failure to take **reasonable** response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports, shall be considered a ~~violation of~~ **deviation from** this permit.

(7) Appendix B, Page 70
Please review the wording in the paragraph that begins "Nucor Steel, IN decided that no additional...". [USEPA]

IDEM Response

This serves as correction:

Nucor Steel, IN decided that no additional truck as slag pot carrier will be added, such that there is no physical modification ~~is experience in terms of transportation~~. Increase in utilization of existing slag pot carrier is expected.

There is no change in the draft permit itself due to this comment.

LMF SO2 PSD BACT

(1) LMF SO2 BACT Analysis
Appendix B, Page 43, (6)(B): The Technically Infeasible Control Options section of the BACT analysis for the LMF SOx provides a blanket statement that "due to the relatively large gas flow rate, low SO2 concentrations in the gas stream and large temperature fluctuations..." none of the technologies are feasible. Since this technology could potentially be applied, it is requested that this section be expanded to support this statement. It appears that the flow through the LMF is 4 to 8 times less than the EAF and the concentration of SO2 is only slightly less. It appears that further analysis might be warranted. [USEPA]

IDEM Response

It has to be emphasized that none of the SO2 technologies(Spray Dryer Absorption (SDA), Wet Scrubbing and Dry Sorbent Injection (DSI)) have been applied to LMFs. Even for sources where the EAFs and the LMFs exhaust to the same stack, none of these SO2 control technologies have been considered technically feasible.

The SO_2 Control Technology Technical Feasibility Study in Appendix B - - PSD BACT Evaluations (pages 15 and 16) that was made for the EAFs applies to the LMFs too. The conclusion made was based on the fact that if these SO2 control technologies have not been considered technically feasible for EAFs, then the same control technologies are not technically feasible for LMFs. It has to be noted that EAFs have higher emission rates than LMFs.

In summary, due to the expected low concentration of SO_2 in the exhaust gas stream, any add-on control device would be considered technically infeasible and economically infeasible for the LMFs.

There is no change in the draft permit due to this comment.

(2) SO2 Control Cost Analysis
On the top of page 44 of Appendix B, a BACT analysis from a previous Nucor PSD permit is referenced as a recent cost analysis performed that demonstrated that SO2 controls would not be feasible. This analysis however, appears to be almost three years old (not one year, as referenced). It is requested that an updated cost analysis be performed. [USEPA]

IDEM Response

The Strip Caster LMS was permitted in January, 2001. The application for this proposed modification under review was submitted in November, 2002. IDEM still considered this cost analysis to be sufficient for evaluation.

It has to be noted that none of the SO2 control technologies is technically feasible to control emissions from the LMFs. However, some of these control technologies have been successfully applied to utility boilers, then based on technology transfer, the controls could possibly apply to LMFs. Per the USEPA Guidance, there is no need to perform cost analysis if a control technology is considered technically infeasible.

(3) LMF SO2 BACT Numerical Limit

Condition D.2.1(f): It appears there could be a miscalculation in the pounds per hour limit for SO2. Please check calculations. [USEPA]

IDEM Response

The incorrect calculation has been corrected based on the following:
SO2 = (0.185 lb/ton)*(502 ton/hour) = 92.87 lb/hour.

D.2.1(f) The SO_2 emissions from the Meltshop LMF Baghouse shall not exceed 0.185 lb/ton of steel produced and ~~80.32~~ **92.87** pounds of SO_2 per hour, based on a 3-hour block average.

(4) LMF SO2 CEMS

Based on the emission factors and maximum steel production of the facility, the LMF has the potential to emit over 400 tons of SO2 per year. Has a SO2 CEMS device been considered for this stack? [USEPA]

IDEM Response

The LMF has SO2 PTE of:
SO_2 = (0.185 lb/ton)*(502ton/hour)*(8760 hour/year)*(1 ton/2000 lb) = 406.77 ton/year

The draft permit specified a SO_2 compliance testing in a 2.5-year cycle.

The scrap and other materials that is processed in the LMF is the same scrap that has been monitored in the EAFs. IDEM will be adding a compliance monitoring requirement to monitor the sulfur content of the charge carbon and injected carbon.

SO_2 compliance testing and monitoring the sulfur content of carbon are sufficient compliance methods to assure compliance with the SO2 BACT limit.

A PSD permit (107012143-00038), issued to Nucor on January, 19, 2001 for their Strip Caster LMS, did not have an SO_2 CEMS. It has the same SO_2 compliance testing requirement.

The following condition has been added in Section D.2 of the permit:

D.2.5 Sulfur Content

The Permittee shall monitor the sulfur content of the charge carbon and injection carbon added to the LMFs. Vendor certifications or analyses may verify the sulfur content of the charge carbon and injection carbon.

Corresponding record keeping requirement has also been added in Condition D.2.10.

Due to the addition of Condition D.2.5, subsequent conditions in Section D.2 have been renumbered.

LMF CO PSD BACT

(1) Compliance with the LMF CO BACT Limits

Based on the emission factors and calculations in Appendix A (Table 9), it appears that the LMF has the potential to emit over 156 tons per year of CO, 38 tons per year of NOx and 18 tons per year of VOC. Please explain how compliance with these limits will be demonstrated (i.e. why a stack test and/or other method of compliance isn't required for these pollutants). [US EPA]

IDEM Response

IDEM re-evaluated the compliance monitoring for the Meltshop LMFs.

IDEM agrees that there should be a performance testing to verify compliance. Based on the PTE, CO testing will be required. NOx and VOC testing will not be required because they are below the significant threshold.

D.2.4(a) Pursuant to 326 IAC 2-2 (PSD), within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up of the modified Meltshop LMFs, the Permittee shall perform testing on the Meltshop LMF Baghouse for the following:

(i) SO_2,

(ii) Filterable PM, ~~and~~

(iii) Filterable and condensible PM_{10}, **and**

(iv) CO.

(2) Flaring CO Emissions

Appendix B, Page 45, (9)(B): Could you please explain why the temperature of exhaust would need to be raised prior to flaring CO emissions? Further technical clarification would be much appreciated. [US EPA]

IDEM Response

Flaring is a CO control that can successfully oxidize CO emissions if the exhaust gas temperature is at 1,300 to 1,800 ^{o}F and sufficient residence time is maintained. The LMFs exhaust gas stream are much lower in temperature that this range. Based on this, to have a successful flaring of CO emissions, the temperature has to be raised, which would require additional fuel and create more emissions.

There is no change in the draft permit due to this comment.

(3) LMF CO BACT Limit Comparison

Appendix B, Page 46, Table 21: The statement is made that "this [CO] limitation is more restrictive than BACT determinations for similar sources, however the table lists SDI, Dekalb, IN with a CO limitation of 0.01, much less than the proposed 0.07125 Nucor limitation. Stack test data is generally not a sufficient mechanism on which to justify a higher BACT limitation. [US EPA]

IDEM Response

The CO BACT limit for SDI, Dekalb County, IN is more restrictive than the BACT determinations for similar sources that are in the RBLC.

The Nucor LMFs CO BACT limit was based on their own stack test, which was also used as a basis for their other LMF (Strip Caster LMS). Since BACT is proper operation of the LMFs, sources operate their LMFs slightly differently, which contributes to the selection of BACT. A more stringent CO limit is not justified in this case because proper combustion operation is achieved and the numerical limit is the result of their own compliance testing.

There is no change in the draft permit due to this comment.

EAF Dust Handling and Dust Treatment Systems PSD BACT

(1) 2 Different Systems: Handling and Treatment
The header of this provision (D.1.6) and the provision in paragraph D.1.6(a) should be revised to reflect that the Dust Handling and Dust Treatment are separate systems, as follows:
(a) Visible emissions from the EAF Dust Handling and the Dust Treatment Systems shall not exceed 10% opacity each, based on a 6-minute average. [Nucor Steel]

IDEM Response
IDEM agrees.

D.1.6 Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements:
(a) Visible emissions from the EAF Dust Handling **System** ~~/~~ **and the Treatment** System shall **each** not exceed 10% opacity, based on a 6-minute average.

(2) Control Equipment Clarification
(a) For purposes of clarification, Nucor requests that the OAQ revise Section D.1.9(a) as follows:
The EAF Dust Handling System shall be equipped with bin vents on the silos. The Dust Treatment System shall be equipped with a scrubber on the dust system and incorporates baghouse(s) for evacuation of the truck loading buildings. [Nucor Steel]

(b) For purposes of clarification, Nucor requests that the OAQ add "on silos" after "bin vents" in the proposed BACT determination (Appendix B). [Nucor Steel]

(c) Nucor requests that the OAQ replace "EAF Dust Handling System" with "truck loading" in paragraph (1)(d)(i) of the TSD because truck loading, not the EAF dust handling system, is controlled by a baghouse. [Nucor Steel]

(d) Appendix B, Page 73 and D.1.9(a): The BACT analysis for the EAF Dust Handling System only lists "bin vent" as BACT however Condition D.1.9(a) in the permit states that the Dust Handling System shall be equipped with bin vents, a scrubber and a baghouse. Could you please explain why these control devices are listed in the analysis? [USEPA]

IDEM Response
IDEM agrees and this also serves as correction.

D.1.9 Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements:
(a) The EAF Dust Handling~~/Treatment~~ System shall be equipped with bin vents ~~in~~ **on** the silos.

The Dust Treatment System shall be equipped with a scrubber on ~~for~~ the dust system ~~treatment~~ and **shall incorporate** ~~a~~ baghouse**(s)** for **evacuation on the** truck loading **buildings.**

(3) NSPS Subpart 60 Applicability to the EAF Dust Handling - - TSD
Nucor requests that the OAQ replace "40 C.F.R. 60.273(b)" with "40 C.F.R. 60.273a(b)" as the applicable authority and replace "for the EAF Dust Handling/treatment system" with "on any control device serving the dust-handling system" as stated in 40 C.F.R. ' 60.273a(b). TSD Compliance Determination and Monitoring [Nucor Steel]

IDEM Response

This serves as correction:

- - The correct cite is 40 CFR Part 60.273a(b).
- - The EAF Dust Handling System is not required to have a COM.

(4) Compliance Monitoring

(a) To clarify applicability of compliance monitoring in the TSD Compliance Determination and Monitoring,
- - Nucor requests that the OAQ delete the second sentence, and
- - replace the third sentence with "Compliance monitoring will be required at the EAF Dust Treatment scrubber stack." [Nucor Steel]

(b) For purposes of clarification, Nucor requests that the OAQ
- - add "EAF and LMF/LMS" before "baghouses", and
- - replace "use" with "used" in paragraph (4) of the TSD. [Nucor Steel]

IDEM Response

This serves as a clarification:

- - A certified opacity reader is not required to observe visible emissions from the EAF Dust Handling System. There will not be even a visible emission notations requirement.
- - Compliance monitoring will be required at the EAF Dust Handling scrubber stack.
- - All the EAFs, LMFs and LMS baghouses used by Nucor Steel, IN are multi compartment.

Baghouse Operation and Monitoring

(1) EAF Bag Leak Detection System (BLDS)

The Bag Leak Detection System (BLDS) should be an option, not a requirement.

As the OAQ is aware, EPA has proposed an amendment to the NSPS, Subpart AAa requirements, which would allow bag, leak detection coupled with a once-per-day opacity observation as an alternative monitoring option to a COMS. Under the proposed alternative, a facility could elect to install, calibrate, maintain and operate a bag leak detection system ***in lieu of a COMS***. Similarly, Nucor proposed a bag leak detection system (BLDS) for EAF Baghouse No. 2 as an alternative to a COMS, due to the documented problems with COMS accuracy and reliability at extremely low opacity levels. Nucor understands that the OAQ has taken the position that the COMS requirement cannot be removed because the Subpart AAa amendments are still pending. However, the OAQ has now imposed ***both*** a COMS and a BLDS. The doubling of monitoring requirements is unwarranted and unsupported by Indiana law. Indeed, the OAQ has cited no authority for this provision as required by 326 IAC 2-7-5(1)(A).

In the proposed Subpart AAa amendments, EPA has recognized that a BLDS is capable of detecting small leaks while particulate emissions are well below the levels that would result in observable opacity. For that reason, EPA believes that a BLDS is superior than a COMS for monitoring the performance of a baghouse. As the OAQ has noted, the BLDS has not yet been generically approved as an alternative monitoring protocol, so the OAQ cannot approve the BLDS in lieu of the COMS. Such approval is expected during the life of this permit, however. Therefore, Nucor requests that the OAQ include the following provision:

Permittee may elect to install a BLDS meeting the specifications set forth below. If and when EPA approves use of the BLDS in lieu of the COMS required pursuant to NSPS Subpart AAa, either on a case-by-case basis pursuant to 40 C.F.R.' 60.13(i) or by amendment of NSPS Subpart AAa, Permittee may elect to comply exclusively through the use of the BLDS in lieu of the COMS by giving written notice to IDEM, OAQ. Until such time, if Permittee elects to install a BLDS, compliance with the permit opacity limits for the Meltshop Baghouse2 opacity limits shall be evaluated in light of all the evidence, giving due weight to the relative accuracy of the various measurement techniques.

Nucor’s proposed provision thus provides Nucor with an incentive to implement both monitoring systems, which would otherwise not be required, while the amendments are pending.

The proposed bag leak detection system (BLDS) for EAF Baghouse No. 2 is an alternative to a COMS, not an additional requirement. Nucor does not object to making the BLDS requirement for EAF Baghouse No.2 conditional upon the promulgation of the pending amendments to Subpart AAa. Furthermore, given the inability of a COMS to provide reliable monitoring data for the established opacity level, Nucor also has no objection to initially implementing both monitoring systems while the amendments are pending if the OAQ clarifies that the BLDS is an option as set forth in Nucor's "Principal Objections."

With respect to the BLDS provisions as currently drafted, the last sentence of Section D.1.18(b)(ii), which is currently mis-numbered as "D.1.18(b)(b)," should be deleted as it is inconsistent with Section C.14(b)(4), which states that the failure to take reasonable response steps "shall be considered a deviation from the permit." [Nucor Steel]

(2) EAF Baghouse Operation and Short term Limit

D.1.18(a)(i) has an excellent appearance, however there is doubt that it will be achieved. Further there is no requirement that that ability be required to be maintained in continuous normal operation. As a minimum, the certification must be required to be filed with DEM as a public record prior to steel production in excess of 40,000 tons per calendar month. That production level is adequate for Nucor to test its systems (there being no shorter term limit), and it is low enough to inspire Nucor to motivate its bag leak detection system contractor to perform in a timely manner. If, at any time, the certification is withdrawn, then the 40,000-t per calendar month production limit shall be in effect. [Stephen Loeschner]

(3) BLDS Requirement Rule Cite

Conditions D.1.18: Please provide a regulatory citation for the referenced permit conditions. [USEPA]

IDEM Response

In 2001, IDEM resolved an appeal for SDI, Whitley County, IN permit concerning the remanded Lead limit and its monitoring. As part of the resolution, BLDS was added as a compliance monitoring requirement. This has been the procedure by IDEM to require BLDS for similar operations or sources with particulate emitting units that are PSD major.

Both 326 IAC 3-5 and 326 IAC 2-7 provide authority to specify compliance monitoring to assure that compliance is attained on a continuous basis.

The BLDS is one of the options to show compliance for PM. Until the USEPA's changes to the NSPS 40 CFR Part 60 Subpart AAa are finalized, the COMS requirement can not be removed.

If and when the USEPA finalized the NSPS amendment, the IDEM will modify the permit to reflect the latest monitoring requirements.

In most cases, for non PSD sources/units, visible emission notations in conjunction with baghouse pressure drop monitoring and baghouse inspections are sufficient compliance monitoring. For these sources, visible emissions notations alone is not sufficient, thus the baghouse parametric and inspections are added.

The EAFs are the significant operations in this mill. BLDS with baghouse inspections are sufficient compliance monitoring and are not redundant to COMS.. It has to be noted that monitoring of the baghouses pressure drops is not required.

COMS is the compliance method to comply with the opacity standard, while the use of BLDS is the compliance method to show compliance with the particulate limitation

There is no 40,000 tons/month production limit specified in this permit. The PM and PM10 short term limits are specified in grains/dscf.

Annual Compliance Certifications are required for all Part 70 sources.

The BLDS requirement is under the Compliance Monitoring requirements portion of Section D.1. Any conditions under this subsection of Section D is authorized under 326 IAC 2-7-6(1) and 326 IAC 2-7-5(1). If there are additional rule cites that are different from these 2, then the additional cite is specified.

The condition is changed as follows:

D.1.18 Bag Leak Detection System (BLDS)

(a) The Permittee shall install and operate ~~a~~ continuous bag leak detection system**s** (BLDS) for the Meltshop EAF Baghouses (1 and 2). The bag leak detection system**s** shall meet the following requirements:
- (i) The bag leak detection system**s** must be certified by the manufacturer to be capable of detecting particulate matter emissions at concentrations of 0.0018 grains per actual cubic foot or less.
- (ii) The bag leak detection system sensor must provide output of relative particulate matter loading.
- (iii) The bag leak detection system must be equipped with an alarm system that will alarm when an increase in relative particulate loading is detected over a preset level.
- (iv) The bag leak detection system shall be installed and operated in a manner consistent with available written guidance from the U.S. Environmental Protection Agency or, in the absence of such written guidance, the manufacturer's written specifications and recommendations for installation, operation, and adjustment of the system.
- (v) The initial adjustment of the system shall, at a minimum, consist of establishing the baseline output by adjusting the sensitivity (range) and the averaging period of the device, and establishing the alarm set points and the alarm delay time.
- (vi) In no event shall the sensitivity be increased by more than 100 percent or decreased by more than 50 percent over a 365 day period unless such adjustment follows a complete baghouse inspection which demonstrates the baghouse is in good operating condition.
- (vii) The bag detector must be installed downstream of the baghouses.

(b) In the event of a bag leak detection system alarm:
- (i) For multi-compartment units, the affected compartments will be shut down immediately until the failed units have been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the emergency provisions of this permit (Section C- Emergency Provisions).
- (~~b~~ **ii**) Within eight (8) business hours of the determination of failure, **reasonable** response steps according to the timetable described in the Compliance Response Plan shall be initiated. For any failure with corresponding **reasonable** response steps and timetable not described in the Compliance Response Plan, **reasonable** response steps shall be devised within eight (8) business hours of discovery of the failure and shall include a timetable for completion. Failure to take **reasonable** response steps in accordance with Section C - Compliance Response

Plan - Preparation, Implementation, Records and Reports, shall be considered a ~~violation of~~ **deviation from** this permit.

(c) If operations continue after bag failure is observed and it will be 10 days or more after the failure is observed before the failed units will be repaired or replaced, the Permittee shall promptly notify the IDEM, OAQ of the expected date the failed units will be repaired or replaced. The notification shall also include the status of the applicable compliance monitoring parameters with respect to normal, and the results of any response actions taken up to the time of notification.

(4) Truck Loading Particulate Control Equipment Operation
For purposes of clarification, Nucor requests that the OAQ add "building evacuation" after "truck loading" in Section D.1.10(b)(iii). [Nucor Steel]

IDEM Response
IDEM made the changes as recommended.

D.1.10(b) Pursuant to 326 IAC 2-2, the following particulate control shall be in operation and control emissions at all times when its corresponding process is in operation:
(i) bin vents for the silos,
(ii) scrubber for dust treatment, and
(iii) baghouse for truck loading **building evacuation**.

(5) D.2.6 [now D.2.7] LMF Baghouse Parametric Operation
(a) There is no cited authority for this condition as required by 326 IAC 2-7-5(1)(A) of Indiana's Part 70 program. [Nucor Steel]

(b) Nucor requests that the OAQ replace "once per shift" with "once per day" in Section D.2.6(a)[now D.2.8(a)] given the relatively small size of this unit compared to the main EAF baghouse.

(c) Nucor also requests that the OAQ delete the last sentence of Section D.2.6(e)[now D.2.7(e)] as it is inconsistent with Section C.14(b)(4), which states that the failure to take reasonable response steps "shall be considered a deviation from the permit." [Nucor Steel]

IDEM Response
The parametric monitoring required for the baghouse is specified under the Compliance Determination Requirements portion of Section D.2. Any conditions under this subsection of Section D is authorized under 326 IAC 2-7-6(1) and 326 IAC 2-7-5(1). If there are additional rule cites that are different from these 2 rules, that it is the time that the cite is specified.

The LMF is one of the significant operations in this mill. It has its own baghouse to control its emissions. The LMF's baghouse may be smaller than the EAFs baghouses, however, it is comparable to other baghouses in Nucor's plant and other sources in Indiana, where once per shift frequency has been required.

There is no Condition 2.6(e) in the draft permit. However, the change is made on the last sentence of the first paragraph.

D.2.7 Baghouses Parametric Monitoring

The Permittee shall record the total static pressure drop across the Meltshop LMF Baghouse, at least once per shift, when one or more of the Meltshop LMFs is in operation when venting to the atmosphere. ~~Unless operated under conditions for which the Compliance Response Plan specifies otherwise, the pressure drop across the baghouses shall be~~ ~~**maintained**~~ **When for any one reading, the pressure drop across the baghouse is outside** ~~within~~ the range of 1 and 10 inches of water or a range established during the latest stack test, **the Permittee shall take reasonable steps in accordance with Section C - Compliance Response Plan -Preparation, Implementation, Records and Reports**. ~~The Compliance Response Plan for this unit shall contain troubleshooting contingency and~~ ~~**reasonable**~~ ~~response steps for when the pressure reading is outside of the above mentioned range for any one reading.~~

A pressure reading that is outside the above mentioned range is not a deviation from this permit.

Failure to take **reasonable** response steps in accordance with Section C - Compliance Response Plan -Preparation, Implementation, Records and Reports, shall be considered a ~~violation of~~ **deviation from** this permit.

The instrument used for determining the pressure shall comply with Section C - Pressure Gauge and Other Instrument Specifications, of this permit, shall be subject to approval by IDEM, OAQ, and shall be calibrated at least once every six (6) months.

The instrument used for determining the pressure shall have a range higher than 10 inches of water to accurately measure the range.

(6) D.2.7 (now D.2.8) LMF Baghouse Inspections

(a) There is no cited authority for this condition as required by 326 IAC 2-7-5(1)(A) of Indiana's Part 70 program. [Nucor Steel]

(b) Condition D.2.7(a)[now D.2.8(a)]: Permit Condition is unclear, please clarify. [USEPA]

IDEM Response

The baghouse inspection condition is specified under the Compliance Determination Requirements portion of Section D.2. Any conditions under this subsection of Section D are authorized under 326 IAC 2-7-6(1) and 326 IAC 2-7-5(1). If there are additional rule cites that are different from these 2 rules, then the additional cite is specified.

Condition D.2.8 is clarified as follows:

D.2.8 Baghouses Inspections

(a) An inspection shall be performed**,** each calendar quarter**,** of the Meltshop LMF Baghouse is ~~configured to~~ **when** vent**ing** to the atmosphere.

(7) D.2.8 (now D.2.9) LMF Baghouse Broken or Failed Bag Detection

(a) There is no cited authority for this condition as required by 326 IAC 2-7-5(1)(A) of Indiana's Part 70 program. [Nucor Steel]

(b) Nucor requests that the OAQ revise Section 2.8(a) to clarify that operations need not shut down in the event of bag failure in a multi-compartment baghouse because the baghouse is designed to operate with one or more compartments down without affecting efficiency and performance. While Nucor has no objection to shutting down the affected compartment until a bag can be repaired or replaced, operations can continue even if the event does not qualify as an emergency. Nucor proposes the following revision:

(a) For the Meltshop EAF Baghouse 1 and Meltshop EAF Baghouse 2 multi-compartment units, the affected compartments will be shut down immediately until the failed bags have been repaired or replaced. Operation of unaffected compartments may continue so long as the shutdown of affected compartments does not impair performance of the baghouse. For other baghouses, operations may continue only if the event qualifies as an emergency and the Permittee satisfies the emergency provisions of this permit (Section C B Emergency Provisions). [Nucor Steel]

(c) Nucor also requests that the OAQ add "reasonable" before all occurrences of "response steps" to remain consistent with the CRP provisions set forth at Section C.14 and the Emergency Provisions set forth at Section C.16. Furthermore, Nucor requests that the OAQ delete the last sentence of Section D.2.8(b)[now D.2.9(b)] as it is inconsistent with Section C.14(b)(4), which states that the failure to take reasonable response steps "shall be considered a deviation from the permit." [Nucor Steel]

IDEM response

The baghouse failure detection is specified under the Compliance Determination Requirements portion of Section D.2. Any conditions under this subsection of Section D is authorized under 326 IAC 2-7-6(1) and 326 IAC 2-7-5(1). If there are additional rule cites that are different from these 2 rules, that it is the time that the cite is specified.

D.2.9 Broken or Failed Bag Detection

In the event that bag failure has been observed:

(a) For multi-compartment units, the affected compartments will be shut down immediately until the failed ~~units~~ **bags** have been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the emergency provisions of this permit (Section C- Emergency Provisions).

(b) Within eight (8) business hours of the determination of failure, **reasonable** response steps according to the timetable described in the Compliance Response Plan shall be initiated. For any failure with corresponding **reasonable** response steps and timetable not described in the Compliance Response Plan, **reasonable** response steps shall be devised within eight (8) business hours of discovery of the failure and shall include a timetable for completion. Failure to take **reasonable** response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports, shall be considered a ~~violation of~~ **deviation from** this permit.

(c) **If operations continue after bag failure is observed and it will be 10 days or more after the failure is observed before the failed units will be repaired or replaced, the Permittee shall promptly notify the IDEM, OAQ of the expected date the failed units will be repaired or replaced. The notification shall also include the status of the applicable compliance monitoring parameters with respect to normal, and the results of any response actions taken up to the time of notification.**

(8) Castrip Milling/Drilling Baghouse Operation

Nucor requests that the OAQ add "except during the times that the LMF Baghouse serves as a backup" to Section D.10.3(a) and (b). [Nucor Steel]

IDEM Response

IDEM agrees.

D.10.3 Baghouse Operation [326 IAC 2-2]

(a) Pursuant to MSM 107-15289-00038, issued on April 16, 2002, the Castrip Milling/Drilling Baghouse for particulate control shall be in operation and control emissions at all times that the Castrip Nozzle Core Milling/Drilling is in operation, **except that the Meltshop LMF Baghouse serves as a back up**.

(b) Pursuant to 326 IAC 2-2, the Castrip Nozzle Core Milling/Drilling Baghouse or Castrip LMS Baghouse for particulate control shall be in operation and control emissions at all times, that the coil cutting is operating in the Castrip area, **except that the Meltshop LMF Baghouse serves as a back up**.

Scrubber Operation and Monitoring

(1) Rule Cites for the Scrubber Operation
Conditions D.1.21, D.1.22, and D.1.23: Please provide a regulatory citation for the referenced permit conditions. [USEPA]

IDEM Response

These conditions have been renumbered to D.1.22, D.1.23 and D.1.24 due to deletion of a condition in Section D.1.

The requirement to detect baghouse failure is specified under the Compliance Determination Requirements portion of Section D.1. Any conditions under this subsection of Section D are authorized under 326 IAC 2-7-6(1) and 326 IAC 2-7-5(1). If there are additional rule cites that are different from these 2 rules, then the additional cite is specified.

There is no change in the draft permit due to this comment.

(2) Scrubber Compliance Response Plan vs. Deviation

(a) The last sentence of Section D.1.21(a) [now D.1.20(a)]should be deleted as it is inconsistent with Section C.14(b)(4), which states that the failure to take reasonable response steps "shall be considered a deviation from the permit." [Nucor Steel]

(b) The last sentence of Section D.1.23(a) and (b) should be deleted as they are inconsistent with Section C.14(b)(4), which states that the failure to take reasonable response steps "shall be considered a deviation from the permit." [Nucor Steel]

IDEM Response

The following changed is made to clarify that failure to take reasonable response step is considered a deviation from the permit.

D.1.20(a) The Permittee shall continuously monitor the flow rate of the scrubbing liquid.

The Compliance Response Plan for the scrubber shall contain troubleshooting contingency and **reasonable** response steps for when the flow rate reading is below the normal minimum for any one reading. Failure to take **reasonable** response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports, shall be considered a ~~violation of~~ **deviation from** this permit.

(3) Scrubber Compliance Response Plan vs. Emergency Provision
Section D.1.23(a)[now D.22(a)] is inconsistent with the emergency provision in Section C.16. Nucor therefore requests that the OAQ

revise the first sentence as follows:

(a) The affected processes will be shut down immediately unless the event qualifies as an emergency and the Permittee satisfies the emergency provisions of this permit (Section C - Emergency Provisions). [Nucor Steel]

IDEM Response

IDEM has clarified the following condition to provide flexibility and to clarify that failure to take **reasonable** response steps is considered as a deviation from the permit.

D.1.22 In the event that scrubber failure has been observed:

(a) The affected process will be shutdown immediately until the failed unit has been replaced.

Failure to take **reasonable** response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports, shall be considered a ~~violation~~ **deviation from this permit.**

Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the emergency provisions of this permit (Section C- Emergency Provisions).

(b) Within eight (8) hours of the determination of failure, **reasonable** response steps according to the time table described in the Compliance Response Plan shall be initiated. For any failure with corresponding **reasonable** response steps and timetable not described in the Compliance Response Plan, **reasonable** response steps shall be devised with in eight (8) hours of discovery of the failure and shall include a timetable for completion.

(4) Scrubber Calibration Frequency

To remain consistent with the NESHAP requirements that apply to all the other scrubbers at the plant, Nucor requests that calibration frequency be changed to once per year for this scrubber as well. [Nucor Steel]

IDEM response

To be consistent with the NESHAP Part 63, IDEM makes the change.

D.1.20(b) The instruments used for determining the flow rate shall comply with Section C - Pressure Gauge and Other Instrument Specifications, of this permit, shall be subject to approval by IDEM, OAQ, and shall be calibrated at least once ~~every six (6) months~~ **a year.**

(5) Pickling Lines Scrubber CRP vs. Deviation

Nucor requests that the OAQ delete the last sentence of Section D.4.10(a)[now D.4.9(a)] as it is inconsistent with Section C.14(b)(4), which states that the failure to take reasonable response steps "shall be considered a deviation from the permit." [Nucor Steel]

IDEM Response

IDEM made the change.

D.4.9(a) The Permittee shall continuously monitor the flow rate of the scrubbing liquid.
~~Unless operated under conditions for which the Compliance Response Plan specifies otherwise, the flow rate shall be maintained at a minimum of 170 gallons per minute or a minimum established during the latest stack test. The Compliance Response Plan for the scrubber shall contain troubleshooting contingency and response steps for when the flow rate reading is below the normal minimum for any one reading.~~
When for any one reading, the flow rate is outside the minimum rate of 170 gallons per minute or the rate established during the latest stack test, the Permittee shall take reasonable steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports. A flow rate reading that is outside the above mentioned rate is not a deviation from this permit.

Failure to take **reasonable** response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports, shall be considered a ~~violation of~~ **deviation from** this permit.

(6) Pickling Lines Scrubber Calibration Frequency
Nucor requests that the OAQ replace "once every six (6) months" in D.4.10(b)[now D.4.9(b)] with "once a year pursuant to 40 C.F.R. ' 63.1162(a)(5)." [Nucor Steel]

IDEM Response
To be consistent with the NESHAP 40 CFR Part 63, IDEM makes the change.

D.4.9(b) The instruments used for determining the flow rate shall comply with Section C - Pressure Gauge and Other Instrument Specifications, of this permit, shall be subject to approval by IDEM, OAQ, and shall be calibrated at least once **a year** ~~every six (6) months~~.

(7) Acid Regeneration Scrubber CRP vs. Deviation
Nucor requests that the OAQ delete the last sentence of Section D.5.11(a) [now D.5.10(a)] as it is inconsistent with Section C.14(b)(4), which states that the failure to take reasonable response steps "shall be considered a deviation from the permit." [Nucor Steel]

IDEM Response
IDEM made the change.

D.5.10(a) The Permittee shall continuously monitor the flow rate of the scrubbing liquid.
~~Unless operated under conditions for which the Compliance Response Plan specifies otherwise, the flow rate shall be maintained at a minimum of 80 gallons per minute or a minimum established during the latest stack test. The Compliance Response Plan for the scrubber shall contain~~

~~troubleshooting contingency and response steps for when the flow rate reading is below the normal minimum for any one reading.~~

When for any one reading, the flow rate is outside the minimum rate of 80 gallons per minute or the rate established during the latest stack test, the Permittee shall take reasonable steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports. A flow rate reading that is outside the above mentioned rate is not a deviation from this permit.

Failure to take **reasonable** response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports, shall be considered a **deviation from** ~~violation of~~ this permit.

(8) Acid Regeneration Scrubber Calibration Frequency
Nucor requests that the OAQ replace "once every six (6) months" in D.5.11(b) [now D.5.10(b)] with "once a year pursuant to 40 C.F.R. ' 63.1162(a)(5)." [Nucor Steel]

IDEM Response
IDEM agrees.

D.5.10(b) The instruments used for determining the flow rate shall comply with Section C - Pressure Gauge and Other Instrument Specifications, of this permit, shall be subject to approval by IDEM, OAQ, and shall be calibrated at least once **a year** ~~every six (6) months~~.

(9) Scrubber Failure
IDEM is initiating the following changes to reflect the correct provisions.

D.4.11 ~~In the event that scrubber failure has been observed, the Permittee shall implement the Start up, Shutdown and Malfunction (SSM) Plan, as specified in 40 CFR 63, Subpart CCC.~~ **In the event that scrubber failure has been observed:**

(a) **The affected process will be shutdown immediately until the failed unit has been replaced. Failure to take reasonable response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports, shall be considered a deviation from this permit.**

Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the emergency provisions of this permit (Section C- Emergency Provisions).

(b) **Within eight (8) hours of the determination of failure, reasonable response steps according to the time table described in the Compliance Response Plan shall be initiated. For any failure with**

corresponding reasonable response steps and timetable not described in the Compliance Response Plan, reasonable response steps shall be devised with in eight (8) hours of discovery of the failure and shall include a timetable for completion.

D.5.12 ~~In the event that scrubber failure has been observed, the Permittee shall implement the Start-up, Shutdown and Malfunction Plan, as specified in 40 CFR 63, Subpart CCC.~~ **In the event that scrubber failure has been observed:**

(a) The affected process will be shutdown immediately until the failed unit has been replaced. Failure to take reasonable response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports, shall be considered a deviation from this permit.

Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the emergency provisions of this permit (Section C- Emergency Provisions).

(b) Within eight (8) hours of the determination of failure, reasonable response steps according to the time table described in the Compliance Response Plan shall be initiated. For any failure with corresponding reasonable response steps and timetable not described in the Compliance Response Plan, reasonable response steps shall be devised with in eight (8) hours of discovery of the failure and shall include a timetable for completion.

Record Keeping and Reporting Requirements

(1) NSPS Subpart 60 Rule Cite for Record Keeping Requirement

(a) Condition D1.24(f)[now D1.23(f)]: Please provide a regulatory citation for the referenced permit condition. [USEPA]

(b) The record keeping requirements specified in Section D.1.24(f) presumably were intended to satisfy NSPS, Subpart AAa. However, Section D.1.24(f) incorrectly transcribes the requirement pursuant to 40 C.F.R. 60.276a to keep records of the monitoring of operations conducted pursuant to 40 C.F.R. ' 60.274a(a). Nucor therefore requests that the OAQ revise the provision as follows:

D.1.24(f)[now D.1.23(f)]

Pursuant to 40 C.F.R. 60.274a(a) and 60.276a(a), the Permittee shall make available upon request to IDEM, OAQ and the US EPA records of shop opacity observations conducted at least once per day and either:

(i) once-per-shift fan motor amperes and damper position; or

(ii) continuous volumetric flow rate through each separately ducted hood; or

(iii) continuous volumetric flow rate at the control device inlet and once-per-shift damper positions.[Nucor Steel]

IDEM Response

Condition D.1.23 is written under the Record Keeping and Reporting Requirements portion of Section D.1. The rule cites for this is 326 IAC 2-7-5(3) and 326 IAC 2-7-19. If the requirements have an additional rule cite, in addition to these 2 rules, then the additional cite is specified.

D.1.23(f) **Pursuant to 40 CFR 60.276a(a), the** Permittee shall maintain records of the following and make available upon request to IDEM, OAQ, and the US EPA:

(i) either the control system fan motor amperes and all damper positions, ~~or~~

(ii) or the volumetric flow rate through each separately ducted hood during all periods in which a hood is operated for the purpose of capturing emissions from the EAF and

(iii) the monthly operational status inspections of the equipment that is important to the performance of the total capture system (i.e., pressure sensors, dampers, and damper switches).

(2) CEMS and COM Readings

For purposes of clarification, Nucor requests that the OAQ

- - add “in lbs/hour” to the end of Section D.1.24(c)[now D.1.23(c), and
- - add “% opacity” to the end of Section D.1.24(d)[now D.1.23(d)].

[Nucor Steel]

IDEM Response

The following changes have been made:

D.1.23(c) The Permittee shall maintain records of the readings of the SO_2, NO_x, CO and ~~VOC~~ **THC** CEMS **in pounds per hour.**

D.1.23(d) The Permittee shall maintain records of the readings of the COM **% opacity.**

(3) EAF Dust Treatment Scrubber

Nucor also requests that the OAQ clarify that the provisions of Section D.1.24(g)[now D.1.23(g)] apply to the EAF Dust Treatment scrubber and are recorded once per shift. Suggested language is as follows:

D.1.23(g) The Permittee shall maintain records of the following for the EAF Dust Treatment scrubber and make available upon request to IDEM, OAQ, and the US EPA:

(i) Records of once per shift visible emissions notations;

(ii) Records of once per shift scrubber flow rate;

(iii) Records of the results of the scrubbers inspections; and

(iv) Documentation of all response steps implemented for every scrubber flow rate reading that is outside of the range. [Nucor Steel]

IDEM Response

IDEM agrees. The records for the once per shift visible emissions notations have been removed due to the removal of the requirement to observe visible emissions to the scrubber.

D.1.23(g) The Permittee shall maintain records of the following **for the EAF Dust Treatment scrubber** and make available upon request to IDEM, OAQ, and the US EPA:

~~(i) Records of the once per shift visible emissions notations.~~

(i~~i~~) Records of the scrubber's flow rate.

(ii ~~i~~) Records of the results of the scrubber's inspections.

(**iii** ~~v~~) Documentation of all **reasonable** response steps implemented for every flow rate reading that is outside of the range.

(4) Records Retention Time Frame

In addition, 40 C.F.R. ' 60.276a requires that records of measurements required in ' 60.274a must be retained for at least 2 years following the date of measurement, not 5 years as incorrectly stated in Section D.1.24(i)[now D.1.23(i)]. [Nucor Steel]

IDEM Response

IDEM made the correction. However, such records may be required by the Part 70 Operating Permit Program to be retained for at least 5 years.

D.1.23(i) Pursuant to 40 CFR 60.276a**(a),** records of the measurements required in 40 CFR 60.274a, must be retained for at least ~~5~~ **2** years following the date of the measurement.

(5) EAF Dust Handling Opacity Reporting

Opacity readings of the EAF Dust Handling System are not a record of measurement required in 40 CFR' 60.274a and therefore is not required pursuant to 40 C.F.R. ' 60.276a. Accordingly, Nucor requests that the OAQ delete Section D.1.25(a)(iv)[now D1.24(a)]. [Nucor Steel]

IDEM Response

The EAF Dust Handling system is an affected facility under 40 CFR Subpart AAa. An opacity limit of 10% has been specified under 40 CFR 60.272a(b).

The exceedance reporting is not mainly required under the NSPS, it is also a requirement under the Part 70 program.

For clarification that the exceedance reporting also satisfies the NSPS requirements:

D.1.24(a) The Permittee shall submit a quarterly report of excess emissions, using the Quarterly Deviation and Compliance Monitoring Report or equivalent, of the following:

(i) SO_2, NO_x, CO and total hydrocarbons readings from the CEMS,
(ii) Opacity readings from the COM of the Meltshop EAF Baghouse2 stack
(iii) Opacity readings from the Meltshop EAF Baghouse1 Roof vent, and
(iv) Opacity readings from the EAF Dust Handling System.

This reporting requirement also satisfies the semi annual exceedance reporting required under 40 CFR 60.276a(b) and (g).

(6) Additional Record Keeping Requirements

The IDEM is adding the following requirements:

D.8.4 Record Keeping Requirements

(a) The Permittee shall maintain records of any additional inspections prescribed by the Preventive Maintenance Plan.

(b) All records shall be maintained in accordance with Section C - General Record Keeping Requirements of this permit.

D.10.4 Record Keeping Requirements

(a) The Permittee shall maintain records of any additional inspections prescribed by the Preventive Maintenance Plan.

(b) All records shall be maintained in accordance with Section C - General Record Keeping Requirements of this permit.

D.11.4 Record Keeping Requirements

(a) The Permittee shall maintain records of any additional inspections prescribed by the Preventive Maintenance Plan.

(b) All records shall be maintained in accordance with Section C - General Record Keeping Requirements of this permit.

D.13.5 Record Keeping Requirements

(a) The Permittee shall maintain records of the natural gas fuel usage of the boilers~~, with maximum capacities equal to or greater than 10 MMBTU/hour,~~ and make available upon request to IDEM, OAQ and the US EPA.

(b) The Permittee shall maintain records of any additional inspections prescribed by the Preventive Maintenance Plan.

(~~b~~ **c**) Records necessary to demonstrate compliance shall be available within 30 days of the end of each compliance period.

(~~c~~ **d**) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

Visible Emission Notation and Its Record Keeping Requirements

(1) D.1.20 Dust Treatment Scrubber VE

(a) Please provide a regulatory citation for the referenced permit conditions. [USEPA]

(b) There is no cited authority for this provision as required by 326 IAC 2-7-5(1)(A) of Indiana's Part 70 program. [Nucor Steel]

(c) Because NSPS Subpart AAa requires the same opacity limit from the dust handling system, but does not require once per shift visible emission notations or visible emissions observations (except during performance testing), the dust treatment system likewise does not warrant visible emission notations. More significantly, the dust treatment process is a damp system so no opacity is anticipated from the treatment process or treatment scrubber stack. Nucor therefore requests that the OAQ delete Section D.1.20 in its entirety. In any event, the last sentence of Section D.1.20(e) should be deleted as is inconsistent with Section C.14(b)(4), which states that the failure to take reasonable response steps "shall be considered a deviation from the permit." [Nucor Steel]

IDEM Response

IDEM re-evaluated these requirements and based on Nucor's historical compliance with this specific operations, the visible emissions notations and corresponding record keeping requirements are being deleted. Subsequent conditions have been renumbered.

~~D.1.20 Visible Emissions Notations~~

~~(a) Visible emission notations of the EAF Dust Treatment scrubber stack exhaust shall be performed once per shift during normal daylight operations when exhausting to the atmosphere. A trained employee shall record whether emissions are normal or abnormal.~~

~~(b) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time.~~

~~(c) In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.~~

~~(d) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.~~

~~(e) The Compliance Response Plan for this unit shall contain troubleshooting contingency and response steps for when an abnormal emission is observed. Failure to take response steps in accordance with Section C - Compliance Response Plan -Preparation, Implementation, Records and Reports, shall be considered a violation of this permit.~~

D.1.23(g) The Permittee shall maintain records of the following and make available upon request to IDEM, OAQ, and the US EPA:
~~(i) Records of the once per shift visible emissions notations.~~

(2) D.2.5 (now D.2.6) LMF Baghouse VE

(a) There is no cited authority for this condition as required by 326 IAC 2-7-5(1)(A) of Indiana's Part 70 program. [Nucor Steel]

(b) Nucor requests that the OAQ replace "once per shift" with "once per day" in Section D.2.5(a) [now D.2.7(a)] given the relatively small size of this unit compared to the main EAF baghouse.

(c) Nucor also requests that the OAQ delete the last sentence in Section D.2.5(e)[now D.2.6(a)] as it is inconsistent with Section C.14(b)(4), which states that the failure to take reasonable response steps "shall be considered a deviation from the permit." [Nucor Steel]

IDEM Response

- - The visible emissions notations requirements are specified under the 1 of the 4 main subsections of a Section D: Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]. Any monitoring requirements under this subsection used these 2 rules cites as the authority.

- - The LMF Baghouse is small relative to the EAF Baghouses, which is why the LMF Baghouse is not required to have a COMS. However, the LMF is one of the main operations in a mini mill. Once per shift visible emission notations is justified because the goal is to require monitoring to assure continuous compliance.

- - IDEM agrees to make the last part of the condition consistent with the previous condition, thus the following has been changed:

D.2.6(e) The Compliance Response Plan for this unit shall contain troubleshooting contingency and **reasonable** response steps for when an abnormal emission is observed. Failure to take **reasonable** response steps in accordance with Section C - Compliance Response Plan - Preparation, Implementation, Records and Reports, shall be considered a ~~violation~~ **deviation** ~~of~~ **from** this permit.

(3) Pickling Lines Scrubbers VE

Based on previous discussions with the OAQ, the visible notations requirement was removed from the previous draft permit. Without justification, the OAQ has elected to put the visible notations requirement back in the permit. Nucor requests that the OAQ delete Section D.4.9 in its entirety as previously agreed. In 15 years, Nucor has not recorded an opacity problem from the scrubbers. As the OAQ has previously agreed and as routinely recognized by IDEM inspectors, opacity is not a problem at the scrubbers and therefore once per shift visible emissions notations are not necessary to demonstrate compliance. [Nucor Steel]

Nucor requests that the OAQ delete Section D.4.13(a)(i) as visible emissions notations should not be required as previously agreed. Nucor also requests that the OAQ add "once per shift" before "flow rate" in paragraph (a)(ii) as required pursuant to 40 C.F.R. ' 63.1162(a)(2).

IDEM Response

IDEM re-evaluated these requirements and based on Nucor's historical compliance of the pickling operations. The visible emissions notations and corresponding record keeping requirements are being deleted. Subsequent conditions have been renumbered.

~~D.4.9 Visible Emissions Notations~~
~~(a) Visible emission notations of the:~~
~~(i) PL1 Scrubber stack exhaust and~~
~~(ii) PL2 Scrubber stack exhaust~~
~~shall be performed once per shift during normal daylight operations when exhausting to the atmosphere. A trained employee shall record whether emissions are normal or abnormal.~~
~~(b) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time.~~
~~(c) In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.~~
~~(d) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.~~
~~(e) The Compliance Response Plan for this unit shall contain troubleshooting contingency and response steps for when an abnormal emission is observed. Failure to take response steps in accordance with Section C - Compliance Response Plan -Preparation, Implementation, Records and Reports, shall be considered a violation of this permit.~~

D.4.12(a) Permittee shall maintain the following records and make available upon request to IDEM, OAQ and the US EPA:
~~(i) Records of the once per shift visible emissions notations.~~

(4) Acid Regeneration Scrubber VE

Based on previous discussions with the OAQ, the visible notations requirement was removed from the previous draft permit. Without justification, the OAQ has elected to put the visible notations requirement back in the permit. Nucor requests that the OAQ delete Section D.5.10 in its entirety as previously agreed. [Nucor Steel]

Nucor requests that the OAQ delete Section D.5.14(a)(i)[now D.5.13(a)(i)] as visible emissions notations should not be required as previously agreed. Nucor also requests that the OAQ add "once per shift" before "flow rate" as required pursuant to 40 C.F.R. ' 63.1162(a)(2).

IDEM Response

IDEM re-evaluated these requirements and based on Nucor's historical compliance of the Acid Regeneration, the visible emissions notations and corresponding record keeping requirements are being deleted. Subsequent conditions have been renumbered.

~~D.5.10 Visible Emissions Notations~~

~~(a) Visible emission notations of the scrubber stack exhaust shall be performed once per shift during normal daylight operations when exhausting to the atmosphere. A trained employee shall record whether emissions are normal or abnormal.~~

~~(b) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time.~~

~~(c) In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.~~

~~(d) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.~~

~~(e) The Compliance Response Plan for this unit shall contain troubleshooting contingency and response steps for when an abnormal emission is observed. Failure to take response steps in accordance with Section C - Compliance Response Plan -Preparation, Implementation, Records and Reports, shall be considered a violation of this permit.~~

D.5.13(a) Permittee shall maintain the following records and make available upon request to IDEM, OAQ and the US EPA:

~~(i) Records of the once per shift visible emissions notations.~~

Caster

(1) Castrip Maximum Capacity

The capacity of the caster is incorrectly stated as 135 tons/hr instead of 502 tons/hr in Table 22 of Appendix B - - PSD BACT Evaluations.

The capacity of the Continuous Caster is 502 tons/hr, not 135 tons/hr as stated in Table 42 of Appendix B . [Nucor Steel]

IDEM Response

For clarification, Nucor has 2 Continuous Casters that are located in the Meltshop area, and a Caster that is located in Castrip area.

The Meltshop Casters have a capacity of 502 tons/hour.

The Castrip Caster has a capacity of 135 tons/hour.

(2) Opacity Limit

The opacity at the roof is 5%, not 3%. The control device is limited to 3% opacity.

Although the Meltshop Continuous Caster exhausts to the Meltshop EAF Baghouse, which is subject to NSPS Subpart AAa limits of 3% opacity at the control device and a 6% opacity at the melt shop roof monitor, the caster is not an affected facility subject to NSPS Subpart AAa and therefore is not subject to the Subpart AAa opacity limits. Because the Meltshop EAF baghouse is already subject to a 3% opacity limit and "other Meltshop operations" are subject to a 5% opacity limit, Nucor believes that the opacity limit for the caster (i.e., "other Meltshop operations") should be no more stringent than 5%, which is more stringent than any limit identified by the OAQ. [Nucor Steel]

IDEM Response

The Casters in the Meltshop have been identified as follows:

Two (2) Meltshop Continuous Casters with total maximum capacity of 502 tons/hour. These Meltshop Continuous Casters also exhaust to the Meltshop EAF Baghouse1 and Meltshop EAF Baghouse2. The steam from the Meltshop Continuous Casters exhausts directly to the atmosphere.

This shows that these casters exhaust to the same control device of the EAFs, thus the opacity limit (3%) specified to the EAFs baghouses apply to the Meltshop Casters too.

Any fugitive emissions from the Meltshop Continuous Casters exhausting to the Meltshop Roof monitor has the same opacity limit (5%) as the other meltshop operations not exhausting to the baghouses.

Existing permits

- - PC(54)(1742) issued on April 20, 1989, Operation Condition No. 3, and
- - CP 107-2764-00038, issued on November 30, 1993,

both specified the opacity limit for the Casters at 3%.

The draft permit did not specify a different opacity limit for the Meltshop Continuous Casters only.

There is no change in the draft permit due to these comments.

(3) More than 1 Preheaters/Dryers

For purposes of clarification, Nucor requests that the OAQ replace "Preheater/Dryer" with "Preheaters/Dryers" in paragraph (b)(3) of the description of Appendix B. [Nucor Steel]

IDEM Response

IDEM agrees with this comment.

There is no change in the draft permit itself due to this comment because the typographical error appears in Appendix B only.

Hot Strip Mill

(1) VOC BACT Limit
For purposes of clarification, Nucor requests that the OAQ clarify that the VOC BACT is 0.06 lb/ton "each." [Nucor Steel]

(2) VOC BACT Limit
Condition D.3.1(b): There appears to be a typo on the emission limit (i.e. should be 0.06 lb/ton not 0.6 lb/ton), based on the calculations shown on page 63 of the BACT analysis (Appendix B). [USEPA]

IDEM Response

It is clarified that the VOC PSD BACT limits applied to each of the Mill (Hot Strip, Cold Reversing Mill1 and R/T Mill). Since the Hot Strip Mill has its own Section D and its VOC limit was not tied to any other Section Ds of the permit, it is already clear that the VOC BACT limit applies to the Hot Strip Mill.

The typographical errors have been corrected.

D.3.1(b) The VOC emissions from the Hot Strip Mill shall not exceed 0.**06** lb/ton of steel produced.

D.6.1(c) The VOC emissions from the Cold Reversing Mill 1 shall not exceed 0.**06** lb/ton.

D.7.1(d) The VOC emissions from the R/T Mill (Cold Reversing Mill 2) shall not exceed 0.**06** lb/ton.

(3) Water Descaling
Because some products are not required to run through the high pressure water descaling operation, Nucor requests that the OAQ revise Section D.3.1(a)(i) as follows:

(i) The rolling mill shall be operated using water roll cooling sprays with any particulate matter, in solid or liquid form, collected in flumes and transported to the scale pit. [Nucor Steel]

IDEM Response

D.3.1(a)(i) was carried over from Operation Condition No. 7 of existing permit PC(54)1742, issued on April 20, 1989 and Operation Condition No. 10 of CP 107-2764-00038, issued on November 30, 19932.

Based on this new additional information, the condition is revised.

D.3.1(a) The Hot Strip Mill shall comply with the following existing requirements specified in the PSD permit 107-2764-00038:

(i) The **rolling mill in the** Hot Strip Mill shall be operated using ~~a high pressure water descaler when the rolling mill is operating and~~ water **roll** cooling sprays with any particulate matter, in solid or liquid form, collected in flumes and transported to the scale pit.

(4) Mist Eliminator

For purposes of clarification, Nucor requests that the OAQ remove "mist eliminator" in Table 32 on Page 64 of Appendix B for the Hot Strip Mill. [Nucor Steel]

IDEM Response

This serves as a correction:

The Hot Strip Mill does not have a mist eliminator for control. It used water **roll** cooling sprays.

(5) NOx BACT Limit - - Tunnel Furnace

The total lack of CO and mixed nitrogen oxides expressed as equivalent NO_X BACT limits for Condition D.3 200 million Btu per hour tunnel furnace combustion group ("TF") is patently illegal. Pounds per billion Btu performance and tpy caps together with a testing regimen is needed for both CO and NO_X. The performance of this equipment does change with age and nothing less than annual testing is applicable. The CO limit shall not exceed the 30 pound CO per billion Btu (183-10097-00030 Condition D.5.2.) (***See*** ftp://ftp2.ai.org/pub/idem/oam/10097f.pdf Whitley County SDI PSD permit incorporated in its entirety herein by reference.) A non-technical "Golden Calf" defense by DEM alleging that superior diligence and stringency in re NO_X provides discretion to grant Nucor laissez faire in re CO is not acceptable. [Stephen Loeschner]

IDEM Response

The Tunnel Furnace System that is referenced in this comment is not being physically modified. The existing limits and applicable requirements of the system are not being revised in this modification. As the permit indicated, increase in the utilization is expected, but no physical modification has been planned to it.

There is no change in the draft permit due to this comment.

Steel Pickling and Acid Regeneration

(1) NESHAP Subpart CCC Applicability

Similarly, because the pickling lines and acid regeneration are already subject to NESHAP Subpart CCC, the reference to physical modifications is of no consequence. There is no such thing as a "new affected facility" under the NESHAP regulations. For purposes of clarification, Nucor therefore requests that the OAQ remove "however, since there is physical modification, the pickling lines are considered as new affected facilities." in the TSD. [Nucor Steel]

IDEM Response

The pickling lines and acid regeneration are already subject to the NESHAP Subpart CCC requirements even prior to this proposed modification. However, due to the dates of their construction (such as pickle line 2 was permitted in 1995) and the promulgation of the final rule, the NESHAP requirements were not in any Nucor's existing permits.

The compliance dates under 40 CFR 63.1160 required:

- - existing affected facilities to comply by June 22, 2001 and
- - new or reconstructed affected facilities to comply by June 22, 1999 or upon start up.

IDEM intended to explain that the pickling lines and acid regeneration, prior to this proposed PSD modification, were subject to the NESHAP Subpart CCC requirements and would have complied by June 22, 2001.

With this proposed modification, the pickling lines and acid regeneration are still subject to the same NESHAP requirements and should continue to comply.

There is no change in the draft permit due to this comment.

(2) Steel Pickling HCl Control for PM BACT

Additional controls for PM beyond those designed to limit HCl emissions and associated operational requirements already required by NESHAP Subpart CCC are infeasible.

As recognized by the OAQ, PSD BACT requirements do not apply to HCl emissions (a listed HAP under the Clean Air Act). With respect to BACT for PM, additional controls beyond those designed to limit HCl emissions and associated operational requirements already required by NESHAP Subpart CCC are infeasible. Indeed, Section D.4.1(b) and (c) simply repeat those specified under the Pickling NESHAP requirements of Section D.4.3(c) and (d) and therefore should be deleted. Furthermore, Section D.4.1(e) is not a BACT determination and therefore should be deleted from this section. [Nucor Steel]

IDEM Response

Existing permit PSD 107-3702-00038, issued on March 28, 1995, specified PSD BACT limits for the Pickle Line 2 :
- - PM = 0.27 lb/hour,
- - 0.01 gr/dscf and
- - a flow rate of 3,117 dscfm.

These limits resulted due to an IDEM letter to Nucor Steel, dated June 27, 1991, which required Nucor to go through PSD review for request to increase emissions. These existing limits were re-evaluated during this review.

IDEM did not specify or require different control equipment for particulate than what the NESHAP Part 63 already required. The scrubbers required under the NESHAP were also the option considered for the PSD BACT control.

There is no change in the draft permit due to this comment.

(3) Opacity Limit

(a) Nucor requests that the OAQ clarify that the visible emissions "from the scrubber stack" shall not exceed 5% opacity. [Nucor Steel]

(b) For purposes of clarification, Nucor requests that the OAQ add "stack" after "pickling line" in Section D.4.1(d). [Nucor Steel]

IDEM Response

IDEM agrees.

D.4.1(d) The visible emissions from each pickling line **scrubber stack** shall not exceed 5% opacity, based on a 6-minute average.

(4) Storage Vessels

Nucor suggests that the OAQ closely follow the 40 C.F.R. ' 63.1159(b) requirements for HCl storage vessels if it is going to establish these NESHAP requirements as BACT.

Nucor requests that the OAQ either delete these HAP provisions as no longer subject to PSD or else at least revise these BACT determinations to accurately reflect the Subpart CCC requirements. Section D.4.3(c) and (d) incorrectly state the 40 C.F.R. ' 63.1159(b) requirements for HCl storage vessels. Nucor requests that the OAQ revise these conditions to accurately reflect the Subpart CCC requirements as follows:

D.4.3(c) Each raw or regenerated HCL storage vessel shall provide and operate, except during loading and unloading of acid, a closed-vent system for each vessel.

D.4.3(d) Acid loading and unloading shall be conducted either through enclosed lines or each point where the acid is exposed to the atmosphere shall be equipped with a local fume capture system, ventilated through an air pollution control device. [Nucor Steel]

IDEM Response

Condition D.4.3 only referenced the NESHAP Subpart CCC citations. This condition did not specify that they are under the PSD program.

IDEM agrees with the proposal to accurately reflect the NESHAP requirements.

D.4.3 (c) Each **virgin or regenerated** HCl vessel shall **provide and** operate, **except during loading and unloading of acid,** with a closed vent system **for each vessel.** ~~, covered by lids, maintained under negative pressure, except during loading and unloading.~~

(d) Loading and unloading shall be conducted either through enclosed lines or each **point where the acid is exposed to the atmosphere** shall be **equipped with a local fume capture system, ventilated through an air pollution control device** ~~controlled~~.

(5) Acid Regeneration HCl Control for PM

Additional controls for PM beyond those designed to limit HCl and Cl_2 emissions and associated operational requirements already required by NESHAP Subpart CCC are infeasible. [Nucor Steel]

IDEM Response

IDEM did not specify or require different control equipment for particulate than what the NESHAP Part 63 already required. The scrubbers required under the NESHAP were also the option considered for the PSD BACT control.

Condition 5.1 lists the requirements from an existing permit (PSD 107-2764-00038).

There is no change in the draft permit due to this comment.

(6) NESHAP Compliance Monitoring

To remain consistent with the requirements of NESHAP, Subpart CCC, Nucor requests that the OAQ delete "either by monitoring the performance of the control device and" and "or by using a CEMS" from the fourth sentence of paragraph (2)(a)(ii) (TSD Federal Rule Applicability), as this language is inconsistent with 40 C.F.R. ' 63.1161(a)(1) [Nucor Steel]

IDEM Response

This serves as a clarification:

- For acid regeneration units, the owner or operator would limit both hydrochloric acid and chlorine emissions by monitoring the maximum concentration of these chemicals in the process or control device off gas.
- Hydrochloric acid emissions would be controlled by using a combination of an efficient acid recovery unit (absorber) and an air pollution control device.
- Chlorine emissions would be controlled by operating the acid regeneration unit under conditions that minimize chlorine formation.
- Monitoring for hydrochloric acid would be accomplished by monitoring the performance of the control device and performing annual emissions testing.
- Monitoring for chlorine would be accomplished by monitoring the operating

parameters of the acid regeneration units and performing annual emissions testing.

There is no change in the draft permit due to this comment.

(7) Pickling Lines Scrubber Operation - - HCL only vs. PM
For purposes of clarification, Nucor requests that the OAQ add "HCl" before "emissions" in Section D.4.7(a) and (b). [Nucor Steel]

IDEM Response

IDEM is retaining the condition as is because even though the scrubbers are mainly used to control HCl, they are also used to control PM emissions.

There is no change in the draft permit due to this comment.

(8) Acid Regeneration Back up Fuel
Nucor requests that the OAQ add "with propane as a backup" to the end of Section D.5.1(a)(1) as recognized in the facility description. [Nucor Steel]

IDEM Response

IDEM agrees.

D.5.1(a)(i) The two (2) tangentially fired burners shall burn ~~only~~ natural **gas as primary fuel and propane as back up fuel.**

Cold Reversing Mill and R/T Mill

(1) D.6.5 Cold Reversing Mill 1 Mist Eliminators
For purposes of clarification, Nucor requests that the OAQ remove "drift" from Section D.6.5. [Nucor Steel]

(2) D.7.1(d) Issuance Date
In Section D.7.1(d), "2995" should be "1995." [Nucor Steel]

(3) D.7.1(d) VOC BACT Limit
There appears to be a typo on the emission limit (i.e. should be 0.06 lb/ton not 0.6 lb/ton), based on the calculations shown on page 63 of the Appendix B - - BACT analysis. [USEPA]

(4) D.7.3 Cold Reversing Mill 2 Mist Eliminators
For purposes of clarification, Nucor requests that the OAQ remove "drift" from Section D.7.3. [Nucor Steel]

IDEM Response
The following four (4) changes are made due to these comments:

D.6.5 The mist/~~drift~~ eliminators for particulate control shall be in operation and control emissions at all times that the Cold Reversing Mill 1 is in operation.

D.7.1(d) The VOC emissions from the R/T Mill (Cold Reversing Mill 2) shall not exceed ~~0.6~~ **0.06** lb/ton. This supersedes the condition no. 14(c) of CP-107-3702-00038, issued on March 28, ~~2995~~ **1995**.

D.7.3 The mist/~~drift~~ eliminators for particulate control shall be in operation and control emissions at all times that the R/T Mill (Cold Reversing Mill 2) is in operation as cold reversing mill.

Cold Mill Boilers

(1) Existing Cold Mill Boiler Capacity
The capacity of the existing Cold Mill Boiler is 34 MMBTU/hour, not 4.2 MMBTU/hour (Page 64 of Appendix B). [Nucor Steel]

IDEM Response

The write up in Page 64 of Appendix B for the Existing Cold Mill Boiler is an explanation of the sequence of permitting events. To indicate this in a different format:

- - In June 20, 1996, PSD permit 107-5235-00038 incorporated an existing 4.2 MMBTU/hour boiler in the Cold Mill.
- - In November 30, 1993, PSD permit 107-2764-00038 permitted a 34 MMBTU/hour vacuum degasser boiler with PSD BACT limits (Operation Condition No. 14).

As the TSD already indicated, the 34 MMBTU/hour vacuum degasser boiler has been moved in the Cold Mill . It serves as the original 4.2 MMBTU/hour boiler. It was also indicated in the TSD, there is no boiler that is used for vacuum degassing. This relocating and changing of boilers was brought to IDEM's attention during this review.

It is correct that the capacity of the existing boiler in the Cold Mill is 34 MMBTU/hour, however, that boiler was not permitted to be in the Cold Mill. The purpose of this is to document the permitting events.

As explained in the Appendix A - - PSD BACT Evaluations, due to different sizes and uses of the boilers, the other more stringent limits have not been considered as BACT for this specific boiler.

There is no change in the draft permit due to this comment.

(2) Cold Mill Boiler Steam Supplier
Nucor requests that the OAQ end the last sentence of the second paragraph of Page 64 of Appendix B at "Cold Mill" and delete "Reversing" and the entire last sentence in the third paragraph. [Nucor Steel]

IDEM Response

IDEM agrees with the following change because using the designation Cold Mill already covers the other operations mentioned.

> This boiler was transferred to the Cold Mill. This boiler, together with the new Cold Mill Boiler will supply steam to the Cold Mill~~, Pickle Lines 1 and 2, tank farms and Galvanizing Line~~.

IDEM agrees to delete "reversing", however does not agree to remove the entire sentence because this documentation is necessary for clarification, since Nucor has the tendency to move boilers of different capacities for different purposes.

> For clarification, there will be total of 2 boilers in the Cold ~~Reversing~~ Mill, each

rated at 34 MMBTU/hr. There is no boiler in the VTD Degasser and Pickle Line 2.

There is no change in the draft permit due to this comment.

(3) TSD Cold Mill Boilers Description
Nucor also requests that the OAQ replace "34 MMBTU/hour each" with "34 MMBTU/hour each for the 2 Cold Mill Boilers and 15 MMBTU/hr for the BOC Gases Low NOx Burner Boiler." on Page 18 of the TSD State Rule Applicability.

IDEM response

TSD State Rule Applicability , item (1)(d)(vi), indicated that PMP is required for the 2 Cold Mill Boilers and BOC Gases Low NOx Burner Boiler because they are subject to 40 CFR Part 60, Subpart Dc and their maximum capacities of 34 MMBTU/hour each is greater than the cut off of 10 MMBTU/hour rating.

IDEM agrees that there is a need to clarify this:

(a) The 2 Cold Mill Boilers are rated at 34 MMBTU/hour each, and
(b) The BOC Gas Boiler is rated at 15 MMBTU/hour.

The permit is correct in identifying the ratings.

There is no change in the draft itself due to this comment.

(3) BOC Gases Boilers
As recognized in the OAQ's BACT evaluation, BACT limits are established only for BOC Gases Boiler No. 306 because the existing BOC Gases Boilers are not being physically modified. Accordingly, Nucor requests that the OAQ either clarify applicability to only the new boiler by replacing "each boiler" with "Boiler No. 306" in Section D.13.1(c) through (h).

IDEM Response

It is correct that the existing BOC Gases Boilers are not going to be physically modified, however, the BOC Gas Plant is being modified as indicated in Condition B.XVI(b): Modify onsite oxygen, argon, nitrogen and hydrogen gas supplier and associated delivery systems (pipes, valves, storage tanks, vaporizers, and controls). The hydrogen gas Plant has a burner rated at 9.98 MMBTU/hr.

The BOC Gas Boiler is described as follows:

Natural gas fuel with propane as back up fuel BOC Gases Low NO_x Burner Boiler ID no. 306, rated at 15 MMBTU/hour. This is in addition to the existing BOC Gases Boiler ID no. 1, rated at 9 MMBTU/hr, and BOC Gases Boiler ID no. 2, rated at 15 MMBTU/hr.

The capacity of one of the existing BOC Gas Boiler, identified as No. 1 is 9 MMBTU/hour, not 9.98 MMBTU/hour.

The 2 existing BOC Gas Boilers were permitted under PSD permit 107-3702-00038, issued on March 28, 1995. PM , NOx and SO2 BACT limits were specified in Operation Conditions No. 5, 6 and 7.

IDEM agrees that the new BOC Gas Boiler is the only one that is going to be subject to the BACT limits determine during this review:

D.13.1 Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements:

(a) The **Boiler ID no. 306** ~~3 BOC Gases Boilers~~ shall use pipeline natural gas as primary fuel and propane as back up fuel.

(b) **Boiler ID no. 306** ~~Each boiler~~ shall be equipped and operated with low NO_x burners.

(c) The NO_x emissions from **Boiler ID no. 306** ~~each boiler~~ shall not exceed 0.035 lb/MMBTU.

(d) The CO emissions from **Boiler ID no. 306** ~~each boiler~~ shall not exceed 0.061 lb/MMBTU.

(e) The VOC emissions from **Boiler ID no. 306** ~~each boiler~~ shall not exceed 0.0026 lb/MMBTU.

(f) The SO_2 emissions from **Boiler ID no. 306** ~~each boiler~~ shall not exceed 0.0006 lb/MMBTU.

(g) The filterable and condensible PM_{10} emissions from **Boiler ID no. 306** ~~each boiler~~ shall not exceed 0.0076 lb/MMBTU.

(h) The filterable PM emissions from **Boiler ID no. 306** ~~each boiler~~ shall not exceed 0.0019 lb/MMBTU.

(i) Good combustion shall be practiced.

(4) New Cold Mill Boiler PSD Requirements

Nucor requests that the OAQ clarify that the BACT limits apply only to the new Cold Mill Boiler. In the alternative, Nucor requests that the OAQ clarify that BACT requirements apply to the Cold Mill Boilers only upon construction of the new boiler or modification of the existing boilers. Suggested language is as follows:

D.6.2 Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements upon construction of new Cold Mill Boiler or modification of the existing Cold Mill Boiler~~s~~.

IDEM Response

The new Cold Mill Boiler is clearly subject to the PSD BACT limits as specified in Condition D.6.2.

Appendix B - - PSD BACT Analysis - indicated:

Since the existing Cold Mill Boiler is being physically modified, re-evaluation of BACT is necessary. Based on the BACT performed for the new Cold Mill Boiler, the BACT for the existing Cold Mill Boiler should be identical.

Based on this, in addition to the fact that this boiler was previously permitted to be a vacuum degasser boiler, the new PSD BACT limits also apply to this boiler.

IDEM agrees with the suggested clarification:

D.6.2 Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements **upon construction of the new Cold Mill Boiler or modification of the existing Cold Mill Boiler**:

(a) The 2 Cold Mill Boilers shall use pipeline natural gas as primary fuel and propane as back up fuel.

(b) Each Cold Mill Boiler shall be equipped and operated with low NO_x burners.

(c) The NO_x emissions from each boiler shall not exceed 0.035 lb/MMBTU.

(d) The CO emissions from each boiler shall not exceed 0.061 lb/MMBTU.

(e) The VOC emissions from each boiler shall not exceed 0.0026 lb/MMBTU.

(f) The SO_2 emissions from each boiler shall not exceed 0.0006 lb/MMBTU.

(g) The filterable and condensible PM_{10} emissions from each boiler shall not exceed 0.0076 lb/MMBTU.

(h) The filterable PM emissions from each boiler shall not exceed 0.0019 lb/MMBTU.

(i) Good combustion shall be practiced.

(5) Boilers NOx BACT Limit

Appendix B, Page 54, third paragraph: Please provide a more specific reference to the SDI Whitley 2002 permit mentioned in the analysis. Please explain why IDEM made the statement "OAQ believes 0.040 lb/MMBTU is BACT" when 0.035 was chosen for the facility's BACT. Also, there are a number of facilities with much lower boiler NOx limitations, could you please provide an explanation as to why these limitations were not chosen as BACT. [USEPA]

IDEM Response

During the early stage of the PSD BACT evaluations, the NOx BACT limit being considered was 0.04 lb/ton. As additional information of new emission rates are coming in and as part of the review process, re-evaluations have to be made, until the a final permit is issued.

The following statement was not updated when IDEM recently issued a PSD permit to SDI, in August, 2003. It is clear that the permit reference in this statement is prior to the issuance of the most recent PSD permit.

> Based on the most recent PSD permit issued, in 2002, by the OAQ to SDI, Whitley, IN, the NOx BACT limit for a boiler in a mill is 0.040 lb/MMBTU. The OAQ believes that this is still consider the BACT for this type of operation.

This statement should have been:

> Based on the most recent PSD permit issued, in 2003, by the OAQ to SDI, Hendricks, IN, the NOx BACT limit for a boiler in a mill is 0.030 lb/MMBTU. The OAQ believes that this is still consider the BACT for this type of operation.

This limit is the limit specified in the draft permit.

There is no change in the draft permit due to this comment.

(6) Boilers CO BACT Limit

Appendix B, Page 56, Table 28: There appears to be a number of typos in and preceding Table 28. The BACT is stated as 0.061 lb/MMBTU but the Table list it as 0.084 lb/MMBTU for this facility. SDI Hendricks is incorrectly listed as having a BACT limitation of 0.061 (instead of 0.084). Furthermore, in the paragraph preceding the Table a statement is made that IDEM believes 0.084 is BACT. Please clarify. Additional justification needs to be provided if the 8 BACT limitations more stringent then 0.061lb/MMBTU are to be rejected. A BACT analysis should take into account more limits than those "recently issued in Indiana". [USEPA]

IDEM Response

The following statement should have been updated to referenced the most recent PSD permit issued in Indiana with a more stringent CO PSD BACT limit of 0.061 lb/MMBTU.

> Based on the most recent PSD permit issued, in 2002, by the OAQ to SDI, Whitley, IN, the CO BACT limit for the boiler in this plant is 0.084 lb/MMBTU. The OAQ believes that this is still consider the BACT for this type of operation.

Table 28 of Appendix B was not completely updated when a more stringent BACT limit was recently considered. This table indicated that SDI Hendricks County CO BACT limit was specified at 0.61 lb/MMBTU based on their final permit issued in August 2003, however, Nucor Steel, IN should have been indicated with the same limit. This table might not have been updated, but the draft permit has specified the intended PSD BACT limit.

The CO limit considered as BACT was chosen as the BACT based on recently issued permits in Indiana. Underlying factors used for this basis are: comparison of boilers of similar ratings, fuel, and intended use of the boiler. Companies with more stringent limits are either power plants, merchant plants or chemical plants.

There is no change in the draft permit due to this comment.

(7) Boilers SO2 BACT Limit

The 0.0006 pound SO_2 per million Btu limit of conditions D.6.2(f) and D.13.1(f), which is a nominal 0.2142 grains total S per 100 scf, (The weight of SO_2 being twice the weight of the S therein, and assuming a nominal 1,020 Btu per scf: 0.0006 / E6 x 1,020 x 7,000 / 2 x 100 = 0.2142 grains total S per 100 scf.) is sufficiently low that it may be violated from time to time. ***See*** 66 FR 31978, 31980 (13 June 2001) III.A.1:

> ... typical supplies of pipeline natural gas that have an average [total] sulfur content of 0.2 to 0.3 grains per 100 scf ...
>
> In how many other permit setting circumstances is a “shall not exceed” limit set at ***less*** than the typical or expected amount? Rather than have Nucor fail these limits and or appeal, it would be wise to change them all to 1.54 pounds SO_2 per billion Btu. It is also unlikely that Nucor will accept a 1.54 pound SO_2 per billion limit on propane fuel, thus dual

numeric limits must be written everywhere dual fuels are authorized. [Stephen Loeschner]

IDEM Response

The SO2 BACT limit of 0.0006 lb/MMBTU is also the emission factor established in the AP-42 (Compilation of Air Pollutants Emission Factors), Chapter 1.4 AP-42 rated this SO2 emission factor as "A " (Excellent) and that the random population of sources tested is sufficient to minimize variability.

The recommended SO2 limit of 1.54 lb/billionBTU is less stringent than the proposed BACT limit.

The SO2 BACT limits apply at all times during the operation of the boilers.

There is no change in the draft permit due to this comment.

(8) Natural Gas Fuel Record Keeping

Nucor requests that the OAQ clarify that keeping natural gas fuel usage records apply to the Cold Mill Boilers only upon construction of the new boiler or modification of the existing boiler by replacing "boilers" with "new Cold Mill Boiler" or modified existing Cold Mill Boiler in Section D.6.7(b). [Nucor Steel]

IDEM Response

Both the Cold Mill Boilers are subject to record keeping requirements under the 40 CFR Part 60.

The new Cold Mill Boiler will be required to keep such records as soon as it starts operating.

The existing Cold Mill Boiler was already subject to the same requirements at this time because of the date of its construction and designed capacity. Before and after any physical modification to the existing Cold Mill Boiler that Nucor is planning to do to capitalize the boiler's maximum capacity, they must comply with record keeping.

There is no change in the draft permit due to this comment.

Cooling Towers BACT Analysis

(1) PSD BACT of Cooling Towers
Nucor requests that the OAQ add "new" before "cooling towers" throughout Section D.11.1 to clarify that BACT requirements apply only to new cooling towers. Compliance with new BACT-derived drift rate specifications and opacity levels and submitting drift design specifications is not required for existing cooling towers that are not being physically modified. [Nucor Steel]

(2) Cooling Towers Drift/Mist Eliminators
While Nucor has no objection to operating drift/mist eliminators at all times that the cooling towers are in operation (indeed, the mist eliminators are inherent process equipment), Nucor requests that the OAQ remove "for particulate control" as the drift/mist eliminators are primarily designed to prevent water loss. [Nucor Steel]

IDEM Response

Section A and corresponding Section D for the Cooling Towers have been modified to indicate that the towers capacity mentioned as part of their descriptions is the designed capacity.

Existing permits under which Nucor has been operating do not mention any of the existing cooling towers. Without going through extensive research to determine which cooling towers should have been exempted from PSD review either due to their dates of construction or potential to emit, this PSD permit will specify PSD limits to all (existing and new) cooling towers.

The only existing permit that indicated cooling towers as part of the process is PSD permit 107-14935-00038, issued on January 19, 2001 and amended on November 20, 2001 (A107-14935-00038). This permit is a PSD permit and the permitted contact and non cooling towers are the ones in the Castrip portion of the mill. The Castrip is not part of this modification.

Mist eliminators (drift eliminators as sometimes identified) are widely accepted as particulate control for cooling towers. There are several PSD BACT inputs in the RBLC that confirm this. Nucor may be using the eliminators for other purposes (such as water loss prevention), however, in this review, they are the chosen PSD BACT control. If Nucor prefers to choose other control options as BACT, justification has to be submitted why mist eliminators are not a viable option.

There is no change in the draft permit due to this comment.

Emission Units with PSD BACT Limits and No Specific Compliance Monitoring

(1) PSD BACT Limits With No Compliance Monitoring
Sections D.3, D.5 and D.9: The permit contains an emission limitation for NOx, CO, PM/PM10 and/or VOCs, but there does not appear to be any method to demonstrate compliance. It is suggested that a record keeping requirement for fuel usage be added to the permit, so that the facility can adequately demonstrate compliance with these limitations. [USEPA]

(2) Opacity Limits Specified With No Monitoring
Conditions D.2.1(d), D.3.1(a)(iii), D.4.1(d), D.5.1(b), D.6.1(d), D.7.1(e), D.8.1(b), D.9.1(e), D.10.1, D.11.1(c) and D.12.1(d) and (e): There does not appear to be any mechanism to demonstrate compliance with the percent opacity limitations in these permit conditions. It is suggested that permit conditions be added for a COM or performance of a periodic visible emissions evaluations (VEE). [USEPA]

(3) D.3.2, D.5.7, D.6.6, D.9.2, D.13.4 Natural Gas Fuel
(a) Condition D.3.2
The cited authority for this condition, 326 IAC 2-2 does not provide the extensive definition of pipeline natural gas as set forth in Section D.3.2. Indeed, the OAQ expressly states in the BACT evaluation that "there is no definition for Natural Gas in the Indiana IAC rules . . . ." To the extent that this definition is considered by the OAQ to be a case-by-case BACT determination, the OAQ nonetheless states that it "believes that Nucor complies with the quality of the natural gas used as long as it is through pipeline." Nucor therefore requests that the OAQ simply state that the Permittee shall use "pipeline natural gas."

(b) Condition D.5.7
326 IAC 2-2 does not provide the extensive definition of pipeline natural gas as set forth in Section D.5.7. Indeed, the OAQ expressly states in the BACT evaluation that "there is no definition for Natural Gas in the Indiana IAC rules . . . ." To the extent that this definition is considered by the OAQ to be a case-by-case BACT determination, the OAQ nonetheless states that it "believes that Nucor complies with the quality of the natural gas used as long as it is through pipeline." Nucor therefore requests that the OAQ simply state that the Permittee shall use "pipeline natural gas."

As previously explained, Nucor requests that the OAQ simply state that the Permittee shall use "pipeline natural gas." [Nucor Steel]

(4) Sulfur Content of the Natural Gas

The U.S. Environmental Protection Agency put considerable effort into writing the fuel sulfur content controlling definition that is now "40 CFR 72.2 (July 2003) ***pipeline natural gas***." (***See*** 66 FR 31978 (13 June 2001) and 67 FR 40394 (12 June 2002), 155 pages, many devoted to this subject.) 40 CFR 75, related thereto, includes an a la carte menu of ways to demonstrate that fuel qualifies as being that defined substance. In TSD Appendix B, DEM devoted the entirety of page 49 toward the goal of making a bastard of EPA's work by pandering to the polluter, Nucor, and telling them, 'You may enjoy all the fruit of that definition with zero responsibility for demonstrating compliance by any of its methods.'

EPA's menu of ways to demonstrate that fuel qualifies as being 40 CFR 72.2 (July2003) pipeline natural gas is set at 40 CFR 75 Appendix D. One of the menu items is:

> If the requirements of paragraphs (a)(1) and (a)(2) of this section cannot be met, a fuel may initially qualify as pipeline natural gas if at least one representative sample of the fuel is obtained and analyzed for total sulfur content and for either the gross calorific value (GCV) or percent methane, and the results of the sample analysis show that the fuel meets the definition of pipeline natural gas in § 72.2 of this chapter. Use the sampling methods specified in sections 2.3.3.1.2 and 2.3.4 of this appendix. The required fuel sample may be obtained and analyzed by the owner or operator, by an independent laboratory, or by the fuel supplier. If multiple samples are taken, each sample must meet the definition of pipeline natural gas in § 72.2 of this chapter. 40 CFR 75 (July2003) Appendix D 2.3.1.4(a)(3)

DEM, in claiming to have imposed a BACT limit, giving no quotation from Nucor, as they had already wasted 90 % of a page, states:

> On January 18, 2003, Nucor Steel confirmed that the natural gas used in this mill is pipeline natural gas, and the back up fuel propane is from tanks. Therefore, as BACT, the natural gas fuel should have the specifications of the pipeline natural gas. Nucor objects to the extent that gas quality needs to be monitored, because it is beyond Nucor's control. The OAQ believes that Nucor complies with the quality of the natural gas used as long as it is through pipeline. [***sic***] TSD Appendix B p. 49

How was this confirmation made? Is this an admission that there is no 40 CFR 75 Appendix D 2.3.1.4(a)(3) qualifying analysis, an admission that such test failed to qualify the fuel, or an admission that such a test may fail to qualify the fuel? As there is little doubt that at $4 per million Btu, Nucor expends more than $7 million per year (Nucor has on-site fuel gas using equipment totaling more than 200 million Btu per hour (Condition D.3(2) and much more), and their ability to purchase fuel gas at $4 or less per million Btu average is in doubt. 4 x 200 x 8,760 = $7,008,000) for this single fuel, their implied plea of poverty and DEM's acceptance of it is tyranny. As response to comment, publish each data pair analysis report for the grains total sulfur per 100 standard cubic feet ("scf") of fuel gas and Btu per scf fuel gas that Nucor has for its piped fuel gas for the most-recent 24-month period.

"Beyond Nucor's control" is ludicrous for such a large user of that fuel. Fuel testing is within Nucor's control. When you burn in excess of 35,000 tons per year of something (At a nominal 1,020 Btu per scf, a nominal 0.041 pounds per scf, and a nominal 200 million Btu per hour: 200 E6 / 1,020 x 0.041 x 8,760 / 2,000 = 35,200 tons per year—likely a low estimate of Nucor's fuel gas use) with no pollution control equipment, the public has a right to have that something tested to identify its total sulfur content and to have those tests performed with a frequency and a methodology of frequency so as to produce a meaningful set of public SO_2 emission precursor data. Unless Nucor submits an affidavit under pain of perjury claiming unavailability of 40 CFR 72.2 (July 2003) pipeline natural gas, that defined fuel must be required as SO_2 BACT.

Under no circumstance must DEM permit mere 40 CFR 72.2 (July 2003) ***natural gas*** as SO_2 BACT as it could result in an emission of greater than 60.15 pounds SO_2 per billion Btu. (1 E9 / 950 / 1 E2 x 2 x 20 / 7,000 = 60.15 pounds SO_2 per billion Btu.) BACT is an emission limitation. Absent such a numeric and a credible means of demonstrating compliance via testing and public data on a more or less continuous basis, the permit is illegal.
DEM must abandon the deceptive pandering babble and place into the permit text substantially compliant with:

> SO_2 BACT for natural gas fired units, when firing natural gas, shall be an emission limitation of 1.54 pounds SO_2 per billion Btu (This is a comfort margin, as it allows for sulfur in ambient air and also for gases compliant with 40 CFR 72.2 (July 2003) pipeline natural gas under the 70 % methane option that may be less than the 950 minimum Btu per standard cubic foot option. 0.5 grains total sulfur per 100 scf at 950 Btu per scf is less than 1.504 pounds SO_2 per billion Btu) controlled by fuel specification. The fuel shall be 40 CFR 72.2 (July 2003) pipeline natural gas. To comply with this permit requirement, Nucor shall submit to DEM within 30 days of their creation each of the documents needed to show conformance with that fuel definition by the specified regimen in 40 CFR 75 (July 2003) Appendix D 2.3.1. Each submission shall immediately become a public record.

If DEM does not amend those ***citations*** into the permit text, then there will be continuing evidence of DEM's plan of deception. DEM is not to "create" the text sans citations by copying or rewriting EPA's text nor is the permit condition to be external (the TSD, Appendices, Addendum, etc.) to the permit.

(5) <u>Propane Fuel as Back up</u>
As response to comment, state whether or not Nucor is entitled by law to receive propane fuel (The phrase, propane fuel, unlike "propane" does not imply a highly pure C_3H_8 alkane, rather it implies a mixture having a high majority of C_3H_8 with various significant amounts of C_4 hydrocarbons. Fewer and greater carbon-count compounds may be present in small amounts. Some sulfur compounds are expected as impurities and some of them may be added intentionally, such that the fuel might have

a "human sense leak detection" odor in small concentrations in air. For clarity, throughout the permit, propane should be amended to propane fuel.) that does not have the 49 CFR 173.315(b)(1) odor characteristic, and state whether or not Nucor does receive propane fuel that does not have the 49 CFR 173.315(b)(1) odor characteristic. As response to comment, publish each data pair analysis report for the pounds total sulfur per 10,000 gallons of propane fuel and Btu per gallon of propane fuel that Nucor has for its propane fuel for the most-recent 24-month period.
DEM must place into the permit text substantially compliant with:

> SO_2 BACT for natural gas fired units, when firing propane fuel, shall be an emission limitation of 3.53 pounds SO_2 per billion Btu (This is a comfort margin, as it allows for sulfur in ambient air and also for fuel variation. It is highly unlikely that Nucor will receive any propane fuel that has more than 1.75 pounds total sulfur per billion Btu. ***See*** 49 CFR 173.315(b)(1) Note 2. There being 32 / 62 pounds sulfur in 1 pound of ethyl mercaptan (it being by far the most common odorant for liquefied petroleum gas (of which propane fuel is one) in the U.S.) and approximately 0.89 billion Btu per 10,000 gallons of propane fuel, that is about 0.580 pounds total sulfur per billion Btu of ethyl mercaptan odorized propane fuel. A 3:1 permit pad should allow for more than the minimum intentional odorant concentration and a variety of unintended sulfur compound impurities.) controlled by fuel specification. The fuel shall be have no more than 1.75 pounds total sulfur per billion Btu.

To comply with this permit requirement, Nucor shall submit to DEM within 30 days of their creation monthly test reports of representative fuel sample analysis giving pounds total sulfur per billion Btu or (total sulfur per unit weight and Btu per unit weight) or (total sulfur per unit volume and Btu per unit volume). Should the computation of an analysis show less than 1.60 pounds total sulfur per billion Btu, then sampling frequency may be reduced to once per calendar quarter. Should the average of analyses in any 12-month period be less than 1.40 pounds total sulfur per billion Btu, then sampling frequency may be reduced to once per 12-month period.
The draft is patently illegal as Nucor's SO_2 PTE considerably exceeds 100 tpy invoking BACT and "... BACT is an emission limitation...." Nowhere in the permit did DEM assign a numeric pounds SO_2 per million Btu emission limitation to each combustion unit (for each permitted fuel type) and assign a pounds SO_2 per year emission limitation to each combustion unit for each permitted fuel type. This is clear error and abuse of discretion. And DEM can take no comfort in allegedly ordering the 'best' fuel as DEM intentionally proposes to require no proof of purchase, possession, or use of that fuel. [Stephen Loeschner]

(6) <u>Propane Fuel as Back up</u>
There is the possibility of an electric or piped fuel gas interruption of service with little or no notice. The probability of both occurring within an hour of each other is likely so small that building equipment for such a simultaneous loss is not economically wise. Nucor has the right (and indeed a fiduciary responsibility to its owners) to build redundant systems with redundant energy sources in order to be able to

shut down the plant in a capital protective mode should there be an electric or piped fuel gas interruption. As compressed air is needed for normal operation and for normal and protective shutdown, several tanks having substantial capacity (but less than that needed for a worst-case shutdown event without replenishment) are likely in place.

While the draft permit is profoundly unclear, it seems Nucor is seeking additional "emergency" electricity generation capacity and new (perhaps only?) non-electric air compressor capacity. See, e.g., conditions A.2(V)(4), B.6(XVI)(f), and D.14(1) (mentions compressors in heading and lists zero); TSD p. 11 (V)(5) (mentions compressors in heading and lists zero) and p. 12 (V)(6) "add non-electrical powered ... air compressors;" and TSD Appendix B p. 74 (mentions compressors in heading and lists zero) and p. 75 "add non-electrical powered ... air compressors."

This nebulousness, wherein the fuel kind, the function kind, the quantity and the size "crucial facts" of the emission units is denied to the public for review is clearly contumacious of ***In re Tallmadge Generating Station***. There is nothing in the permit that would limit the proposed (potential diesel-fired engine) air compressors to 500 or fewer hours per year.
DEM must list each emission unit, including its function, size, and permitted fuels together with a BACT limit for each.
Given Nucor's piped gas and electric connections, there is little reason for Nucor to have new emission units that do not use those sources; however, they may feel more comfortable with the ability to use on-site stored energy. Condition B.6 (XVI)(d) states:

Add propane [fuel] as back up for all natural gas fired units.

This indicates that Nucor plans to continue some production should it be faced with either a reduced authorization to draw fuel gas from its off-site piped source, or there becomes an economic advantage to using propane fuel rather than the fuel gas from its off-site piped source. No matter, the point is that Nucor has, and intends to continue to have a substantial on-site store of propane fuel.
Given that energy store, and given the 42 USC 7479(3) clean fuels consideration requirement, there is no reason to permit any additional use of oil-fired equipment. (For the purpose of this comment 42 USC 7479(3) fuel "cleanliness" is an inverse of on-site SO_2 production ability. Electricity would be zero, propane fuel may produce a maximum of 3.53 pounds SO_2 per billion Btu, and a 500-part per million total sulfur by weight diesel oil would be about 55 pounds SO_2 per billion Btu (based on 18,300 Btu per pound fuel).
DEM provided zero statistical information as to why, for electric service loss, the off-site piped fuel gas and the on-site propane fuel store are not good and sufficient to serve all of Nucor's energy needs to operate equipment needed to perform a capital protective shutdown. There appears no evidence within the draft permit that DEM considered Nucor's store of propane fuel, a liquid chemical energy that is substantially cleaner than 500 part per million total sulfur by weight diesel oil (a liquid chemical energy) as BACT for new emission units. That is clear error. DEM must deny the construction and operation any new proposed oil-fired emission units. [Stephen Loeschner]

IDEM Response

These sets of comments deal with emissions units that have limitations and minimal compliance monitoring, record keeping or reporting, if none at all. Most of these units' emissions are due to combustion. The permit limits, such as opacity, are enforced by requiring the Permittee to use natural gas as fuel. Since natural gas is considered the least emitting fuel, it is sufficient to show compliance by using pipeline natural gas. It is not uncommon that only record keeping of the raw materials or fuel to be required as a compliance tool. If smoke is coming out from these units that clearly violates of their opacity limits, it is the Permittee's obligation to investigate the cause and perform corrective actions and in most instances, the cause is not because of the use of natural gas.

In previous permits, comments have been received concerning the meaning of natural gas. In anticipation of minimizing the same comments, IDEM proactively defined what a natural gas fuel is. This natural gas definition written in the permit is taken from the federal Acid Rain program (Title IV). IDEM acknowledges that there are different specifications for natural gas in different references, such as the AP-42. Differences might occur due to averaging of rates to get an emission factor, range of heating value, and sulfur content. Since the definition in the Title IV is the only definition that can be found and its development underwent public and legal reviews for its final promulgation, it is the definition that IDEM will use.

AP-42 Chapter 1.4 considered natural gas fuel to be relatively clean-burning fuel. This chapter mainly concentrated on the NOx , CO and PM emissions. Approximately less than 50 tons/year of SO2 emissions from the combustion units were estimated to be emitted from this proposed modification, using the AP-42 emission factor. The USEPA classified the AP-42 emission factor as excellent. This is sufficient to be relied upon, thus there is no need to require Nucor and other sources in Indiana to test the composition of the natural gas they use.

Nucor is not required to verify the specifications of the natural gas. When looking at the NOx emissions from this source due to the use of natural gas as fuel, IDEM does not consider it necessary to require stack tests to demonstrate compliance. Compliance is assumed to be in order as long as pipeline natural gas is used. In addition, there are no operational parameters that can be measured to demonstrate continuous compliance. It is in the company's best interest to assure that these units are operating properly such as to prevent unnecessary natural gas consumption. IDEM retains the authority to require testing if necessary and EPA has corresponding authority under the Clean Air Act (CAA).

It is routine that sources specify a different and accessible fuel to be used for start up, back ups and emergency purposes. Existing permits already indicated that Nucor has been approved to use propane as back up fuel for combustion units in their plant that are primarily powered by natural gas fuel. As widely known, propane is just one of the many fossil fuels that are included in the liquefied petroleum (LP) gas family and is clean-burning and efficient because its molecular structure, C_3H_8, makes it one of the lightest, simplest hydrocarbons. It is colorless, odorless, tasteless and above all, non-toxic. Since propane is as efficient as natural gas as fuel, it is an acceptable back up fuel and there is no need to specify a different set of PSD BACT limits.

There is no change in draft permit due to these comments.

IDEM is initiating the following change to provide clarity:

D.8.1 Alkali Cleaning PSD BACT [326 IAC 2-2]

Pursuant to 326 IAC 2-2 (PSD), the Permittee shall comply with the following BACT requirements:

(a) The Galvanizing Line Alkaline Cleaning station shall be controlled by mist eliminators ~~with a rate of~~ **and the PM emissions shall not exceed** 0.003 gr/dscf.

Comments on Appendix A - - Emission Calculations

(1) Table 3
The emission factors for new natural gas-fired, low-NOx burner boilers are 50 lbs/MMCF for NOx, 84 lbs/MMCF for CO, and 5.5 lbs/MMCF for VOC, which is inconsistent with the BACT limitations of 35 lbs/MMCF for NOx, 61 lbs/MMCF for CO, and 2.6 lbs/MMCF for VOCs as set forth in Sections D.6.2 and D.13.1 of the draft permit. Nucor requests that the OAQ clarify this inconsistency. [Nucor Steel]

IDEM Response

The PTE of the boilers were at first determined using the standard AP-42 emissions factors. Additional columns are added to indicate the revised PTE based on the PSD BACT limits. These changes in the PTE also correspondingly changed Table 5 (Summary of the Total PTE of the New Units Only), Table 1(Total PTE) and Table 3 of the TSD (Total PTE of the Modification). However, these changes do not change the status of the modification, or impact any PSD BACT limits and conditions of the final permit.

Table 3 --- New NG Low NOx Boilers (49 MMBTU/hr)

Pollutant	Emission Factor (EF) (lb/MMCF)	PTE (tons/year)	**Emission Factor (EF) (lb/MMCF)**	**PTE (tons/year)**
SO_2	0.6	0.1	0.6	0.1
NOx	50	10.7	**35**	**7.49**
VOC	5.5	1.2	**2.6**	**0.567**
CO	84	18	**61**	**13.07**
PM	1.9	0.41	1.9	0.41
PM_{10}	7.6	1.6	7.6	1.6
Benzene	0.0021	0.00045	0.0021	0.00045
Formaldehyde	0.075	0.016	0.075	0.016
Hexane	1.8	0.388	1.8	0.388
Toluene	0.0034	0.00073	0.0034	0.00073
Lead	0.0005	0.00011	0.0005	0.00011
Chromium	0.0014	0.0003	0.0014	0.0003

Maximum capacity = 34 MMBTU/hour and 15 MMBTU/hour = 49 MMBTU/hour
PM EF is filterable only. PM_{10} EF is condensible and filterable combined.
All EFs are based on normal firing. 1MMBTU = 1,000,000 BTU

EFs **(Second Column)**are from AP-42, Chapter 1.4.
EFs (Fourth Column)are based on the PSD BACT limits.

PTE = (Heat Input MMBTU/hr)(EF lb/MMBTU)(1MMCF/1,000MMBTU)(8760 hr/yr)(1ton/2000 lb)

These EFs **(Fourth Column)**are also going to be the PSD BACT limits for this boiler.

(2) Table 10
After Pickle Line 2, "9000 acf/min" should be changed to "additional 5000 acfm." Also, total PM_{10} should be changed from "30.98" to "30.78." [Nucor Steel]

IDEM Response
The following clarification has been added at the bottom of Table 10. The total PM10 has also been corrected.

Table 10 - - PTE (tons/year) of Other Physically Modified Units							
Unit/Process	SO_2	NO_x	PM	PM_{10}	CO	VOC	Pb
Meltshop Roof Monitors and Ladle Preheaters Stack	0.41	33.4	26.2	20.1	13.3	1.1	0.19
Tunnel Furnace System	0.31	92.2	7.0	7.0	17.8	1.4	- -
EAF Digout/EAF to Slag Processing	- -	- -	1.3	1.3	- -	- -	- -
Strip Caster LMS	38.3	- -	- -	- -	- -	- -	- -
Strip Caster Monitor	0.38	- -	- -	- -	- -	- -	- -
Cold Reversing Mill 1	- -	- -	- -	- -	- -	5.25	- -
R/t Mill (Cold Reversing Mill 2)	- -	- -	- -	- -	- -	5.25	- -
Galvanizing Line Cleaning (Additional 5,000 acf/min)	- -	- -	0.6	0.6	- -	- -	--
EAF Dust Recycling System	- -	- -	0.05	0.05	- -	- -	- -
Lime Silo	- -	- -	0.19	0.19	- -	- -	- -
EAF Dust Silo	- -	- -	0.04	0.04			
Pickle Line 2 (9,000 acf/min)*	- -	- -	1.5	1.5	- -	- -	- -
Total	39.4	125.6	36.88	30.~~9~~78	31.1	13.0	0.19

***** **The flow rate is increased from 4,000 acf/min to 9,000 acf/min. The PTE indicated in the above table is for the 5,000 acf/min increase only.**

(3) Table 11
The following cooling tower emissions were incorrectly calculated:
Meltshop Caster Contact: Change 1.9 tpy to 8.33 tpy.
Cold Mill Non Contact: Change 0.93 to 1.86.
Cold Mill Non Contact Expansion: Change 1.87 to 0.93
Castrip Contact: Change TDS from 0.0076 to 0.0022.
Castrip Non Contact: Change TDS from 0.0017 to 0.0022.
Total Emissions: Change 38.32 to 44.86. [Nucor Steel]

IDEM Response
Table 11 - - Cooling Towers - - has been revised.

Table 11 - - Cooling Towers				
Cooling Towers	Capacity (gal/min)	TDS Fraction	Drift Losses	PM PTE (tons/year)
Existing				
Meltshop Noncontact (9 cells)	60,000	0.0016	0.00005	10.53
Meltshop Caster Contact (4 cells)	10,000	0.0076	0.00005	~~1.9~~ **8.33**
Hot Mill Contact (4 cells)	16,383	0.0021	0.00005	3.77
Hot Mill Contact Expansion (1 cell)	4,000	0.0021	0.00005	0.92
Hot Mill Noncontact (4 cells)	25,319	0.0015	0.00005	4.17
Laminar Contact (3 cells)	11,600	0.001	0.00005	1.27
Cold Mill Non Contact (2 cells)	10,000	0.0017	0.00005	~~0.93~~ **1.86**
Cold Mill Non Contact Expansion(1 cell)	5,000	0.0017	0.00005	~~1.87~~ **0.93**
Galvanizing/Annealing Non Contact (2 cells)	6,500	0.0015	0.00005	1.07
* Annealing Non Contact (2 cells)	2,400	0.0017	0.00005	0.43
Castrip Contact (4 cells)	12,000	~~0.0076~~ **0.0022**	0.00005	2.9
Castrip Non Contact (6 cells)	12,000	~~0.0017~~ **0.0022**	0.00005	2.9
BOC Non Contact CT-91A (1 cell)	750	0.002	0.00005	0.16
BOC Non Contact CT-91B (2 cells)	3,200	0.002	0.00005	0.7
Proposed				
Meltshop Caster Contact Expansion (2 cells)	5,000	0.0076	0.00005	4.17
Main Compressor Non Contact (4 cells)	3,200	0.002	0.00001	0.14
Castrip Compressor Non Contact (3 cells)	2,400	0.002	0.00001	0.11
* Annealing Non Contact (2 cells)	2,600	0.0017	0.00005	0.5
Total (54 cells)	**192,352**			~~38.32~~ **44.86**

TDS Fraction and Drift losses are provided by the source.
* The 2 cells of the Annealing Non Contact Cooling Tower is going to be replaced with a higher capacity.
Cooling Tower PM/PM_{10} = (Maximum Rate gal/min)(TDS fraction)(8.34 lb/gal)(60 min/hr)(drift losses)

(4) Table 9
The emission estimates for SO2 and NOx are based on emission factors that differ from those provided in the permit and BACT analysis. Please double check calculations. [USEPA]

IDEM Response

Table 9 is showing incorrect emission factors for SO2 and NOx. The correct emission factors (which are also the PSD BACT) are:
SO2 = 0.185 lb/ton and NOx = 0.0176 lb/ton. Appendix B, Table 17 and Section D.2 of the permit indicated the correct emission rates.

Comments on Appendix C - - Air Quality Analysis

Nucor Steel pointed out numerous changes to the Appendix C - - Air Quality Analysis-- that need to be revised for clarification. The corrections are indicated after each item. These changes did not change the result of the air quality impact analysis.

(1) Introduction
In the last sentence of the first paragraph of the Introduction, add "lead (Pb)" after "(VOCs)." [Nucor Steel]

IDEM Response

IDEM is making the change.

These standards for Nitrogen Dioxide (NO_2), Sulfur Dioxide (SO_2), Carbon Monoxide (CO), Volatile Organic Compounds (VOCs), **Lead (Pb)** and Particulate Matter less than 10 microns (PM_{10}) are set by the United States Environmental Protection Agency (U.S. EPA) to protect the public health and welfare.

(2) Summary
In the fifth sentence of the Summary, delete "VOCs." Also, in the tenth sentence, delete "except Cadmium." In the last sentence, "facility' should be "modification." [Nucor Steel]

IDEM Response

Cadmium is not deleted because it was over the 0.5% PEL.

Modeling results taken from the Industrial Source Complex Short Term (ISCST3) model showed pollutant impacts for NO_2, SO_2, ~~VOCs,~~ and PM_{10} were predicted to be greater than the significant impact levels for purposes of a National Ambient Air Quality Standards analysis. The modeling showed no violations of the NAAQS for NO_2, SO_2, and PM_{10}. Analysis for PSD increment consumption was also necessary for NO_2, SO_2, and PM_{10}. Results from the PSD increment analysis showed increment consumption below 80% of the available PSD increment for NO_2, SO_2, and PM_{10}. Hazardous Air Pollutant (HAPs) modeling was conducted for seventeen pollutants. HAP 8-hour maximum concentrations modeled below 0.5% of each Permissible Exposure Limit (PEL) for all pollutants except Cadmium. There was no impact review conducted for the nearest Class I area, which is Mammoth Cave National Park in Kentucky. No Class I analysis is required if a source is located more than 100 kilometers (61 miles) from the nearest Class I area. An additional impact analysis on the surrounding area was conducted and no significant impact on soils, vegetation, federal and state endangered species or visibility from the proposed ~~facility~~ **modification** was expected.

(3) Part A
The last sentence of the first paragraph should end after "BACT determination." [Nucor Steel]

IDEM Response

IDEM agrees.

It should be noted that all emissions are based on the Best Available Control Technology (BACT) determination ~~and other limitations resulting from the OAQ review of the application.~~

(4) Modeled Results

(a) In Table 2, all significant impact levels and significant monitoring levels should not be expressed to the tenth. In addition, Footnote a indicates bold values in the table, yet there are none. Each of the modeled values for NO_2, SO_2, and PM_{10} should be in bold print. Also, the modeled value for NO_2 represents NOx. USEPA allows a factor of 0.75 to be applied to the modeled NOx concentration to represent NO_2. Thus, NOx is 4.3 ug/m3 and NO_2 is 3.2 ug/m3. [Nucor Steel]

(b) In addition, in the first sentence after Table 2, delete "significant" in front of "monitoring." [Nucor Steel]

IDEM Response

The original version showed the bolded values, however, in some cases, transfer of electronic files removes some features, such as bold font. The table below shows the values that should have been bolded.

TABLE 2 – Summary of OAQ Significant Impact Analysis for Nucor Steel – Montgomery County (ug/m3)

Pollutant	Year	Time-Averaging Period	Maximum Modeled Impacts	Significant Impact Levels	~~Significant~~ Monitoring **Deminimis** Levels
CO	1991	1-hour	737.6	2000.0	a
CO	1994	8-hour	217.3	500.0	575.0
NO_2	1991	Annual	**4.3**	1.0	14.0
SO_2	1994	3-hour	**130.3**	25.0	a
SO_2	1992	24-hour	**64.8**	5.0	13.0
SO_2	1991	Annual	**5.4**	1.0	a
PM_{10}	1994	24-hour	**9.6**	5.0	10.0
PM_{10}	1990	Annual	**1.2**	1.0	a

a No limit exists for this time-averaged period; **bolded numbers** require refined modeling

Modeled concentrations for NO_2, PM_{10}, and SO_2 at all applicable time-averaged periods were above the significant impact levels and SO_2 **and PM10** ~~was~~ **were at or** above the ~~significant~~ monitoring de minimis level. Refined modeling was required for NO_2, PM_{10}, and SO_2. No additional modeling was required for CO.

(5) Part C

(a) In the last line of the second paragraph, delete "and further modeling was not required." [Nucor Steel]

(b) In Table 4, the modeled source impacts NOx concentration is 14.1 ug/m3 and total of 48.3 ug/m3. To represent NO_2, the modeled source impacts concentration is 10.6 ug/m3 and total of 44.8 ug/m3.[Nucor Steel]

IDEM Response

IDEM agrees.

All maximum concentrations of NO_2, SO_2, and PM_{10} for every time-averaged period were below their respective NAAQS limit ~~and further modeling was not required.~~

TABLE 4 – National Ambient Air Quality Standards Analysis Nucor Steel – Montgomery County (ug/m3)						
Pollutant	Year	Time-Averaging Period	Modeled Source Impacts	Background	Total	NAAQS Limits
NO_2	1991	Annual	14.1	34.2	48.3	100
SO_2	1994	Highest 2nd, high 3-	173.1	327.5	500.6	1300
SO_2	1990	Highest 2nd, high	62.8	128.4	191.2	365
SO_2	1991	Annual	8.4	16.2	24.6	80
PM_{10}	1994	Highest 2nd, high	29.4	55	84.4	150
PM_{10}	1990	Annual	6.2	26.3	32.5	50

(6) PSD Compliance Analysis and Results

(a) In the third sentence of the first paragraph, replace "major" with "PSD increment consuming." [Nucor Steel]

(b) In Table 5, the modeled source impacts NO_2 concentration is 10.6 ug/m3 and is 42.4% of PSD Class II increment. [Nucor Steel]

(c) In the first full sentence on the page, change 'available increment" to "increment concentration of 24 ug/m3." [Nucor Steel]

IDEM Response

IDEM agrees.

Since the impacts for NO_2, PM_{10}, and SO_2 from Nucor Steel were modeled above the significant impact levels, a PSD increment analysis for the existing major sources in Montgomery County and its surrounding counties was required.

TABLE 5 – Prevention of Significant Deterioration Analysis for Nucor Steel – Montgomery County (ug/m3)					
Pollutant	Year	Time-Averaging Period	Modeled Source Impacts	PSD Increment	Impact on PSD Increments

NO_2	1991	Annual	14.1	25	56.3%
SO_2	1994	Highest 2nd, high 3-hour	173.1	512	33.8%
SO_2	1990	Highest 2nd, high 24-hour	61.3	91	67.3%
SO_2	1991	Annual	7.5	20	37.7%
PM_{10}	1994	Highest 2nd, high 24-hour	29.4	30	**97.8%**
PM_{10}	1990	Annual	6.2	17	36.7%

However, one or more values for the 24-hour time averaging period for PM_{10} was above the 80% **increment concentration of 24 ug/m3** ~~available increment.~~

(7) Part E
In the eighth sentence, delete "except Cadmium." Note in Table 8, the modeled percentage of cadmium PEL of 0.089% is less than 0.5%. [Nucor Steel]

IDEM Response

Cadmium is above 0.5% of its PEL
PEL = 5.0
0.5% of 5.0 = 0.025
Therefore: 0.089 is greater than 0.025

All HAP concentrations except Cadmium were modeled below 0.5% of their respective PELs.

The unit for the last column of Table 8 should be ug/m^3, not %.

(8) Economic Growth and Impact of Construction Analysis
In the second sentence, delete "will" after "construction." Also in the second to last sentence, change "will" to "may." [Nucor Steel]

IDEM Response

IDEM agrees.

Secondary emissions are not expected to significantly impact the area as all roadways will be paved. Industrial and residential growth is predicted to have negligible impact in the area since it will be dispersed over a large area and new home construction ~~will~~ is not expected to significantly increase. Any commercial growth, as a result of the proposed modification, will occur at a gradual rate and will be accounted for in the background concentration measurements from air quality monitors. A minimal number of support facilities ~~will~~ **may** be needed. There will be no adverse impact in the area due to industrial, residential, or commercial growth.

(9) Soils Analysis
In the last sentence, delete "insignificant." [Nucor Steel]

IDEM Response

IDEM agrees.

According to the ~~insignificant~~ modeled concentrations of NO_2, SO_2 and PM_{10} and the HAPs analysis, the soils will not be adversely affected by the proposed facility.

(10) Vegetation Analysis
In the second sentence, change "power facility" to "steel mill modification." [Nucor Steel]

IDEM Response
IDEM agrees.

The maximum modeled concentrations of the proposed ~~power facility~~ **steel mill modification** for NO_2, SO_2 and PM_{10} are well below the threshold limits necessary to have adverse impacts on surrounding vegetation such as autumn bent, nimblewill, barnyard grass, bishopscap and horsetail milkweed (Flora of Indiana - Charles Deam).

(11) Federal and State Endangered Species Analysis
In the first sentence of the third paragraph, delete "proposed." [Nucor Steel]

IDEM Response
IDEM agrees.

The state of Indiana's list of endangered, special concern and extirpated nongame species, as listed in the Department of Natural Resources, Division of Fish and Wildlife, contains species of birds, amphibians, fish, mammals, mollusks and reptiles which may be found in the area of the Nucor Steel ~~proposed~~ facility.

(12) Additional Analysis Conclusions
In the first sentence of the second paragraph, change "power facility" to "steel mill modification." [Nucor Steel]

IDEM Response
IDEM agrees.

The results of the additional impact analysis conclude the Nucor Steel's proposed ~~power facility~~ **steel mill modification** will have no adverse impact on soils, vegetation, endangered or threatened species or visibility on any Class I area.

General Comments

(1) Public Notice

There is a possibility that the requisite notice, specified by 326 IAC 2-1.1-6(a)(2) and (a)(4), was not published 30 or more days prior to the scheduled 12 October 2003 end of the comment period. Should that be the case, then I request that a full (a)(4) 30-day comment period follow a valid (a)(2) notice. [Stephen Loeschner]

IDEM Response

The notice was published on September 13, 2003, in the Journal Review newspaper. The end of the 30-day comment period is October 13, 2003.

There is no change in the draft permit due to this comment.

(2) AOD Vessel Hours of Operation - - Appendix B

The existing limit on hours of operation of the AOD is 8760 hrs/yr, not 1800 hrs/yr as stated in Table 34 of Appendix B - - PSD BACT Evaluations. [Nucor Steel]

IDEM Response

Table 34 - - AOD Existing Limits - - was showing the comparison between the existing limits of the AOD Vessel and its new PSD BACT limits.

The existing limit of the AOD was specified in the Amendment 107-4631-00038, issued on September 28, 1995, for the Permit 107-3599-00038, issued on September 22, 1994, Condition No. 4, indicated that the AOD was increased from 1,008 hours/year to 1,800 hours/year of operation.

IDEM did not find any approval that changed this limit prior to this modification and Nucor did not indicate a specific approval where the hours of operation was different.

There is no change in the draft permit due to this comment.

(3) 326 IAC 2-4.1 Applicability

Nucor's proposed modifications neither constitute construction of a new source or reconstruction of an existing source of HAPs and therefore 326 IAC 2-4.1 does not apply as indicated in paragraph (23) of TSD State applicability. Nucor is already subject to NESHAP Subpart CCC requirements and hence the proposed modifications are of no consequence. [Nucor Steel]

IDEM Response

326 IAC 2-4.1 applies to sources who constructs or reconstruct a HAPs major source.

The TSD simply indicated that this modification is subject to the NESHAP for steel pickling.

There is no change in the draft permit due to this comment.

(4) Comments made during the Public Hearing

Comments made during the public hearing were addressed during the hearing. The transcript of the hearing is part of the application file. No specific comments were made during the hearing.

An informal meeting was held with discuss Ms. Judy Goshern and Ms. Jane Truax, after the hearing, and discussed the review process. They were also provided resources, such as Citizen's Guide to Permitting, to assist them in understanding the permitting program.

There is no change due to the specific comments made during the public hearing.

(5) CO State Rule Applicability - - TSD

Page 23 of the TSD indicated that Nucor Steel is subject to the rule 326 IAC 9 (CO Emissions), however, no emission limit is specified for a steel mill.

Based on the most recent version of the rule, Nucor Steel is not subject to this rule.

Indiana Department of Environmental Management
Office of Air Quality

Technical Support Document (TSD) for a Prevention of Significant Deterioration (PSD) and Part 70 Significant Source Modification (SSM)

Source Background and Description

Source Name:	Nucor Steel
Source Location:	4537 South Nucor Street, Crawfordsville, IN 47933
Mailing Address:	4537 South Nucor Street, Crawfordsville, IN 47933 RR2, Box 311, Crawfordsville, IN 47933
General Telephone Number:	765-364-2323
General Facsimile Number:	765-364-5311
Responsible Official:	General Manager
County Location:	Montgomery
SIC Code:	3312 (Steel Mill)
Source Categories:	1 of 28 Listed Source Categories Major PSD Source Major Source, CAA Section 112
Significant Source Modification:	PSD 107-16823-00038
Permit Reviewer:	Iryn Calilung

History

Nucor Steel is proposing to modify their existing electric arc furnaces (EAFs), argon-oxygen decarburization (AOD) operations and other processes within the mill. The modification will be accomplished by:

(1) constructing new units,

(2) making physical modifications to existing units, and

(3) administrative permit changes.

Nucor Steel has a maximum capacity of 502 tons/hour of steel production and has been permitted at its maximum capacity. It produces all grades of carbon and stainless steel, all grades of alloy steel, all grades of ultra low and low carbon steel, hot rolled, cold rolled, galvanized, pickled and oiled steel (slabs, sheets) products. Raw materials are brought to the mill by rail or truck. The raw materials and flux are charged to the EAFs and melted by the application of electric current through the mixture. The mill also incorporates an argon-oxygen decarburization (AOD) vessel. Molten metal is tapped to ladles and transferred to ladle metallurgical furnaces (LMFs), where the metallurgy is adjusted. From the LMFs, the molten metal is transferred to continuous casters. Then the slabs proceed through the tunnel furnaces, to the rolling mill, where they are rolled to gauge and then coiled.

The main goal of the PSD application is for Nucor Steel to utilize its rated maximum capacity, and undergo PSD major review and requirements in order to do so.

The table below lists the air approvals issued to Nucor Steel, IN. This information is based on the OAQ database. They are arranged in descending order of their issuance dates. This table is not inclusive, even though attempts have been made to account for all the issued air approvals issued to Nucor Steel, IN.

Table 1 - - Air Approvals		
Permit No.	Type	Issuance Date
107-16004-00038	Minor Source Modification	December 3, 2002
107-16103-00038	Review Request	July 12, 2002
107-14297-00038	Prevention of Significant Deterioration	June 6, 2002
107-16049-00038	Administrative Amendment	June 5, 2002
107-15150-00039	Exemption	May 3, 2002
107-15289-00038	Minor Source Modification	April 16, 2002
107-15599-00038	Minor Source Modification	April 10, 2002
107-15435-00038	Registration Notice Only Change	January 29, 2002
107-14935-00038	Administrative Amendment	November 20, 2001
107-15059-00038	Administrative Amendment	November 2, 2001
107-14782-00038	Minor Source Modification	October 4, 2001,
107-14780-00038	Exemption	September 18, 2001
107-14777-00038	Experimental Operation	September 4, 2001
107-12143-00038	Prevention of Significant Deterioration	January 19, 2001
107-11364-00038	Administrative Amendment	November 3, 1999
107-11154-00038	Administrative Amendment	August 11, 1999
107-10915-00038	Administrative Amendment	July 16, 1999
107-9751-00038	Construction Permit	July 16, 1999
107-9924-00038	Registration	February 12, 1999
107-9857-00038	Administrative Amendment	September 17, 1998
107-8731-00038	Administrative Amendment	July 31, 1997
107-8254-00038	Administrative Amendment	July 1, 1997
107-7298-00038	Administrative Amendment	January 13, 1997
107-5235-00038	Prevention of Significant Deterioration	June 20, 1996
107-4840-00038	Administrative Amendment	January 17, 1996
107-4631-00038	Administrative Amendment	September 28, 1995
107-3702-00038	Prevention of Significant Deterioration	March 28, 1995
107-4263-00038	Exemption	January 5, 1995
107-4100-00038	Exemption	October 27, 1994
107-4085-00038	Exemption	September 23, 1994
107-3599-00038	Construction Permit	September 22, 1994
107-3794-00038	Registration	July 28, 1994
107-2764-00038	Prevention of Significant Deterioration	November 30, 1993
107-2437-00038	Registration	March 19, 1992
107-2164-00038	Registration	February 7, 1992
107-1742-00038	Review Request	June 27, 1991
54-05-93-0148 to 54-05-93-0166	Operating permits	June 13, 1989
PC(54)1742	Construction Permit	April 20, 1989

Description of Proposed Project

On November 22, 2002, Nucor Steel submitted an application to modify its existing steel mill. The following is the list of the proposed modification. The descriptions of the units and processes are the final results after the proposed changes.

I MELTSHOP

(1) Two (2) Meltshop Electric Arc Furnaces (EAFs) together with the Argon-Oxygen Decarburization (AOD) have a maximum capacity of 502 tons/hour. The EAFs utilize the following emission control technologies:
(i) a direct shell evacuation (DSE) control system ("fourth hole" duct),
(ii) an overhead roof exhaust system consisting of canopy hoods,
(iii) low NO_x /oxy fuel burners and
(iv) multi compartment, reverse air type baghouses (identified as Meltshop EAF Baghouse1 and Meltshop EAF Baghouse2).

(a) Raw materials used are all types of scrap steel, including stainless, DRI, pig iron, HBI, various types of lime, alloys, carbon and various types of metal scrap substitutes.

(b) Each or any combination of the Meltshop EAFs and AOD can independently produce the maximum capacity of 502 tons/hour of steel. Each Meltshop EAF can operate concurrently or independently to achieve this maximum capacity.

(c) Both the Meltshop EAF Baghouse1 and Meltshop EAF Baghouse2 capture the emissions from the Meltshop EAFs, AOD vessel, Desulfurization, Meltshop Continuous Caster. Each Meltshop Baghouse can sufficiently control emissions independently. Each Meltshop EAF Baghouse serves as a back up control to the Meltshop LMFs.

(i) The Meltshop EAF Baghouse1 is a multi compartment positive pressure baghouse, has a air flow rate of 1,527,960 actual cubic foot/min (acf/min) and loading of 0.0018 grains/dry standard cubic foot (gr/dscf). This Meltshop EAF Baghouse1 exhausts to a roof vent/monitor (identified as BH1 vent).

(ii) The Meltshop EAF Baghouse2 is a multi compartment negative pressure baghouse, has a flow rate of 915,000 dscf/min and 1,200,000acf/min and loading of 0.0018 gr/dscf. This Meltshop EAF Baghouse2 exhausts to a stack (identified as BH2 stack).

(d) The fugitive emissions generated during the furnace operations are captured by the Meltshop Roof Canopies or contained within the Meltshop Building.

(e) The Meltshop roof monitors include exhausts from the ladle preheaters, ladle dryers, tundish preheaters, tundish dryers, ladle lancing station, tundish dumping, fugitive emissions from the LMFs, fugitive emissions from the Meltshop Casters and other Meltshop operations.

(f) An arc dust treatment facility, with a capacity of 50,000 lb/hour or transfer the dust to the existing system which will then be a total of 100,000 lb/hour. Dust transfer will also occur inside the building. Options for the dust transfer are:

(i) from silo to truck through a loading spout,
(ii) from silo to railcar through a loading spout,
(iii) from silo to truck through a loading spout to transfer to the existing Meltshop EAF Baghouses. Unloading from the truck at the existing Meltshop EAF Baghouses also occurs in the building, transferring the dust through augers and a bucket elevator to the existing silo. In this option, the existing EAF dust treatment will have a maximum capacity of 100,000 lb/hr.
(iv) treating dust at the new silo and transferring to a truck. No loading spout is necessary because the material is no longer dusty, as treated.

The proposed physical and operational modifications to maintain and utilize the maximum capacity of 502 tons/hour are:

(a) Replace and/or upgrade PLC controls and process equipment.

(b) Install a second Baghouse in addition to the existing Meltshop EAF Baghouse. The new Meltshop EAF Baghouse is a reverse air type multi compartment negative pressure baghouse, with the following specifications: 1,200,000 acf/min and 0.0018 grain/dscf.

(c) Install an arc dust treatment facility, with a capacity of 50,000 lb/hour or transfer the dust to the existing system which will then be a total of 100,000 lb/hour. Dust transfer will also occur inside the building.

    Options for the dust transfer are:
    (i) from silo to truck through a loading spout,
    (ii) from silo to railcar through a loading spout,
    (iii) from silo to truck through a loading spout to transfer to the existing Meltshop EAF Baghouse. Unloading from the truck at the existing Meltshop EAF Baghouse also occurs in the building, transferring the dust through augers and a bucket elevator to the existing silo. In this option, the existing EAF dust treatment will have a maximum capacity of 100,000 lb/hr.
    (iv) treating dust at the new silo and transferring to a truck. No loading spout is necessary because the material is no longer dusty, as treated.

(d) Upgrade the current conducting arms on the 2 Meltshop EAFs.

(e) Install an automatic machine that sets electrodes at the Meltshop EAFs.

(f) Install additional and or different styles of oxy fuel burners, post burners, post combustion burners, carbon injection system, lances, both oxygen and carbon.

(g) Install an alloy system for direct feeding of alloys, lime and carbon to EAFs.

(h) Install a new conveyor systems to feed raw materials to the EAF charge buckets with outside truck or rail dump.

(i) Install additional charge buckets.

(2) Argon oxygen decarburization (AOD) vessels, together with the Meltshop EAFs have a total maximum capacity of 502 tons/hour. The AOD vessels and Desulfurization also exhaust to the Meltshop EAF Baghouse1 and Meltshop EAF Baghouse2. Only 1 AOD vessel can operate at a time.

The proposed physical and operational modifications to maintain the total maximum steel production remains at 502 tons/hour are:

(a) Install additional and or different styles of oxy fuel burners, post burners, post combustion burners, carbon injection system, oxygen lances, and argon lances.

(b) Install additional lances and tuyerers.

(c) Install additional AOD vessels as spare, and only one at a time will be used.

(d) Install additional rebricking stations.

(e) Install additional spout ladles, use to transfer molten steel from AOD to ladles.

(3) Desulfurization is an additional step in the Meltshop operations that remove sulfur. It has a maximum capacity of 502 tons of metal per hour.

(4) Two (2) Meltshop Continuous Casters with total maximum capacity of 502 tons/hour. These Meltshop Continuous Casters also exhaust to the Meltshop EAF Baghouse1 and Meltshop EAF Baghouse2. The steam from the Meltshop Continuous Casters exhausts directly to the atmosphere.

The proposed physical modifications are:
(a) Replace and/or upgrade PLC controls and process equipment.
(b) Extend the steam vents from the caster spray chambers to the top of the roof.
(c) Caster spray water and mold water modifications.

(5) Two (2) Meltshop Ladle Metallurgy Furnaces (LMFs)/Stirring Station have a maximum capacity of 502 tons/hour and controlled by a baghouse, (identified as Meltshop LMF Baghouse), exhausting to a stack (identified as Meltshop LMF Baghouse). The Meltshop LMF Baghouse has a flow rate of 200,000 acf/min.

The proposed physical and operational modifications are:
(a) Replace and/or upgrade PLC controls and process equipment.

(b) Add a new alloying conveyor system, silos, storage bin, and feed equipment and control.

(c) Install additional argon lances for stirring in the LMFs.

(d) Add porous plugs to ladles for argon stirring.

(e) Add new ladles.

(f) Install new exhausts for the Ladle Preheaters instead of exhausting to roof monitors.

(6) Operations in the Meltshop that are not going to be physically modified, but increase in utilization is expected:
(a) Ladle Preheat Stations consisting of:
(i) 3 units, each rated at 10 MMBTU/hr
(ii) 1 unit, rated at 7.5 MMBTU/hr
(iii) 1 unit, rated at 15 MMBTU/hr
(b) Ladle Dryout Station consisting of a low NO_x natural gas fired burner, rated at 5 MMBTU/hour.
(c) Tundish Preheaters consisting of 4 low NO_x natural gas fired heaters, each rated at 6 MMBTU/hour.
(d) Two (2) Tundish Dryers, rated at 1.5 MMBTU/hour and 9 MMBTU/hour.
(e) Four (4) Tundish Nozzle Preheaters consisting of a low NO_x natural gas fired Preheater, each rated at 0.8 MMBTU/hour.
(f) Tundish Dumping for removal of excess molten metal.
(g) Ladle Dumping for removal of excess molten steel and slag
(h) Ladle tap hole cleaning and repair
(i) Ladle/tundish refractory application and curing.

II HOT MILL

(1) Hot Strip Mill has a maximum capacity of 502 tons/hour consisting of the Tunnel Furnace System, and other rolling mills processes: Shearing, Descaling, Finishing, Rollout Table, Coilers, Skin Pass Mill and Roll Grinders.

The proposed physical and operational modifications are:
(a) Replace and/or upgrade PLC controls and process equipment.

(b) Take into account VOC emissions that were not taken into account during the initial review.

It is also clarified that the coilers in the Hot Mill are not electrostatic, meaning these coilers do not use oil in the coiling process.

(2) Operations in the Hot Mill that are not going to be physically modified, but increase in utilization is expected:
Tunnel Furnace System (total of 200 MMBTU/hr) consisting of:
(a) Tunnel Furnace 1 -Natural gas fired 84 MMBTU/hour
(b) Tunnel Furnace 2 - Natural gas fired 84 MMBTU/hour
(c) Shuttle Furnaces 1 and 2, each has 13 MMBTU/hour natural gas fired Low NO_x burners
(d) Snub Furnace - 6 MMBTU/hour

III COLD MILL

(1) Pickle Line 1 and Pickle Line 2 have maximum capacity of 250 tons/hour each, use HCl pickling solution and rinse water, and are equipped with process tanks. Each Pickle Line1 and Pickle Line2 is also equipped with electrostatic coilers.

(a) Pickle Line 1 is controlled by a counter flow-packed scrubber and mist eliminators. The PL1 Scrubber has a flow rate of 12,000 acf/min, and loading of 0.01 gr/dscf.

(b) Pickle Line 2 is controlled by a new counter flow tray scrubber and mist eliminators. The new PL2 Scrubber has a flow rate of 9,000 acf/min and loading of 0.01 gr/dscf. This new PL2 Scrubber will replace the existing PL2 Scrubber.

(c) Tank Farm treats the rinse water from Pickle Line1 and Pickle Line 2. These tanks also store spent acid, raw acid, regenerated acid oily wastewater and processed water.

The proposed physical and operational modifications are:

(a) Replace the tray type fume scrubber and collection system of Pickle line 2 and increase the flow rate from 4,000 acf/min to 9,000 acf/min.

(b) Replace all process tanks and rinse tanks and auxiliary equipment on both pickle lines. This will allow wider product to be processed and various pickling enhancing products.

(c) Replace and/or upgrade PLC controls and process equipment on both pickle lines 1 and 2.

(d) The use of various pickling agents, various levels of concentrations, flows and temperatures of acid at both Pickle lines 1 and 2.

(2) Acid Regeneration consisting of two natural gas fueled tangentially fired burners at a total rating of 7.3 MMBTU/hour, and controlled by its own counter flow packed scrubber (identified as AR scrubber) with mist eliminator. The counter flow-packed scrubber has a flow rate of 4,269 acf/min and loading of 0.04 gr/dscf. Propane is used as back up fuel.

The proposed physical and operational modifications are:

(a) Replace and/or upgrade PLC controls and process equipment (valves, dampers).

(b) Install a rail loading facility for acid in the Cold Mill area.

(3) Cold Reversing Mill 1 has a maximum capacity of 250 tons/hour, emulsion oil is sprayed in the strip, controlled by hoods mounted on both sides of the mill stand and exhausting thru a panel-typed collision mist eliminators at a rate of 84,000 acf/min and 0.01 gr/dscf.

The Part 70 application indicated that the maximum capacity of the Cold Reversing Mill 1 was 150 tons/hour. Based on this proposed modification, the maximum capacity of the Cold Reversing Mill 1 is 250 tons/hour.

There are two (2) natural gas fueled with propane as back up fuel Cold Mill Boilers, each rated at 34 MMBTU/hour. Each Cold Mill Boiler exhausts to its own stack. These 2 Cold Mill Boilers will supply steam to the entire Cold Mill.

The proposed physical and operational modifications are:

(a) Replace and/or upgrade PLC controls and process equipment.

(b) Take into account VOC emissions that were not taken into consideration during the initial review of the Cold Reversing Mill 1.

(c) Install a natural gas fired low NO_x burner Cold Mill Boiler, identified as Unit No. 300, rated at 34 MMBTU/hour, with propane as back up fuel. This is in addition to the existing one (1) natural gas fueled Cold Mill Boiler, rated at 34 MMBTU/hour. This existing Cold Mill Boiler was previously the VTD Degasser Boiler, then moved to the /Pickle Line 2 boiler, then finally was transferred to the Cold Mill. These 2 Cold Mill Boilers will supply steam to the Cold Mill, Pickle Lines 1 and 2, Tank Farms and Galvanizing Line. For clarification, there will be total of 2 boilers in the Cold Mill, each rated at 34 MMBTU/hr. There is no boiler in the VTD Degasser/Pickle Line 2.

(d) Modify the burner of the existing Cold Mill Boiler (34 MMBTU/hr) to achieve its permitted capacity.

(e) Install additional cooling tower chillers for motor cooling.

(f) Install a fume collection enclosure.

(4) Reversing and Tempering (R/T) Mill a.k.a. Cold Reversing Mill 2 has a maximum capacity of 250 tons/hour, emulsion oil is sprayed in the strip, controlled by hoods mounted on both sides of the mill stand and exhausting thru a panel-typed collision mist eliminators at a rate of 84,000 acf/min and 0.01 gr/dscf. This mill can reverse and temper. The mist eliminators are operating as controls only when the mill is operating as cold reversing mill.

The Part 70 application indicated that the maximum capacity of the Cold Reversing Mill 2 was 125 tons/hour. Based on this proposed modification, the maximum capacity of the R/T Mill (Cold Reversing Mill 2) is 250 tons/hour.

The proposed physical and operational modifications are:

(a) Replace and/or upgrade PLC controls and process equipment.

(b) Take into account VOC emissions from this mill that were not taken into account during the initial review.

(c) Install a fume collection enclosure.

(5) Alkali Cleaning at the Galvanizing line with mist eliminator as control. The mist eliminator of the Alkaline Cleaning section is increased from 5,000 acf/min to 10,000 acf/min.

The proposed physical and operational modifications are:

(a) Install new coil transfer system from the Cold Reversing Mills 1 and 2 to Annealing furnace then to the Galvanizing line.

(b) Increase the flow to the mist eliminator on the Alkali Cleaning section from 5,000 acf/min to 10,000 acf/min.

(c) Either modify or add cleaning sections.

(d) Replace and/or upgrade PLC controls and process equipment in the Galvanizing Line and Alkali Cleaning section.

(6) Operations in the Galvanizing Line that are not going to be physically modified, but increase in utilization is expected:
Galvanizing Line/Furnace consisting of:
(a) 36 main burners, each at 1.622 MMBTU/hr,
(b) 3 auxiliary burners, each at 0.1 MMBTU/hr
(c) a galvalum tank, a zinc pot,
(d) 44 burners each at 0.323 MMBTU/hr in radiant tube section
(e) Welding at the Galvanizing line
This Galvanizing Line controlled by SCR/SNCR was recently permitted under PSD 107-14297-00038, issued on June 6, 2002. The existing PSD limits for the Galvanizing Line/Furnace are not being revised.

(7) Natural gas fueled Annealing Furnaces - -consisting of 18 furnaces at 4.8 MMBTU/hr each and have maximum capacity of 200 tons/hour. Emissions exhaust to roof vent.

There were originally 12 furnaces rated at 4.75 MMBTU/hr each and 6 units at 4.8 MMBTU/hr each, but this has changed. The 12 units rated at 4.75 MMBTU/hr have been removed. For clarification, there should only be a total of 18 units at 4.8 MMBTU/hr each.

The proposed physical and operational modifications are:
(a) Replace and/or upgrade PLC controls and process equipment.

(b) Install additional heat exchanger capacity on the annealing lip seal closed loop water supply cooling system (this change is not related to the burners/furnaces).

(8) Slitter/Rewind/Trimmer Line for trimming operations exhausting to roof vent.
The proposed physical modification is:
Upgrade the Slitter/Rewind/Trimming line.

IV CASTRIP

(1) The nozzle core milling/drilling operation is going to be controlled by its own baghouse (identified as Castrip Milling/Drilling Baghouse) and exhausting to the atmosphere, instead of exhausting through the Castrip LMS Baghouse, as previously permitted under MSM 107-15289-00038.

(2) To be able to cut coils in the Castrip area with the Castrip Nozzle Core Milling/Drilling Baghouse or Castrip LMS Baghouse as particulate control.

(3) Operations in the Castrip that are not going to be physically modified, but increase in utilization is expected:

(a) Castrip LMS, with a maximum capacity of 135 tons/hour, with Castrip LMS Baghouse as control.
(b) Castrip Caster
(c) Castrip Hot Strip Mill
(d) Castrip Tundish and Ladle Preheater/Dryer, exhausting to the Castrip Roof monitors.

These operations were recently permitted under PSD 107-12143-00038, issued on January 19, 2001.The existing PSD limits for the Castrip are not being revised.

V MISCELLANEOUS OPERATIONS

(1) Contact and Non-Contact Cooling Towers with maximum capacity of 192,352 gal/min and consisting of a total of 54 cells.

Cooling Towers	No. of Cells	Capacity (gal/min)
Meltshop Non Contact Cooling	9	60,000
Meltshop Caster Contact Cooling	4	10,000
Meltshop Caster Contact Cooling (expansion)	2	5,000
Hot Mill Contact Cooling	4	16,383
Hot Mill Contact Cooling (expansion)	1	4,000
Hot Mill Non Contact Cooling	4	25,319
Laminar Contact Cooling	3	11,600
Cold Mill Non Contact Cooling	2	10,000
Cold Mill Non Contact Cooling (expansion)	1	5,000
Galvanizing/Annealing Non Contact	2	6,500
Annealing Non Contact Cooling	2	5,000
Castrip Contact Cooling	4	12,000
Castrip Non Contact Cooling	6	12,000
Castrip Compressor Non Contact Cooling	3	2,400
BOC Non Contact Cooling (CT-91A)	1	750
BOC Non Contact Cooling (CT-91B)	2	3,200
Main Compressor Non Contact Cooling	4	3,200
Total	**54**	**192,352**

The proposed physical and operational modifications are:

(a) Install an additional cooling tower for the Caster at 5,000 gallon per minute, equipped with mist eliminator.

(b) Install an additional cooling tower at the main compressor building, 3,200 gal/min.

(c) Install an additional cooling tower in the Castrip compressor building, 2,400 gal/min.

(d) Replace the annealing noncontact cooling tower, such that the water circulation rate increases from 2,400 gal/min to 5,000 gal/min.

(e) Modify the water cooled ducts, water system, and cooling tower water treatment.

(f) Install additional water spray towers using cooling tower water to cool exhaust gases.

(2) Scrap processing and handling

The proposed physical and operational modifications are:

(a) Install new cranes.

(b) Modify existing cranes and associated auxiliary equipment plant wide.

(c) Add scrap loading of buckets to overhead cranes and truck dumping under roof in the scrap bay area.

(d) Add scrap cranes and mobile scrap cranes to the Meltshop scrap bay.

(e) Modify, upgrade and perform non-routine repairs to the scrap cranes and magnets in the melt shop scrap bay.

(f) Use of ground level mobile cranes to load scrap buckets in conjunction with the existing overhead scrap cranes.

(g) Relocate existing soda ash silo to another location within the steel mill plant.

(h) Be allowed to store sand.

(3) Slag Handling
Nucor Steel decided not to add an additional slag pot carrier (truck) for slag processing. There is no proposed physical modification in the slag handling and processing. Increase utilization is expected.

(4) BOC Gases Plant is an onsite contractor, provides gases (oxygen, nitrogen, hydrogen, argon, and liquid air), and consists of:

(a) Natural gas fuel with propane as back up fuel BOC Gases Low NO_x Burner Boiler ID no. 306, rated at 15 MMBTU/hour.

(b) This is in addition to the existing BOC Gases Boiler ID no. 1, rated at 9 MMBTU/hr, and BOC Gases Boiler ID no. 2, rated at 15 MMBTU/hr.

(5) Diesel fired generators and air compressors for power outages and emergencies.
(a) Cold Mill generator, rated at 280 HP
(b) Hot Mill NC Cooling Tower generator, rated at 2100 HP
(c) Galv Line Pot generator, rated at 890 HP
(d) MS Cooling Tower Cold Well generator, rated at 2,520 HP
These (a) to (d) generators are not portable, and have already been indicated as part of the Part 70 application submittal.

(e) Portable natural gas heaters for winter use.

(6) Miscellaneous proposed modifications:
The proposed physical and operational modifications are:
(a) Upgrade hydraulic, oil and lube systems.
(b) Modify onsite oxygen, argon, nitrogen and hydrogen gas supplier and associated delivery systems (pipes, valves, storage tanks, vaporizers, and controls). The hydrogen gas Plant has a burner rated at 9.98 MMBTU/hr.
(c) Addition, upgrade or modification of transformers, static var systems, reactors, and electrical control and monitoring systems to allow the maximum utilization of production.
(d) Add propane as back up for all natural gas fired units.
(e) Install inline spare to these miscellaneous operations to allow the maximum utilization of production.
(f) Add non-electrical powered (e.g. natural gas or diesel fueled) air compressors.

(7) Operations that are not going to be physically modified, but increase in utilization is expected:
(a) Quality Control Furnace - Natural gas fired 1 MMBTU/hour
(b) Miscellaneous Markings - - use chalk and decals and is done plant wide
(c) Miscellaneous Storage Tanks for gasoline, diesel fuel, kerosene, oils, pressurized, sodium hypochlorite, sulfuric acid, biocides, sodium nitrate, polymers, boilers chemicals, hydrochloric acids, aluminum sulfate, chromate, corrosion inhibitors, and cleaners, such as 500 gallon aboveground gasoline tank, 500 gallon aboveground diesel tank, and 5,000 gallon aboveground diesel storage tank.

(8) The following is the list of units that have been permitted but have been removed from operation:
(a) Cold Mill Annealing Furnaces (12 units), rated at 4.75 MMBTU/hr each
(b) Continuous Blasting System (this unit as never constructed)
(c) Vacuum Degasser System, its Boiler was transferred to the Cold Mill (previously permitted under CP 107-2764-00038, issued November 30, 1993).
(d) Iron Carbide Handling System

Appendix B lists the units/operations that are not being physically modified and their corresponding existing limits.

Increase Utilization

Since the goal of the proposed modification is to utilize the maximum capacity of the steel mill, there is clearly an increase in utilization, however increase utilization on some units can be attained without physical modification to the existing unit.

After the modification the maximum capacities of the steel mill plant will be:

Table 2 - - Maximum Capacity

Operation	Maximum Capacity (tons/hour)	Operation	Maximum Capacity (tons/hour)
Meltshop EAFs/AOD	502	Cold Mill Pickle Line 1	250
Meltshop LMFs		Cold Reversing Mill 1	
Melt Shop Caster		Cold Mill Pickle Line 2	
Hot Mill Tunnel Furnaces		Reversing/Temper Mill aka Cold Reversing Mill 2	
Hot Strip Mill			
Hot Mill Skin Pass		Cold Mill Annealing Furnaces	200
		Cold Mill Acid Regeneration 1	- -
Castrip LMS	135	Tank Farm	- -
Castrip Caster		Cold Mill Slitting Line	60
Castrip Hot Strip Mill		Cold Mill Galvanizing Line	140
Slag Processing	305	Cooling Towers	192,352 gal/min

Nucor's Part 70 application have indicated different maximum capacities for these units:

Pickle Line 1 - 200 tons/hr	Cold Reversing Mill 1 - 150 tons/hr
Slag processing - 75 tons/hr	Cold Reversing Mill 2 - 125 tons/hr
Pickle Line 2 - 75 tons/hr	Cooling Towers - 48,500 gals/min

Emission Calculations

Appendix A of this TSD shows the PTE of the new units and the net emission increase (PTE-Past Actual) of the existing units being modified (6 pages).

Potential To Emit of Modification

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as "the maximum capacity of a stationary source to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U.S. EPA."

Table 3 --- Total PTE of the Modification

Pollutant	PTE (tons/year)	PSD Significant Levels (tons/year)
SO_2	594.67	40
NO_x	477.47	40
VOC	188.18	40
CO	2,603.43	100
PM	161.91	25
PM_{10}	157.01	15

Table 3 --- Total PTE of the Modification		
Pollutant	PTE (tons/year)	PSD Significant Levels (tons/year)
Pb	0.458	0.6
Mercury	0.014	0.1
Beryllium	0.00023	0.0004
Asbestos	- -	0.007
Vinyl Chloride	- -	1.0
Fluorides	- -	3.0
Sulfuric Acid Mist	- -	7.0
Hydrogen Sulfide	- -	10
Total Reduced Sulfur	- -	10

Justification for Modification

The Part 70 Source is being modified through a Part 70 Significant Source Modification. This modification is being performed pursuant to 326 IAC 2-7-10.5 (f) (1) because this modification is major for 326 IAC 2-2 (Prevention of Significant Deterioration). This modification is major for PSD review, because the net emissions increase from this modification is greater than significance thresholds under 326 IAC 2-2-1.

County Attainment Status

The source is located in Montgomery County. Table 4 shows the attainment status of Montgomery County.

Table 4 - - Montgomery County	
Pollutant	Status
PM_{10}	Attainment
SO_2	Attainment
NO_2	Attainment
Ozone	Attainment
CO	Attainment
Lead	Attainment

(1) Volatile organic compounds (VOC) and Ozone
VOC are precursors for the formation of ozone. Therefore, VOC emissions are considered when evaluating the rule applicability relating to the ozone standards. Montgomery County has been designated as attainment or unclassifiable for ozone. Therefore, VOC emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD) 326 IAC 2-2.

(2) Criteria Pollutants
Montgomery County has been classified as attainment or unclassifiable for all the other pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

(3) Fugitive Emissions

Since this type of operation is one of the 28 listed source categories under 326 IAC 2-2-1(y)(1) and since there are no applicable New Source Performance Standards that were in effect on August 7, 1980, the fugitive PM emissions are counted toward determination of PSD and Emission Offset applicability.

Source Status

(1) 1 of 28 Listed Source Categories
Nucor Steel is a major stationary source because an attainment regulated pollutant is emitted at a rate of 100 tons per year or more, and it is one of the 28 listed source categories. This major status is based upon issued permits and existing enforceable potential to emit.

(2) Actual Emissions
Based on IDEM, OAQ Emission Inventory, Nucor Steel, IN emitted the following amount for the calendar year 2001:

CO = 604 tons/year	NO_x = 202 tons/year	PM_{10} = 113 tons/year
SO_2 = 141 tons/year	VOC = 53 tons/year	Pb = 0.39 tons/year

(3) Part 70 Source
Nucor Steel submitted their Part 70 permit application on November 14, 1996. A notice of completeness was mailed to the source on December 10, 1996. The Part 70 permit has not yet been issued and is still under review by the OAQ.

Federal Rule Applicability

(1) New Source Performance Standards (NSPS)

(a) Nucor Steel, IN has been subject to 40 CFR Part 60 Subpart AAa (NSPS for steel plants: EAF and AOD). This source will still be subject to the requirements. The provisions of these federal rules are subject to the EAF, AOD vessels and dust handling systems. All of these 3 affected facilities are all going to be physically modified in this proposed modification.

(i) Pursuant to 40 CFR 60.272a(a)(1), the PM from the EAF and AOD vessel shall not exceed 0.00052 gr/dscf.

(ii) Pursuant to 40 CFR 60.272a(a)(2), the opacity from the Meltshop EAF Baghouses controlling the EAF and AOD shall not exceed 3%.

(iii) Pursuant to 40 CFR 60.272a(a)(3), the visible opacity from the Meltshop operations shall not exceed 6% opacity, based on a 6-minute average. There are roof monitors in the Meltshop.

(iv) Pursuant to 40 CFR 60.272a(b), the opacity from the EAF Dust Handling System shall not exceed 10%.

(b) The Cold Mill Boiler (34 MMBTU/hr) and BOC Gases Boiler (15 MMBTU/hr) are subject to 40 CFR 60.40c Subpart Dc because they are going to be constructed after June 9, 1989, and with maximum capacity between 10 MMBTU/hr and 100 MMBTU/hr. [40 CFR Part 60.40c]

(i) There is no SO_2 emission standard for boilers using natural gas and propane as fuel.

(ii) There is no PM emission standard for boilers using natural gas and propane as fuel.

(iii) Pursuant to 40 CFR Part 60.48c(a), notification of the date of construction, anticipated start up, and actual start up shall be submitted.

(iv) Pursuant to 40 CFR Part 60.48c(g), records of the amount of fuel combusted each day shall be maintained.

(v) Pursuant to 40 CFR Part 60.48c(i), records shall be maintained for a period of two (2) years following the date of such record.

(c) Pursuant to 40 CFR part 60.7, Nucor Steel, IN has to report the following milestones for the affected units: modified EAFs, modified AOD vessels, Dust handling system and new and modified boilers:

(i) Commencement of construction date (no later than 30 days after such date);

(ii) Actual start-up date (within 15 days after such date); and

(iii) Date of performance testing (at least 30 days prior to such date), when required by a condition elsewhere in this permit.

(2) National Emission Standards for Hazardous Air Pollutants (NESHAP)

(a) Nucor Steel, IN is subject to 40 CFR Part 63, Subpart CCC (Steel Pickling). Both the pickling lines (2 lines) and acid regeneration are already subject to this federal rules, even prior to the physical modification, however, since there is physical modification, the pickling lines are considered as new affected facilities.

(i) For pickling lines, the owner or operator would have the choice of limiting hydrochloric acid emissions either by utilizing an air pollution control device that effectively collects emissions or by limiting emissions from the process or control device off gas to a low concentration. Facilities could satisfy monitoring requirements either by monitoring the performance of their control devices and performing annual emissions testing or by using continuous emission monitoring systems.

(ii) For acid regeneration units, the owner or operator would limit both hydrochloric acid and chlorine emissions by monitoring the maximum concentration of these chemicals in the process or control device off gas. Hydrochloric acid emissions would be controlled by using a combination of an efficient acid recovery unit (absorber) and an air pollution control device. Chlorine emissions would be controlled by operating the acid regeneration unit under conditions that minimize chlorine formation. Monitoring for hydrochloric acid would be accomplished either by monitoring the performance of the control device and performing annual emissions testing or by using CEMS. Monitoring for chlorine would be accomplished by monitoring the operating parameters of the acid regeneration units and performing annual emissions testing.

(b) A NESHAP for integrated iron and steel manufacturing plants is in the proposed stage at this time. It is subject to sinter plants, blast furnaces and BOP shops. Nucor Steel, IN is not subject to this proposed NESHAP because it does not have the processes mentioned.

(3) Section 112(j) of the Clean Air Act (CAA)

Nucor Steel is considered a major source for HAPs because it has HAPs PTE of greater than 10 tons/year for a single HAP and 25 tons/year for any combination.

Nucor Steel submitted their Part 1 application on May 15, 2002. This source requested for a CAA section 112(j) application determination on some processes of the plant.

(4) Prevention of Significant Deterioration (PSD) 40 CFR 52.21

On March 3, 2003, the federal NSR reform under 40 CFR 52.21 became effective. The revisions provided new applicability provisions for PSD rules for baseline emissions determination, actual-to-projected-actual methodology, plant wide applicability limitations, clean units, and pollution control projects. None of these new provisions will change the final outcome of the PSD review on this proposed modification.

On March 3, 2003, US EPA published a notice for “Conditional Approval of Implementation Plan: Indiana” in the Federal Register. This notice grants conditional approval to the PSD State Implementation Plan (SIP) under provisions of 40 CFR 51.166 and 40 CFR 52.770 while superceding the delegated PSD SIP authority under 40 CFR 52.793. The effective date for these provisions is April 2, 2003. Therefore, the PSD permits will be issued under the authority of 326 IAC 2-2 and will no longer be issued under the provision of 40 CFR 52.21 and 40 CFR 124.

The main difference between a SIP approved and PSD delegation is in the effective date of the permit:

- - Under PSD delegation, the permit becomes effective immediately upon its issuance if no comments requested a change in the draft permit. If a comment is received which requests a change, the effective date of the permit will be 30 days after the service of notice of the decision. If the final day of the 30 day time period falls on a weekend or legal holiday, the time period is extended to the next working day. [40 CFR 124.15, 40 CFR 124.19, and 40 CFR 124.20]

- - Under PSD SIP approved, the permit becomes effective upon its issuance. [IC 13-15-5-3]

Another difference is in the appeal process:

- - Under PSD delegation, petition of appeals are directed to the Environmental Appeals Board (EAB) within the 33 calendar days from the mailing of the decision (40 CFR 124.19) and to the Office of Environmental Adjudication (OEA) within 18 calendar days from the mailing of the decision.

- - Under PSD SIP approved, petitions of appeals are now only directed to the OEA.

The OAQ web site has been updated to include the SIP approval and information about the rulemaking. http://www.in.gov/idem/air/permits/psdapprovalhistory.html

The conditional approval of the PSD program can be found at: http://a257.g.akamaitech.net/7/257/2422/14mar20010800/edocket.access.gpo.gov/2003/03-5024.htm

(5) 40 CFR 64 (Compliance Assurance Monitoring)

(a) The SO_2, and NO_x PTE of the EAFs are greater than 100 tons/year, but do not have controls for these pollutants.

(b) The VOC PTE of the EAFs is greater than 100 tons/year, and uses scrap management plant to control emissions.

(c) The PM and PM_{10} PTE of the EAFs are greater than 100 tons/year and have controls (Baghouse) to comply with emission standards or limitations. Therefore, the requirements of 40 CFR Part 64, Compliance Assurance Monitoring, are applicable to these EAFs. Monitoring of the pollutant-specific emission unit will be conducted pursuant to 40 CFR Part 64.

(d) The CO PTE of the EAFs are greater than 100 tons/year and have controls (DSE and canopy hood) to comply with emission standards or limitations. Therefore, the requirements of 40 CFR Part 64, Compliance Assurance Monitoring, are applicable to these EAFs. Monitoring of the pollutant-specific emission unit will be conducted pursuant to 40 CFR Part 64.

State Rule Applicability

(1) 326 IAC 1-6-3 (PMP)

(a) Nucor Steel is subject to this rule even prior to this proposed modification.

(b) Nucor indicated that any change to its PMP required by OAQ is appealable as otherwise provided by State law. Also, Nucor has expressed that they do not waive any right to challenge any OAQ decision on the adequacy of its maintenance projects.

The OAQ is aware of Nucor's opinion on the PMP requirements.

(c) Nucor has also indicated that PMP should only be subject to the control devices and not to the emission units.

Pursuant to 326 IAC 1-6-1 (Applicability), 326 IAC 1-6-3 applies to the owner or operator of any facility required to obtain a permit under 326 IAC 2-1-2 and 326 IAC 2-1-4. Therefore, it is clear from the structure of 326 IAC 1-6-3 that the PMP requirement affects the entirety of the applicable facilities. Only 326 IAC 1-6-3 (a)(1) is limited, in that it requires identification of the personnel in charge of only the emission control equipment, and not any other facility equipment. In additional support of this position, 326 IAC 1-6-5 provides that the IDEM may require changes in the maintenance plan to reduce excessive malfunctions in any control device or combustion or process equipment. Therefore, PMP is also required for the emission unit.

(d) The OAQ has evaluated PMP requirements and recommends the following:

(i) PMP will be required for the Meltshop EAFs, Meltshop LMFs, Meltshop Continuous Caster, AOD vessels, Desulfurization, EAF Dust Handling System and their Baghouses, bin vents and scrubber because these are significant operations. Individually, PTE of these units may be minimal or specific compliance monitoring might not be required, however, PMP will be required because all them are exhausting to the same controls.

(ii) PMP is not required for the Hot Strip Mill because the PTE is minimal.

(iii) PMP is required for the Cold Mill Pickle Lines 1 and 2 and their scrubbers because they are subject to a NESHAP federal requirement, in addition to being subject to PSD. The OAQ recognized that these pickling lines are also required to prepare and maintain operation and maintenance (O&M) plan for the scrubbers. The PMP and O&M may be of the same document.

(iv) PMP is required for the Acid Regeneration 1 and its scrubber and mist eliminators because this process is subject to a NESHAP federal requirement, in addition to being subject to PSD.

(v) PMP is not required for the Galvanizing Line Alkali Cleaning section, because the PTE after the mist eliminator is minimal. Only the cleaning section is under review at this time. The Galvanizing Line controlled by SCR/SNCR was recently permitted under PSD 107-14297-00038, issued on June 6, 2002 and the permit required a PMP for the line.

(vi) PMP is required for the 2 Cold Mill Boilers and BOC Gases Low NO_x Burner Boiler because they are subject to 40 CFR 60, Subpart Dc and their maximum capacities of 34 MMBTU/hour each is greater than the cut off 10 MMBTU/hour rating.

(vii) PMP is required for the Cold Reversing Mill 1 and R/T Mill 2 (Cold Reversing MILL 2) and their controls because the PTE at 0.01 gr/dscf and 84,000 acf/min is significant.

(viii) PMP is not required for the Cold Mill Annealing Furnaces because their maximum capacities are minimal.

(ix) PMP is required for the Baghouse only of the Castrip nozzle core milling/drilling to assure proper operation, however, no additional compliance monitoring will be required for the operation because the PTE after the baghouse is minimal.

(x) PMP will not be required for the fugitive emissions from paved and unpaved areas, because a Fugitive Dust Plan is required.

(xi) PMP will be required for the cooling towers drift eliminators to assure proper operation, however, no additional compliance monitoring will be required for the cooling towers because the PTE after the drift eliminators is minimal.

(xii) PMP will not be required for the emergency generator because the PTE is insignificant.

(2) 326 IAC 1-7-1 (Stack height requirements)
Nucor Steel is subject to this rule because it emits more than 25 ton/yr of PM and SO_2. The stacks heights of the Mill are less than the good engineering practice (GEP) stack heights, thus a dispersion modeling has been performed to analyze air quality impact. Detailed analysis of this in Appendix C.

(3) 326 IAC 2-1.1-8 (Time periods for determination on permit applications)
Pursuant to 326 IAC 2-1.1-8(a)(1), a final action needs to be issued no later than 270 calendar days from the receipt of the application, taking into account actions that can suspend the time period. The application was received on November 22, 2002. Without any suspension in the time period, the 270 day-period is estimated to end on August 22, 2003.

(4) 326 IAC 2-2-1(PSD)
The proposed modification is considered major modification and subject to PSD review for PM, PM_{10}, NO_x , CO, VOC and SO_2, based on the emissions calculation. Appendix A details the emission calculations.

PSD annual productions are specified in a 12-consecutive month period, rolled on a monthly basis.

(5) 326 IAC 2-2-3 (PSD control technology)
PSD review of the best available control technologies for the new units/operations and units being physically modified is in Appendix B.

On July 10, 2003, Nucor Steel, IN has indicated their intention to use used oil filters and used tires as raw materials. Nucor Steel, IN indicated that a Nucor plant in Auburn, NY is using these raw materials as scrap substitutes and injection carbon. The OAQ has evaluated that adding these as raw materials will cause re-evaluation of the PSD BACT again. Nucor Steel, IN decided then not to pursue this proposal at this time.

(6) 326 IAC 2-2-4 (PSD air quality analysis)
Nucor Steel submitted air quality analysis. This analysis has been evaluated by the OAQ Modeling Section. PSD air quality analysis is explained in Appendix C.

(7) 326 IAC 2-2-5 (PSD air quality impact)
Nucor Steel is not located within 200 kilometers radius of the closest Class 1 area. The closest Class I area is the Mammoth Cave, KY. The analysis and results submitted by Nucor Steel were checked by the OAQ Air Modeling Section. The analysis and conclusion are in Appendix C.

(8) 326 IAC 2-2--6 (PSD increment consumption)
Analysis of this requirement is explained in Appendix C. Demonstration has been shown that the increase emissions do not exceed 80% of the available maximum allowable increases over the baseline for SO_2, PM and NO_x .

(9) 326 IAC 2-2-7 (PSD additional analysis)

(a) Land use classification - -rural

(b) Air quality impact on vegetation - - There will be no significant adverse impact on vegetation because the predicted concentrations are below the NAAQS level.

(c) Topography - - The elevation of the plant is approximately 870 feet above sea level. The topography of the site is essentially flat lands.

(d) Air quality impact on soil - - no significant adverse impact on soil is anticipated, because the concentrations are below the NAAQS level.

(e) Air quality impact on visibility - - Nucor Steel will not adversely impact the visibility at the Class I area. Appendix C has the details.

(f) Wind Flow Pattern - - The prevailing wind directions are from south to west, occurring approximately 44% of the time. .

(g) Construction impact - - emissions from and during the general construction are not expected to cause significant impact. Fugitive dust during construction phase is expected to be minimal.

(h) Endangered Species -- Based on the location of the Mill and air quality analysis done, the impact of the modification would not affect habitats of endangered species.

(10) 326 IAC 2-2-8 (PSD source obligation)

(a) Approval to construct shall become invalid if construction is not commenced within 18 months after receipt of the approval, or if construction is not completed within reasonable time. [326 IAC 2-2-8(a)(1)]

(b) Approval for construction does not relieve Nucor Steel of the responsibility to comply fully with applicable provisions of the Indiana implementation plan and any other requirements under local, state or federal law. [326 IAC 2-2-8-(a)(2)]

(11) 326 IAC 2-2-9 (PSD innovative control technology)

There is no requirement at the State or Federal level which requires innovative control to be used. Innovative control means a control that has not been demonstrated in a commercial application on similar units, As stated in the U.S. EPA Top-Down BACT Guidance (Section V.A.2):

“Although not required, innovative controls may also be evaluated and proposed as BACT... Innovative technologies are distinguished from technology transfer BACT candidates in that an innovative technology is still under development and has not been demonstrated in a commercial application on identical or similar emission units.”

Innovative controls are normally given a waiver from the BACT requirements due to the uncertainty of actual control efficiency. PSD BACT requires that the applicant install the best available control technology, not create new ones. Based on this the OAQ will not evaluate or require any innovative controls for this BACT analysis. Only available and proven control technologies are evaluated. A control technology is considered “available” when “there are sufficient data indicating (but not necessarily proving)” the technology “will lead to a demonstrable reduction in emissions of regulated pollutants or will otherwise represent BACT.”

(12) 326 IAC 2-2-10 (PSD source information)

Nucor Steel has submitted the information necessary to perform analysis or make determination required under PSD review.

(13) 326 IAC 2-2-11 (PSD Stack height)
This rule applies to source which commenced construction after December 31, 1970. The stacks heights of the Mill are less than the good engineering practice (GEP) stack heights, thus a dispersion modeling has been performed to analyze air quality impact. Detailed analysis of this in Appendix C.

(14) 326 IAC 2-2-12 (PSD permit rescission)
The construction permit remains in effect, unless it is rescinded, modified, revoked, or expires.

(15) 326 IAC 2-2-13 (Area designation and re-designation)
Nucor Steel does not fall on any of the listed areas.

(16) 326 IAC 2-2-14 (Additional requirements impacting Class I area).
Nucor Steel is not subject to this requirement because it does not impact a Class I area. The nearest Class 1 area is the Mammoth Cave National Park, Edmonson County, KY. The state of Indiana has no Class I and III areas.

(17) 326 IAC 2-2-15 (Public participation)
A copy of the application has been provided to the Crawfordsville Public Library on November 25, 2002. A notice of the preliminary findings will be published in the most circulated newspaper in the area. There will be a 30-day comment period.

(18) 326 IAC 2-2.5-1 (PCP)
Nucor Steel was not able to utilize this exclusion because the units that will be controlled by the new controls (baghouse, scrubber, mist eliminators) are also being physically modified.

(19) 326 IAC 2-6-1 (Emission Reporting)
Even prior to this proposed modification, Nucor Steel is already subject to this requirement because it has a PTE of greater than 100 tons/year.

(20) 326 IAC 2-7 (Part 70 program)
Nucor Steel submitted their Part 70 permit application on November 14, 1996. The Part 70 permit has not yet been issued and is still under review by the OAQ.

(21) 326 IAC 3-5-1 (Continuous Monitoring of Emissions)
Nucor Steel shall install continuous monitoring system, as appropriate, to determine continuous compliance.

(22) 326 IAC 4-1 (Open Burning)
Nucor Steel Shall not open burn material except as provided in 326 IAC 4-1-3, 326 IAC 4-1-4, or 326 IAC 4-1-6.

(23) 326 IAC 2-4.1 (Hazardous Air Pollutants)
This modification is subject to the NESHAP for steel pickling.

(24) 326 IAC 5-1 (Opacity limitations)
Specific opacity limits have been indicated as BACT limits. If there is no specific opacity limits indicated, then this rule applies. The opacity shall not exceed 40%.

(25) 326 IAC 6-1 (PM Nonattainment limitation)
This rule does not apply to Nucor Steel because it is not located in a nonattainment area.

(26) 326 IAC 6-2
The Cold Mill Boiler (34 MMBTU/hr) and BOC Gases Boiler (15 MMBTU/hr) are subject to these rules. However, since these boilers are both subject to NSPS and PSD, the limits specified by these 2 federal requirements supersede the 326 IAC 6-2 limits.

(27) 326 IAC 6-3 (Particulates emission for manufacturing process)
The units/process involved in this modification are not subject to this rule, because PM limits have been established by 326 IAC 2-2.

(28) 326 IAC 6-4 and 6-5 (Fugitive dust)
Even prior to this modification, Nucor Steel is already subject to these rules. Nucor has submitted fugitive dust plan to comply with these rules. Fugitive dust crossing the boundary or property line should not be visible.

(29) 326 IAC 7-1 (SO_2 Limitation)
Nucor Steel is subject to this rule because it has a PTE of 25 tons/yr of SO_2 and 10 lb/hour of actual emissions. SO_2 emissions from fuel combustion when using distillate oil shall not exceed 0.5 lb/MMBTU.

(30) 326 IAC 8 (VOC)
Nucor Steel is subject to this rule because it has actual emissions greater than 15 lb/day. VOC BACT limits established under 326 IAC 2-2 (PSD) satisfy the requirements of 326 IAC 8-1-6. For the VOC limits, refer to Appendix B.

(31) 326 IAC 9 (CO emission rules)
Nucor Steel is subject to this rule because it commenced operation after March 21, 1972, however, no emission limit is specified for steel Mill.

(32) 326 IAC 10 (NO_x rules)
This rule does not apply to Nucor Steel because it is not located in Clark or Floyd Counties.

(33) 326 IAC 11 (Source Specific limitations)
Steel Mill is not one of the operation listed in this rule.

(34) 326 IAC 12 (NSPS)
Compliance with this rule has been addressed under the Federal Rules Applicability of this TSD.

(35) 326 IAC 13 (Motor vehicles emissions)
Not applicable.

(36) 326 IAC 14 (HAPs Emission)
This rule incorporates by reference the 40 CFR Part 61. No 40 CFR Part 61 applies to this source.

(37) 326 IAC 15 (Lead Rules)
Nucor Steel, IN is not of the listed sources subject to this rule.

(38) 326 IAC 16 (Environmental Assessment, Activities of State Agencies)

The air permitting review process indirectly satisfy this rule.

(39) 326 IAC 17 (Public records)
There is no confidentiality request made regarding the application submitted.

(40) 326 IAC 18 (Asbestos Management at School)
Not applicable.

(41) 326 IAC 19 (Mobile Source Rules)
These particular rules are applicable to employees in Lake and Porter Counties only. These are not applicable because the source is located in Montgomery County.

Compliance Determination and Monitoring

The OAQ has evaluated monitoring requirements and recommends the following:

(1) CEMS

(a) Nucor Steel has expressed objections to the requirement of installing and using VOC CEMS to show continuous compliance. It is noted that Nucor Steel, IN has provided justification why they believe it is not necessary to install and use a CEMS for VOC emissions.

(b) The OAQ does not believe that the VOC emissions from the EAFs are relatively insignificant part of the EAF emissions because the VOC PTE is approximately 286 tons/year. The additional justification that since there is no pollution control equipment that is required as PSD VOC BACT and therefore there is no added value to the VOC CEMS. The OAQ has evaluated this justification and concludes that the use of VOC CEMS to show compliance with the PSD limit and management of scrap is essential.

(c) Compliance emission monitor systems (CEMS) will be required to be installed, operated and maintained at the Meltshop EAF Baghouses for monitoring CO and VOC emissions.

(d) Upon further discussion with Nucor Steel, the OAQ learned of a consent decree, issued by US EPA, which requires Nucor Steel, IN to install CEMS for SO_2 and NO_x for the Meltshop EAF Baghouses. Since these CEMS are already required, the same CEMS can be used to show compliance with the PSD BACT limits. Additional compliance testing and monitoring will not be required. Nucor Steel agreed to the same schedule of installation and calibration of these CEMS with the other 2 CEMS.

(e) Nucor Steel requested that the hourly NOx BACT limit be specified in an 8-hour block. The NOx BACT limit is specified in a 3-hour period to be consistent with test method.

(f) Nucor Steel requested that the hourly VOC BACT limit be specified in an 8-hour block. The VOC BACT limit was specified in a 3-hour period to be consistent with the test method. The total hydrocarbon limit is specified in an 8-hour time frame that is going to be monitored by a CEMS.

(2) A COM is required to be installed, operated and maintained in the Meltshop EAF Baghouse2, exhausting to a stack. A COM is not feasible to be installed to the Meltshop EAF Baghouse 1 because it exhausts to the Meltshop Roof vent. Opacity readings to be made by a certified reader will be required instead.

Nucor Steel, IN has indicated the preference of showing compliance by using Baghouse Leak Detectors instead of the COM. This can not be approved because the COM is required under the federal NSPS requirement, 40 CFR Part 60, Subpart AAa.

(3) Pursuant to 40 CFR 60.273(b), no COM is required for the EAF Dust Handling/Treatment system. Opacity readings to be made by a certified reader will be required instead. No pressure drop reading will be required for the bin vents. Compliance monitoring will be required for the scrubber used to control EAF dust and baghouse for truck loading. The compliance monitoring for the scrubber is different with the compliance monitoring for the scrubbers controlling the pickle lines, because the pickling lines are also subject to 40 CFR Part 63, Subpart CCC.

(4) All the baghouses use by Nucor Steel, IN are multi compartment.

(5) Compliance monitoring will be required for the Meltshop LMF Baghouse to assure compliance with the PSD BACT limits.

(6) No compliance monitoring (e.g. visible emissions) will be required for the Cold Mill Boilers and BOC Gases Boilers because the emissions are from the use of natural gas as fuel.

(7) No compliance monitoring (e.g. visible emissions) will be required for the Cold Reversing Mill 1 and R/T Mill (aka Cold Reversing Mill 2).

(8) Compliance monitoring will be required for the Pickle Lines 1 and 2 and their scrubbers, and the Acid Regeneration. The parameters (flow rate of the scrubbing liquid) to be monitored for the scrubbers are based on the 40 CFR Part 63, Subpart CCC (Steel Pickling). The pH level and pressure drop are not required to be monitored because based on the US EPA study done during the development of the Steel Pickling NESHAP, these parameters are not the best compliance indicators for scrubbers.

(9) No compliance monitoring will be required for the Hot Strip Mill.

(10) No compliance monitoring will be required for the Cold Mill Annealing Furnaces, because the emissions are from the use of natural gas as fuel.

(11) No compliance monitoring will be required for the cooling towers and emergency generators.

Testing Requirements

Based on PTE, rule applicability and requirements; the following preliminary findings are recommended:

(1) Meltshop EAFs

(a) Compliance testing will be required for the Meltshop EAF Baghouses for filterable PM, and filterable and condensible PM_{10}.

(b) HAP testing is for Lead and Mercury only, at this time.

(c) Nucor Steel, IN is required to install and use continuous emission monitoring systems (CEMS) for SO_2, and NO_x. They are required by a consent decree issued to Nucor Steel. Compliance testing is going to be required for SO_2 and NO_x, if the installation and use of CEMS for these pollutants have been installed and calibrated prior to the testing schedule .

(d) Nucor Steel is going to be required to install and use CEMS for CO, thus no compliance testing will be required.

(e) Compliance testing will still be required for VOC, even though there is going to be a CEMS because the CEMS measures total hydrocarbons. The VOC testing will be used to show compliance with the VOC BACT limit, and the CEMS will be used to monitor the total hydrocarbons.

(2) Since the Meltshop EAF Baghouses control other units which are not subject to the 40 CFR Subpart AAa, performance testing shall follow the procedure specified in 40 CFR 60.275a(b).

(3) The Meltshop EAFs have not been tested for HAPs emissions. Based on the 61 FR 28197, US EPA indicated that non-stainless and stainless EAF operations because there are no existing EAFs which qualify for HAPs major source.

The OAQ is still requiring Nucor Steel, IN to perform compliance test for Lead and Mercury, because these 2 HAPs are also consider regulated pollutants under 326 IAC 2-2 (PSD).

(4) Compliance testing will be required for the Meltshop LMF for SO_2, filterable PM, and filterable and condensible PM_{10}.

(5) Compliance testing will be required for the Pickling Line 2 to verify compliance of the scrubber/collection system.

(6) Compliance testing will be required in the Acid Regeneration to show compliance with the scrubber control.

(7) Compliance testing will be required at the EAF dust handling/treatment system to verify compliance for opacity. This EAF dust handling/treatment system is subject to NSPS 40 CFR 60 Subpart AAa, and requires an opacity compliance testing.

(8) No compliance testing will be required for the 2 new boilers.

(9) These testing requirements shall comply with the provisions of 326 IAC 3-6.

Recommendation

Based on the facts, conditions and evaluations made, OAQ recommends to the IDEM Commissioner that the preliminary findings in the PSD/SSM 107-16823-00038 be provided to the public for review.

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

An application for the purposes of this review was received on November 22, 2002, with additional information received on March 17, 2003.

The applicant has provided a copy of the application in the Crawfordsville Public Library, 222 South Washington, Crawfordsville, IN 47933, Telephone: 765-362-2242.

The following officials will be notified of this proposed modification:

(1) County Commissioner, 100 East Main Street, Crawfordsville, IN 47933 and

(2) Mayor, 300 East Pike Street, Crawfordsville, IN 47933.

Conclusion

The construction of this proposed modification shall be subject to the conditions of the attached proposed Part 70 SSM and PSD Permit No. 107-16823-00038.

NUCOR

SHEET MILL-CRAWFORDSVILLE

Crawfordsville, IN

Scrap Specifications

These are the specifications, exhibits, and requirements for purchased ferrous scrap. In addition to these descriptions, Nucor Crawfordsville will not accept the following:

1. **Radioactivity** Scrap must be free of radioactivity. Scrap will be screened by detection equipment at the entrance of the plant. Scrap that does not pass this screening will be quarantined awaiting disposition by the NRC.

2. **Closed Cylinders** Scrap may not contain closed cylinders of any type including tanks, shocks, gas cylinders, etc.

3. **Excessive Moisture** Scrap is to be free of excessive moisture.

4. **Excessive Oil** Scrap cannot contain excessive oil. Cutting fluids must be held to a minimum.

5. **Non-Metallics** Scrap is to be free of non-metallic items such as wood, paper, plastic, etc.

6. **Non-ferrous** Scrap is to be free of non-ferrous items such as copper, aluminum, brass, bronze, chrome, etc., unless otherwise specified.

7. **Debris** Garbage and other debris are not permissible.

Scrap must be shipped pursuant to the purchase order. Scrap delivered by truck will be received between **6:30 AM to 4:00 PM EST.** All scrap will be inspected when received. Scrap that does not conform to the specification will be rejected. If rejectable scrap is found after dumping, the scrap will be reloaded and removed from the plant.

Indiana Department of Environmental Management
Office of Air Quality

Appendix A - - Emission Calculations - - for a Prevention of Significant Deterioration (PSD) and Part 70 Significant Source Modification (SSM)

Source Background and Description

Source Name:	Nucor Steel
Source Location:	4537 South Nucor Street, Crawfordsville, IN 47933
Mailing Address:	4537 South Nucor Street, Crawfordsville, IN 47933
General Telephone Number:	765-364-2323
General Facsimile Number:	765-364-5311
Responsible Official:	General Manager
County:	Montgomery
SIC Code:	3312 (Steel Mill)
Source Categories:	1 of 28 Listed Source Categories Major PSD Source Major Source, CAA Section 112
Significant Source Modification:	PSD 107-16823-00038
Permit Reviewer:	Iryn Calilung

Potential to Emit Calculations

The table below summarizes the total PTE of the proposed modifications. Detailed calculations are shown in the subsequent pages and tables.

Table 1 --- Total PTE

Pollutant	PTE (tons/year)	PSD Significant Levels (tons/year)
SO_2	594.67	40
NO_x	477.47	40
VOC	188.18	40
CO	2,603.43	100
PM	161.91	25
PM_{10}	157.01	15
Pb	0.458	0.6
Mercury	0.014	0.1
Beryllium	0.00023	0.0004
Asbestos	- -	0.007
Vinyl Chloride	- -	1.0
Fluorides	- -	3.0
Sulfuric Acid Mist	- -	7.0
Hydrogen Sulfide	- -	10
Total Reduced Sulfur	- -	10

The following tables show the PTE of the new units: 5790 HP Diesel Fired Emergency Generators, 49 MMBTU/hr Low NOx Boilers and Meltshop EAF Baghouse.

Table 2 --- New Diesel Fired Emergency Generators (5790 HP)		
Pollutant	Emission Factor (lb/hp-hr)	PTE (tons/year)
SO_2	0.00205	2.97
NOx	0.031	44.87
VOC	0.0025141	3.64
CO	0.00668	9.67
PM	0.0022	3.18
PM_{10}	0.0022	3.18

Maximum capacity = 5790 HP
Conversion factor of 7,000 BTU/hp-hr to convert from BTU/hr.
Emission factors are from AP-42, Table 3.3-2 Supplement B 10/96.
Since these are emergency generators, PTE is based at 500 hours/year.
PTE = (Maximum Capacity Hp)(EF lb/hp-hr)(500 hr/yr)(1ton/2000 lb)
The limited hours of operation (500 hr/yr) for each emergency generators will be considered as PSD BACT.

Table 3 --- New NG Low NOx Boilers (49 MMBTU/hr)		
Pollutant	Emission Factor (EF) (lb/MMCF)	PTE (tons/year)
SO_2	0.6	0.1
NOx	50	10.7
VOC	5.5	1.2
CO	84	18
PM	1.9	0.41
PM_{10}	7.6	1.6
Benzene	0.0021	0.00045
Formaldehyde	0.075	0.016
Hexane	1.8	0.388
Toluene	0.0034	0.00073
Lead	0.0005	0.00011
Chromium	0.0014	0.0003

Maximum capacity = 34 MMBTU/hour and 15 MMBTU/hour = 49 MMBTU/hour
PM EF is filterable only. PM_{10} EF is condensible and filterable combined.
All EFs are based on normal firing. 1MMBTU = 1,000,000 BTU EFs are from AP-42, Chapter 1.4.
PTE = (Heat Input MMBTU/hr)(EF lb/MMBTU)(1MMCF/1,000MMBTU)(8760 hr/yr)(1ton/2000 lb)
These EFs are also going to be the PSD BACT limits for this boiler.

Table 4 - - New Meltshop EAF Baghouse	
Baghouse Specifications	PM PTE (ton/yr)
0.0018 grain/dscf at 915,000 dscf/min or 1,200,000 acf/min	61.8
This is a new Baghouse in the Meltshop EAF. This grain loading is also going to be the PSD BACT limit for this new Baghouse. The PTE of the new Meltshop Baghouse alone is already greater than the PSD Significant levels. PM PM_{10} = (grain/dscf)(flow rate cfm)(1 lb/7,000 grains)(60 min/hr)(8760 hr/yr)(1 ton/2000 lb) The 2 Meltshop Baghouses capture the emissions from the 2 EAFs, AOD vessel, 2 continuous casters, and other meltshop operations.	

The following table shows the total PTE of the new units . This table shows that based on the new units alone of the proposed modification is considered a significant source modification because at least one pollutant has a PTE of 25 ton/year or more. It is also considered a PSD major modification because PM and PM_{10} exceeds the PSD significant levels of 25 tons/year and 15 tons/year, respectively, and NOx exceeds the PSD Significant level of 40 tons/year.

Table 5 --- Summary of the Total PTE of the New Units Only		
Facility	Pollutant	PTE (tons/year)
Emergency Generators Low NOx Boilers and Meltshop EAF Baghouse	SO_2	3.1
	NOx	55.6
	VOC	4.8
	CO	27.7
	PM	65.4
	PM_{10}	66.6

The table below shows the maximum capacity of the significant processes of the steel mill. The goal of the proposed modification is to utilize the full capacity of these units. Any deviations from these maximum capacities after the modification will be considered unpermitted unit or capacity.

Table 6 - - Maximum Capacity			
Operation	Maximum Capacity (tons/hour)	Operation	Maximum Capacity (tons/hour)
Meltshop EAFs/AOD	502	Pickle Line 1*	250
Meltshop LMFs		Cold Reversing Mill 1*	
Melt Shop Continuous Caster		Batch Annealing Furnaces	200
Tunnel Furnaces		Acid Regeneration 1	- -
Hot Strip Mill		Acid Regeneration 2	- -
Hot Mill Skin Pass		Slitting Line	60
Slag Processing	305	Cooling Towers*	192,352 gal/min
Stip Caster (Castrip) LMS	135	Pickle Line 2*	250
Castrip Mill Caster		Reversing/Temper Mill aka Cold Reversing Mill 2*	
Galvanizing Line	140		

* Nucor's Part 70 application have indicated different maximum capacities for these units:

Pickle Line 1 - 200 tons/hr
Slag processing - 75 tons/hr
Pickle Line 2 - 75 tons/hr
Cold Reversing Mill 1 - 150 tons/hr
Cold Reversing Mill 2 - 125 tons/hr
Cooling Towers - 48,500 gal/min

The table below shows the actual emissions of the steel mill based on the IDEM, OAQ Emission Inventory. Calendar years 2001 and 2000 are the years used to determine as representative years as normal operation. The PSD application was submitted in 2002, thus these 2 previous years were used. At this time, IDEM does not have actual emission report from Nucor Steel for 2002. No other calendar years have been looked into to by Nucor and IDEM, OAQ for this evaluation.

Table 7 - - Actual Emissions (tons/year)

Year	Production	CO	NOx	SO_2	VOC	PM_{10}	Pb
2001	1,917,611	604	202	141	53	113	0.39
2000	1,963,318	616	252	145	54	165	0.05
Average	1,940,464.5	610	227	143	53.5	139	0.22

An average actual production of 1,807,512 tons of steel was the rate indicated by Nucor Steel in this PSD application.

Past Actual = (EF lb/ton)*(actual steel production tons/year)(1 ton/2000 lb) = tons/yr
To determine the emission increase, the actual emissions average over the past two most recent years is subtracted from the PTE. Based on the new Federal NSR revision, emission increase can be determine by using the Projected actual minus the Past Actual. Since the main goal of this proposed modification is to fully utilize the maximum full capacity of the still mill, it can be concluded that the Projected actual will be approximately equal to the PTE.

The following tables show the increase emissions of the existing permitted units and operations. Increase emissions need to be determine because the units/operations are either being physically modified or increase utilization is expected.

Table 8 - - Meltshop EAFs

Pollutant	Emission Factor (EF) (lb/ton)	PTE (tons/year)	Past Actual (tons/year)	PTE-Past Actual (tons/year)	PSD Significant level (tons/year)
SO_2	0.2		194.05	355.64	40
	0.25	549.69			
NOx	0.51		494.82	274.746	40
	0.35	769.57			
VOC	0.13	285.84	126.13	159.71	40
CO	2	4,397.52	1,940.46	2,457.06	100
PM/PM_{10}	0.0018 gr/dscf at 1,527,960 acf/min, at 1,121,287dscf/min	75.77	48.45	27.32	25/15
Pb	none specified	0.3	0.046	0.254	0.6

The EAFs are going to be physically modified to fully utilize their maximum capacity of 502 ton/hour. The methodology that is going to be used to determine the increase emissions is PTE- Past Actual.

These EFs are also the PSD BACT limits.

PTE = (EF lb/ton)(502 ton/hr maximum capacity)(8760 hr/yr)(1ton/2000 lb)
PM/PM_{10} = (grain/dscf)(flow rate cfm)(1 lb/7,000 grains)(60 min/hr)(8760 hr/yr)(1 ton/2000 lb)
Past Actual = (EF lb/ton)*(average actual steel production 1,940,464.5 tons/year)(1 ton/2000 lb)
Emission Increase = PTE - Past actual Emission = tons/yr
Pb = (0.07 lb/hr)(8760 hr/yr)(1 ton/2000 lb) = 0.3 tons/yr
EAF Pb average = 2000 (0.04 tons/yr) and 2001 (0.052 tons/yr) actual emissions = 0.046 ton/yr

Table 9 - - Meltshop LMF

Pollutant	Emission Factor (EF) (lb/ton)	PTE (tons/year)	Past Actual (tons/year)	PTE-Past Actual (tons/year)
SO_2	0.16	351.8	155.24	196.56
NOx	0.0175	38.5	16.98	21.52
VOC	0.0086	18.9	8.34	10.6
CO	0.07125	156.7	69.13	87.57
PM/PM_{10}	0.0018 gr/dscf at 200,000 acf/min (new)	13.51	19.52	- 6.01
	0.0026 gr/dscf at 200,000 acf/min (existing limit)			
Pb			0.014	- -

The LMFs are going to be physically modified to fully utilize their maximum capacity of 502 ton/hour. The methodology that is going to be used to determine the increase emissions is PTE- Past Actual.
PTE = (EF lb/ton)(maximum capacity tons/hour)(8760 hr/yr)(1ton/2000 lb) = tons/yr
PM/PM_{10} = (grain/dscf)(flow rate cfm)(1 lb/7,000 grains)(60 min/hr)(8760 hr/yr)(1 ton/2000 lb)
Past Actual = (EF lb/ton)*(actual steel production tons/year)(1 ton/2000 lb) = tons/yr
Emission Increase = PTE - Past actual Emission = tons/yr
These EFs (except PM) are also the PSD BACT limits.
The PM grain loading is being changed from 0.0026 gr/dscf to 0.0018 gr/dscf as the PSD BACT limit
IDEM Emission Inventory does not itemized the PM emissions for the LMF. Since the grain loading is more stringent than the existing limit, there is an assumed reduction in total emissions.

The emissions calculations submitted by Nucor Steel for the other units being physically modified have been verified and summarized below. The slag processing was not included because Nucor Steel decided not to physically modified this specific operation.

Table 10 - - PTE (tons/year) of Other Physically Modified Units

Unit/Process	SO_2	NO_x	PM	PM_{10}	CO	VOC	Pb
Meltshop Roof Monitors and Ladle Preheaters Stack	0.41	33.4	26.2	20.1	13.3	1.1	0.19
Tunnel Furnace System	0.31	92.2	7.0	7.0	17.8	1.4	- -
EAF Digout/EAF to Slag Processing	- -	- -	1.3	1.3	- -	- -	- -
Strip Caster LMS	38.3	- -	- -	- -	- -	- -	- -
Strip Caster Monitor	0.38	- -	- -	- -	- -	- -	- -
Cold Reversing Mill 1	- -	- -	- -	- -	- -	5.25	- -
R/t Mill (Cold Reversing Mill 2)	- -	- -	- -	- -	- -	5.25	- -
Galvanizing Line Cleaning (Additional 5,000 acf/min)	- -	- -	0.6	0.6	- -	- -	--
EAF Dust Recycling System	- -	- -	0.05	0.05	- -	- -	- -
Lime Silo	- -	- -	0.19	0.19	- -	- -	- -
EAF Dust Silo	- -	- -	0.04	0.04			
Pickle Line 2 (9,000 acf/min)	- -	- -	1.5	1.5	- -	- -	- -
Total	39.4	125.6	36.88	30.98	31.1	13.0	0.19

Table 11 - - Cooling Towers

Cooling Towers	Capacity (gal/min)	TDS Fraction	Drift Losses	PM PTE (tons/year)
Existing				
Meltshop Noncontact (9 cells)	60,000	0.0016	0.00005	10.53
Meltshop Caster Contact (4 cells)	10,000	0.0076	0.00005	1.9
Hot Mill Contact (4 cells)	16,383	0.0021	0.00005	3.77
Hot Mill Contact Expansion (1 cell)	4,000	0.0021	0.00005	0.92
Hot Mill Noncontact (4 cells)	25,319	0.0015	0.00005	4.17
Laminar Contact (3 cells)	11,600	0.001	0.00005	1.27
Cold Mill Non Contact (2 cells)	10,000	0.0017	0.00005	0.93
Cold Mill Non Contact Expansion(1 cell)	5,000	0.0017	0.00005	1.87
Galvanizing/Annealing Non Contact (2 cells)	6,500	0.0015	0.00005	1.07
* Annealing Non Contact (2 cells)	2,400	0.0017	0.00005	0.43
Castrip Contact (4 cells)	12,000	0.0076	0.00005	2.9
Castrip Non Contact (6 cells)	12,000	0.0017	0.00005	2.9
BOC Non Contact CT-91A (1 cell)	750	0.002	0.00005	0.16
BOC Non Contact CT-91B (2 cells)	3,200	0.002	0.00005	0.7
Proposed				
Meltshop Caster Contact Expansion (2 cells)	5,000	0.0076	0.00005	4.17
Main Compressor Non Contact (4 cells)	3,200	0.002	0.00001	0.14
Castrip Compressor Non Contact (3 cells)	2,400	0.002	0.00001	0.11
* Annealing Non Contact (2 cells)	2,600	0.0017	0.00005	0.5
Total (54 cells)	**192,352**			**38.32**

TDS Fraction and Drift losses are provided by the source.

* The 2 cells of the Annealing Non Contact Cooling Tower is going to be replaced with a higher capacity.

Cooling Tower PM/PM_{10} = (Maximum Rate gal/min)(TDS fraction)(8.34 lb/gal) (60 min/hr)(drift losses)

Indiana Department of Environmental Management
Office of Air Quality

Appendix B - - PSD BACT Evaluations - - for a Prevention of Significant Deterioration (PSD) and Part 70 Significant Source Modification (SSM)

Source Background and Description

Source Name:	Nucor Steel
Source Location:	4537 South Nucor Street, Crawfordsville, IN 47933
Mailing Address:	4537 South Nucor Street, Crawfordsville, IN 47933
General Telephone Number:	765-364-2323
General Facsimile Number:	765-364-5311
Responsible Official:	General Manager
County:	Montgomery
SIC Code:	3312 (Steel Mill)
Source Categories:	1 of 28 Listed Source Categories Major PSD Source Major Source, CAA Section 112
Significant Source Modification:	PSD 107-16823-00038
Permit Reviewer:	Iryn Calilung

PSD BACT Overview

The Prevention of Significant Deterioration (PSD) Program requires a est available control technology (BACT) review and air quality modeling to be performed on the proposed modification. BACT is an emission limitation based on the maximum degree of reduction of each pollutant subject to the PSD requirements. In accordance with the *"Top-Down" Best Available Control Technology Guidance Document* outlined in the 1990 draft USEPA *New Source Review Workshop Manual*, this BACT analysis takes into account the energy, environmental, and economic impacts on the source. These reductions may be determined through the application of available control techniques, process design, work practices, and operational limitations. Such reductions are necessary to demonstrate that the emissions remaining after application of BACT will not cause or contribute to air pollution, thereby protecting public health and the environment.

All BACT analyses are conducted according to the guidelines set forth by the U.S. EPA's New Source Review Workshop Manual and "Top-Down" Best Available Control Technology Guidance Document. According to these guidance documents, the determination of BACT is dependent on both the technology and the limitation. These guidance documents also specify a five step process to make these determinations.
- - The first step is to identify all control technologies.
- - The second step is to eliminate technically infeasible options.
- - The third step is to rank the remaining control technologies by effectiveness.
- - The fourth step is to evaluate the most effective controls and document results.
- - The last step is to select the BACT control and limit.

In going through the feasible controls, there may be several different limits that have been set as BACT for the same technology. The best alternative is the most stringent and the applicant would be required to demonstrate in a convincing manner why that limit is not feasible, either technically or economically. The final BACT determination would be the technology with the most stringent corresponding limit that is feasible.

There is no requirement at the State or Federal level which requires innovative control to be used. Innovative control means a control that has not been demonstrated in a commercial application on similar units, As stated in the U.S. EPA Top-Down BACT Guidance (Section V.A.2):

> "Although not required, innovative controls may also be evaluated and proposed as BACT... Innovative technologies are distinguished from technology transfer BACT candidates in that an innovative technology is still under development and has not been demonstrated in a commercial application on identical or similar emission units."

Innovative controls are normally given a waiver from the BACT requirements due to the uncertainty of actual control efficiency. PSD BACT requires that the applicant install the best available control technology, not create new ones. Based on this the OAQ will not evaluate or require any innovative controls for this BACT analysis. Only available and proven control technologies are evaluated. A control technology is considered "available" when "there are sufficient data indicating (but not necessarily proving)" the technology "will lead to a demonstrable reduction in emissions of regulated pollutants or will otherwise represent BACT."

The primary goal of BACT is to assure that all new major sources and major modifications apply the best available control technology at the time of permit issuance. If the best available control technology happens to also be a standard for the industry, the BACT analysis is not supposed to require above and beyond the existing BACT. But if in reviewing the existing control technologies it is determined that new similar controls can do better, then the limitations will become more stringent. In addition, the presumption that one stack test can prove a lower standard is more appropriate is incorrect. In order to determine when an existing limitation should be lowered for BACT, U.S. EPA's guidance provides many factors must be considered.

Proposed Modification

Nucor Steel is located in Montgomery County, IN which is designated as attainment or unclassifiable for all criteria pollutants. Based upon the emissions calculations (see Appendix A), the proposed modification exceeds the PSD significant threshold levels stated in 326 IAC 2-2-1 for PM, PM_{10}, NO_x, CO, VOC and SO_2. Therefore, these pollutants were reviewed under the PSD Program (326 IAC 2-2). Since the primary goal of Nucor Steel's PSD modification is to achieve the maximum capacity of the steel mill producing sheets steel products, it will clearly result in increase utilization in all the existing units and operations. However, PSD BACT analysis will only be limited to units that are being physically modified.

The following BACT determinations are based on information obtained from the PSD permit application submitted by Nucor Steel on November 22, 2002, additional documentation provided by Nucor Steel subsequent to the submittal of the application, and the EPA RACT/BACT/LAER (RBLC) Clearinghouse. The RBLC is a database system that provides emission limit data for industrial processes throughout the United States. It will be obvious that there are wide ranges of existing BACT limits and controls even for similar sources or units. Some significant factors contributing to these are: (a) Type of raw materials used and product manufactured, (b) Search of the RBLC database is sometimes limited to the most recently issued permits, (c) If the permitting agency is SIP approved in terms of PSD program, (d) public interests and (e) data not input in the RBLC due to recent permit revisions. Due to some factors that can not be found in the RBLC, permitting agencies have been contacted to discuss review process. This is in addition to using available information in the permitting agency's web sites.

Meltshop EAF BACT Analysis

Nucor Steel is proposing the following modification to the Melt Shop Electric Arc Furnace (EAF):

(a) Maintain and utilize the maximum capacity of 502 tons/hour.

(b) Replace and/or upgrade PLC controls and process equipment

(c) Install a second Baghouse in addition to the existing Meltshop EAF Baghouse. The new Meltshop EAF Baghouse is a reverse air type multi compartment negative pressure baghouse, with the following specifications: 1,200,000 acf/min and 0.0018 grain/dscf.

(d) Install an arc dust treatment facility, with a capacity of 50,000 lb/hour or transfer the dust to the existing system which will then be a total of 100,000 lb/hour. Dust transfer will also occur inside the building.
Options for the dust transfer are:
    (i) from silo to truck through a loading spout,
    (ii) from silo to railcar through a loading spout,
    (iii) from silo to truck through a loading spout to transfer to the existing Meltshop EAF Baghouse. Unloading from the truck at the existing Meltshop EAF Baghouse also occurs in the building, transferring the dust through augers and a bucket elevator to the existing silo. In this option, the existing EAF dust treatment will have a maximum capacity of 100,000 lb/hr.
    (iv) treating dust at the new silo and transferring to a truck. No loading spout is necessary because the material is no longer dusty, as treated.

(e) Upgrade the current conducting arms on the 2 Meltshop EAFs.

(f) Install an automatic machine that sets electrodes at the Meltshop EAFs.

(g) Install additional and or different styles of oxy fuel burners, post burners, post combustion burners, carbon injection system, lances, both oxygen and carbon.

(h) Install an alloy system for direct feeding of alloys, lime and carbon to EAFs.

(i) Install a new conveyor systems to feed raw materials to the EAF charge buckets with outside truck or rail dump.

(j) Install additional charge buckets.

The table below summarizes the existing and proposed PSD BACT limits. Detailed evaluations are in the subsequent pages. BACT analysis for the conveyors, silos, storage, bins and feed equipment are lump together with similar operations.

Each or any combination of the Meltshop EAFs and Argon-Oxygen Decarburization (AOD) can independently produce the maximum capacity of 502 tons/hour of steel. Each Meltshop EAF can operate concurrently or independently to achieve this maximum capacity, however, the annual production is limited at 4,397,520 tons/year, not 8,795,040 tons/year. In addition, only one AOD can operate at a time.

The Meltshop Baghouses will capture the emissions from the 2 EAFs, AOD vessel, 2 continuous casters, desulfurization station, and other Meltshop operations. These baghouses also act as a back up to the Meltshop LMF baghouse.

Table 1 - - Meltshop EAFs Existing and New PSD BACT

Operation	Pollutant	Existing Limit	New PSD BACT/Limit
EAFs (2 units) Meltshop Baghouse PSD 107-2764 and PSD 107-5235	NOx	0.51 lb/ton	0.35 lb/ton Good operating practices, Use NG oxy-fuel burners
	SO_2	0.2 lb/ton Use quality scrap	0.25 lb/ton Use quality scrap (EAF, AOD, Desulfurization, Caster)
	VOC	0.13 lb/ton Scrap Management Plan Work practices	0.09 lb/ton Scrap Management Plan Work practices
	CO	2 lb/ton	2 lb/ton
	PM/PM_{10}	0.0018 gr/dscf at 1,527,960 acfm Baghouse	PM = 0.0018 gr/dscf (Filterable) PM_{10} = 0.0052 gr/dscf (Filterable and Condensible) Baghouse
	Opacity	3% from the Meltshop Baghouse 5% from other Meltshop operations	3% from the Meltshop Baghouses 5% from other Meltshop operations
	Fugitive	3% Roof canopies	3% Roof canopies
	Capacity	502 tons/hour (EAFs and AOD)	502 tons/hour (EAFs and AOD)
New EAF Baghouse	PM Filterable		PM = 0.0018 gr/dscf Baghouse
	PM_{10} Filterable and Condensible		PM_{10} = 0.0052 gr/dscf Baghouse

Summary of Existing EAF Limits in the RBLC

The table below summarizes the existing BACT limits that are listed in the RBLC. Sources are listed in alphabetical order.

Based on this summary table, the BACT limits for EAF should be:

NO_x = 0.22 lb/ton
SO_2 = 0.0.47 lb/ton
PM/PM_{10} = 0.0015 gr/dscf
VOC = 0.06 lb/ton
CO = 0.91 lb/ton

However, BACT analysis takes into account several factors in evaluating and considering what should be BACT limits. Some of these factors to consider , in no particular order, are: PSD SIP status of the permitting agency, attainment status of the source location, issuance date of the permit, compliance with the BACT limits, design of the operation, pollution control technologies, pending revisions of existing BACT limits, products produced, raw materials used, construction or operation status of the source, available resources during the permit review, public interests and participation, economic climate, and participation/input of the US EPA. Based on these contributing factors, further research, communication and documentation are required in performing BACT review.

In the next pages, BACT analysis for each pollutant is explained.

Table 2 - - EAF BACT Comparison

Source Name	NOx (lb/ton)	SO_2 (lb/ton)	PM/PM10 (gr/dscf)	VOC (lb/ton)	CO (lb/ton)
Ameristeel (Florida Steel), FL	0.33	- -	0.0034	0.0295	3.0
Ameristeel, NC	6.0	- -	- -	- -	6.0
Arkansas Steel, AR	1.0	0.7	0.0052	0.35	6.0
Beta Steel, IN	**0.22** 0.45	**0.047** 0.25 0.33	0.0052	0.13 0.15	8.17
Birmingham Steel (now Nucor Steel), IL	0.26	- -	- -	- -	2.01
Chaparral Steel, VA	0.7	0.7	0.0018	0.35	4.0
Charter Steel, WI	0.51	- -	**0.0015**	**0.06**	3.5
IPSCO, IA	0.27 0.8	0.06 0.7	0.0052	0.18	**0.91** 1.93
IPSCO, AL	0.4	0.7	0.0033	0.35	2.0
Keystone Steel, IL	0.51	0.2	0.0018		1.34
Mac Steel, AR	0.51	0.54 1.05	0.0018	0.13	4.9
Nucor Steel, AL	0.4 0.5	0.09 0.5 0.6	0.0032	0.20	2.0
Nucor Steel, AR	0.51	0.2 0.84	0.0018	0.09	- -
Nucor Steel, IN	0.51	0.2	0.0018	0.13	2.0
Nucor Steel, SC	0.35	0.2 0.35	0.0052	0.13	2.0 2.76
Nucor Steel, UT	0.33 0.73	0.31	0.0020 0.0033		5.87 14.97
Nucor Steel, NC	0.27 0.51	0.22	0.0018	0.13	1.82 4.0
Nucor-Yamato, AR	0.38	0.15	0.0018	0.13	2.0
Qualitech, IN	0.5	0.25 0.52 1.04	0.0032	0.15	4.7
Republic Technologies, OH	0.35	0.07	0.0032	0.35	4.0
Roanoke Steel, VA	0.378	0.17	0.0034	0.3	1.37 2.4
SDI, Dekalb, IN	0.51	0.2	0.0032	0.13	2.0
SDI, Hendricks, IN	0.35	0.25 1.5 1.8	0.0018 0.0052	0.09	2.0
SDI, Whitley, IN	0.35	0.25	0.0018 0.0052	0.09	2.0
SMI Steel, SC	0.51	0.35	0.0020		2.0
Stafford Steel, AR	0.52	0.07	0.0018	0.09	2.0
Tuscaloosa Steel, AL	0.35	0.62	0.00325	0.13	2.0

(1) NOx Control Technology Technical Feasibility Study

Four (4) available control alternatives were evaluated to control NO_x from the EAF:

(A) Combustion Controls,
(B) Selective Catalytic Reduction (SCR),
(C) Non-Selective Catalytic Reduction (NSCR), and
(D) Selective Non-Catalytic Reduction (SNCR) options - Exxon's Thermal $DeNO_x$ ® and Nalco Fuel Tech's NO_xOUT®.

(A) Combustion Controls

There is an entire family of combustion controls for NO_x reduction from various combustion units - low excess air (LEA), low-NO_x/oxy-fuel burners, overfire air (OFA), burners out of service (BOOS), reduced combustion air temperature, load reduction, and flue gas re-circulation (FGR). Among these, low-NO_x/oxyfuel burners are considered technically feasible for controlling NO_x emissions from EAFs. LEA and OFA generally creates more CO emissions due to low primary air resulting to incomplete combustion. Such conditions can result in inefficient scrap melting and unacceptable increases in tap-to-tap time. NO_x reduction using these technologies are also very minimal (i.e, 10% - 20%). BOOS, reduced combustion air temperature, and load reduction all result to an inefficient scrap melting and unacceptable increases in tap-to-tap time. FGR alters the distribution heat, resulting in cold spots) and lowers the efficiency of the EAF.

(B) Selective Catalytic Reduction (SCR)

SCR is a technology that uses a catalyst and ammonia injection to promote the removal of NOx at certain exhaust stream parameters such as inlet NOx concentration, volumetric flow and temperature range. SCR operates best when inlet NOx concentrations and exhaust temperatures are constant and in the range specified for the particular catalyst. Other parameters that can affect the performance of the catalyst are poisoning due to certain metals or chemicals in the exhaust stream and fouling or masking due to particulate matter plugging or covering the catalyst. In selective catalytic reduction (SCR) systems, ammonia (NH_3), usually diluted with air or steam, is injected through a grid system into the exhaust gas stream upstream of a catalyst bed. On the catalyst surface, the NH_3 reacts with NO_x to form molecular nitrogen and water. The function of the catalyst is to effectively lower the activation energy of the NO_x decomposition reactions.

In order for a SCR system to effectively reduce NO_x emissions, the exhaust gas stream should have relatively stable gas flow rates, NO_x concentrations, and temperature - steady-state system. The EAF operation is a highly transient process and is a batch operation. The temperature of the EAF exhaust gas will vary widely over the melt cycle, and the gas flow rates and NO_x concentrations will exhibit a wide amplitude.

SCR systems are highly susceptible to catalyst poisoning due to contamination of the catalyst by reactive materials entrained in the EAF gas stream. Other problems with catalysts are their propensity to fouling and masking. Fouling occurs when the catalyst's cell openings are plugged with a solid material. Masking occurs when the catalyst surfaces are covered with residues which prevent their contact with the flue gas. The problems with catalyst poisoning, fouling, and masking would, at a minimum, require the placement of the SCR unit downstream of the particulate control device (baghouse). SCR catalysts require high gas stream temperatures (500 to 1,100 °F), thus the gas stream would have to be reheated from approximately 200 °F to the proper operating temperature for the catalyst. This would require substantial energy expenditure (natural gas combustion) and result in additional NO_x emissions, not to mention CO emissions. SCR catalyst suppliers and manufacturers that were contacted confirm the above problems. The OAQ is not aware of any situation where a SCR system has been properly operated to control NO_x emissions from an EAF. Beta Steel, IN has a SCR system installed at its Hot Strip Mill Slab Reheat Furnace. However, Beta Steel has experienced problems with the performance of its SCR system. Beta Steel claimed possible catalyst poisoning as a problem. This innovative application has not achieved manufacturer's claims. Therefore, SCR is considered technically infeasible.

(C) Non-Selective Catalytic Reduction (NSCR)
A non-selective catalytic reduction (NSCR) system is a post combustion add-on exhaust gas treatment system. It is often referred to as "three-way conversion" catalyst since it reduces NO_x, unburdened hydrocarbons (UBH), and CO simultaneously. In order to operate properly, the combustion process must be near-stoichiometric. Under this condition, in the presence of a catalyst, NO_x is reduced by CO, resulting in nitrogen (N_2) and carbon dioxide (CO_2). Steelmaking in an EAF is not considered a combustion process. Although combustion of CO and hydrocarbons occurs in the EAF and DEC ductwork, the process is not steady state with respect to available fuel (CO) and hydrocarbons and combustion air. Steady-state near-stoichiometric combustion conditions do not exist in the DEC ductwork. Other potential problems with NSCR systems include catalyst poisoning by additives such as phosphorous and zinc which may be present in the steel scrap charge into the EAF. Therefore, NSCR is considered technically infeasible.

The OAQ is not aware of a steel mill where a NSCR system has been operated to control NO_x emissions from an EAF.

(D) Selective Non-Catalytic Reduction (SNCR) options - Exxon's Thermal DeNO$_x$ ®
and Nalco Fuel Tech's NO$_x$OUT®
The two (2) commercially available selective non-catalytic reduction (SNCR) systems are *Exxon's Thermal DeNO$_x$® system* and *Nalco Fuel Tech's NO$_x$OUT® system*. In order for the Thermal DeNO$_x$® system and NO$_x$OUT® system to effectively reduce NO_x emissions, the exhaust gas stream should have relatively stable gas flow rates, ensuring the requisite residence time and temperature requirements. The temperature of the EAF exhaust gas varies widely over the melt cycle, and does not remain in the desired temperature window during all phases of the EAF operation. Similarly, the gas flow rates do not remain stable during the EAF operation, precluding the possibility of adequate residence time. Therefore, these SNCR technologies are considered technically infeasible.

The OAQ is not aware of a steel mill where either type of SNCR system has been properly operated to control NO_x emissions from an EAF.

(2) NOx Existing BACT Emission Limitations

The table below lists the NOx BACT limits of EAFs. Limits are arranged in an ascending order. Some sources are indicated more than once because of recent revisions or having more than 1 limit.

The RBLC indicates that all steel mills listed do not have add-on control devices to control NO_x

emissions from EAFs. Instead, either low-NO_x burners, oxyfuel burners, or a combination of low-NO_x and oxyfuel burners have been required as combustion controls. The RBLC also indicates a wide range of NO_x emission limitations (0.22 lb/ton - 6.0 lb/ton).

Most steel mills have their Meltshop Baghouse also capture the LMF and Caster emissions in addition to the EAF emissions. Nucor Steel, IN has a different arrangement. In the Nucor mill, the Meltshop EAFs have their own baghouses and the Meltshop LMFs have their own baghouse.

Nucor Steel, IN Meltshop EAF Baghouses capture the emissions from the EAF, AOD, Desulfurization and Caster. Nucor's Meltshop LMFs have their own Baghouse.

Table 3 - - EAF NO_x BACT of Other Similar Sources

Source Name		NOx Limit (lb/ton)	Source Name		NOx Limit (lb/ton)
Beta Steel, IN	(1992)	0.22	Beta Steel, IN	(2003)	0.45
Birmingham (Nucor Steel), IL	(1993)	0.26	Nucor (Trico Steel), AL	(2002)	0.50
IPSCO, IA	(1996)	0.27	Qualitech, IN	(1996)	0.50
Nucor Steel, NC	(2002)	0.27	Charter Steel, WI	(2000)	0.51
Ameristeel (Florida Steel), FL	(1995)	0.33	Keystone Steel, IL	(2000)	0.51
Nucor Steel, UT	(1994)	0.33	SDI, Dekalb, IN	(1997)	0.51
Tuscaloosa Steel, AL	(1995)	0.35	SMI Steel, SC	(2001)	0.51
Republic Technologies, OH	(1999)	0.35	Mac Steel, AR	(1998)	0.51
Nucor Steel, SC	(1996)	0.35	Nucor Steel, AR	(1991)	0.51
SDI, Whitley, IN	(1999)	0.35	Nucor Steel, NC	(1999)	0.51
Nucor (Trico Steel), AL	(2002)	0.35	**Nucor Steel, IN**	**(1996)**	0.51
SDI, Hendricks, IN	(2003)	0.35	Stafford Railsteel, AR	(1993)	0.52
Beta Steel, IN	(2003)	0.35	Chaparral Steel, VA	(1998)	0.70
Nucor Steel, IN (proposed)	**(2003)**	0.35	Nucor Steel, UT	(1997)	0.73
Roanoke Electric, VA	(1998)	0.378	IPSCO, IA	(2002)	0.80
Nucor Yamato, AR	(2001)	0.38	Arkansas Steel, AR	(1998)	1.0
Nucor (Trico Steel), AL	(2002)	0.40	Ameristeel, NC	(1999)	6.0
IPSCO Steel, AL	(1998)	0.40			

Beta Steel, IN

Beta Steel, IN is listed three times in the above table.

Beta Steel, IN was permitted the most stringent limit of 0.22 lb/ton. The limit was given at that time based on an AP-42 emission factor with an "E" rating (lowest rating of accuracy). A recently issued permit revises the NO_x limit to 0.35 lb/ton for the EAF, and 0.45 lb/ton to the combination of EAF, LMF and Caster.

The BACT limit (0.22 lb/ton) will not be use in the evaluation because it has been revised.

The BACT limit (0.35 lb/ton) will be consider as BACT for this evaluation because there are at least 3 mills of similar products produced by Nucor Steel, IN. This limit also accurately represent the emissions rate for the EAF only, which is the same arrangement as Nucor Steel, IN.

The BACT limit (0.45 lb/ton) will not be use in the evaluation because it does not accurately represent the meltshop arrangement of Nucor Steel, IN.

Birmingham Steel (now Nucor Steel), IL

On May 23, 2003, the IDEM confirmed that this Birmingham Steel, Kankakee, IL plant was bought by Nucor Steel in 2002 and is still in operation, producing billets. This NO_x limit is one of the earliest BACT limits established (1993), however, it was not entered in the RBLC until 1998. The Title V permit issued in July 2002 also indicated the NO_x limit in terms of lb/hour rate, in addition to the lb/ton rate. No compliance testing nor monitoring was required for the NO_x limit. The NO_x BACT limit encompasses the emissions from the EAF only. Birmingham Steel, IL does not have an LMF. Nucor Steel, IN has each separate limit for their EAF and LMF.

Due to differences in steel products produced (billets versus sheets), this NO_x BACT limit (0.26 lb/ton) will not be consider as BACT for this evaluation.

IPSCO, IA

IPSCO, IA is listed twice in the table above.

On February 5, 2003, the IOWA DNR (Corey Detter 515/281-4842) was contacted regarding the limits of IPSCO, IA. The 0.27 lb/ton NO_x limit was specified in 1996, however, IPSCO can not comply with it. In July, 2002, the NO_x limit was revised to 0.8 lb/ton. This new limit was not considered as BACT because the IOWA DNR admits that they did not have the time to extensively perform a BACT analysis, and US EPA has provided significant comments to the proposed limit. The permit was issued even with the significant comments. IOWA is SIP approved in terms of PSD program.

Based on this information, both the old (0.27 lb/ton) and new (0.8 lb/ton) NO_x limits will not be use in this BACT evaluation.

Nucor Steel, NC

Nucor Steel, NC is listed twice in the above table.

On February 6, 2003, the North Carolina Air Pollution Division (Fred Langenback 919/715-6242) was contacted regarding the only steel mill in their area. Nucor Steel, NC was initially permitted at 0.51 lb/ton NO_x in 1999. The permit has a provision that provides an opportunity to re-open the BACT review based on testing data that the existing limit can be revised. The NO_x limit was changed to 0.27 lb/ton in December, 2002. This is one of the revised NO_x limits that is changed to a more stringent limit. There were extensive comments received from the public. Nucor Steel, NC manufactures slabs.

Since the new NOx limit for Nucor Steel, NC was based on their own test results, not necessarily the most stringent BACT limit in the RBLC, the OAQ believes this NOx limit (0.27 lb/ton) is source specific.

Both the NOx limits (0.51 lb/ton and 0.27 lb/ton) will not be use in this evaluation.

Ameristeel (Florida Steel), FL

On June 4, 2003, the Florida Division of Air Resources (Teresa Heron and Arif Syed 850/921-9529) was contacted regarding this mill. Ameristeel, FL was formerly the Florida Steel. This mill produced steel reinforcing bars and steel rods. A permit was issued in 1999, but the information was not put in the RBLC until 2001. This permit is to increase the steel production from 600,000 tons/year to 720,000 tons/year and to install a new LMF. The NO_x limit was not revised with this modification. The NO_x limit (0.33 lb/ton) was established when the mill did not have a LMF in its operations. NO_x compliance testing was required in the Title V permit issued in 2000, however, a NO_x CEM was not.

Due to the difference in products produced (reinforced bars versus slabs), this NOx limit (0.33 lb/ton) will not be use in this evaluation.

Nucor Steel, UT

Nucor Steel, UT is listed twice in the above table.

The permit for Nucor Steel, UT was issued in 1994, but the information was not put in the RBLC until 2001. The permit limits the steel production to 1.4 million ton/year of scrap fed to the source's 2 EAFs. The NO_x BACT limit was specified in lb/hour rate. The NO_x BACT limit (0.33 lb/ton) indicated in the above table was determined based on the maximum capacity of each EAF at 65 ton/hour. No additional information can be found to supplement this information found in the RBLC.

The RBLC is also showing another permit issued in 1997 for Nucor Steel, UT. The NO_x BACT limit was specified in lb/hour rate. The NO_x BACT limit (0.73 lb/ton) indicated in the above table was determined based on the maximum capacity of each EAF at 65 ton/hour. No additional information can be found to supplement this information found in the RBLC.

The NO_x rates (0.33 lb/ton and 0.73 lb/ton) will not be used in the evaluation because the limits are in terms of lb/hour and the source is not required to comply with the lb/ton rates.

Tuscaloosa Steel, AL

On February 6, 2003, the Alabama DEM (Doug Carr 334/271-7887) was contacted regarding this mill. The state of Alabama is SIP approved for the PSD program. The NO_x (0.35 lb/ton) limit for Tuscaloosa Steel, AL has not been revised. Tuscaloosa Steel, AL is showing in the RBLC to be in compliance with their 0.35 lb/ton NO_x BACT limit by using conventional burners.

Since compliance has been verified with the NO_x BACT limit of 0.35 lb/ton, this limit will be consider as BACT.

Republic Technologies, OH

The EAF No. 9 of Republic Technologies, OH has a maximum capacity of 165 ton/hour. The NO_x limit was specified both in terms of lb/ton (primary limit) and lb/hour (secondary limit). However, if calculation is made, the emission rates do not coincide.

NO_x = (0.35 lb/ton)(165 ton/hr) = 57.75 lb/hr.

RBLC indicates the NO_x limit to be 33 lb/hr and to arrive to this lb/hr rate, the NO_x limit should have been 0.2 lb/ton.

NO_x = (33 lb/hr)/(165 ton/hr) = 0.2 lb/ton.

No additional information can be found to supplement this information found in the RBLC.

The NO_x rate (0.2 lb/ton) will not be consider in this BACT evaluation.

Nucor Steel, SC

The NO_x BACT limit for Nucor Steel, SC was set at 0.35 lb/ton and uses low NO_x burners. The NO_x limit encompasses the EAF and LMF because both of them exhaust to the EAF baghouse. Nucor Steel, SC is showing in the RBLC to be in compliance with their 0.35 lb/ton NOx BACT NO_x limit and this was confirmed by the South Carolina Department of Health and Environment.

Since compliance has been verified with the NO_x BACT limit of 0.35 lb/ton, this limit will be consider as BACT.

SDI, Whitley, IN

SDI, Whitley, IN was provided a limit of 0.51 lb/ton for a transition period of 540 days, and then the limit becomes 0.35 lb/ton. This mill was recently tested on February, 2003 for compliance. Based on preliminary review of the test results, it seems that SDI, Whitley, IN complied with the 0.35 lb/ton limit. The NO_x limit encompasses the emissions from the EAF and LMF.

Since compliance has been verified with the NO_x BACT limit of 0.35 lb/ton, this limit will be consider as BACT.

Nucor Steel, AL (formerly Trico Steel)

Nucor Steel, AL is listed 3 times in the above table.

On February 6, 2003, the Alabama DEM (Doug Carr 334/271-7887) was contacted regarding this mill. The state of Alabama is SIP approved for the PSD program. Nucor Steel, AL (formerly Trico Steel) was initially permitted at 0.35 lb/ton of NO_x. The NO_x limit was changed in November, 2002. Nucor Steel, AL was given a limit of 0.4 lb/ton when the production is equal to or greater than 352 ton/hr and 0.5 lb/ton when the production is less than 352 ton/hr.

These BACT limits (0.4 lb/ton and 0.5 lb/ton) will not be consider because they are less stringent.

SDI, Hendricks, IN (formerly Qualitech)

This mill was previously permitted under Qualitech. A permit was recently issued and the NOx BACT limit for the EAF is 0.35 lb/ton. This was a revision from 0.51 lb/ton.

Nucor Steel, IN

Nucor Steel, IN has a NO_x BACT limit of 0.51 lb/ton for their EAF.

Three (3) sources among the 5 sources listed in the RBLC with the NO_x limit of 0.35 lb/ton that compliance has been verified. Following the Top Down BACT analysis has sufficiently satisfied in eliminating the other more stringent limits as BACT. Information that follows regarding the other sources are additional information that supplement the BACT analysis.

Roanoke Steel, VA.

On February 10, 2003, the Virginia Air Pollution Control (Dean Downs 540/597-2711) has been contacted regarding the Roanoke Steel, VA. This mill applied for a modification to increase the maximum capacity of their EAF from 70 ton/hr to 100 ton/hr. The NO_x limit was changed from 0.12 lb/ton to 0.378 lb/ton. This is based on stack test done on the plant. Roanoke Steel, VA has a separate stack for the EAF and LMF, which is different from most meltshops.

This BACT limit (0.378 lb/ton) will not be consider because the OAQ believes that it is source specific, rather than based on Top Down BACT analysis.

Nucor-Yamato, AR

The permit issued to Nucor-Yamato, AR was for an increase in production. Nucor Yamato, AR limit encompasses emissions from EAF only. This NO_x limit in terms of lb/ton is a secondary limit. The primary NO_x limit was specified in lb/hr. Nucor-Yamato, AR is required to show compliance with its NO_x BACT limit by using CEMS.

The NOx BACT limit (0.38 lb/ton) will not be consider because the mill is not required to comply with the lb/ton rate.

IPSCO, AL

On February 6, 2003, the Alabama DEM (Doug Carr 334/271-7887) was contacted regarding this mill. The state of Alabama is SIP approved for the PSD program. The NO_x (0.4 lb/ton) limit for IPSCO, AL has not been revised.

This BACT limit (0.4 lb/ton) will not be consider because it is less stringent than the limit being proposed by OAQ for Nucor Steel, IN.

Charter Steel, WI

On February 11, 2003, Wisconsin Department of Environmental Management (Don Faith 608/267-3135) was contacted regarding their only steel mill that manufactures specialty bars. Charter Steel, WI was issued a modification in 2000. The NO_x limit was specified at 0.51 lb/ton, which has been the existing NO_x BACT limit since 1996. EPA Region 5 did not provide comment on this PSD modification.

This BACT limit (0.51 lb/ton) will not be consider because it is less stringent than the limit being proposed by OAQ for Nucor Steel, IN.

Keystone Steel, IL

On February 10, 2003, the Illinois EPA (Jason Schnepp 217/524-3724) was contacted to discuss the limits of Keystone Steel, IL. The permit was for an expansion, however, it can not be confirmed if the expansion has been constructed.

This BACT limit (0.51 lb/ton) will not be consider because it is less stringent than the limit being proposed by OAQ for Nucor Steel, IN.

SDI, Dekalb, IN

The permit issued in 1994 was for an EAF with a maximum capacity of 22 ton/hour.

This BACT limit (0.51 lb/ton) will not be consider because it is less stringent than the limit being proposed by OAQ for Nucor Steel, IN.

SMI Steel, SC

On February 10, 2003, the South Carolina Air Permitting (Matt Gibbs 8-3/898-3288 and Larry Ragsdale 803/898-3840) was contacted regarding SMI Steel.

The NO_x BACT limit for SMI Steel, SC was set at 0.51 lb/ton. SMI Steel, SC uses pet coke and injection carbon, and low grade scrap to manufacture rebars. The NO_x limit encompasses the EAF and LMF because both of them exhaust to the EAF baghouse and was revised to 0.51 lb/ton based on stack test results. This is the most recent PSD permit issued by this permitting agency. SC is SIP approved in terms of the PSD program.

This BACT limit (0.51 lb/ton) will not be consider because it is less stringent than the limit being proposed by OAQ for Nucor Steel, IN.

Mac Steel, AR

The NO_x BACT limit specified for the Mac Steel, AR is primarily expressed in lb/hour. Converting the lb/hour limit to lb/ton rate at its maximum capacity of 86 ton/hour resulted to 0.51 lb/ton. No additional information can be found to supplement this information found in the RBLC.

This NO_x rate (0.51 lb/ton) will not be consider because it is less stringent than the limit being proposed by OAQ for Nucor Steel, IN, in addition that the mill is not required to comply with a lb/ton rate.

Nucor Steel, AR

RBLC indicates the NO_x BACT limit for Nucor Steel, AR in terms of lb/hour. Converting the lb/hour limit to lb/ton rate based on the maximum capacity (300 ton/hour) of the plant resulted to 0.51 lb/ton. This permit was issued in 1991. No additional information can be found to supplement this information found in the RBLC.

This NO_x rate (0.51 lb/ton) will not be consider because it is less stringent than the limit being proposed by OAQ for Nucor Steel, IN, in addition that the mill is not required to comply with a lb/ton rate.

Stafford Steel, AR

Previous PSD reviews indicated that the Stafford Steel, AR was never built. Based on this, compliance has not been established. This limit (0.52 lb/ton) will not be considered in this BACT evaluation.

Chaparral Steel, VA

Chaparral Steel, VA has a NO_x limit of 0.7 lb/ton and it encompasses the emissions from the EAF and LMF. Nucor Steel, IN has a different meltshop arrangement than Chaparral Steel, VA. Nucor Steel, IN has each separate limit for their EAF and LMF. No additional information can be found to supplement this information found in the RBLC.

This BACT limit (0.07 lb/ton) will not be consider because it is less stringent than the limit being proposed by OAQ for Nucor Steel, IN.

Arkansas Steel, AR

The permit issued in 1998 for Arkansas Steel, AR was for an EAF with a maximum capacity of 50 tons/hour. The NO_x BACT limits was both specified in terms of lb/ton and lb/hour.

This BACT (1.0 lb/ton) limit will not be consider because it is less stringent than the limit being proposed by OAQ for Nucor Steel, IN.

- - Even with attempts to discuss the BACT limits and search of the permitting agency's web site, the status of the other mills can not be verified and confirmed if they have been constructed, operated or in compliance.

(3) Proposed NOx BACT for Nucor Steel, IN

No add-on control devices that are technically feasible in controlling NO_x emissions from EAFs and that EAF operational practices with low NOx burners will be considered as BACT.

Nucor Steel, IN wants to retain its NOx BACT limit of 0.51 lb/ton. Nucor Steel, IN believes that this limit is consistent with the most stringent existing NOx BACT limits for the same type of meltshop arrangement and for which achievability has been verified or confirmed.

The OAQ disagrees with Nucor Steel, IN that 0.51 lb/ton of NOx is the most stringent BACT limit that compliance has been verified because the OAQ has issued PSD permits with more stringent limits (0.35 lb/ton). These limits even include the emissions from the LMF and EAF.

Nucor Steel, IN also points out that there are recently issued permits by other agencies that have less stringent NOx BACT limits, and should be given the same limits.

The OAQ wants to reiterate that the BACT analysis that is followed is based on a Top Down Analysis, which means that the evaluation of the BACT limits starts at the most stringent limits and eliminates limits that are not feasible. Based on this procedure, there is no sufficient information to support that the NOx BACT limit should be maintained at 0.51 lb/ton or relaxed.

The Meltshop Caster is a negligible source of NOx emissions. Emissions of NOx from the ladle to tundish teeming operation at the Caster are believed to be negligible with respect to emissions from the EAF and LMF.

The NOx BACT for the EAF is revised from 0.51 lb/ton to 0.35 lb/ton. This NOx BACT limit does not include the emissions from the Meltshop LMF.

(4) SO_2 Control Technology Technical Feasibility Study

Two (2) available control alternatives were evaluated to control SO_2 from the EAF:
(A) Charge substitution and
(B) Flue Gas Desulfurization (FGD) options - wet scrubbing, spray dryer absorption (SDA), and dry sorbent injection.

(A) Charge substitution
Sulfur dioxide (SO_2) emissions are directly related to the amount of sulfur being charged to the EAF. Scrap, direct reduced Iron (DRI), pig iron, injection carbon, charge carbon, and pet coke all have varying amounts of sulfur that will end up in the steel, slag or exhaust air. Sulfur content can vary from 0.2 % for DRI, 2.5 % (injection carbon) to 3% (pet coke). The sulfur that enters the exhaust stream may be oxidized to SO_2 when contacted with extreme heat and oxygen present in the ambient air. The amount of SO_2 present in the exhaust air will not be great enough to allow for any control technology to remove. One other factor that affects the SO_2 emissions is the sulfur content of the metal being charged to the furnace. Scrap metal inherently has low sulfur content (0.03-0.07% sulfur).

Charge substitution with lower sulfur-bearing raw materials is considered technically infeasible by Nucor Steel. Therefore, the IDEM, OAQ does not believe that requiring scrap with a lower sulfur content is a probable solution and the OAQ is not aware of any other means to assure low sulfur content in the scrap besides a scrap management plan. The OAQ believes that the scrap management plan required is consistent with the best scrap management plans at other PSD sources.

(B) FGD options - wet scrubbing, spray dryer absorption (SDA), and dry sorbent injection.
FGD systems currently in use for SO_2 abatement can be classified as wet and dry systems. Since FGD options have been applied to utility boilers and other steel mill furnaces, it is logical to further examine the feasibility of applying these technologies in controlling SO_2 emissions from EAFs.

- - Wet scrubbers are regenerative processes which are designed to maximize contact between the exhaust gas and the absorbing liquid. The exhaust gas is scrubbed with a 5% - 15% slurry, comprised of lime (CaO) or limestone ($CaCO_3$) in suspension. The SO_2 in the exhaust gas reacts with the CaO or $CaCO_3$ to form calcium sulfite ($CaSO_3$*$2H_20$) and calcium sulfate ($CaSO_4$). The scrubbing liquor is continuously recycled to the scrubbing tower after fresh lime or limestone has been added.

The types of scrubbers which can adequately disperse the scrubbing liquid include packed towers, plat or tray towers, spray chambers, and venturi scrubbers. In addition to lime and limestone, numerous other absorbents are available including sodium solutions and ammonia-based solutions.

The main technical problem associated with the operation of wet scrubbers is the presence of high particulate loading in the EAF exhaust gas. Particulates are not acceptable in the operation of wet scrubbers because they would plug spray nozzles, packing, plates, and trays. However, locating the wet scrubber downstream of the EAF particulate control device would make operation of the wet scrubber technically feasible. However, due to the expected low concentration of SO_2 in the exhaust gas stream, any add-on control device would be considered technically infeasible and economically infeasible.

The OAQ is not aware of a steel mill where a wet scrubber has been operated to control SO_2 emissions from an EAF.

- - As in wet scrubbing, spray dryer absorption (SDA), also known as dry scrubbing, the gas phase SO_2 is removed by intimate contact with a suitable absorbing solution. Typically, this may be a solution of sodium carbonate (Na_2CO_3) or slaked lime [$Ca(OH)_2$]. In SDA systems, the solution is pumped to rotary atomizers which create a spray of very fine droplets. The droplets mix with incoming SO_2-laden exhaust gas in a very large chamber and subsequent absorption leads to the formation of sulfites and sulfates within the droplets. Almost simultaneously, the sensible heat of the 200 ^oF exhaust gas which enters the chamber evaporates the water in the droplets, forming a dry powder before the gas leaves the spray dryer.

  Unlike wet scrubbing, the presence of high particulate loading in the EAF exhaust gas is not much of a problem. Hence, it can be operated prior to a particulate control device, especially baghouses employing teflon-coated fiberglass bags to minimize bag corrosion. This arrangement would also make the particulate control device capture the precipitated particulates from the spray dryer. Like wet scrubbing, due to the expected low concentration of SO_2 in the exhaust gas stream, any add-on control device would be considered technically infeasible and economically infeasible.

  The OAQ is not aware of a steel mill where a spray dryer absorption unit has been properly operated to control SO_2 emissions from an EAF.

- - Dry sorbent injection typically involves the injection of dry powders into either the furnace or post-furnace region of utility-sized boilers. This process was developed as a lower cost option to conventional FGD technology. Since the sorbent is injected directly into the exhaust gas stream, the mixing offered by the dry scrubber tower is not realized. Unlike wet scrubbing, the presence of high particulate loading in the EAF exhaust gas is not much of a problem. Like wet scrubbing, due to the expected low concentration of SO_2 in the exhaust gas stream, any add-on control device would be considered technically infeasible and economically infeasible.

The OAQ is not aware of a steel mill where dry sorbent injection has been operated to control SO_2 emissions from an EAF.

Adsorption and absorption control technologies have not been designed to control a gas stream of 5 ppm or less because:

(a) The only control technologies proven to remove SO_2 emissions from industrial processes with exhaust gas streams similar to an EAF were wet/dry scrubbers using lime, limestone or alkali metal scrubbing agents and lime spray dryers. This is supported by every BACT determination that the IDEM, OAQ has seen from other states.

(b) Although several different absorption and adsorption processes exist which may use different chemical reactions for removal, they all must have the same basic operating properties, which are sufficient contact between the SO_2 and scrubbing agent, sufficient residence time, and the necessary equilibrium in the exhaust.

(c) For an exhaust with a concentration of 5 ppm or less and 1.3 million cubic feet per minute exhaust, an unreasonable amount of reagent would be necessary to provide sufficient contact between the SO_2 and reagent, and even if absorbed or adsorbed in the tower, almost certainly the proper equilibrium would not exist to maintain the reduction.

(5) SO_2 Existing BACT Emission Limitations

The table below lists the SO_2 BACT limits of similar sources. Limits are arranged in an ascending order. Some sources are listed more than once because of recent revisions to their BACT limits.

The RBLC indicates that all steel mills listed do not have add-on control devices to control SO_2 emissions from EAFs. The RBLC indicates a wide range of SO_2 limits from 0.047 to 1.05 lb/ton.

Steel products produced will be taken into consideration on this SO2 BACT analysis because SO2 emissions will be mainly generated from the oxidation of the sulfur contained in the raw materials charged into the EAFs. Sulfur is present in varying quantities in steel scrap mix, charge carbon, injected carbon, fluxes and metallurgical additives.

Table 4 - - EAF SO_2 BACT of Other Similar Sources			
Source Name	SO_2 Limit (lb/ton)	Source Name	SO_2 Limit (lb/ton)
Beta Steel, IN (1992)	0.047	Beta Steel, IN (2003)	0.33
IPSCO, IA (1996)	0.06	SMI Steel, SC (2001)	0.35
Republic Technologies, OH (1999)	0.07	Nucor Steel, SC (1996)	0.35
Stafford Railsteel, AR (1993)	0.07	Nucor (Trico Steel), AL (2002)	0.50
Roanoke Electric Steel, VA (1998)	0.075	Qualitech, IN (1996)	0.52
Nucor (Trico Steel), AL (1996)	0.09	Mac Steel, AR (1998)	0.54
Nucor-Yamato Steel, AR (2001)	0.15	Nucor (Trico Steel) AL (2002)	0.60
Nucor Steel, AR (1992)	0.20	Tuscaloosa Steel, AL (2003)	0.62
Nucor Steel, SC (1995)	0.20	Chaparral Steel, VA (1998)	0.70
Keystone Steel, IL (2000)	0.20	IPSCO, IA (2002)	0.70
Nucor Steel, IN (1996)	0.20	IPSCO Steel, AL (1998)	0.70
SDI, Dekalb, IN (1997)	0.20	Arkansas Steel, AR (1998)	0.70
Nucor Steel, NC (2002)	0.22	Nucor Steel, AR (1991)	0.84
SDI, Whitley, IN (1999)	0.25	Qualitech, IN (1996)	1.04
Nucor Steel, IN (proposed) (2003)	0.25	Mac Steel, AR (1998)	1.05
SDI, Hendricks, IN (2003)	0.25	SDI, Hendricks, IN (2003)	1.5
Beta Steel, IN (2003)	0.25	SDI, Hendricks, IN (2003)	1.8
Qualitech, IN (1996)	0.25		
Nucor Steel, UT (1997)	0.31		

Beta Steel, IN

Beta Steel, IN is listed 3 times in the table above.

Beta Steel, IN was initially permitted at 0.047 lb/ton SO_2. A recently issued permit revises SO2 limit from 0.047 lb/ton to 0.25 lb/ton for the EAF. Since the EAF exhausts in a common baghouse together with the LMF and Caster, the SO_2 limit for the combination is set at 0.33 lb/ton.

The SO_2 limit (0.047 lb/ton) will not be relied upon in this BACT evaluation, because it has been revised.

The revised SO_2 limit (0.25 lb/ton) is the limit that OAQ is proposing as BACT limit for Nucor Steel, IN, because it is the limit for the EAF only. Nucor Steel, IN has separate limits for their EAF and LMF.

The SO_2 limit (0.33 lb/ton) will not be consider in this evaluation because it encompasses the emissions from the EAF and LMF, which is a different arrangement from Nucor Steel, IN.

IPSCO, IA

IPSCO, IA is listed twice in the table above.

On February 5, 2003, the IOWA DNR (Corey Detter 515/281-4842) was contacted regarding the limits of IPSCO, IA. The 0.06 lb/ton SO_2 limit was specified in 1996, however, IPSCO, IA can not comply with it. In July, 2002, the SO_2 limit was revised to 0.7 lb/ton. This new limit was not considered as BACT, even though it is already lower than the test result (0.85 lb/ton), because the IOWA DNR admitted that they did not have time to extensively preform a BACT analysis, and US EPA has provided significant comments on the limit. The permit was issued even with the comments. IOWA is SIP approved in terms of PSD program.

Since the old SO_2 limit (0.06 lb/ton) is not being complied with and the new SO_2 limit (0.7 lb/ton) is not considered as BACT, both limits will not be considered in this BACT evaluation.

Republic Technologies, OH

The SO_2 limit for the EAF No. 7 of Republic Technologies, OH was specified in terms of lb/hour. The SO2 limit (0.07 lb/ton) indicated in the above table was converted based on the maximum capacity of the EAF at 85 ton/hour. The lb/ton rate was not listed in the RBLC.

Since the limit is specified in lb/hour rate and the mill is not required to comply with a lb/ton rate, the equivalent rate (0.07 lb/ton) will not be used in this evaluation.

Stafford Steel, AR

Previous PSD reviews indicated that the Stafford Steel, AR was never built. Based on this, compliance has not been established.

This BACT limit (0.07 lb/ton) will not be considered in this BACT evaluation.

Roanoke Steel, VA

On February 10, 2003, the Virginia Air Pollution Control (Dean Downs 540/597-2711) has been contacted regarding the Roanoke Steel, VA. This mill applied for a modification in 1998, to increase the maximum capacity of their EAF from 70 ton/hr to 100 ton/hr. The SO_2 limits were specified in terms of lb/hour and tons/year rates. The NO_x lb/ton rate (0.075 lb/ton) was converted using the 100 tons/hour maximum capacity of the EAF.

The SO_2 rate (0.075 lb/ton) will not be use in this evaluation, because the mill is not required comply with a lb/ton BACT limit.

Nucor Steel, AL (formerly Trico Steel), AL

Nucor Steel, AL is listed 3 times in the above table.

On February 6, 2003, the Alabama DEM (Doug Carr 334/271-7887) was contacted regarding Nucor Steel, AL. The state of Alabama is SIP approved for the PSD program. SO_2 limits range from 0.5 to 0.7 lb/ton in the State of Alabama.

Nucor Steel, AL (formerly Trico Steel) was initially permitted at 0.09 lb/ton of SO_2, due to Class I area impact. The SO_2 limit was changed in November, 2002 because of the high cost and scarcity of injection carbon. Nucor Steel, AL was given new limits of 0.5 lb/ton when the production is equal to or greater than 352 ton/hr and 0.6 lb/ton when the production is less than 352 ton/hr.

The OAQ will not rely on these SO_2 existing (0.09 lb/ton) limit and new (0.5 lb/ton and 0.6 lb/ton) limits as BACT because the ADEM admitted that the decisions were simply based on the fact that the limits are within the range of existing limits.

Nucor Steel, IN was informed of the option of having SO_2 limits/ranges at different levels of production. Nucor Steel, IN decline the option.

Nucor Steel-Yamato, AR

Nucor Steel-Yamato, AR was permitted at 0.15 lb/ton SO_2 for their EAF rated at 450 tons/hour. This mill produces steel beams. The SO_2 limit is for the EAF only and uses a low sulfur injection carbon.

Due to difference in products produced (beams versus sheets), and scrap used, the SO2 BACT limit (0.15 lb/ton) will not be use in this BACT evaluation.

Nucor Steel, AR

Nucor Steel, AR is listed twice in the table above.

The RBLC is showing a permit issued in 1992, which specified the SO_2 limit in terms of lb/hr. This is equivalent to 0.2 lb/ton based on the 300 tons/hour maximum capacity of the EAF.

Another permit issued to Nucor Steel, AR in 1991 specified a SO_2 limit in terms of lb/hr, and based on the maximum capacity of 300 ton/hour, it is converted to the 0.84 lb/ton rate, listed in the table above.

No additional information can be found to supplement this information found in the RBLC.

Since both permits indicated the SO_2 BACT limit in terms of lb/hour, the equivalent SO_2 rates (0.2 lb/ton and 0.84 lb/ton) will not be use in this evaluation.

Nucor Steel, SC

Nucor Steel, SC is listed twice in the above table.

On February 10, 2003, the South Carolina Air Permitting (Matt Gibbs 8-3/898-3288 and Larry Ragsdale 803/898-3840) was contacted regarding Nucor Steel, SC. The SO_2 BACT limit for Nucor Steel, SC was set at 0.20 lb/ton. This limit is for the EAF only at 165 ton/hour capacity. Nucor Steel, SC initially had problems in complying with the SO_2 limit, however, their scrap management plan was revised to wash the oil from the scrap. Nucor Steel, SC is now complying with the limit.

RBLC is indicating another SO_2 limit (0.35 lb/ton) for the Meltshop no. 3 which encompasses the emissions from the EAF, LMF, and caster. This meltshop no. 3 has a capacity of 150 tons/hour. The SO_2 limit was also specified in terms of lb/hour rate and the equivalent rate (0.35 lb/ton) was based on the maximum capacity of the EAF.

The SO_2 limit (0.2 lb/ton) will not be consider as BACT in this evaluation because it only encompasses the emissions from the EAF. Nucor Steel, IN has to take into account emissions from the AOD and Desulfurization.

The SO_2 limit (0.35 lb/ton) will not be consider in this evaluation because it encompasses the emissions from EAF and LMF, which is different arrangement at Nucor Steel, IN.

Keystone Steel, IL.

On February 10, 2003, the Illinois EPA (Jason Schnepp 217/524-3724) was contacted to discuss the limits of Keystone Steel, IL. The permit issued in 2000 was for an increase in production to 1.2 million tons/year. The mill is going to use low sulfur injection coke (0.65% or less). He can not confirmed if the expansion has been constructed.

The SO_2 limit encompasses the emissions from the EAF and LMF. The OAQ believes that 0.2 lb/ton is not consider as BACT for Nucor Steel, IN because of the difference in scrap used.

Nucor Steel, IN

Nucor Steel, IN was permitted in 1996 with SO2 limit of 0.2 lb/ton. This SO2 limit applies to the EAF only, because the LMF has its own baghouse/stack and limit. Nucor Steel, IN applied for a revision of their SO2 BACT limit to be relaxed. Justification provided by Nucor Steel, IN is expressed in the next pages.

SDI, Dekalb, IN

In 1998, a permit issued to SDI, Dekalb, IN specified a SO_2 limit of 0.20 lb/ton for the combined emissions of EAF and LMF. This was the same limit issued in 1997.

Due to additional emissions to be accounted for, in addition to the emissions from the EAF, this SO_2 BACT limit (0.2 lb/ton) will not be consider as BACT for this evaluation.

Nucor Steel, NC

On February 6, 2003, the North Carolina Air Pollution Division (Fred Langenback 919/715-6242) was contacted regarding the only steel mill in their area. Nucor Steel, NC SO_2 limit has been revised in December, 2002, to 0.22 lb/ton, based on testing data. This is the only steel mill that its existing limit has been changed to a more stringent one. However, it is still not the most stringent SO_2 BACT limit documented in the RBLC.

SDI, Whitley, IN

SDI, Whitley, IN was issued a PSD permit with 0.25 lb/ton SO_2 BACT limit. This mill was recently tested on February, 2003 for compliance. Based on preliminary review of the test results, it seems that SDI, Whitley, IN complied with the 0.25 lb/ton limit. The SO_2 limit encompasses the emissions from the EAF and LMF. This is the same limit that SDI, Hendricks, IN is proposing.

The SO_2 limit (0.25 lb/ton) will be consider as BACT, because compliance has been shown.

SDI, Hendricks, IN (formerly Qualitech, IN)

Qualitech, IN was issued a PSD permit in 1996, which specified 3 different SO2 limits for specialty bar quality products. The SO_2 limits are: 0.25 lb/ton, 0.52 lb/ton and 1.04 lb/ton.

Under new ownership (SDI), the steel mill was recently issued a PSD permit. The SO2 limits have been evaluated and SDI is accepting the following limits: 0.25 lb/ton, 1.5 lb/ton and 1.8 lb/ton. The majority (more than 65% of the steel production) will be under the 0.25 lb/ton SO_2 limit. SDI, Hendricks, IN is indicated 3 times in the above table. Qualitech/SDI Hendricks, IN is indicated 3 times in the above table.

The OAQ believes that SO_2 BACT limit (0.25 lb/ton) is comparable as BACT.

Nucor Steel, UT

The permit limits the steel production of Nucor Steel, UT, to 1.4 million ton/year of scrap fed to the source's 2 EAFs. The SO_2 BACT limit was specified in lb/hour rate. The SO_2 BACT limit (0.31 lb/ton) indicated in the above table was determined based on the maximum capacity of each EAF at 65 ton/hour. No additional information can be found to supplement this information found in the RBLC.

Since the limit is specified in lb/hour rate and the mill does not need to comply with a lb/ton rate, the equivalent rate in lb/ton (0.31 lb/ton) will not be used in this evaluation. In addition, this SO_2 (0.31 lb/ton) rate is less stringent than the SO_2 limit that is being consider in this evaluation.

SMI Steel, SC

On February 10, 2003, the South Carolina Air Permitting (Matt Gibbs 8-3/898-3288 and Larry Ragsdale 803/898-3840) was contacted regarding SMI Steel, SC. The SO_2 BACT limit for SMI Steel, SC was set at 0.35 lb/ton. This limit encompasses the EAF and LMF because both of them exhaust to the EAF baghouse.

Nucor Steel, IN has a different meltshop arrangement: The LMF does not exhaust to the same EAF stack.

This BACT limit (0.35 lb/ton) will not be consider because of the different meltshop arrangement in Nucor Steel, IN.

Mac Steel, AR

Mac Steel, AR is listed twice in the table above.

In 1993, a permit was issued for Mac Steel, AR, for an EAF at a rate of 74 tons/hour. The SO_2 limit was 0.54 lb/ton. However, the information was not put in the RBLC until 2002.

Another permit was issued in 1998 and the SO_2 limit was specified in terms of lb/hour rate. Converting it based on the EAF's maximum capacity of 85 ton/hour, the SO_2 limit is equivalent to 1.05 lb/ton, as indicated in the table above. No additional information can be found to supplement this information found in the RBLC.

Both the equivalent rates (0.54 lb/ton and 1.05 lb/ton) will not be consider in this BACT evaluation.

Tuscaloosa Steel, AL

On February 6, 2003, the Alabama DEM (Doug Carr 334/271-7887) was contacted regarding this steel mill. Tuscaloosa Steel, AL was not initially reviewed as PSD for SO_2, due to use of test results as emission factors from another steel mill. However, when the test in the steel mill itself was done, the SO_2 came up as significant in terms of PSD. A proposed permit was put on publication for public review in January 2003, with a SO_2 limit of 0.62 lb/ton, indicating that this limit is acceptable because it is within the range of existing limits in the RBLC. Since this limit is not final yet, the SO_2 limit (0.62 lb/ton) will not be used in this BACT evaluation.

Chaparral Steel, VA

Chaparral Steel, VA has a limit of 0.7 lb/ton of SO_2. This limit is based on the arrangement that the baghouse captures the emissions of the EAF and LMF and other processes of the meltshop.

This BACT limit (0.7 lb/ton) will not be consider because it is less stringent than the limit that OAQ is proposing for Nucor Steel, IN.

Arkansas Steel, AR

The permit issued in 1998 for Arkansas Steel, AR was for an EAF with a maximum capacity of 50 tons/hour. The NO_x BACT limits was both specified in terms of lb/ton and lb/hour.

This BACT limit (.7 lb/ton) will not be consider because it is less stringent than the limit that OAQ is proposing for Nucor Steel, IN.

IPSCO, AL

On February 6, 2003, the Alabama DEM (Doug Carr 334/271-7887) was contacted regarding this steel mill. The SO_2 limit (0.7 lb/ton) for IPSCO, AL has not been revised.

This BACT (0.7 lb/ton) limit will not be consider because it is less stringent than the limit that OAQ is proposing for Nucor Steel, IN.

- - Even with attempts to discuss the BACT limits and search of the permitting agency's web site, the status of the other mills can not be verified and confirmed if they have been constructed, operated or in compliance.

- - Several steel mills have been permitted in 1998 with higher SO_2 BACT limits because of the types of raw materials being charged to the furnace. These are Chaparral Steel, VA; Arkansas Steel, AR; and IPSCO Steel, AL; which have all been permitted at 0.7 lbs/ton. However, there are also steel mills that have been recently permitted at a much lower SO_2 limit.

(6) Proposed SO_2 BACT Limit for Nucor Steel, IN

Nucor Steel indicated in this application that the existing SO_2 BACT limit of 0.2 lb/ton be changed to 0.35 lb/ton. Nucor Steel provided the following information to support the request:

(a) There is trend in change in quality and availability of scrap material, charge and injection carbon sources; leading to a higher residual sulfur levels. Scrap supply is changing as higher residual scrap is coming due to lack of "clean scrap". Nucor Steel, IN has spend considerable expense to produce a broad range of products and should not be restricted because of SO2 BACT limit. Nucor Steel, IN has to consider cost and lack of availability of prime scrap and the need to expand the customer base to remain competitive.

- - The OAQ believes that change in customer demands by itself is not an overwhelming and convincing justification to relax the SO_2 BACT limit, because all steel mills have constructed at considerable expense with the intent of producing a broad range of products. All steel mills and other industries for that matter have to address customer demands and still protect the environment by complying with existing BACT requirements.

(b) Nucor Steel, IN is also starting to field customer requests for both lower and higher sulfur residual steel. For the lower residual steel, the change in sulfur residual is around (0.01 - 0.008) = 0.002%.

For a 130 ton heat, this is an increase of 5.2 lb of SO_2 that is removed from the steel.
Sulfur removed = (0.002%/100)(130 ton heat)(2,000 lb/ton) = 5.2 lb

Based on a 130 ton heats, this would add a maximum of 0.04 lb/ton of elemental sulfur = (5.2 lb)/(130 ton) = 0.04 lb/ton

As higher residual steels become more prevalent in the industry, the more comes back to the mill as scrap, thereby increasing the amount of sulfur going to the EAF that has to be removed. The industries in the surrounding states are producing increasingly larger quantities of high sulfur scrap and lower sulfur residual scrap has become more and more scarce.

- - The OAQ has re-evaluated the calculations provided by Nucor Steel, IN. Hypothetically taking into account the additional sulfur emissions from the anticipated lower residual steel products, the

SO_2 emissions would be 0.2 lb/ton plus 0.04 lb/ton = 0.24 lb/ton. The limit that Nucor Steel is proposing (0.35 lb/ton) is higher than this.

The OAQ is proposing SO_2 limit (0.25 lb/ton) that takes into account scrap variability and the emissions contributing to the common stack (AOD and Desulfurization). This is the emission rate that OAQ is proposing after evaluations of other existing mills and found this to be comparable.

(c) Nucor Steel, IN further indicated that their ability to comply with the existing limit under future operations is not determinative of the BACT.

- - The OAQ has been following the US EPA Top Down BACT analysis and does not believe that complying with existing BACT limit hinder Nucor Steel, IN to have new or future customers. Future change in operations may need air approval prior to making such change. Nucor's PSD BACT has been issued in 1996, and the premise of the PSD program is to comply with the BACT limit in the future with existing and new customers by either using efficient control or performing better and efficient work practices. In case of the EAF, SO_2 emissions can be minimize by following and implementing an efficient scrap management plan.

(d) The OAQ should not consider Nucor Steel, SC, because, although Nucor Steel, SC appears to be able to meet the SO_2 limit of 0.2 lb/ton, it incorporates a different scrap mix than Nucor Steel, IN. If Nucor Steel, IN would switch to an identical scrap mix, the resulting increase in cost would be $69,906,667 per year. This analysis included shipping and handling of the scrap from SC to IN.

SO2 = (0.35 lb/ton - 0.2 lb/ton)*(502 ton/hr)*(8760 hr/yr)*(1 ton/2000 lb) = 329.8 ton/year
Cost = ($69,906,667.00/year)/(329.8 ton/year) = $211,966.85/ton.

- - There is no line by line detailed cost analysis to supplement the final outcome of this cost analysis. To make an intelligent and accurate comparison, Nucor Steel, IN has been asked by OAQ to provide the approximate proportion of the scrap mixture that Nucor Steel, SC is using and compare it with the scrap mix that Nucor Steel, IN is using or going to use. Factors to consider, but not limited to, are: how are the mixture significantly different, and the availability of the mixture because of location or product produced. This information was not provided by Nucor Steel, IN. The OAQ did not require Nucor Steel, IN to make a cost comparison by using the exact mix by Nucor Steel, SC and have it transported in Indiana.

Based on the insufficient information supplied by Nucor Steel, IN, this cost analysis is not a valid analysis that can be use in this evaluation.

(e) Nucor Steel, IN provided a break down of the scrap used in a 1994 compliance test. This is the scrap mixture that Nucor Steel, IN is using for comparison because this specific scrap mixture was used in their compliance testing. The exact proportion of the scrap mixture has been requested by Nucor Steel, IN to be consider confidential.

The 1994 scrap mixture cost approximately $152.00/ton in 1994. Majority of this mixture consisted of busheling and the least portion of the scrap is designated as home scrap.

The same 1994 scrap mixture will cost $150.27/ton at today's pricing.

The current scrap mixture used at today's pricing is $133.77/ton. This scrap mixture is of different component as the 1994 mixture. The current scrap mixture still has busheling as the majority component and shredded part is the least portion of the scrap mixture. The big difference in the scrap mixture is the increase in the use of blended parts.

At today's pricing, the mix that Nucor Steel used in the 1994 SO_2 test would price out at approximately $16.5/ton more ($150.27/ton - $133.77/ton) than today's mixture. This would cost around $33 million at 2 million ton/year of production ($16.5/ton*2 million ton/yr), just to maintain the existing 0.2 lb/ton SO_2 limit. The 2 million/year production was used based on an estimate of actual production. The cost would be much higher at maximum capacity.

Nucor Steel, IN even saw a price increase $22.00/ton in April 2003 from the December 2002 scrap mixture.

- - The OAQ has evaluated the scrap mixture and cost analysis that Nucor Steel, IN has submitted. Based on the information submitted Nucor Steel, IN, it shows that there is a reduction in pricing of the mixture ($152.00 versus $150.27.00) , thus the OAQ believes that pricing of the scrap mixture is not a contributing factor to grant the relation of the SO_2 BACT limit and that it is not necessary to perform further analysis.

(f) Nucor Steel, IN points out that Nucor's Desulfurization station vents to the same EAF baghouses and stack test results indicate at least 47 lb/hr of SO_2 from this station enters the main baghouse. Based on the 270 ton/hr of steel production rate during the test, this would add 0.175 lb/ton of SO_2 to the baghouse. Nucor contends that if all SO_2 emissions are taken into account; this would result to 0.415 lb/ton (0.2 + 0.04 + 0.175).

Nucor Steel, IN calculated that it would cost around $168,837.00/ton of SO_2 removed if the limit is maintain at 0.2 lb/ton.

In expanding the customer base, Nucor Steel, IN, among other things, has to produce low sulfur alloys in greater volumes than in the past. This means more Desulfurization and greater utilization of the AOD.

Some level of desulfurization occurs in the EAFs. Additional desulfurization is achieved at the AOD and LMF desulfurization station and both evacuates to the EAF Baghouses. With the trend toward lower sulfur steel, Nucor Steel, IN is anticipating doing more desulfurization than in the past. Higher sulfur scrap would increase the need for additional desulfurization just to stay the same.

- - It is correct that desulfurization should be taken into account. Most SO_2 limits in the RBLC encompasses the emissions from the EAF and LMF. In Nucor Steel, IN case, instead of the LMF exhausting to the same EAF baghouse, it is the desulfurization, thus it evens it out.

The OAQ can not find any issued air permit approval that specify any limits or requirements for the Desulfurization because it has been taken into account as part of the meltshop EAF operations. the Desulfurization exhausts to the same Meltshop EAF Baghouse.

The LMF in Nucor Steel, IN does not currently have an SO_2 limit because it was originally exhausting to the Meltshop EAF Baghouse and when it was re-permitted with its own Baghouse, an SO_2 limit was overlooked. In this review, the Meltshop EAF is proposed to have the same SO_2 limit (0.185 lb/ton) as the Strip Caster LMS.

Nucor Steel, IN is claiming that the desulfurization is emitting an additional 0.175 lb/ton of SO_2.

If all the SO_2 emissions that Nucor Steel, IN mentioned should be accounted for and include the LMF emissions, such that there is accurate comparison of emissions with the common meltshop arrangement, the SO_2 emissions would be 0.6 lb/ton. No steel mill listed in the RBLC has this SO_2 limit for a meltshop.

Table 5 - - SO_2 BACT Comparison

Operations	This is what Nucor is proposing as SO_2 limit (lb/ton)	This is what OAQ believes to be BACT for Nucor Steel, IN (lb/ton)
EAF	0.2	0.25
EAF SO2 increase	0.04	
Desulfurization	0.175	
LMF	0.185	0.185
TOTAL	0.6	0.435

(g) Nucor Steel, IN also pointed out that the SO_2 limit of Beta Steel, IN has been revised. The new SO_2 limit is 0.33 lb/ton for the EAF, LMF and Caster. Nucor Steel, IN contends that they should have a higher SO_2 limit because the EAFs, desulfurization station, AOD and caster all exhaust to the same stacks.

Nucor Steel, IN after re-evaluation of the Beta Steel permit, indicated that OAQ should consider the same SO_2 emission rate provided to the other operations emitting the common EAF Baghouse.

- - It is correct that Beta Steel was specified 2 revised SO_2 limits: 0.25 lb/ton for the EAF only and 0.33 lb/ton for the combined emissions of the EAF, LMF and caster. The combined SO_2 limit was based on the source stack test result.

The table below compares which operations exhaust to the same EAF Baghouse. The caster and AOD do not contribute a significant SO_2 emissions. Desulfurization is additional step to remove sulfur from the scrap. No additional material is added to the scrap that can contribute to the sulfur. Since it is the same scrap that goes through the EAF and desulfurization station, the SO_2 emissions from the same scrap should only be accounted once in the process.

Table 6 - - Meltshop Operations Comparison

Operations	Nucor Steel, IN	Beta Steel, IN
EAFs	T	T
LMF	V	T
Caster	T	T
Desulfurization	T	V
AOD	T	V

The LMF of Nucor Steel, IN has a separate limit of 0.16 lb/ton, thus if added to the existing 0.2 lb/ton SO_2 limit will result to 0.36 lb/ton, which is higher than the Beta Steel, IN (0.33 lb/ton) limit, thus Nucor Steel, IN can not claim that Beta Steel, IN was given a less stringent limit.

<table>
<tr><th colspan="8">Table 7 - - SO_2 Meltshop Operations Comparison</th></tr>
<tr><th>Operations</th><th>Nucor Steel, IN (existing)</th><th colspan="4">4 Different Sets of BACT Proposed by Nucor Steel, IN</th><th>Beta Steel, IN</th><th>OAQ Proposed BACT for Nucor Steel, IN</th></tr>
<tr><td>EAFs</td><td rowspan="4">0.2</td><td rowspan="4">0.35</td><td rowspan="4">0.345</td><td>0.2</td><td rowspan="3">0.24</td><td>0.25</td><td rowspan="4">0.25</td></tr>
<tr><td>Caster</td><td rowspan="3">0.08</td><td>- -</td></tr>
<tr><td>AOD</td><td>- -</td></tr>
<tr><td>Desulfurization</td><td>0.175</td><td>- -</td></tr>
<tr><td>LMF</td><td>- -</td><td>0.185</td><td>0.185</td><td>0.185</td><td>0.185</td><td>0.08</td><td>0.185</td></tr>
<tr><td>Total</td><td>0.2</td><td>0.535</td><td>0.53</td><td>0.465</td><td>0.6</td><td>0.33</td><td>0.435</td></tr>
</table>

The LMF was originally permitted to be exhausting under the same EAF Baghouse, thus there was no existing SO2 limit for the LMF alone. Later, the LMF was permitted with its own Baghouse, however, there was still no SO2 limit specified for it. Under this review, the LMF is specified to have the same SO2 limit (0.185 lb/ton) as Nucor's recently permitted Strip Caster LMS.

The OAQ is proposing to revise the SO_2 limit to be 0.25 lb/ton, which if the LMF emission is added, would result to 0.41 lb/ton, which is less stringent than the SO_2 limit of Beta Steel, IN thus Nucor can not claim that Beta Steel was given a less stringent limit. The difference in the SO_2 limit already accounts for the 2 operations that are not present in the Beta Steel, IN plant.

The OAQ is proposing SO_2 limit of 0.25 lb/ton and believes this has accurately taken into account the emissions due to variability of scrap mixture and emissions from other operations ducted to the same stack.

The following table compares Nucor Steel, IN with other similar mills in Indiana:

Table 8 - - SO_2 Meltshop Operations Comparison

Operations	Nucor Steel, IN (existing)	SDI Whitley, IN	SDI Dekalb, IN	SDI Hendricks, IN	Beta Steel, IN	OAQ Proposed BACT for Nucor Steel, IN
EAFs	0.2	0.25	0.2	0.25	0.25	0.2
LMF	- -				0.08	0.185
Caster	- -			- -	- -	0.05
AOD	- -	- -	- -	- -	- -	
Desulfurization	- -	- -	- -	- -	- -	
Total	0.2	0.25	0.2	0.25	0.33	0.435

SDI, Whitley, IN - - PSD permit 183-10097-00030, issued in July 7, 1999

SDI, Dekalb, IN - - PSD permit 033-9187-00043, issued March 24,1998.

SDI, Hendricks, IN - - PSD draft permit 063-16628-00037, issued August 29, 2003.

Beta Steel, IN - - PSD permit 127-9642-00036, issued May 30, 2003

(g) Nucor Steel, IN also contends that the OAQ is redefining the source, which is prohibited under PSD program. Nucor Steel, IN at considerable expense, constructed a steel batch mill capable to producing a broad range of steel products, which varies over time due to customer demands.

- - The OAQ is not redefining the source. Nucor Steel, IN was not limited to a specific steel product. Per PSD BACT procedure, the operation was compared to existing similar steel mills and follow the Top Down BACT procedure. The OAQ believes that the revised SO_2 limit accurately takes into account variability and availability of scrap mixture (as all similar mills have to content with).

The OAQ provided the option to Nucor Steel, IN to specify different limits for different steel products, instead of only one overall limit, to provide further flexibility. This concept has been used in other PSD review of steel mills and other industry. So, far it has been used for steel mills that produce specialty quality bar products. Nucor Steel, IN decline this option.

The BACT limit for the EAF is revised from 0.2 to 0.25 lb/ton. This SO_2 limit does not include the emissions from the Meltshop LMFs. This limit is comparable to existing and proposed BACT limits that have the same arrangement.

(7) VOC Control Technology Technical Feasibility Study and Existing BACT Emission Limitations

Table 9 - - EAF VOC BACT of Other Similar Sources

Source Name	VOC Limit (lb/ton)	Source Name	VOC Limit (lb/ton)
Charter Steel, WI (2003)	0.06	Nucor Steel, NC (2002)	0.13
SDI, Whitley, IN (1999)	0.09	Keystone Steel, IL (2000)	0.13
Stafford Railsteel, AR (1993)	0.09	Qualitech, IN (1996)	0.15
SDI, Hendricks, IN (2003)	0.09	Beta Steel, IN (2003)	0.15
Nucor Steel, AR (1991)	0.09	IPSCO Steel, IA (2002)	0.18
Nucor Steel, IN (2003)	0.09	Nucor (Trico Steel), AL (1996)	0.20
Nucor Steel, IN (1996)	0.13	Ameristeel, FL (1995)	0.295
Nucor- Yamato Steel, AR (2001)	0.13	Roanoke Steel, VA (1998)	0.30
Mac Steel, AR (1998)	0.13	Republic Tech, OH (1999)	0.35
Nucor Steel, SC (1996)	0.13	IPSCO, AL (1998)	0.35
Beta Steel, IN (1992)	0.13	Chaparral Steel, VA (1998)	0.35
SDI, Dekalb, IN (1997)	0.13	Arkansas Steel, AR (1998)	0.35
Tuscaloosa Steel, AL (2002)	0.13		

VOC emissions from the EAF will be generated due to the volatilization of organic compounds (e.g., oils and paints) present in the scrap metal during charging of the scrap into the furnace.

The RBLC indicates a wide range of VOC BACT emission limits for EAF's (0.06 lb/ton – 0.35 lb/ton). Majority of the steel mills have direct shell evacuation system (DEC) and scrap management as VOC BACT.

Charter Steel, WI

On February 11, 2003, Wisconsin Department of Environmental Management (Don Faith 608/267-3135) was contacted regarding the only steel mill in their area. Charter Steel, WI was issued a modification in 2000. The VOC limit of 0.06 lb/ton was a source self imposed limit to avoid LAER and Class I federal requirements, because the source is located in an ozone nonattainment area. This mill operates at higher quality strict scrap and raw materials (containing the possible minimum oils and other non metallic materials) to comply with this VOC limit. In addition to using higher quality scrap, the mill produces different carbon steel products (high quality grade automotive market).

Charter Steel, WI has a higher NO_x BACT limit than that was being proposed for SDI, Hendricks, IN. The OAQ believes that this is due to the stringent VOC limitation, and for meltshop operations, NOx is more significant contributors of emissions than VOC, thus, based on this it is appropriate to not require Nucor Steel, IN to further reduced the VOC emissions.

Table 10 - - VOC and NO_x BACT Comparison

Source Name	VOC (lb/ton)	NO_x (lb/ton)
Charter, WI	0.06	0.51
Nucor Steel, IN	0.09	0.51 (existing)
		0.35 (proposed)

Charter Steel, WI has a pending application for a different EAF and has requested a higher VOC limit because of different products (stainless steel) to be produced.

This VOC limit (0.06 lb/ton) will not be used in this BACT evaluation due to differences in scrap used and products produced.

SDI, Whitley, IN

The VOC BACT limit for the SDI, Whitley, IN was initially proposed at 0.13 lb/ton, however, it was changed to 18 lb/hr (which is equivalent to 0.09 lb/ton) with scrap management plan, thermal oxidizer and maintaining a negative pressure at the dec air gap, when the permit was finalized. SDI, Whitley, IN has started operation in October, 2002, and has recently performed compliance tests in February, 2003. SDI, Whitley, IN manufactures slabs/sheets.

Stafford Railsteel, AR

Stafford Railsteel, AR has a VOC BACT emission limit of 0.09 lb/ton, but this mill was never built. Based on this, compliance has not been established.

SDI, Hendricks, IN (formerly Qualitech, IN)

SDI, Hendricks, IN was recently issued a permit. SDI's permit revised the VOC BACT limit from 0.15 lb/ton to 0.09 lb/ton.

Nucor Steel, AR

Nucor Steel, AR can justify a lower limit of 0.09 lb/ton due to its use of very high grade scrap for the production of slabs and sheets. In addition, Nucor Steel, AR has been approved a unique test method to show compliance.

Nucor Steel, IN; Nucor-Yamato, AR; Nucor Steel, NC; Nucor Steel, SC, Beta Steel, IN; SDI, Dekalb, IN; Tuscaloosa Steel, AL; and Keystone Steel, IL

These sources have 0.13 lb/ton as VOC BACT limit.

The RBLC does not indicate the VOC BACT limit for Keystone Steel, IL. The information was taken from the permit itself.

Nucor Steel, IN

Upon further evaluation, the existing VOC BACT limit of Nucor Steel, IN is being revised from 0.13 lb/ton to 0.09 lb/ton. Nucor Steel, IN is listed twice in the table above.

Nucor Steel, NC

On February 6, 2003, the North Carolina Air Pollution Division (Fred Langenback 919/715-6242) was contacted regarding the only steel mill in their area. Nucor Steel, NC was initially permitted at 0.35 lb/ton VOC in 1999. The permit has a provision that provides an opportunity to re-open the BACT review that based on testing data the existing limit can be revised. The VOC limit was changed to 0.13 lb/ton in December, 2002.

Beta Steel, IN

The Beta Steel, IN was initially permitted at 0.13 lb/ton VOC. A recently issued permit revised it to 0.15 lb/ton, based on stack test results. Beta Steel, IN is listed twice in the table above.

IPSCO, IA.

On February 5, 2003, the IOWA DNR (Corey Detter 515/281-4842) was contacted regarding the limits of IPSCO, IA. The limit for IPSCO was originally specified at 0.13 lb/ton for VOC. It was revised to 0.18 lb/ton in July 2002.

This VOC BACT limit of 0.18 lb/ton will not be considered as BACT because it is less stringent.

Roanoke Steel, VA.

On February 10, 2003, the Virginia Air Pollution Control (Dean Downs 540/597-2711) has been contacted regarding the Roanoke Steel, VA. This mill applied for a modification to increase the maximum capacity of their EAF from 70 ton/hr to 100 ton/hr. The VOC limit was changed from 0.35 lb/ton to 0.3 lb/ton. This is based on stack test done on the plant. This is considered a BACT limit, however, it will not be the BACT limit to be specified to SDI -Bar Products Division, IN, because, it is less stringent.

- - There are eight (8) steel mill sources listed in the RBLC given a limit of 0.13 lb/ton. SDI is proposing the same limit to the SDI-Bar Products Division, Hendricks, IN.

(8) Proposed VOC BACT Limit for Nucor Steel, IN

Nucor Steel, IN will maintain its VOC BACT limit of 0.09 lb/ton, in addition to good operating practices and scrap management plan. This limit is comparable to existing VOC BACT limits in the RBLC.

(9) PM and PM_{10} Control Technology Technical Feasibility Study

Four (4) available technologies were evaluated to control particulate emissions from EAFs:

(A) Electrostatic Precipitator (ESP),
(B) High Efficiency Cyclones,
(C) High Energy Scrubbers, and
(D) Fabric Filters (i.e., baghouses).

(A) ESPs use an electrostatic field to charge particulate matter contained in the gas stream and then attract and collect the particles on a collection surface of opposite charge. While ESPs have a very high removal efficiency (99% or better) for many sources of particulate, they have been proven as unsuitable for applications involving particulate with a high concentration of iron compounds such as those emitted from EAFs. Due to the electromagnetic properties of small charged particles of iron compounds in an electric field, the particles adhere very strongly to the collection plates of an ESP and are extremely difficult to dislodge, resulting in an in-effectivity of the ESP. In addition, the exhaust gas stream from an EAF contains high levels of zinc (10% - 20%) and other metal compounds which can foul ESP electrodes. Thereby, making the ESP ineffective. Therefore, ESP is considered technically infeasible for controlling particulate emissions from EAFs.

The OAQ is not aware of a steel mill where an ESP has been operated to control particulate emissions from an EAF.

(B) Particulate removal in cyclone collectors is achieved through the action of inertial forces, especially centrifugal. As the gas stream enters the top of the cyclone, a vortex is induced as it is forced to travel a circular path. Centrifugal forces cause the heavier particles to concentrate near the outer wall of the cyclone and particle of lesser mass to remain closer to the center of the vortex.

Frictional and gravitational forces then act on the particles closest to the wall, causing them to fall toward the bottom of the cyclone, where they are collected in a hopper. Within the lower segment of the cyclone, the direction of the gas-flow vortex is reversed, and an inner ascending vortex is formed. The inner vortex consists of comparatively particulate-free air, which is collected through an outlet duct at the top of the cyclone.

Cyclone collectors are considered technically feasible. However, they achieve the lowest particulate removal efficiencies (less than 90%) of all particulate control devices, especially for submicron particulates that will be emitted from the EAF.

The OAQ is not aware of a steel mill where a cyclone collector has been operated to effectively control particulate emissions from an EAF.

(C) High energy wet scrubbers are technically feasible and can achieve a high particulate collection efficiency (90% or better), but at the expense of a punitive pressure drop (ranging from 6 - 20 inches of water), higher operational utilities, generation of large quantities of sludge along with the associated problem of sludge handling, de-watering, and disposal.

The OAQ is not aware of a steel mills where a high energy wet scrubber has been operated to control particulate emissions from an EAF.

(D) Fabric filters or baghouses are technically feasible for collecting fine particulate matter emissions associated with metals from EAFs or other types of furnaces that have high particulate emissions. They can also achieve the highest control efficiency, among other particulate control devices, as applied to EAFs.

Positive pressure baghouses or negative pressure baghouses have been used in the steelmaking industry.

(i) Positive pressure baghouses operate at internal pressures greater than the atmospheric pressure. Typically, the fans are located before the fabric filters, (as Nucor would say the fans are on the dirty side) This allows the fans to pull air from the EAF and push the dust laden air through the fabric filters and into the ambient air via a continuous ridge vent (old design) rather than a stack. The discharge area of a ridge vent is on the order of four times that of a single stack.

(ii) Negative pressure baghouses operate at internal pressure less than atmospheric. The fans are located after the fabric filters (as Nucor would say, the fans are on the clean side). This allows the fans to pull the gas laden air from the EAF, through the fabric filters, then push the air up through a central stack.

(10) PM and PM_{10} Existing BACT Emission Limitation

The table below summarizes the PM and PM10 limits in the RBLC. Limits are arranged in ascending order. Some sources are listed more than once because they either have pending applications to revise the exiting limits or have differentiate PM and PM10 limit.

Evaluation of the limits in the RBLC indicates that 0.0032 grains per dry standard cubic feet has been considered BACT for negative pressure baghouses compared to 0.0018 grains per dry standard cubic feet for positive pressure baghouses. Although there was this distinction, baghouse manufacturer's claim that there is no difference in filtering capability between these types of baghouses. The OAQ determines that the achievable control technology and emission limitation should be used to determine the best available control technology for a baghouse instead of a specific type of bag that can be used. The OAQ believes that the limitation of 0.0018 gr/dscf is the most stringent filterable PM limitation applied to an EAF baghouse and should be considered BACT regardless of what type of bags the permittee uses. Therefore, either type of baghouse should meet 0.0018 grains per dry standard cubic feet (gr/dscf) for filterable PM. It is the applicant's responsibility to construct a control device which meets these stringent limitations.

Table 12 - - EAF PM BACT of Other Similar Sources

Source Name	PM/PM_{10} Limit (gr/dscf)	Source Name	PM/PM_{10} Limit (gr/dscf)
Charter Steel, WI	0.0015	Nucor Steel, UT (PM)	0.0033
Chaparral Steel, VA	0.0018	IPSCO, AL	0.0033
Stafford Railsteel, AR	0.0018	Roanoke Electric Steel, VA	0.0034
Nucor-Yamato, AR	0.0018	Ameristeel Corp, FL	0.0034
Nucor Steel, AR	0.0018	Tuscaloosa Steel, AL	0.0035
SDI, Whitley, IN (PM)	0.0018	Atlantic Steel, GA	0.0036
Nucor Steel, NC	0.0018	Florida Steel, TN (PM_{10})	0.0052
Keystone Steel, IL	0.0018	IPSCO, IA	0.0052
Nucor Steel, IN (PM)	0.0018	SDI, Hendricks, IN (PM_{10})	0.0052
SDI, Hendricks, IN (PM)	0.0018	Florida Steel, FL	0.0052
MacSteel, AR	0.0018	SDI, Whitley, IN (PM_{10})	0.0052
Bethlehem Steel, PA	0.0020	Nucor Steel, SC	0.0052
SMI Steel, SC (PM_{10})	0.0020	Cascade Steel, OR	0.0052
Nucor Steel, UT (PM_{10})	0.0026	Armco Steel, MD	0.0052
Co-Steel Raritan, NJ	0.0030	Beta Steel, IN	0.0052
Qualitech, IN	0.0032	Nucor Steel, SC	0.0052
SDI, Dekalb, IN	0.0032	Arkansas Steel, AR	0.0052
Trico Steel, AL	0.0032	**Nucor Steel, IN** (PM_{10})	0.0052
Republic Tech, OH	0.0032		

Charter Steel, WI

Charter Steel, WI has the lowest BACT limit in terms of grain loading, however, the grain loading limit is considered the secondary PSD BACT limit. The primary limit is in terms of lb/hr, which is 6.5 lb/hr at 550,000 tons/year capacity of the mill. The opacity limit is set at 20%.

Table 13 - - PM and Opacity BACT Comparison

Pollutant		Charter Steel, WI	Nucor Steel, IN
PM	(gr/dscf)	0.0015	0.0018
Opacity	(%)	20	3
Capacity	(ton/year)	550,000	4,397,520

This grain loading (0.0015 gr/dscf) will not be considered in this BACT analysis because the mill is not required to comply with this grain loading. Also, most steel mills have 3% as opacity BACT limit.

Nucor Steel, NC

On February 6, 2003, the North Carolina Air Pollution Division (Fred Langenback 919/715-6242) was contacted regarding the only steel mill in their area. Nucor Steel, NC was initially permitted at 0.0032 gr/dscf for PM in 1999. The permit has a provision that provides an opportunity to re-open the BACT review that based on testing data the existing limit can be revised. The grain loading limit was changed to 0.0018 gr/dscf in December, 2002. Nucor Steel, NC is one of the few permits that indicate a clear distinction that 0.0018 gr/dscf limit is for the filterable PM, and 0.0052 gr/dscf is for filterable and condensible PM_{10}.

- - It was confirmed that most of the permits do not clearly distinguished a BACT limit for filterable PM and Filterable and Condensible PM_{10}. The particulate limits indicated in this table are specified for filterable PM and PM_{10} only, except for IPSCO Steel where the limit applies to the total PM_{10} (filterable and condensible portions combined). SDI, Whitley, IN is also one of the few sources with a separate limits for filterable and condensible particulate fractions.

- - There are 9 steel mills sources that have 0.0018 gr/dscf as BACT limits. Nucor Steel, IN is one of these sources.

- - There are 10 steel mills with 0.0052 gr/dscf as BACT limits, 3 of these specified that it is for PM_{10} only.

(11) Proposed PM and PM_{10} BACT Limit for Nucor Steel

The limitation of 0.0018 gr/dscf is the most stringent filterable PM limitation applied to any source and should be considered BACT. Since there is limited information available to determine the filterable and condensible PM_{10}, 0.0052 grain/dscf will be considered as BACT.

The filterable PM BACT for the EAF is the use of a baghouse with a limit of 0.0018 grains per dry standard cubic feet.

The filterable and condensible PM_{10} BACT for the EAF is the use of a baghouse with a limit of 0.0052 grains per dry standard cubic feet.

The visible emissions from the EAF Baghouses shall not exceed 3%.

(12) CO Control Technology Technical Feasibility Study

Eight (8) alternatives were evaluated to control CO from the EAF:

(A) Operating Practice Modification
(B) Flaring of CO emissions,
(C) Post Combustion Reaction Chamber,
(D) CO Oxidation Catalysts
(E) Catalytic Incineration,
(F) Oxygen Injection, and
(G) Direct Shell Evacuation Control (DEC) System
(H) Expert Furnace System Optimization Process (EFSOP)

(A) Operating Practice Modification
Due to marketplace demands on the type of products produced and the required product quality, any additional operating practice modifications that will alter CO emissions from the proposed EAF is technically infeasible. Additional operating practice modifications means the use of less carbon in the raw materials to reduce CO formation.

(B) Flaring of CO emissions
Flaring is a form of thermal oxidation and has been a proven technology in controlling CO emissions from furnaces but not EAFs. This technology can successfully oxidize up to 99% of the CO emissions, especially if an exhaust gas temperature of 1,300 of - 1,800 ^{o}F, depending on the residence time, is maintained. The exhaust gas stream will be approximately 875,000 acf/min at 200 ^{o}F. Due to the relatively large gas volumetric flow at a substantial temperature differential, this would necessitate using a considerable amount of auxiliary fuel which would in turn create more emissions. Therefore, flaring is considered technically infeasible.

The OAQ is not aware of a steel mill where flaring has been used to control CO emissions from an EAF.

(C) Post Combustion Reaction Chamber,
Post combustion reaction chambers, another form of thermal oxidation, has been a proven technology in controlling CO emissions from furnaces but not EAFs. Like flaring, this technology can successfully oxidize up to 99% of the CO emissions, especially at a relatively high temperature and residence time. This technology also works more efficiently without the presence of particulate matter in the exhaust gas stream which can foul the burners. Due to the high particulate loading of the EAF exhaust gases, it would be necessary to operate a baghouse for particulate control prior to the thermal oxidizer. However, baghouses cannot handle the high temperatures associated with thermal oxidation of CO and the exhaust gas must be cooled to a minimum of 350 of prior to entering the baghouse. After the gas leaves the baghouse, it would need to undergo extreme heating to bring the temperature back up to the required thermal oxidation temperature. This would necessitate using a considerable amount of auxiliary fuel which would in turn create more emissions. Based on the above discussion, a post combustion reaction chamber is considered technically infeasible.

The OAQ is aware of one (1) case where post combustion reaction chamber has been determined as BACT for EAFs. IPSCO Steel, IA was issued a PSD permit on April 1996 (Project No. 95-314) which required to install a post combustion chamber in addition to DEC system. IPSCO Steel was initially specified a CO limit of 0.91 pound per ton. However, in 2002, the CO limit was changed to 1.93 lb/ton.

Tuscaloosa Steel, AL has employed oxyfuel burners in the post combustion chamber to promote oxidation of CO. However, this system was not required as part of their BACT analysis, but has been used in trials to determine a means to meet their current BACT limitation of 2.0 lbs/ton. These burners have been removed due to continual maintenance because of particulate plugging.

The OAQ is unaware of any proven oxygen injection or oxyfuel injection system in a post combustion chamber or exhaust ductwork that has achieved lower emissions than what is proposed in this permit.

(D) CO Oxidation Catalysts and
(E) Catalytic Incineration

Catalytic oxidizers and catalytic incineration use the same principle as thermal oxidation with the addition of catalyst to reduce the oxidation temperature. The optimal working temperature range for CO oxidation catalysts is approximately 850 °F - 1,100 °F with a minimum exhaust gas stream temperature of 500 of for minimally acceptable CO control. The optimal working temperature range for catalytic incineration is approximately 500 °F - 600 °F. Exhaust gases from the EAF will undergo rapid cooling as they are ducted from the furnace. Thus, the temperature will be far below the minimum 500 °F threshold for effective operation of either type of control technology. Additionally, the particulate loading in the exhaust gas stream is expected to be too high for efficient operation of the catalyst. Plugging and coating of the catalyst surface would significantly degrade the performance of the catalyst. Therefore, catalytic oxidizers and catalytic incineration are considered technically infeasible.

The OAQ is not aware of a steel mill where these technologies have been used to control CO emissions from an EAF.

(F) Oxygen Injection

Oxygen injection is not a proven technology in controlling CO emissions from EAFs. One can only speculate how much additional reduction of CO would it contribute, especially if a DEC system is also used. Oxygen would be injected at the entrance of the DEC ductwork to increase oxidation of the available CO to CO_2.

The OAQ is aware of only one (1) case where oxygen injection has been determined as BACT for controlling CO emissions from an EAF. Qualitech Steel, IN, was issued a PSD permit on October 31, 1996 which required to install six (6) oxygen injectors in addition to DEC system. However, during the review of Qualitech Steel's permit, there were many discussions about the spikes of CO that they expected to see from their operation and how they would control those spikes. In the final BACT determination, an oxygen injection system was required to alleviate the problems with CO spiking. This technology was unproven and received a much higher limit than other facilities because of the high carbon content of the raw materials and the uncertainty of control efficiency. The facility was required to install a CEM for CO, but was never able to certify the monitor. The plant is currently shut down and is under going permit modification. The OAQ could not assure that the emission limitation currently required would be the same in the modification. Therefore, oxygen injection is still considered technically infeasible.

(G) Direct Shell Evacuation Control (DEC) System

In the steel industry, Direct Shell Evacuation Control (DEC) systems (i.e., "fourth hole" furnace control system) continue to be the primary control technology for controlling CO emissions from EAFs. A DEC system consists of a water-cooled duct connected to the EAF through the furnace roof's "fourth hole". This duct is connected to the melt shop canopy collector system. During melting and refining, a slight negative pressure is maintained within the furnace to withdraw exhaust gases through the DEC duct. At the point there the DEC duct meets the "fourth hole", there is an adjustable gap that allows combustion air to enter, providing oxygen to oxidize the CO which is present. The DEC system allows excellent process emissions capture and combustion of CO, and requires the lowest air volume of other EAF capture devices. Therefore, DEC system control is considered technically feasible.

(H) Expert Furnace System Optimization Process (EFSOP)
The Expert Furnace System Optimization Process (EFSOP) designed by Goodfellows Technologies, Inc. (GTI) was designed to allow companies to optimize the energy requirements of their EAFs. Carbon monoxide produced in the EAF can be a valuable source of energy. When oxidized to CO_2, the reaction gives off heat which can be used to melt the steel. By monitoring CO, CO_2, H_2 and O_2 they can determine whether additional fuel or oxygen is necessary to promote the oxidation of CO in the furnace shell. By operating the furnace at optimum levels, it is thought that CO emissions at the exhaust may be lessened. In addition, GTI contends that although more heat is generated at the furnace shell, NO_x emissions may decrease as well because fuel consumption may be optimized.

Because the plants using these optimization systems are located outside of the United States, they have no CO emissions limitations at the stack. The companies are not required to have a post combustion chamber or any other technology to destruct CO emissions. It is likely that if this type of system is added to an uncontrolled EAF, there would be reductions in CO emissions. However, when a control device is already in place to oxidize the CO emissions escaping the furnace, there is no data to support a claim that greater CO emissions reductions would be realized with the addition of an optimization system. GTI does not guarantee any emissions reduction with the use of EFSOP.

Based on the above control technology review, the DEC system is considered BACT for CO.

(13) CO Existing BACT Emission Limitations

The table below summarizes the CO limits for EAF. Limits are arranged in ascending order.

The RBLC indicates a wide range of CO emission limitations (1.34 lb/ton - 14.97 lb/ton) for this type of control technology.

Table 14 - - EAF CO BACT of Other Similar Sources

Source Name	CO Limit (lb/ton)	Source Name	CO Limit (lb/ton)
IPSCO, IA	0.91	SDI, Hendricks, IN	2.0
Keystone Steel, IL	1.34	Nucor Steel (Birmingham), IL	2.01
Roanoke Steel, VA	1.37	Roanoke Electric Steel, VA	2.4
Nucor Steel, NC	1.82	Nucor Steel, SC	2.76
IPSCO, IA	1.93	Ameristeel, FL	3.0
SDI, Whitley, IN	2.0	Charter Steel, WI	3.5
Nucor (Trico Steel), AL	2.0	Republic Technologies, OH	4.0
SMI Steel, SC	2.0	Chaparral Steel, VA	4.0
Stafford Railsteel, AR	2.0	Qualitech, IN	4.7
IPSCO Steel, AL	2.0	Mac Steel, AK	4.9
Nucor Steel, IN	2.0	Nucor Steel, UT	5.87
Nucor-Yamato Steel, AR	2.0	Ameristeel, NC	6.0
Nucor Steel, SC	2.0	Arkansas Steel, AR	6.0
SDI, Dekalb, IN	2.0	Beta Steel, IN	8.17
Tuscaloosa Steel, AL	2.0	Nucor Steel, UT	14.97

IPSCO, IA

IPSCO, IA is listed twice in the above table.

On February 5, 2003, the IOWA DNR (Corey Detter 515/281-4842) was contacted regarding the limits of IPSCO, IA. The CO limit for IPSCO was originally specified in terms of lb/hr rate and the equivalent rate is 0.91 lb/ton. Another permit was issued in 1995 which specifies the CO limit in terms of ppm. It was revised to 1.93 lb/ton in July 2002. This limit was based on test results performed in the source.

Stack test results at IPSCO, IA also show that IPSCO did not comply with its NO_x limit. The NO_x was revised to a less stringent limit (from 0.27 lb/ton to 0.8 lb/ton). The OAQ believes that the post combustion chamber could have contributed to the increase in NO_x emissions. Since NO_x emissions is more of a concern due to it being a precursor in the formation of ozone, the OAQ believes that it is appropriate to not require Nucor Steel, IN to install a post combustion chamber to further control CO emissions from the EAF. Nucor Steel, IN, even with its existing NOx limit (0.51 lb/ton) has a more stringent NOx limit. With this modification, the NO_x BACT limit (0.35 lb/ton) going to be even more stringent than IPSCO, IA.

Table 15 - - CO and NO_x Comparison

Source Name	CO (lb/ton)	NO_x (lb/ton)
IPSCO, IA	0.91	0.8
Nucor Steel, IN	2.0	0.51 (existing)
		0.35 (proposed)

Keystone Steel, IL.

On February 10, 2003, the Illinois EPA (Jason Schnepp 217/524-3724) was contacted to discuss the limits of Keystone Steel, IL. The permit was issued in 2000 for an increase in capacity to 1.2 million tons/year. It can not be confirmed if the expansion has been constructed. There is no information available to verify the CO limit prior to the increase modification. Keystone Steel, IL has a lower CO limit because in addition to the DSE/DEC, it has post combustion chamber to control the CO emissions. However, the mill has a higher NO_x limit.

The OAQ believes that the post combustion chamber could have contributed to the increase in NO_x emissions. Since NO_x emissions is more of a concern due to it being a precursor in the formation of ozone, the OAQ believes that it is appropriate to not require Nucor Steel, IN to install a post combustion chamber to further control CO emissions from the EAF.

Table 16 - - CO and NO_x Comparison

Source Name	CO (lb/ton)	NO_x (lb/ton)
Keystone, Steel, IL	1.34	0.51
Nucor Steel, IN	2.0	0.51 (existing)
		0.35 (proposed)

Based on the above comparison, the CO BACT (1.34 lb/ton) will not be consider as BACT for this evaluation.

Roanoke Steel, VA

Roanoke Steel, VA is listed twice in the above table.

On February 10, 2003, the Virginia Air Pollution Control (Dean Downs 540/597-2711) has been contacted regarding the Roanoke Steel, VA. This mill applied for a modification to increase the maximum capacity of their EAF from 70 ton/hr to 100 ton/hr. The CO limit was changed from 1.37 lb/ton to 2.4 lb/ton. This is based on stack test done on the plant.

The CO limit (1.37 lb/ton) will not be consider as BACT because it has been revised due to non compliance.

The CO limit (2.4 lb/ton) will not be considered as BACT, because it is less stringent.

Nucor Steel, NC

On February 6, 2003, the North Carolina Air Pollution Division (Fred Langenback 919/715-6242) was contacted regarding the only steel mill in their area. Nucor Steel, NC was initially permitted at 4 lb/ton CO in 1999. The permit has a provision that provides an opportunity to re-open the BACT review that based on testing data the existing limit can be revised. The CO limit was changed to 1.82 lb/ton in December, 2002. This is the only steel mill that OAQ is aware of that the existing limit has been changed to a more stringent one, however, it is still not the most stringent limit in the RBLC. Nucor Steel, NC manufactures slabs.

The CO BACT (1.82 lb/ton) will not be consider as BACT in this evaluation because the OAQ believes that this limit is source specific and its establishment is not based on the Top Down BACT process.

The CO BACT (4 lb/ton) will not be use in this evaluation because it is less stringent.

SDI, Hendricks, IN (formerly, Qualitech, IN)

SDI has a pending application at this time and is proposing the CO limit at 2.0 lb/ton. This is a revision of the CO limit from 4.7 lb/ton.

- - There are at least ten (10) steel mills given a CO BACT limit of 2.0 lb/ton. Three of the four steel mills in Indiana (as listed above) have CO BACT limit of 2 lb/ton.

- - All steel mills that have this limit have tested in compliance, except for Tuscaloosa Steel Corporation in Alabama. According to a staff member of the Alabama Department of Environmental Management (ADEM), Tuscaloosa Steel's DEC duct was clogged which prevented sufficient oxidation of the EAF exhaust gases by the combustion air that enters the air gap.

Nucor Steel (formerly Birmingham Steel), IL

RBLC indicates the CO BACT limit to be 2.01 lb/ton, however, the Title V permit recently issued to the source indicates the CO limit to be 2.0 lb/ton.

(14) Proposed CO BACT Limit for Nucor Steel, IN

Nucor Steel, IN will maintain its CO BACT limit of 2.0 lb/ton and the use of DEC and good operating practices. This is comparable to existing CO BACT limits in the RBLC.

Meltshop LMF BACT Analysis

Nucor Steel is proposing to make the following modifications to the 2 Meltshop Ladle Metallurgy Furnaces (LMFs).
(a) Replace and/or upgrade PLC controls and process equipment
(b) Add a new alloying conveyor system, silos, storage bin, and feed equipment and control.
(c) Install additional argon lances for stirring in the LMFs.
(d) Add porous plugs to ladles for argon stirring.
(e) Add new ladles.
(f) Install new exhausts for the Ladle Preheaters instead of exhausting to roof monitors.

Meltshop roof monitors include exhausts from the Ladle Preheater, Ladle Dryers, Tundish Preheater, Tundish Dryers, fugitive emissions from the LMF, fugitive emissions from the Caster and other Meltshop operations.

The table below summarizes the existing and new BACT limits of the Meltshop LMFs. BACT analysis for the conveyors, silos, storage bins and feed equipment are lump together with similar operations.

Table 17 - - Meltshop LMFs Existing and New PSD BACT

Pollutants	Existing PSD BACT/Limit	New PSD BACT/Limit
SO_2		0.185 lb/ton
CO		0.07125 lb/ton
NOx		0.0176 lb/ton
VOC		0.0086 lb/ton
PM/PM_{10}	0.0026 gr/dscf at 200,000 acf/min Baghouse	0.0018 gr/dscf PM (Filterable only) 0.0052 gr/dscf PM_{10} (Filterable and condensible) Baghouse
Capacity	502 tons/hr	502 tons/hr

(1) PM/PM_{10} BACT Review for the Meltshop LMF

Molten metal in the EAF will be tapped into ladles and transported by electric overhead traveling cranes to the ladle metallurgy furnace/station. There is potential for generation of particulate emissions at the LMF due to the addition of materials, heating with electrodes, argon stirring and lancing, electromagnetic stirring and desulfurization. Fumes from these operations will be captured by the LMF Baghouse and Fugitive emissions (estimated at 1%) will be emitted through the melt shop roof monitor.

(A) Control Options Evaluated
Four (4) available technologies were evaluated to control particulate emissions from the LMF:
- - Electrostatic Precipitator (ESP)
- - High Efficiency Cyclones
- - High Energy Scrubbers
- - Fabric Filters/Baghouses

(B) Technically Infeasible Control Options

The ESP technology is considered technically infeasible for controlling particulate emissions from an LMF because the particulate has a high concentration of iron compounds. ESPs use an electrostatic field to charge particulate matter contained in the gas stream and then attract and collect the particles on a collection surface of opposite charge. While ESPs have a very high removal efficiency (99% or better) for many sources of particulate, the electromagnetic properties of small charged particles of iron compounds in an electric field adhere very strongly to the collection plates of an ESP and are extremely difficult to dislodge. These operational problems drastically lower the efficiency of the ESP.

(C) Technically Feasible Control Options
The fabric filter has the highest removal efficiency of the technically feasible particulate control devices, and is therefore considered BACT. Because a fabric filter has been proposed for the LMF, no further evaluation is necessary.

An evaluation of the capture system to be used is necessary, because some steel mills utilize roof monitors, while others are required to have a closed shop and exhaust all emissions through the baghouse. The use of a close shop is considered to be technically feasible.

Although cyclone collectors and high energy wet scrubbers are technically feasible particulate control options, a baghouse provides a higher control efficiency. The OAQ is not aware of a steel mill where a cyclone collector or a high energy wet scrubber has been properly operated to effectively control particulate emissions from an LMF.

With respect to baghouse technology, there are two types of design configurations: positive pressure baghouses and negative pressure baghouses, both of which have been used in the steelmaking industry.

- - Positive pressure baghouses operate at internal pressures greater than the atmospheric pressure. Typically, the fans are located before the fabric filters. This allows the fans to pull air from the LMF and push the dust laden air through the fabric filters and into the ambient air via a continuous ridge vent rather than a stack. The discharge area of a ridge vent is on the order of four times that of a single stack.

- - Negative pressure baghouses operate at internal pressure less than atmospheric. The fans are located after the fabric filters. This allows the fans to pull the gas laden air from the LMF, through the fabric filters, then push the air up through a central stack.

According to baghouse and bag manufacturer’s claim that there is no difference in filtering capability between these types of baghouses.

(2) Existing BACT/LAER Emission Limitations

The table below summarizes the PM/PM_{10} limits for LMF of similar sources as listed in the RBLC. This table is limited to the comparison of LMF/LMS limits that has their own separate limits from an EAF.

SDI, Dekalb, IN was not listed in the RBLC. Information was taken from an issued permit.

Table 18 - - LMF PM BACT of Other Similar Sources	
Source Name	PM/PM_{10} Limit (gr/dscf)
Nucor Steel, IN (Strip Caster LMS)	0.0018
Nucor Steel, IN (Meltshop LMF) (proposed) (Filterable only)	0.0018
(existing)	0.0026
SDI, Dekalb, IN	0.0032
Nucor Steel (Trico), AL	0.0032
Republic Technologies, AR	0.005
Hoaegaes Corp, TN	0.0052
Roanoke Steel, VA	0.0052
Nucor Steel, IN (Meltshop LMF) proposed (Filterable and Condensible PM_{10})	0.0052

Nucor Steel, IN distinguishes their LMFs by indicating the one in the meltshop area as Meltshop LMF and the one in the Castrip area as Strip Caster LMS.

The Meltshop LMF has an existing BACT limit of 0.0026 gr/dscf and uses a baghouse as particular control. The recently (2001) permitted Strip Caster LMF has a BACT limit of 0.0018 gr/dscf and uses a baghouse for particulate control.

Based on the summary of BACT limits in the table above, the BACT limit to be consider is 0.0018 gr/dscf. The limitation of 0.0018 gr/dscf is the most stringent filterable PM limitation applied to any source and should be considered BACT. Since there is limited information available to determine the filterable and condensible PM_{10}, the 0.0052 grain/dscf will be considered as BACT.

(3) Proposed PM and PM_{10} BACT limit for Nucor Steel, IN

Nucor Steel, IN indicated that the PM and PM_{10} limit for the Meltshop LMF should be maintained at 0.0026 gr/dscf because based on a stack test, the result is slightly higher than the proposed 0.0018 gr/dscf limit.

Nucor Steel, IN is also contending that BACT is on a case by case basis and that the limits for the similar process in the same source should not be the same.

Nucor Steel, IN did not provide additional information, such as cost analysis, why they can comply with the stringent limit in one LMF and can not in another LMF.

The OAQ believes that Nucor Steel has to comply with the most recent BACT limits for LMFs.

The filterable PM BACT for the Meltshop LMF shall be the use of a baghouse with a limit of 0.0018 grains per dry standard cubic feet.

The filterable and condensible PM_{10} BACT for the Meltshop LMF shall be limited to 0.0052 grains per dry standard cubic feet.

These limits are comparable to existing BACT limits in the RBLC for LMF.

In most cases the LMF is venting to the EAF Baghouse. thus there is no separate opacity limit for the LMF. As Nucor pointed out, the LMF is not subject to the federal rule 40 CFR 60, Subpart AAa, which specified opacity limit of 3% from the EAF stack and 6% from other meltshop operations.

Nucor Steel, IN has an opacity PSD BACT limits of 3% from the Meltshop EAF Baghouses and 5% from the other meltshop operations exhausting to roof monitors. Nucor is proposing a 5% opacity PSD BACT limit for the Meltshop LMF.

Another mill in Indiana (SDI, Dekalb, IN) has 3% opacity limit for their LMF.

The **visible emissions from the Meltshop LMF shall not exceed 3 percent opacity when emitted from the Meltshop LMF Baghouse** because it has a control, unlike the other meltshop operations exhausting through roof monitors which are considered fugitive emissions.

(4) NOx BACT Review for the LMF

NOx is formed from the chemical reaction between nitrogen and oxygen at high temperatures. NOx formation occurs by different mechanisms. In the case of LMF, NOx predominantly forms from thermal dissociation and subsequent reaction of nitrogen and oxygen molecules in the combustion air. This mechanism of NOx formation is referred to as thermal NOx. The other mechanisms of NOx formation such as fuel NOx (due to the evolution and reaction of fuel-bound nitrogen compounds with oxygen) and prompt NOx (due to the formation of HCN followed by oxidation to NOx) are thought to have lesser contributions to NOx emissions from LMF.

(A) Control Options Evaluated
Six (6) available technologies were evaluated to control NOx emissions from the LMF:
- - Combustion Controls
- - Selective Catalytic Reduction (SCR)
- - Non-Selective Catalytic Reduction (NSCR)
- - GoalLine SCONOx Catalytic Oxidation/Absorption
- - Shell DeNOx System (modified SCR)
- - Selective Non-Catalytic Reduction (SNCR) Options:
  – Exxon's Thermal DeNOx
  – Nalco Fuel Tech's NOxOUT
  – Low Temperature Oxidation (LTO)

(B) Technically Infeasible Control Options
Combustion controls are technically infeasible because of the absence of fuel combustion activities at the LMF.

SCR, NSCR and SNCR (as explained in the EAF NOx BACT analysis) are considered technically infeasible for LMF.

(C) Existing BACT/LAER Emission Limitations
The following table summarizes previous BACT determinations for NOx found in the RBLC on similar operations.

SDI, Dekalb, IN was not listed in the RBLC. Information was taken from an issued permit.

These sources minimize NOx emissions by proper operation of the unit.

Table 19 - - LMF NOx BACT Limits of Other Similar Sources	
Source	NOx Limit (lb/ton)
Nucor Steel, IN (Strip Caster LMS)	0.0176
Nucor Steel, IN (Meltshop LMF)	0.0176
Nucor Steel (Trico), AL	0.02
Nucor-Yamato, AR	0.02
SDI, Dekalb, IN	0.025
Roanoke Steel, VA	0.06

Nucor Steel, IN distinguishes their LMFs by indicating the one in the meltshop area as Meltshop LMF and the one in the Castrip area as Strip Caster LMS.

The recently permitted Strip Caster LMS was specified the same limit as the Meltshop LMF, which was based on the actual tests done on the Meltshop LMF.

Roanoke Steel, VA has never been required to perform compliance testing.

(5) Proposed NOx BACT Limit for Nucor Steel, IN

Nucor Steel, IN proposes to maintain its NOx BACT limit (0.0176 lb/ton) by proper operation of the unit, which is consistent with BACT determinations for similar sources.

The NOx BACT for the LMF shall be proper operation and shall not exceed a NOx emission rate of 0.0176 pounds per ton of steel produced. This limit is comparable to existing BACT limit of Nucor's other LMF. This limitation is more restrictive than BACT determinations for similar sources.

(6) SO_2 BACT Review for the Meltshop LMF

The source of SO_2 emissions from the LMF is attributable to the sulfur content of the raw materials added to the LMF, and residual sulfur carried over in the molten metal matrix from the melting and refining process.

(A) Control Options Evaluated
The following available technologies were evaluated to control SO_2 emissions from the LMF: Flue Gas Desulfurization (FGD) Options:
- - Spray Dryer Absorption (SDA)
- - Wet Scrubbing
- - Dry Sorbent Injection (DSI)

(B) Technically Infeasible Control Options
None of these SO_2 control technologies have been applied to an LMF; however, these controls options have been successfully implemented on utility boilers. Because this technology has been successfully applied to utility boilers, the technology could be transferred and applied to an LMF, which is known as a technology transfer. However, the SO_2 control efficiencies are significantly impaired due to the relatively large gas flow rate, low SO_2 concentrations in the gas stream, large temperature fluctuations and variability resulting from a batch operation.

In addition, based on the most recent permit issued to Nucor Steel, IN for their Strip Caster LMF, the technically available control options are not economically feasible. During the review, it showed that annualized cost ranges from $15,000 to $20,000 to remove SO_2 for SDA, wet scrubbing or DSI. Since this review was done less than a year ago (2001), the cost analysis does not change significantly.

(7) Existing BACT/LAER Emission Limitations

Table 20 - - LMF SO_2 BACT Limits of Other Similar Sources

Source	SO_2 Limit (lb/ton)	
Roanoke Steel, VA	0.06	
Nucor Steel, IN	0.185	(Meltshop LMF)
	0.185	(Strip Caster LMS)
Nucor- Yamato, AR	0.36	

None of these facilities have applied SO_2 control technologies to an LMF.

- - Roanoke Steel, VA has a more stringent SO_2 limit of 0.06 lb/ton, however, the facility has never been required to perform compliance testing. Thus compliance can not be verified.

- - Nucor Steel, IN distinguishes their LMFs by indicating the one in the meltshop area as Meltshop LMF and the one in the Castrip area as Strip Caster LMS.

  Nucor Steel, IN was recently issued a PSD permit for its Strip Caster LMS with SO_2 limit of 0.185 lb/ton. The basis of the Strip Caster LMF BACT limit was the stack test data from the test performed to the Meltshop LMF.

- - Nucor Steel-Yamato, AR has a higher SO_2 limit for their LMF.

(8) Proposed SO_2 BACT Limit for Nucor Steel, IN

Nucor Steel, IN proposed to relax the SO_2 limit because of the same reasons provided in the SO_2 analysis of the EAF. The residual sulfur will continue down stream with the molten metal and thus an increase in SO_2 in the LMF.

The OAQ has already revised the SO_2 limit in the EAF to accommodate any emission increase due to residual sulfur. This LMF limit is applicable only when it is exhausting to its own separate baghouse. There is no additional information provided by Nucor Steel, IN to relax the SO_2 limit.

The SO_2 BACT for the Meltshop LMF will be the same as the Strip Caster LMS SO_2 limit of 0.185 pound per ton.

(9) CO BACT Review for the Meltshop LMF

CO will be emitted as a byproduct of incomplete or inefficient combustion of the molten matrix in the LMF. Typically, CO emissions from combustion sources depend on the oxidation efficiency of the fuel. By controlling the combustion process carefully, CO emissions can be minimized. Also, smaller combustion units tend to emit more CO than comparable larger units because smaller units usually have a higher ratio of heat transfer surface area to flame volume than larger combustors. This leads to reduced flame temperature and combustion intensity, and therefore lower combustion efficiency. CO emissions result when there is an insufficient residence time at high temperature to complete the final step in hydrocarbon oxidation. However, in the context of a LMF, CO emissions are predicated by residual incomplete oxidation reactions of matrix constituents during alloying operations.

(A) Control Options Evaluated

Six (6) available technologies were evaluated to control CO emissions from the LMF:

- - Fuel Spec: Clean-Burn Fuel,
- - Good Combustion Practices,
- - Flaring of CO Emissions,
- - Low CO Burners,
- - CO Oxidation Catalysts, and
- - Post-Construction Reaction Chamber.

(B) Technically Infeasible Control Options

Clean-Burn Fuel and Good Combustion Practices - Combustion controls are technically infeasible because of the absence of fuel combustion activities at the LMF.

Flaring - The OAQ has found no known applications of flaring for similar LMF exhaust gases for CO control. Flaring of emissions for CO destruction would require raising the exhaust gas temperature. Thus, based on the relatively large gas volumetric flow at a substantial temperature differential, the auxiliary fuel requirements needed to operate the flare would be overwhelmingly large. Additionally, it can be speculated as to whether the flare would actually result in a decrease of CO emissions or increase thereof from supplemental fuel combustion. Supplemental fuel combustion would also result in an increase in NOx emissions. Consequently, flaring is considered to be technically infeasible.

CO Oxidation Catalysts - The OAQ has found no known applications of CO oxidation catalysts to control CO emissions from a steel mill LMF. The optimal working temperature range for CO oxidation catalysts is approximately 850 to 1100 degrees Fahrenheit with a minimum exhaust gas stream temperature of 500 degrees Fahrenheit for minimally acceptable CO control. Exhaust gases from the LMF will undergo rapid cooling as they are ducted from the furnace configuration. Thus, the temperature will be below the minimum 500 degrees Fahrenheit threshold for effective operation of CO oxidation catalysts. Additionally the particulate matter in the gas stream is anticipated to be a detriment to efficient operation of a CO oxidation catalyst. Masking effects such as plugging and coating of the catalyst would almost certainly result in impractical maintenance requirements, and would significantly degrade the performance of the catalyst. Consequently, this control alternative is not considered technically feasible.

Post-Combustion Reaction Chambers - The OAQ has found no known applications of post combustion reaction chambers to control CO emissions from a steel mill LMF. Due to the heat and particulate loading, the burners would have a short life expectancy, and may sustain severe maintenance and reliability problems. Additionally, a single or multiple duct burner system would not be able to heat the relatively cool gases from the LMF during cold cycling. Consequently, this control alternative is not considered technically feasible.

Catalytic incineration - The OAQ has found no known applications of catalytic incineration to control CO emissions from a steel mill LMF. Catalytic incineration systems are subject to potential poisoning, deactivation, and/or blinding of the catalyst. Lead, arsenic, vanadium, and phosphorus are generally considered poisons to catalysts and deactivate the available reaction sites on the catalyst surface. Particulate can also build up on the catalyst, effectively blocking the porous catalyst matrix and rendering the catalyst inactive. Due to the potentially adverse issues with catalyst blocking and poisoning with this application, this technology is not considered technically feasible.

(10) Existing BACT/LAER Emission Limitations

Only the sources listed above have CO BACT limits for LMF indicated in the RBLC. These sources minimize CO emissions by proper operation of the unit.

SDI, Dekalb, IN was not listed in the RBLC. Information was taken from an issued permit.

Table 21 - - LMF CO BACT Limits of Other Similar Sources

Source	CO Emission Limit (lb/ton)
Nucor Steel, IN	0.07125 (Strip Caster LMF)
	0.07125 (Meltshop LMF)
SDI, Dekalb, IN	0.01
Nucor-Yamato, AR	0.14
Roanoke Electric Steel, VA	0.48

Nucor Steel, IN distinguishes their LMFs by indicating the one in the meltshop area as Meltshop LMF and the one in the Castrip area as Strip Caster LMS.

(11) Proposed CO BACT Limit for Nucor Steel, IN

The CO BACT for the Meltshop LMF shall be proper operation and CO emissions shall not exceed 0.07125 pounds per ton of steel produced. This limit is based on the results of stack tests performed in the plant .This limitation is more restrictive than BACT determinations for similar sources.

(12) Work Practices

The LMF ladles will not be covered with lids when times when transporting molten metal because the process occurs inside the building and a short distance.

Meltshop Continuous Caster

Nucor Steel is proposing to:

(a) Replace and/or upgrade PLC controls and process equipment.

(b) raise to the top of the roof the steam vents from the casters spray chambers. These steam vents do not change the capacity and limits.

(c) Caster spray water and mold water modifications.

The Meltshop Continuous Caster exhausts to the same Meltshop EAF Baghouses 1 and 2, thus its emissions are already accounted for in the Meltshop EAFs BACT limits.

The following table summarizes the existing limits applicable to the Meltshop Continuous Caster.

Table 22 - - Meltshop Caster Existing Limits

Pollutant	Limit
PM/PM_{10}	0.0018 gr/dscf at 160,000 acf/min Baghouse and canopy
Opacity	3%
Capacity	135 tons/hr

Cold Mill Annealing Furnaces BACT Analysis

Nucor Steel is proposing the following modifications to the Annealing Furnaces- - Roof Vent

(a) Replace and/or upgrade PLC controls and process equipment.

(b) Install additional heat exchanger capacity on the annealing lip seal closed loop water supply cooling system (this change is not related to the burners/furnaces).

The table below summarizes the existing limits of the annealing furnaces:

Table 23 - - Annealing Furnaces

Process	Pollutant	Limit
Annealing Furnaces (18 units) PSD 107-12143	NOx	0.1 lb/MMBTU Low NOx
	CO	0.084 lb/MMBTU
	Capacity	4.8 MMBTU/hr each

In addition to Nucor Steel, IN there are only total of 3 steel sources in the RBLC that have BACT limits for annealing furnaces.

(a) Charter Steel, WI uses Low NOx burners in their 2.4 MMBTU/hr annealing furnace. This was permitted in 2000.

(b) USS POSCO, CA uses a SCR fo their 95.7 annealing furnace. This was permitted in 1986. This is not an accurate scenario to be compared to Nucor's annealing furnace because of the significant difference in the heating capacity.

A steel mill similar to Nucor Steel, IN (SDI, Dekalb, IN) has annealing furnaces, rated at 4 MMBTU/hour, use natural gas as fuel and the bases are equipped with low NOx burners. The NOx BACT limit is 0.2 lb/MMBTU. This information is not in the RBLC.

Eighteen (18) annealing furnaces were recently permitted under CP-107-12143-00038, issued on January 19, 2001. The existing limits are based on heating capacity of the furnaces (4.8 MMBTU/hr), and the proposed modification will not change the capacities. In addition to **the NOx (0.1 lb/MMBTU) and CO (0.084 lb/MMBTU) limits, the BACT for these Cold Mill Annealing Furnaces shall be that each furnace shall be equipped with Low NOx burners and use pipeline natural gas as primary fuel and propane as back up fuel.**

Natural Gas Fuel as BACT

Use of natural gas is considered BACT for most units that use it as fuel. Since there is no definition for Natural Gas in the Indiana IAC rules, other references have been used to clarify what is meant by natural gas fuel.

(a) Webster Dictionary
Natural gas means a mixture of hydrocarbon gases that occurs with petroleum deposit, chiefly methane with one ethane, propane, and butane.

(b) 40 CFR 72.2 Acid Rain Program
Natural gas means a naturally occurring fluid mixture of hydrocarbons (e.g., methane, ethane, or propane) produced in geological formations beneath the Earth's surface that maintains a gaseous state at standard atmospheric temperature and pressure under ordinary conditions. Natural gas contains 20.0 grains or less of total sulfur per 100 standard cubic feet.

Additionally, natural gas must either be composed of at least 70 percent methane by volume or have a gross calorific value between 950 and 1100 BTU per standard cubic foot.

Natural gas does not include the following gaseous fuels: landfill gas, digester gas, refinery gas, sour gas, blast furnace gas, coal-derived gas, producer gas, coke oven gas, or any gaseous fuel produced in a process which might result in highly variable sulfur content or heating value.

(c) 40 CFR 72.22 Acid Rain also has a definition for Pipeline natural gas as: a naturally occurring fluid mixture of hydrocarbons (e.g., methane, ethane, or propane) produced in geological formations beneath the Earth's surface that maintains a gaseous state at standard atmospheric temperature and pressure under ordinary conditions, and which is provided by supplier through a pipeline. Pipeline natural gas contains 0.5 grains or less of total sulfur per 100 standard cubic feet.

Additionally, pipeline natural gas must either be composed of at least 70 percent methane by volume or have a gross calorific value between 950 and 1100 BTU per standard cubic foot.

On January 18, 2003, Nucor Steel confirmed that the natural gas used in this mill is pipeline natural gas, and the back up fuel propane is from tanks. Therefore, **as BACT, the natural gas fuel should have the specifications of the pipeline natural gas.** Nucor objects to the extent that gas quality needs to be monitored, because it is beyond Nucor's control. The OAQ believes that Nucor complies with the quality of the natural gas used as long as it is thru pipeline.

Cold Mill Boiler and BOC Gases Boiler BACT Analysis

Nucor Steel is proposing to install:

(a) Cold Mill Low NOx boiler, rated at 34 MMBTU/hr, natural gas fueled with propane as back up fuel, and

(b) BOC Gases Low NOx Burner Boiler, ID no. 306, rated at 15 MMBTU/hour, natural gas fuel with propane as back up fuel.

All emissions from natural gas-fired combustion sources are products of combustion. Propane, a similar fuel to natural gas, is utilized as a backup fuel for these combustion sources.

The table below summarizes the proposed BACT limits for the 2 boilers. Detailed BACT evaluations are shown in the subsequent pages.

Table 24 - - Cold Mill Low NOx Boiler (34 MMBTU/hr) and BOC Gases Low NOx Boiler (15 MMBTU/hr)

Pollutants	PSD BACT/Limit (lb/MMBTU)
NOX	0.035
CO	0.061
VOC	0.0026
PM	0.0019
PM_{10}	0.0076
SO_2	0.0006

Comparison to existing sources was limited to boilers with less than 100 MMBTU/hour capacity with natural gas as fuel, to make an accurate evaluation based on emission factors and technological and economical feasibility. BACT comparison, however, was not limited to boilers in steel mills to cover a broader scope.

(1) PM/PM_{10} Control Technology Technical Feasibility Study

There are three potential sources of particulate emissions from combustion processes: mineral matter found in the fuel, solids or dust in the ambient air used for combustion, and unburned carbon formed by incomplete combustion of the fuel. Due to the fact that natural gas is a gaseous fuel, PM emissions are typically low. Particulate matter from natural gas combustion has both filterable and condensible fractions. The particulate matter generated from natural gas combustion is usually larger molecular weight hydrocarbons that are not fully combusted. Increased PM emissions may result from poor air/fuel mixing or maintenance problems.

There are two sources of condensible particulate emissions from combustion processes: condensible organic matter that are the result of incomplete combustion and sulfuric acid mist. For natural gas-fired sources such as boilers, there should be no condensible organic matter originating from the source because the main components of natural gas (i.e. methane and ethane) are not condensible at the temperatures found in Method 202 ice bath. As such, any condensed organics are from the ambient air. The most likely condensible particulate matter from natural gas combustion sources is the sulfuric acid dihydrate, which results when the sulfur in the fuel and the ambient air is combusted and then cools.

The following control options were evaluated in the BACT review:- - Fabric Filter (Baghouse) - - Electrostatic Precipitator (ESP) - - Wet Scrubber

All control options are basically technically infeasible because the sole fuel for the proposed boilers is natural gas, which has little to no ash that would contribute to the formation of PM or PM_{10}. Add-on controls have never been applied to commercial natural gas fired boilers, therefore, add on particulate matter control equipment will not be considered in this BACT review.

(2) Existing BACT/LAER Emission Limitations

The table below summarizes the PM and PM_{10} limits of boilers in the RBLC.

Table 25 - - Boiler PM/PM_{10} BACT Limits of Other Sources

Source	Capacity (MMBTU/hr)	Limit (lb/MMBTU)	Source	Capacity (MMBTU/hr)	Limit (lb/MMBTU)
Nucor Steel, IN (PM)	34 & 15	0.0019	Duke, TX	25	0.008
SDI, Hendricks, IN (PM)	48.4	0.0019	Duke, NM	33	0.009
Merk, NJ	99.5	0.003	Duke, NM	44.1	0.009
Tenaska, AL	30	0.005	American Soda, CO	51	0.009
Mid-Georgia, GA	60	0.005	Duke, AL	35	0.009
Gordonsville, VA	22	0.005	NRG, OK	22	0.009
Redbud, OK	93	0.0053	Duke, AR	44.1	0.01
Entergy, IA	48.69	0.007	US Army, AL	13.4	0.0076
GenPower, SC	38	0.007	Duke, AR	33	0.01
Ameripol, TX	54	0.007	Genenova, OK	33	0.01
Sithe, MA	96	0.007	Energetix, OK	30	0.01
PSEG, IN	124.6	0.007	Kamine, NY	33	0.01
Redbud, OK	20	0.0074	Gen Power, AL	83	0.01
Thunderbird, OK	20	0.0074	Air Liguide, LA	95	0.01
Duke, IN	46.6	0.0075	Quad, OK	62.77	0.01
Arcadia Bay, IN	21	0.0075	Cabot, MA	26.6	0.011
Barton, AL	40	0.0075	Darling, CA	31.2	0.0137
Tenaska, IN	40	0.0075	Qualitech, IN	67.5	0.0137
Interstate, IA	68	0.0075	Waupaca, IN	93.9	0.014
Nucor Steel, IN (PM10)	34 & 15	0.0076	BMW, SC	60	0.014
SDI, Hendricks, IN (PM10)	48.4	0.0076	Smith Cogen, OK	48	0.015
SDI, Whitley, IN (PM10)	41.8	0.0076	Cogentrix, IN	35	0.02
Honda, AL	30	0.0076	Blount, AL	40	0.02
Hyundai, AL	50	0.0076	Archer Daniels, ND	28	0.086
MidAmerican, IA	68	0.0076	Toyota, KY	96	0.1
Kiowa, OK	27.5	0.0076	Toyota, IN	58	0.2
US Army, AL	11.7	0.0076	Agrimark, VA	27	0.31

The BACT for PM/PM_{10} listed in the RBLC for natural-gas-fired boilers is combustion control and use of natural gas as fuel. As stated above, PM/PM_{10} emissions from natural-gas-fired sources are minimal, thus making add on PM/PM_{10} control both economically and technically infeasible. Differences in limits are minor and mostly due to rounding off of numbers.

The RBLC does not specify the purpose of the boilers in the operations of the sources. The RBLC also does not make a distinction in most cases between PM and PM10 BACT limits. Based on the dates of the permit issued, the BACT limits were usually based on the most recent emissions factors published in the AP-42. The OAQ believes that the it is acceptable for combustion units to use the most recent emission factors of similar combustion units equipped with low NOx burners.

Based on the most recent PSD permit issued, in 2002, by the OAQ to SDI, Whitley, IN, the PM and PM10 BACT limit for the boiler in this plant is 0.0076 lb/MMBTU. The OAQ believes that this is still consider the BACT for this type of operation.

(3) Proposed PM/PM_{10} BACT Limit for Nucor Steel, IN

The PM/PM_{10} BACT for the boilers is good combustion practice, the use of pipeline natural gas as its primary fuel and propane as back up, the PM_{10} emissions shall not exceed 0.0076 lb/MMBTU and the PM emissions shall not exceed 0.0019 lb/MMBTU. These limit are comparable to PM limits of recently issued PSD permits in Indiana. This is also based on the most recent AP-42 EF for low NOx boilers.

(4) NOx Control Technology Technical Feasibility Study

Nitrogen oxide formation during combustion consists of three types:

(a) Thermal NO_X
The principal mechanism of NO_X formation in natural gas combustion is thermal NO_X. The thermal NO_X mechanism occurs through the thermal dissociation and subsequent reaction of nitrogen and oxygen molecules in the combustion air. Most NO_X formed through the thermal NO_X is affected by three factors: a) oxygen concentration, b) peak temperature, and c) time of exposure at peak temperature. As these factors increase, NO_X emission levels increase. The emission trends due to changes in these factors are fairly consistent for all types of natural-gas-fired boilers and furnaces. Emission levels vary considerably with the type and size of combustor and with operating conditions (e.g. combustion air temperature, volumetric heat release rate, load, and excess oxygen level).

(b) Prompt NO_X
The second mechanism of NO_X formation, prompt NO_X, occurs through early reactions of nitrogen molecules in the combustion air and hydrocarbon radicals from the fuel. Prompt NO_X, reactions occur within the flame and are usually negligible when compared to the amount on NO_X formed through the thermal NO_X mechanism.

(c) Fuel NO_X
The final mechanism of NO_X formation, fuel NO_X, stems from the evolution and reaction of fuel-bonded nitrogen compounds with oxygen. Due to the characteristically low fuel nitrogen content of natural gas, NO_X formation through the fuel NO_X mechanism is insignificant.

The following control options were evaluated in the BACT review:

(a) Flue Gas Recirculation (FGR) incorporates the recirculation of a portion of the flue gas back to the primary combustion zone as a replacement for the combustion air. The recirculated combustion products provide inert gases that lower the adiabatic flame temperature and the overall oxygen concentration in the combustion zone. As a result, FGR controls NO_X emissions by reducing the generation of thermal NO_X.

(b) Low NOx burners are a specially designed set of burners that employ two-staged combustion within the burner. Primary combustion typically occurs at a lower temperature under oxygen deficient conditions and secondary combustion is completed with excess air.

(5) Existing BACT/LAER Emission Limitations

Table 26 - - Boiler NOx BACT Limits of Other Sources

Source	Capacity (MMBTU/hr)	Limit (lb/MMBTU)	Source	Capacity (MMBTU/hr)	Limit (lb/MMBTU)
Mustang Power, Ok	31	0.01	Tenaska, IN	40	0.049
Merk, NJ	99.5	0.011	Interstate Power, IA	68	0.049
US Army, AL	11.7	0.03	American Soda, CO	51	0.05
US Army, AL	13.4	0.03	Barton, AL	40	0.05
Duke, TX	25	0.032	MidAmerican, IA	68	0.05
Entergy, IA	48.69	0.034	Energetix, OK	30	0.05
Duke, AR	33	0.035	Gen Power, AL	83	0.05
Honda, AL	30	0.035	Air Liguide, LA	95	0.05
Hyundai, AL	50	0.035	American Soda, CO	80.8	0.05
Quad, OK	62.77	0.035	BMW, SC	60	0.051
Genenova, OK	33	0.035	Indelk, MI	99	0.06
Kamine, NY	33	0.035	NGP of America, OK	3	0.06
MN Corn, NE	54.4	0.035	Waupaca, IN	93.9	0.074
Sithe, MA	96	0.035	Redbud, OK	93	0.075
SDI, Hendricks, IN	48.4	0.035	Cogentrix, IN	35	0.08
Nucor Steel, IN	34 & 15	0.035	Blount, AL	40	0.08
Duke, NM	33	0.036	SDI, Dekalb, IN	11.8	0.081
Duke, NM	44.1	0.036	Qualitech, IN	67.5	0.081
NRG, OK	22	0.036	Tenaska, AL	30	0.096
Darling, CA	31.2	0.036	Toyota, IN	58	0.1
Solvay, WY	100	0.038	Mid-Georgia, GA	60	0.1
SDI, Whitley, IN	41.8	0.040	Ameripol, TX	54	0.1
Cabot, MA	26.6	0.041	Kiowa, OK	27.5	0.1
Vicksburg, MS	99	0.042	Toyota, KY	96	0.1
GenPower, SC	38	0.048	Duke, AL	35	0.108
Redbud, OK	20	0.049	Gordonsville, VA	22	0.109
Thunderbird, OK	20	0.049	Duke, AR	44.1	0.12
Duke, IN	46.6	0.049	Smith Cogen, OK	48	0.196
Arcadia Bay, IN	21	0.049	Archer Daniels, ND	28	0.21

The table above summarizes the NOx BACT limits of boilers, as listed in the RBLC. Limits are arranged in ascending order.

RBLC indicates that BACT for boilers utilizing natural gas as fuel is Low NOx burners. Few sources have used FGR coupled with Low NOx burners for NO_X emission control for bigger rated boilers. Due to the size of the boilers, FGR would be economically infeasible, therefore, BACT will be the use of Low NOx burners. RBLC does not indicate the type or specific purpose of the boilers.

Based on the most recent PSD permit issued, in 2002, by the OAQ to SDI, Whitley, IN, the NOx BACT limit fora boiler in a mill is 0.040 lb/MMBTU. The OAQ believes that this is still consider the BACT for this type of operation.

(6) Proposed NOx BACT Limit for Nucor Steel, IN

The NO_X BACT for the boilers shall be the use of Low NO_X burner design with pipeline natural gas as primary fuel and propane as back up fuel and NOx emissions shall not exceed 0.035 lb/MMBTU. This limit is comparable to NOx limits of recently issued PSD permits in Indiana.

(7) SO_2 Control Technology Technical Feasibility Study

Sulfur dioxide emissions from natural-gas-fired combustion sources are low because natural gas has a low sulfur content. A properly designed and operated boiler utilizing low sulfur natural gas will insure minimal SO_2 emissions.

The following control options were evaluated in the BACT review:

(a) Flue Gas Desulfurization (FGD) System
A FGD system is comprised of a spray dryer that uses lime as a reagent followed by particulate control or wet scrubber that uses limestone as a reagent. Lime is injected by a spray dryer into the flue gas in the form of fine droplets under well-controlled conditions such that the droplets will absorb SO_2 from the flue gas and then become dry particulate due to evaporation of water. A particulate control device then captures the dry particulate. The captured particles are removed from the system and disposed.

This control option will generate dry solid waste consisting mainly of lime and $CaSO_4$. This waste must be disposed of in a solid waste landfill giving this option additional environmental concerns. Removal efficiencies decrease as the amount of sulfur contained in the fuel decreases. Also natural gas contains very little sulfur, thus making any FGD economically infeasible. Based on additional environmental concerns with the FGD solid waste, low sulfur removal efficiencies, and cost to control, FGD is eliminated from this BACT analysis.

(b) Use of Low Sulfur Fuel
The use of low sulfur fuels was the next level of control that was evaluated. Natural gas has the lowest sulfur content of all the fossil fuels. Very low SO_2 emission rate results from the use of natural gas.

(8) Existing BACT/LAER Emission Limitations

The table below shows the SO_2 limits of boilers in the RBLC. Due to insignificant emission rate for natural gas fueled boilers, a big portion of the boilers that have BACT limits for the other pollutants do not have BACT limits for SO_2.

Table 27 - - Boiler SO_2 BACT Limits of Other Sources

Source	Capacity (MMBTU/hr)	Limit (lb/MMBTU)	Source	Capacity (MMBTU/hr)	Limit (lb/MMBTU)
Waupaca, IN	93.9	0.0006	Merk, NJ	99.5	0.001
Duke, IN	46.6	0.0006	Gen Power, AL	83	0.001
Arcadia Bay, IN	21	0.0006	Cabot, MA	26.6	0.002
Redbud, OK	20	0.0006	Sithe, MA	96	0.003
SDI Hendricks, IN	48.4	0.0006	Duke, NM	33	0.003
Tenaska, IN	40	0.0006	Duke, NM	44.1	0.003
Nucor Steel, IN	34 & 15	0.0006	Duke, TX	25	0.0052
Interstate Power, IA	68	0.0006	Duke, AL	35	0.0057
SDI, Whitley, IN	41.8	0.0006	Cogentrix, IN	35	0.006
US Army, AL	11.7	0.001	Blount, AL	40	0.006
US Army, AL	13.4	0.001	Smith Cogen, OK	48	0.012
NRG, OK	22	0.001	Ameripol, TX	54	0.014
GenPower, SC	38	0.001	Toyota, KY	96	0.3

(9) Proposed SO_2 BACT Limit for Nucor Steel, IN

At least six of the recently issued PSD permits in Indiana have the most stringent SO_2 BACT limits for boilers. Based on the information presented above, **the SO_2 BACT for the boilers shall be the use of low sulfur pipeline natural gas, good combustion practices and the** SO_2 **emissions shall not exceed 0.0006 lb/MMBTU.** This was also based on the most recent AP-42 EF for low NOx boilers.

(10) CO Control Technology Technical Feasibility Study

Carbon monoxide (CO) emissions from boilers are a result of incomplete combustion of natural gas. Improperly tuned boilers operating at off design levels decrease combustion efficiency resulting in increased CO emissions. Control measures taken to decrease the formation of NO_X during combustion may inhibit complete combustion, which could increase CO emissions. Lowering combustion temperatures through premixed fuel combustion can be counterproductive with regard to CO emissions. However, improved air/fuel mixing inherent to newer combustor design and control systems limits the impact of fuel staging on CO emissions.

The following control options were evaluated in this BACT review:
Good combustion practice is considered BACT for CO control on natural-gas-fired boilers. Burner manufactures control CO emissions by maintaining various operational combustion parameters. Fuel conditions, draft and changes in air can be adjusted to insure good combustion.

(11) Existing BACT/LAER Emission Limitations

CO emissions are a result of incomplete combustion of natural gas, thus good combustion practice and good design/operation are a must.

The table below summarizes the CO BACT limits of boilers in the RBLC.

Based on the most recent PSD permit issued, in 2002, by the OAQ to SDI, Whitley, IN, the CO BACT limit for the boiler in this plant is 0.084 lb/MMBTU. The OAQ believes that this is still consider the BACT for this type of operation.

Table 28 - - Boiler CO BACT Limits of Other Sources

Source	Capacity (MMBTU/hr)	Limit (lb/MMBTU)	Source	Capacity (MMBTU/hr)	Limit (lb/MMBTU)
Merk, NJ	99.5	0.0036	Tenaska, IN	40	0.082
Interstate Power, IA	68	0.0164	SDI, Whitley, IN	41.8	0.084
Duke, TX	25	0.032	Honda, AL	30	0.084
Archer Daniels, ND	28	0.036	MidAmerican, IA	68	0.084
Genenova, OK	33	0.037	Kiowa, OK	27.5	0.084
Kamine, NY	33	0.038	Mustang Power, OK	31	0.084
Mid-Georgia, GA	60	0.05	Energetix, OK	30	0.085
Air Liguide, LA	95	0.06	Gen Power, AL	83	0.085
SDI Hendricks, IN	48.4	0.061	Darling, CA	31.2	0.089
Nucor Steel, IN	34 & 15	0.084	American Soda, CO	51	0.09
Redbud, OK	93	0.07	American Soda	80.8	0.09
Tenaska, AL	30	0.073	Hyundai, AL	50	0.09
Entergy, IA	48.69	0.073	Duke, AL	35	0.135
Blount, AL	40	0.08	Duke, NM	33	0.148
Gordonsville, VA	22	0.08	Duke, NM	44.1	0.148
GenPower, SC	38	0.08	Cabot, MA	26.6	0.15
Ameripol, TX	54	0.08	Indelk, MI	99	0.15
Sithe, MA	96	0.08	Duke, AR	44.1	0.15
Cogentrix, IN	35	0.082	Duke, AR	33	0.15
Redbud, OK	20	0.082	Smith Cogen, OK	48	0.165
Duke, IN	46.6	0.082	Waupaca, IN	93.9	0.2
Arcadia Bay, IN	21	0.082	NRG, OK	22	0.37
Barton, AL	40	0.082			

(12) Proposed CO BACT Limit for Nucor Steel, IN

The CO BACT for the boilers shall be the use of good combustion practices and CO emissions shall not exceed 0.061 lb/MMBTU. This limit is comparable to CO limits of recently issued PSD permits in Indiana.

(13) VOC Control Technology Technical Feasibility Study

The VOC emissions from natural gas-fired sources are the result of two possible formation pathways: incomplete combustion and recombination of the products of incomplete combustion. Complete combustion is a function of three variables; time, temperature and turbulence. Once the combustion process begins, there must be enough residence time at the required combustion temperature to complete the process, and during combustion there must be enough turbulence or mixing to ensure that the fuel gets enough oxygen from the combustion air. Combustion systems with poor control of the fuel to air ratio, poor mixing, and insufficient residence time at combustion temperature have higher VOC emissions than do those with good controls.

The following control options and work practice were evaluated in the BACT review:

(a) Thermal oxidation is a proven technology to control VOC emissions, however, it is rarely used on natural-gas-fired sources. Because of the low VOC concentration generated from the use of natural gas and good combustion practice, the thermal oxidation technology is ineffective. In addition, the thermal oxidation technology requires additional combustion of natural gas, which in turn would generate more emissions and fuel cost.

(b) Oxidation catalyst technology uses precious metal-based catalysts to promote the oxidation of CO and unburned hydrocarbons to CO_2. The amount of VOC conversion is compound specific and a function of the available oxygen and operating temperature. The optimal operating temperature range for VOC conversion ranges from 650 to 1000^{o}F. In addition the use of an oxidation catalyst would require additional combustion of natural gas, which increases NO_X and CO emissions.

(14) Existing BACT/LAER Emission Limitations

Table 29 - - Boiler VOC BACT Limits of Other Sources

Source	Capacity (MMBTU/hr)	Limit (lb/MMBTU)	Source	Capacity (MMBTU/hr)	Limit (lb/MMBTU)
SDI, Whitley, IN	41.8	0.0026	Kiowa, OK	27.5	0.0055
SDI Hendricks, IN	48.4	0.0026	Mustang Power, OK	31	0.0055
Nucor Steel, IN	34 & 15	0.0026	Waupaca, IN	93.9	0.006
BMW, SC	60	0.0028	Gen Power, AL	83	0.006
Kamine, NY	33	0.003	Redbud, OK	93	0.0075
Merk, NJ	99.5	0.003	Indelk, MI	99	0.01
Tenaska, AL	30	0.004	Smith Cogen, OK	48	0.011
Mid-Georgia, GA	60	0.005	Cogentrix, IN	35	0.011
Entergy, IA	48.69	0.005	Duke, AL	35	0.014
GenPower, SC	38	0.005	Duke, NM	33	0.015
Ameripol, TX	54	0.005	Duke, NM	44.1	0.015
Sithe, MA	96	0.008	Duke, AR	44.1	0.016
Redbud, OK	20	0.005	Duke, AR	33	0.016
Thunderbird, OK	20	0.005	Genenova, OK	33	0.016
Duke, IN	46.6	0.0054	Energetix, OK	30	0.016
Arcadia Bay, IN	21	0.0054	Cabot, MA	26.6	0.015
Barton, AL	40	0.0054	Duke, TX	25	0.016
Tenaska, IN	40	0.0054	Gordonsville, VA	22	0.018

Interstate Power, IA	68	0.0054	Blount, AL	40	0.02

RBLC indicates good combustion, fuel specification, and good design and operation as BACT for VOC. The table below summarizes the VOC BACT limits of boilers in the RBLC.

Based on the most recent PSD permit issued, in 2002, by the OAQ to SDI, Whitley, IN, the VOC BACT limit for a boiler in a mill is 0.0026 lb/MMBTU. The OAQ believes that this is still consider the BACT for this type of operation.

(15) Proposed VOC BACT Limit for Nucor Steel, IN

The VOC BACT for the boilers shall be good design and operation and VOC emissions shall not exceed 0.0026 lb/MMBTU. This limit is comparable to the VOC limits of recently issued permits in Indiana.

Galvanizing Line Alkali Cleaning Station

Nucor Steel is proposing to do the following modifications to their Galvanizing Line:

(a) Install new coil transfer system from the Cold Reversing Mills 1 and 2 to Annealing furnace then to the Galvanizing line.

(b) Increase the flow to the mist eliminator on the Alkali Cleaning section from 5,000 acf/min to 10,000 acf/min.

(c) Either modify or add cleaning sections.

(d) Replace and/or upgrade PLC controls and process equipment in the Galvanizing Line and Alkali Cleaning section.

The Galvanizing Line was recently permitted under PSD 107-14297-00038, issued on June 6, 2002. The PSD permit accounted for the mist eliminator at its 5,000 acf/min capacity.

In this PSD permit, the PM/PM_{10} PTE for the Alkali Cleaning section mist eliminator was 0.6 ton/year at 0.003 gr/dscf. Since the flow rate is going to be twice as much, the PM/PM_{10} also increases proportionately.

PM/ PM_{10}=(0.003 gr/dscf)*(1 lb/7000 gr)*(5,000 dscf/min)*(60 min/hr)*(2 ton/2000 lb)*(8760 hr/yr) = 0.6 ton/yr

PM/PM_{10} = ((0.003 gr/dscf)*(1 lb/7000 gr)*(10,000 dscf/min)*(60 min/hr)*(1 ton/2000 lb)*(8760 hr/yr) = 1.13 ton/yr

Since the physical modification is limited to the cleaning stations of the line, re-evaluation of BACT will be limited for this portion of the process. **The PM/PM_{10} BACT for the Galvanizing Line Alkali Cleaning Stations is the used of mist eliminators at the rate of 0.003 gr/dscf, the visible emissions shall not exceed 10% opacity, and perform good operating practices.**

Nucor Steel, IN objects to the opacity limit because the particulate loading is very low and due to steam and water vapor, a meaningful Method 9 is not possible. The OAQ believes that an opacity limit should be specified even though the particulate emissions are minimal, however, Nucor Steel, IN will not be required to perform additional visible emission compliance monitoring.

Steel Pickling BACT Analysis

Nucor Steel, IN has 2 existing pickling lines (Pickle Line 1 and Pickle Line 2) in their Cold Mill. Nucor Steel, IN is proposing the following modifications in these pickling lines:

(a) Replace the tray type fume scrubber and collection system of Pickle line 2 and increase the flow rate from 4,000 acf/min to 9,000 acf/min.

(b) Replace all process tanks and rinse tanks and auxiliary equipment on both pickle lines. This will allow wider product to be processed and various pickling enhancing products.

(c) Replace and/or upgrade PLC controls and process equipment on both pickle lines 1 and 2.

(d) The use of various concentrations, flows and temperatures of acid at both Pickle lines 1 and 2.

(1) Control Technology Technical Feasibility Study

Steel pickling is the removal of mill scale (iron oxides) from hot rolled coils using acid, leaving bare metal. The largest single merchant end use application of Hydrochloric acid (HCl) is in iron and steel pickling, mostly in the production of galvanized sheets. HCl generates fumes that are significantly corrosive and toxic, however, one advantage of using HCl is that it can be regenerated from ferrous chloride in spent pickling acid solutions.

Scrubbers are intended primarily for use in the steel and metal processing industries and to handle liquid soluble contaminated gases. The main attractions of these scrubbers to steel pickling industry are:

(a) Low Water flow rate, hence, less generation of effluent.
(b) No recirculating pump to maintain.
(c) No power consumption by the recirculating pump's motor.
(d) Almost, no maintenance required; no packing to plug up or replace.

Even when the scrubber effluent can not, for some reason, be returned to the process, the cost of the waste water treatment plant is minimized by the low volume of scrubber effluent.

Below is the BACT analysis for the Pickling Line 1 and Pickling Line 2 in Nucor Steel, IN. These existing pickling lines are already each controlled by a fume scrubber.

(2) Existing BACT Emission Limitations in the RBLC

There are only two (2) steel mills with steel pickling process and BACT limits listed in the RBLC They are Charter Steel, WI and Nucor Steel, IN. Both uses natural gas for the boilers in the pickling process.

SDI, Dekalb, IN also has a pickling operation controlled by a scrubber and mist eliminator. HCl mist is limited at a rate of 0.32 lb/hour. The pickle line tanks are under negative pressure However, this information is not in the RBLC.

The table below summarizes the limits.

Table 30 - - HCl Pickling Process			
	NOx	VE (%)	PM/PM_{10} (gr/dscf)
Charter Steel, WI	100 ppmvd at 21% O_2	20	0.016
Nucor Steel, IN CP107-2764 and PSD 107-3702	- -	5	0.01 and 0.27 lb/hr
SDI, Dekalb, IN	- -	- -	0.01

Nucor Steel, IN is subject to the NESHAP 40 CFR 63, Subpart CCC. The requirements under this federal requirements are independent from the requirements of the PSD program. HCl is not a regulated pollutant under 326 IAC 2-2.

(3) Proposed BACT Limit for Nucor Steel, IN

Since the pickling lines in Nucor Steel, IN are being physically modified, the BACT is re-evaluated. **The PM BACT for the pickling lines shall be the use of scrubbers as particulate controls, and visible emissions shall not exceed 5% opacity.**

The 0.27 pound of particulate per hour limit specified in CP 107-3702-00038, issued on March 28, 1995, is not carried over because it was based on a specific flow rate and grain loading. These specifications are changed in this modification.

The BACT for HCl storage vessels is the operation of a closed vent system for each vessel, except when during loading and unloading.

Loading and unloading shall be conducted either through enclosed lines or each points shall be equipped with a fume capture/control device.

Acid Regeneration BACT Analysis

Nucor Steel is proposing the following modifications to their Acid Regeneration Roaster:

(a) Replace and/or upgrade PLC controls and process equipment (valves, dampers).

(b) Install a rail loading facility for acid in the Cold Mill.

(c) In this modification the capacity of the tangentially fired burners is maintained at 7.3 MMBTU/hr and the use of natural gas as fuel.

The table below summarizes the existing limits to the Acid Regeneration Roaster as indicated in PSD Permit 107-2764-00038, issued on November 30, 1993.

Table 31 - - Acid Regeneration Roaster Existing Limits

Pollutant	Limits		
NOx	100 lb/MMCF	0.7 lb/hr	3.2 ton/yr
CO	20 lb/MMCF	0.1 lb/hr	0.6 ton/yr
VOC	5.3 lb/MMCF	0.05 lb/hr	0.2 ton/yr
PM/PM_{10}	- -	2 lb/hr	8.8 tons/yr
Opacity	5%		
Capacity	7.3 MMBTU/hr		

Search of the RBLC shows Nucor Steel, IN is the only one listed in the RBLC with BACT limits for acid regeneration.

Search of permits issued by OAQ, it shows that SDI, Dekalb, IN, has an acid regeneration which uses cyclone and scrubber to control particulates and HCl.

The existing limits for both Nucor Steel, IN and SDI, Dekalb, IN are based on the combustion emission rate of the burner.

The heat capacity of the burner in Nucor Steel, IN is not being changed, thus the existing limits mentioned above will be maintained.

Since the acid regeneration in Nucor Steel, IN is going to be physically modified, the BACT is re-evaluated. **The BACT for the acid regeneration shall be the use of scrubbers as particulate controls, and visible emissions shall not exceed 5% opacity.**

Hot Strip Mill, Cold Reversing Mill and Reversing/Tempering Mill BACT Analysis

Nucor Steel is proposing to make the following modifications:

Meltshop:

(1) Hot Strip Mill - - the rolling stands do not have and are not amenable to mist eliminator.
  (a) Replace and/or upgrade PLC controls and process equipment.
  (b) Take into account VOC emissions that were not taken into account during the initial review.

Cold Mill:

(2) Cold Reversing Mill 1 - - Mist Eliminator
  (a) Replace and/or upgrade PLC controls and process equipment.
  (b) Take into account VOC emissions that were not taken into consideration during the initial review of the Cold Reversing Mill 1.
  (c) Install a natural gas fired low NO_x burner Cold Mill Boiler, identified as Unit No. 300, rated at 34 MMBTU/hour, with propane as back up fuel. This is in addition to the existing one (1) natural gas fueled Cold Mill Boiler, rated at 34 MMBTU/hour. This existing Cold Mill Boiler was previously the VTD Degasser Boiler/Pickle Line 2 boiler, but was transferred to the Cold Mill. These 2 Cold Mill Boilers will supply steam to the entire Cold Mill. For clarification, there will be total of 2 boilers in the Cold Reversing Mill, each rated at 34 MMBTU/hr. There is no boiler in the VTD Degasser and Pickle Line 2.
  (d) Modify the burner of the existing Cold Mill Boiler (34 MMBTU/hr) to achieve its permitted capacity.
  (e) Install additional cooling tower chillers for motor cooling.
  (f) Install a fume collection enclosure.

(3) R/T Mill a.k.a. Cold Reversing Mill 2 - - Mist Eliminator
  (a) Replace and/or upgrade PLC controls and process equipment
  (b) Take into account VOC emissions from this mill that were not taken into account during the initial review.
  (c) Install a fume collection enclosure.

Nucor Steel, IN has mist eliminators on the Cold Reversing Mill1 and R/T Mill a.k.a. Cold Reversing Mill 2 to control particulates.

There are only 2 steel mill sources (Charter Steel, WI and Nucor Steel, IN) listed in the RBLC that have Cold and Hot Rolling Mills BACT limits.

- - Charter Steel has a throughput limit of 500,000 tons/year of steel. It did not go thru particulate PSD review. It has a VOC limit and its basis is LAER. The VOC limit is 0.06 lb/ton, which at maximum limited capacity is equivalent to 15 tons/year of VOC emissions.

- - During the initial PSD review of the Nucor Steel Rolling Mills, the VOC emissions were indicated to be zero ton/year. Based on the revised calculations, PTE of VOC is 10 tons/year. Since there is only one other steel mill that can be used as referenced, **the VOC BACT for the Hot Strip Mill, Cold Reversing Mill 1, and R/T Mill a.k.a. Cold Reversing Mill 2 is 0.06 lb/ton.**

The PM/PM_{10} BACT limits will be maintained. The particulate emissions are not dust, they are oil drops and oil mist. These PM limits are the same limits that are required for SDI, Dekalb, IN to comply on their Cold Reversing Mill.

The summary of the BACT limits is shown below.

Table 32 - - Existing and New PSD BACT of the Cold Reversing, R/T and Hot Strip Mills			
Operation	Pollutants	Existing Limit	New PSD BACT/Limit
Cold Reversing Mill 1 and R/T Mill (aka Cold Reversing Mill 2) PSD 107-3702 and CP 107-2764	PM/PM_{10}	0.01 gr/dscf 7.2 lb/hr 31.5 ton/yr	0.01 gr/dscf 7.2 lb/hr 31.5 ton/yr
	VOC	0 tons/yr	10 tons/year 0.6 lb/ton
	Opacity	5%	5%
Hot Strip Mill PSD 107-2764	PM/PM_{10}	0 lb/hr mist eliminator	0 lb/hr mist eliminator

Existing Cold Mill Boiler:

In the Cold Reversing Mills, Nucor Steel is also proposing to modify the burner of the existing Cold Mill Boiler to achieve its permitted capacity. Under PSD permit 107-5235-00038, issued on June 20, 1996. the Cold Mill Boiler has a capacity of 4.2 MMBTU/hour. This boiler was permitted pursuant to this PSD permit, to burn only natural gas and NOx emissions shall not exceed 100 lb/MMCF of gas.

Based on recent information received by Nucor Steel, IN, the boiler that is being used now in the Cold Mill was the previously VTD Degasser Boiler/Pickle Line 2 boiler. This boiler was transferred to the Cold Mill. This boiler, together with the new Cold Mill Boiler will supply steam to the Cold Mill, Pickle Lines 1 and 2, tank farms and Galvanizing Line.

For clarification, there will be total of 2 boilers in the Cold Reversing Mill, each rated at 34 MMBTU/hr. There is no boiler in the VTD Degasser and Pickle Line 2.

Since the existing Cold Mill Boiler is being physically modified, re-evaluation of BACT is necessary. Based on the BACT performed for the new Cold Mill Boiler, the BACT for the existing Cold Mill Boiler should be identical. In summary, the BACT limits are as follows:

Table 33 - - Existing Cold Mill Boiler (34 MMBTU/hr)	
Pollutants	PSD BACT/Limit (lb/MMBTU)
NOX	0.035
CO	0.061
VOC	0.0026
PM	0.0019
PM_{10}	0.0076
SO_2	0.0006

Meltshop AOD Vessel BACT Analysis

Argon Oxygen Decarburization (AOD) is the recognized standard for stainless steel refining and also for all grades of carbon and alloy.

AOD provides numerous advantages:
- - High Metallic yields
- - Flexibility in low cost raw materials selection
- - Pinpoint accuracy in achieving desired aim chemistries, Superior Toughness, Greater Ductility
- - Precise control of carbon, Extra Low Carbon stainless steel at no additional cost.
- - Rapid desulfurization, Lower Sulfur
- - Lead removal
- - Cleaner metal, with low residual oxygen, nitrogen and hydrogen

Primary AOD emissions are generated when the process gases are blown though the bottom into the molten steel. These emissions are captured in a hood and ducted to the EAF Baghouse.

Nucor Steel is proposing to do the following modifications to the AOD operations:

(a) Maintain the total maximum steel production remains at 502 tons/hour.

(b) Install additional and or different styles of oxy fuel burners, post burners, post combustion burners, carbon injection system, oxygen lances, and argon lances.

(c) Install additional lances and tuyerers.

(d) Install additional AOD vessels as spare, and only one at a time will be used.

(e) Install additional rebricking stations.

(f) Install additional spout ladles, use to transfer molten steel from AOD to ladles.

RBLC does not indicate any AOD process.

The table below shows the existing limits of the AOD. The AOD exhausts to the Meltshop EAF Baghouses.

Table 34 - - AOD Vessel Existing Limits

Operation	Criteria	Existing limits	New PSD BACT Limits
AOD A 107-4631	hours	1,800 hr/yr	502 tons/hour (EAFs and AOD)
	Capacity	152 ton/hr	
AOD Vessel and Feed System CP 107-3599	Capacity	130 tons/hr	
	PM/PM_{10}	100% capture	Meltshop EAFs Baghouses
	Opacity	0%	3%

The AOD is exhausting to the Meltshop EAF Baghouses, thus the BACT limits specified for the EAF already accounts for the AOD emissions. The existing limited capacities of the Meltshop AOD have also been removed. Together with the EAFs, the AOD have a maximum capacity of 502 tons/hour. Each or any combination of the Meltshop EAFs and AOD can independently produce the maximum capacity of 502 tons/hour of steel. Each Meltshop EAF can operate concurrently or independently to achieve this maximum capacity, however, the annual production is limited at 4,397,520 tons/year, not 8,795,040 tons/year.

Since Meltshop AOD exhausts to the Meltshop EAF Baghouses, the visible emissions shall also be the opacity limit specified for the Meltshop EAF Baghouses, which is 3%.

Cooling Towers BACT Analysis

(1) Cooling Towers Design

The theory behind cooling towers is that heat is transferred from water drops to the surrounding air by the transfer of sensible and latent heat. Cooling towers fall into two main sub-divisions:

(a) Natural draft designs use very large concrete chimneys to introduce air through the media. Due to the tremendous size of these towers (500 ft high and 400 ft in diameter at the base) they are generally used for water flow rates above 200,000 gal/min. Usually these types of towers are only used by utility power stations in the United States.

(b) Mechanical draft cooling towers are much more widely used. These towers utilize large fans to force air through circulated water. The water falls downward over fill surfaces which help increase the contact time between the water and the air. This helps maximize heat transfer between the two.

Most cooling towers are designed as simple wet cooling towers, but upon occasion, a tower will be designed to operate as a wet-dry cooling tower. A wet-dry cooling tower adds heat to the airflow prior to discharge through the cooling tower fan stack. The discharge air is warmed above the ambient dew point to eliminate any visible plume that could cause local environmental concerns or hazards to local roadways.

Cooling tower may be the most overlooked piece of equipment at a source. A cooling tower uses a combination of heat and mass transfer to cool process water. If improperly selected or poorly maintained, it will add financial costs, cause a loss in production due to increases in circulation water temperature and increase electrical operating costs. Emphasis must be placed on properly specified and designed cooling towers that require minimal maintenance. Factors in proper performance of cooling towers are: water flow rate, air flow rate, water inlet/outlet temperatures, and ambient bulb temperature.

(2) Nucor Steel Proposed Modification

Nucor Steel is proposing the following:

(a) Install an additional cooling tower for the Caster at 5,000 gallon per minute, equipped with mist eliminator.

(b) Install an additional cooling tower at the main compressor building, 3,200 gal/min.

(c) Install an additional cooling tower in the Castrip compressor building, 2,400 gal/min.

(d) Replace the annealing noncontact cooling tower, such that the water circulation rate increases from 2,400 gal/min to 5,000 gal/min.

(e) Modify the water cooled ducts, water system, and cooling tower water treatment.

(f) Install additional water spray towers using cooling tower water to cool exhaust gases.

(3) Cooling Towers of Nucor Steel, IN

The table summarizes the existing and new cooling towers in Nucor Steel, IN. The capacity of these cooling towers is the amount of water (gal/min) that a cooling tower will cool through a specified range, at a specified approach and wet-bulb temperature.

Table 35 - - Cooling Towers

Cooling Towers	No. of Cells	Capacity (gal/min)
Existing		
Meltshop Non Contact	9	60,000
Meltshop Caster Contact	4	10,000
Hot Mill Contact	4	16,383
Hot Mill Contact Expansion	1	4,000
Hot Mill Non Contact	4	25,319
Laminar Contact	3	11,600
Cold Mill Non Contact	2	10,000
Cold Mill Non Contact Expansion	1	5,000
Galvanizing/Annealing Non Contact	2	6,500
Annealing Non Contact	2*	2,400
Castrip Contact	4	12,000
Castrip Non Contact	6	12,000
BOC Non Contact CT-91A	1	750
BOC Non Contact CT-91B	2	3,200
Proposed		
Meltshop Caster Contact Expansion	2	5,000
Main Compressor Non Contact	4	3,200
Castrip Compressor Non Contact	3	2,400
Annealing Non Contact (Replacement)	2*	2,600
Total	**54**	**192,352**

* The 2 cells of the Annealing Non Contact Cooling Tower is going to be replaced with higher capacities.

Nucor Steel is going to control drift/mist by using mist eliminators. Drift is the circulating water lost from the tower as liquid droplets entrained in the exhaust air stream, expressed in % of circulating water rate, gal/min or ppm. Mist eliminators are assembly of baffles or labyrinth passages, used to separate small droplets of liquid (mist) from gas streams by trapping the mist droplets through inertial impaction. Mist eliminator provides consistent high collection efficiency, requires very little maintenance and helps maintain a healthy work environment with increased productivity.

(4) Existing Cooling Towers with Drift Eliminators in the RBLC

The following table lists the sources with cooling towers controlled by drift/mist eliminators. The search of the RBLC was not limited to steel mills only. There are few sources with cooling towers with no control specified in the RBLC. There is also a wide range of limits of particulates because of the different capacity and numbers of cooling towers in a specific source. PM and limits range from 0.0009 lb/hr to 1.6 lb/hr. Some BACT limits are also indicated in terms of percent of drifts

(0.0005% to 0.01%). Since the emissions from the cooling towers are minimal, BACT is usually the manufacturer's specifications that is provided by the applicant.

Sources are listed in alphabetical order.

Table 36 - -Cooling Towers with Drift/Mist Eliminators

Acadia, LA	Duke, AR	North American Power, CO	Plaquemine, LA
AES, NJ	Energetix, OK	**Nucor Steel, IN**	Ponca City Energy, OK
AES, PR	Exxon Mobil, LA	Occidental Chem, LA	Redbud, OK
Arkansas Electric, AR	Formosa Plastics, TX	Power, IA	SDI, Hendricks, IN
Charter Steel, WI	Geneva, OK	PPG, LA	Shell, LA
Carville, LA	Liberty Gen NJ	Rocky Mountain Energy, CO	Tenaska, IN
Cleo Midstream, LA	Mustang Power, OK	PREPA, PR	Tenaska, AR
Cogentrix, IN	Mantua Creek, NJ	PCLP, NJ	Texaco, CA
Conoco Charles Refinery, LA	Mueller Casting, MS	Perryville Power, LA	

(5) Proposed BACT for Nucor Steel, IN

Based on the information provided above, **the BACT for the cooling towers is the use of drift/mist eliminators as particulate control and the drift rate from each cooling tower shall not exceed 0.0005%. The opacity BACT for the cooling towers shall not exceed 20%.** This is the same opacity limit specified to the most recently issued PSD permits in Indiana with cooling towers in their operations. This is also the same limit specified to the only one cooling tower with opacity limit specified in the RBLC (GenPower, SC).

Scrap Handling and Processing BACT Analysis

Slag will be generated from the Meltshop EAF and LMF operations. Slag from these operations will be transported to the slag processing area. Nucor Steel is proposing to:

(a) Install a new conveyor systems to feed raw materials to the EAF charge buckets with outside truck or rail dump.
(b) Install an alloy system for direct feeding of alloys, lime and carbon to EAFs.
(c) Add a new alloying conveyor system, silos, storage bin, and feed equipment and control for the LMF.
(d) Install new cranes.
(e) Modify existing cranes and associated auxiliary equipment plant wide.
(f) Add scrap loading of buckets to overhead cranes and truck dumping under roof in the scrap bay area.
(g) Add scrap cranes and mobile scrap cranes to the Meltshop scrap bay.
(h) Modify, upgrade and perform non-routine repairs to the scrap cranes and magnets in the melt shop scrap bay.
(i) Relocate existing soda ash silo to another location within the steel mill plant.
(j) To allow to store sand.
(k) Use of ground level mobile cranes to load scrap buckets in conjunction with the existing overhead scrap cranes.

Nucor Steel, IN decided that no additional truck as slag pot carrier will be added, such that there is no physical modification is experience in terms of transportation. increase in utilization of existing slag pot carrier is expected.

Nucor Steel, IN has indicated the option to be able to cut big steel scrap outside the building that can not fit in the building as long as visible emissions is not violated during the cutting process. Outdoor scrap cutting is limited to scrap items such as furnace roofs, railroad cars, ductwork, long pieces of scrap pipe and bar stock that can not fit in the existing building.

(1) Existing PM and PM_{10} Emission Limitation

The following table summarizes the Control Methods and Opacity limits of similar sources. Sources are listed alphabetically.

Table 37 -BACT Scrap Handling and Processing of Similar Sources

Source Name	Operation	Control Method	Opacity (%)
Arkansas Steel, AR	Paved and Unpaved Roads	Water Application	- -
	Slag Processing	Water Application	- -
Beta Steel, IN	Vehicular Traffic, Material Handling, Paved Roads	Wet Sweeping	3
Chaparral Steel , VA	Scrap Shredder with Cascade Separator	Intrinsically Wet Process, Work Practices	- -
	Unpaved Roads, Storage Piles, Material Transfer	Dust Management Plan, Work Practices	- -
Georgia Pacific, VA	Paved Roads	- -	10

Table 37 -BACT Scrap Handling and Processing of Similar Sources			
Source Name	Operation	Control Method	Opacity (%)
IPSCO Steel, IA	Lime/Dolomite Storage	Baghouse	- -
	Carbon Storage Silo	Baghouse (0.0768 gr/dscf)	3
	Storage Silos, Lime and Dolomite	Baghouse (0.0967 gr/dscf)	3
	Caster Slab Hand Scarfing	Baghouse	- -
	Plant Roadways	Hard Surface Pavement, Mechanical Sweeping	0
	Tundish Dumping	--	10
	Steel Scrap Cutting	--	- -
	Slag Hauling Roadways	Crushed Stone and Emulsion Spraying	0
Mac Steel, AR	Slag Processing	Water Sprays on Transfer Points	- -
Marathon Ashland, LA	Unpaved Roads	Wetting by Applying 0.01 Inch of Water	- -
Nucor Steel, AR	Slag Processing	Wet Suppression	- -
Nucor Yamato, AR	Slag Processing	Wet Suppression	- -
Nucor Steel, IN	LMF Baghouse Silo	Baghouse (0.01 gr/dscf)	3
	Road Transportation	Speed Limit, Vacuuming Sweeping, Dust Suppressant	10
	Continuous Blasting	Baghouse and Cyclone (0.003 gr/dscf)	3
	Storage Silo for Blasting Media	Bin Vent	3
	See Table below for the rest of the operations and limits		
Nucor Steel, NC	Slag Processing	Water Sprays and Slag Pots	10
Nucor Steel, UT	Paved Roads	Sweeping , Water Flushing	10
	Unpaved Roads	Water Spraying Chemical Treatment	20
	Stock Piles, Transfer Points	Fabric Filter	10
	Conveyor Transfer/Drop Points	Water Sprays	10
Nucor Steel, SC	Slag Processing	Use of Slag Pots and water sprays	10
Qualitech, IN	Material Handling, Storage	Covered Conveyor, Work Practices	3
	Bar Cutting	Baghouse (0.01 gr/dscf)	- -
	Material Crushing	Work Practices,	3
SDI Hendricks, IN	Slag Handling and Processing	work Practices	3
SDI, Whitley IN	Slag Handling and Processing	Water Suppression, Minimizing Drop Heights	10
	Slag Dumping	Partially enclosed building	3
	Roadways		10
	Slag Handling and Processing	Water Sprays, Minimize Drop Heights	3
Steel Stone, ME	Aggregate Handling	Wet Suppression	- -
	Roads	Wet Suppression	- -
Tuscaloosa Steel, Al	Roads	Paved, Vacuum or Flush	- -
	DRI Material Handling	Scrubber and Cyclone	- -

Previous BACT limitations established for slag processing in Indiana require “no visible emissions”, which is equivalent to 0% opacity. Sources subject to this limitation found it to be unattainable within the required safety and product quality standards and have requested revisions to their respective permits.

(3) Proposed PM and PM_{10} BACT Limit for Nucor Steel, IN

Individual bin vent filter will control the PM and PM_{10} emissions from the material storage silos. **The use of bin vent filters to control the PM and PM_{10} emissions from the storage silos is considered BACT. Each bin vent filter will have an outlet grain loading of 0.01 grains per dry standard cubic feet.**

The visible emissions from the outdoor scrap cutting shall not exceed 3% opacity.

EAF Dust Handling BACT Analysis

Nucor Steel is proposing to install an additional arc dust treatment facility with a capacity of 50,000 lb/hour or to transfer the dust to the existing system which will have a total maximum capacity of 100,000 lb/hr. Nucor Steel has not decided at this time which one of these 2 options, they are going to finalized. BACT analysis is determined in the same manner and will have the same outcome in either of the cases.

RBLC indicates that sources with dust handling systems use Baghouse as control. The table below summarizes the limits of these sources. To get a broader scope, the comparison was not limited to steel mills only.

Table 39 - - EAF Dust Handling BACT of Other Sources

Source	Opacity (%)	PM/PM_{10} (gr/dscf)
Chaparral Steel, VA	10	- -
Kronotex USA, SC	- -	0.005
Louisiana Pacific, CA	- -	0.005
Nucor Steel, IN	10	0.005
Nucor Steel, SC	10	- -
World Trona, WY	- -	0.005
Nucor Steel, SC	10	- -

The RBLC is still indicating that the opacity limit for Nucor Steel, IN EAF dust handling system to be 0% opacity. This was revised to 10% on June 20, 1996.

The proposed **BACT for the EAF dust handling is the use of bin vents and the opacity is maintained at 10%.** These limits are comparable to other sources.

Emergency Generators BACT Analysis

Nucor Steel, IN is proposing to install temporary and portable diesel fired generators and air compressors for power outages and emergencies:

(a) Cold Mill generator, rated at 2100 HP.

(b) Hot Mill Non-Contact Cooling Tower generator, rated at 280 HP.

(c) Galv Line Pot generator, rated at 890 HP.

(d) Meltshop Cooling Tower Cold Well generator, rated at 2,520 HP.

(e) Portable natural gas heaters for winter use.

Emergency generator is a generator whose sole function is to provide back up power when electric power from the local utility is interrupted. Pursuant to a US EPA memo dated September 6, 1995, potential to emit (PTE) of emergency generators can be determined on a limited 500 hours per year of operation because inherent physical limitations and operational design can be taken into account. This limited hours of operation is an appropriate default assumption for an emergency generator that is expected to operate under worst case condition.

The table below shows the emergency generators in the RBLC with their hours of operations. Shorter hours of operations are taken voluntarily by the Permittee. It is clearly shown that most of the PSD permits in Indiana specified the limited hours of operation as BACT. This is in addition to performing good combustion practice and using low sulfur fuel.

Table 40 - - Emergency Generators

Source	Limits (hr/yr)	Source	Limits (hr/yr)
Mantua, NJ	100	AES, NJ	500
AES, PR	200	Arcadia, IN	500
Tenaska, IN	250	Cogentrix, IN	500
		Duke, IN	500
		Nucor Steel, IN	**500**
		PSEG, IN	500
		SDI Hendricks, IN	500

The proposed BACT for the emergency generators in Nucor Steel IN:

(a) Each emergency generator shall not operate more than 500 hours per year.

(b) The sulfur content of the diesel fuel used shall not exceed 0.05 percent by weight.

(c) Good combustion practices shall be performed.

Miscellaneous Activities BACT Analysis

Nucor Steel is also proposing to do the following modifications:

(a) Upgrade hydraulic, oil and lube systems.

(b) Modify onsite oxygen, argon, nitrogen and hydrogen gas supplier and associated delivery systems (pipes, valves, storage tanks, vaporizers, and controls).

(c) Addition, upgrades or modification of transformers static var systems, reactors, and electrical control and monitoring systems to allow the maximum utilization of production.

(d) Add propane as back up for all natural gas fired units.

(e) Install in-line spare.

(f) Add non-electrical powered (e.g. natural gas or diesel fueled) air compressors.

Since the heating capacity of the gas supply plant is not going to be physically modified which previous BACT limits were based on, the limits will not be re-evaluated.

Table 41 - - Process Gas Supply a.k.a. Hydrogen Plant (CP 107-5235)		
Pollutant	Limits	
NOx	100 lb/MMCF	9 MMBTU/hr
	140 lb/MMCF	15 MMBTU/hr
Opacity	5%	

Since propane is a fuel similar to natural gas, its use as back up fuel is considered as BACT.

BACT for in-line spare will be the same as the limits for the units or process being back up. Nucor Steel will be required to identify in a easily accessible manner these in-line spares, such as putting tags or identifications.

Units/Processes Not Being Physically Modified

The next table shows the units and processes that are not being physically modified.

Existing limits will not be re-evaluated because PSD BACT does not apply to units that do not undergo actual physical modification.

On January 13, 2003, Nucor Steel confirmed that these units are not going to be physically modified. The limits specified in this table are for information only, enforceable limits are still the ones specified in the actual permits.

Table 42 - - Summary of Existing Limits for Units Not Being Physically Modified

Operation	Pollutants	Existing Limit
Strip Caster (Castrip) LMS CP 107-2764 CP 107-12143	PM	0.0018 gr/dscf at 200,000 dscf/min, Baghouse
	PM_{10}	0.0052 gr/dscf at 200,000 dscf/min, Baghouse
	Opacity	3%
	NOx	0.0176 lb/ton
	CO	0.07125 lb/ton
	SO_2	0.185 lb/ton
	Pb	0.136 lb/hr
	Capacity	135 ton/hr
Continuous Caster PSD 107-2764 CP 107-5235	PM/PM_{10}	0.0018 gr/dscf at 160,000 acf/min Baghouse and canopy
	Opacity	3%
	Capacity	135 tons/hr
Strip Caster Ladle Preheater (2 Units)	NOx CP 107-12143 and A 107-14935	Low NOx 0.1 lb/MMBTU 12 MMBTU/hr each
Strip Caster Ladle Dryer (1 Unit)		Low NOx 0.1 lb/MMBTU 12 MMBTU/hr
Tundish Preheater (2 Units)		Low NOx 0.15 lb/MMBTU 10 MMBTU/hr each
Tundish Nozzle Preheater (2 Units)		Low NOx 0.1 lb/MMBTU 1 MMBTU/hr each
Tundish Dryer (1 Unit)		Low NOx 0.1 lb/MMBTU 4 MMBTU/hr
Transition Piece Preheater (2 Units)		Low NOx 0.1 lb/MMBTU each
Strip Caster Dumping, Storage, and Transfer Points	Opacity	5% CP -107-12143
Ladle Preheater Cp 107-5235	NOx	140 lb/MMCF 15 MMBTU/hr
Meltshop Ladle Preheater	NOx	Low NOx 0.1 lb/MMBTU, 15 MMBTU/hr
Tunnel Furnaces 1 & 2	NOx	190 lb/MMCF 84 MMBTU/hr each (CP 108-3702)
Tunnel Furnace Shuttles 1 and 2	NOx	100 lb/MMCF 13 MMBTU/hr each (CP107-3702)
Snub Furnace on Tf1	NOx	190 lbs/MMCF 6 MMBTU/hr (CP107-5235)

Table 42 - - Summary of Existing Limits for Units Not Being Physically Modified

Operation	Pollutants	Existing Limit
Pickle Line 1 Boilers CP 107-2764 On January 28, 2003, Nucor Steel informed OAQ that these 3 boilers have been removed.	NOx	50 lb/MMBTU 4.8 tons/yr
	CO	20 lb/MMCF 1.9 tons/yr
	VOC	5.3 lb/MMCF 0.1 lb/hr 0.5 ton/yr
	PM/PM_{10}	0.1 lb/hr 0.3 ton/yr
	Opacity	3%
	Capacity	(3) 7.3 MMBTU/hr each
Zinc Coating Line and Furnace CP 107-2764 a.k.a. Galvanizing Line CP 107-3702 a.k.a. Cold Mill hot dip galvanized coating line R-107-2164-00038 a.k.a. Galvanizing Line Burners CP 107-14297 and Cold Mill Ink (coil marking) The latest permit issued for this process is CP -107-14297.	NOx	115 lb/MMCF 4.2 lb/hr 18.2 ton/yr
	CO	35 lb/MMCF 1.3 lb/hr 5.5 ton/yr
	VOC	2.8 lb/MMCF 0.1 lb/hr 0.4 ton/yr
	Capacity	26 MMBTU/hr Preheater furnace 10 MMBTU/hr radiant section
	NOx	90 lb/MMCF
	Capacity	10 MMBTU/additional radiant section
	Capacity	36 burners 1.622 MMBTU/hr
	NOx	2.9 lb/hr 50 lb/MMCF
	Capacity	44 burners 0.323 MMBTU/hr
	NOx	2.8 lb/hr 200 lb/MMCF
	Capacity	36 MMBTU/hr
WWTP MSM 107-14782-00038 and A 107-15059	HCL	NESHAP 63, Subpart CCC
Mill Scale Screen and Conveyor MSM 107-15599	Capacity	1,092,000 ton/yr
	Opacity	none specifically specified
AOD Dryout and Preheat Burner CP 107-3599	Capacity	20 MMBTU/hr
	Opacity	0%
	NOx	140 lb/MMCF 2.8 lb/hr 12.3 tons/yr
(1) 500 gal gasoline stargaze tank (3) 500 gal diesel storage tank (1) 5,000 gal diesel storage tank	VOC CP 107 -2764 and A 107-11154	submerged filling
Vacuum Degasser	On March 31, 2000, Nucor Steel informed IDEM that this vacuum Degasser has been removed.	
	CO	3.3 lb/hr 14.3 ton/yr flare CP 107-2764 and CP 107-5235
	PM/PM_{10}	0 CP 107-5235
	Opacity	0% CP 107-2764
Iron Carbide Handling System R 107-3794	Based on a Nucor Steel meeting on January 13, 2003, this specific unit/operation has been eliminated.	

Table 42 - - Summary of Existing Limits for Units Not Being Physically Modified		
Operation	Pollutants	Existing Limit
Continuous Blasting System CP 107-12143	PM/PM_{10}	0.003 gr/dscf at 36,000 acf/min, Baghouse
	Opacity	3%
	Based on a meeting with Nucor Steel on January 13, 2003, this specific unit/operation is not going to be constructed.	
Portable Refractory Drying Burners (2 units)		1.742 MMBTU/hr 0.18 lb/MMBTU
Space Heaters (30 units)		0.15 MMBTU/hr 0.1 lb/MMBTU
	CO MSM 107-15289	0.084 lb/MMBTU
LMF Dust silo (Baghouse)	PM/PM_{10} 0.01gr/dscf at 100 acf/min	Based on a meeting with Nucor Steel on January 13, 2003, this specific unit/operation is not constructed yet.
	Opacity 3%	
Meltshop roof monitors include exhausts from the Ladle Preheater, Ladle dryers, Tundish Preheater, Tundish Dryers, fugitive emissions from the LMF, fugitive emissions from the Caster and other Meltshop operations.		

Continuous Emissions Monitoring System (CEMS)

In most situations continuous emissions monitoring systems (CEMS) are used to document compliance when a control device is used to reduce emissions. If properly operated, maintained and calibrated, CEMS are accurate in showing compliance.

The EAFs in Nucor Steel, IN have control devices for CO, VOC and PM only. The OAQ will require CEM systems for CO and VOC to ensure that the DSE air gap is being operated properly.

For PM, there are no available technologies to directly monitor mass emissions of PM. However, opacity can be used as a surrogate parameter to ensure that the control device is operating properly. The OAQ will require to continuously monitor the opacity from the EAF stack. Since lead is emitted as particulate matter, the monitoring required for PM is sufficient for determining compliance with the lead emission limitation, in addition to routine compliance testing.

Compliance emission monitor systems (CEMS) will be required to be installed, operated and maintained at the Meltshop EAF Baghouse for monitoring CO and VOC emissions.

It is noted that Nucor Steel, IN has provided justification why it is not necessary to install and use a CEMS for VOC emissions. The OAQ does not believe that the VOC emissions from the EAFs are relatively insignificant part of the EAF emissions because the VOC PTE is approximately 286 tons/year.

Upon further discussion with Nucor, since a consent decree required Nucor to install CEMS for SO_2 and $NO_{x,}$ will also be installed and used. Additional compliance testing and monitoring will not required.

The Permittee will be required to operate these monitors continuously and indefinitely. Relative accuracy test audits (RATA) are normally monitored by the OAQ. The results of the RATA is public information along with the emissions reports required to be submitted.

Endangered Species

The Clean Air Act (CAA) does not contain or express requirement for the applicant or the permitting agency to analyze or consider the impact of hazardous air pollutants on endangered species when applying for or making a decision on a PSD permit. The CAA only requires impacts to endangered species be considered when the US EPA modifies the HAPs list or promulgates a NESHAP. (42 USC 7412). In addition, Indiana's state rules do not require the performance of studies or analyses to determine the effect of toxic emissions from a source on federal or state-listed endangered species in the PSD permitting process. Endangered species are protected under state and federal laws which prohibit the unlawful taking of an endangered species. IC 14-22-34 and 16 USC 701 et. seq.

The OAQ is not aware of any federally-listed endangered species within the vicinity of this source. Therefore, emissions from this source will not adversely affect any federally-listed endangered species nor any state-listed endangered species.

Public Health and Safety

The OAQ takes its responsibility seriously for issuing technically sound permits that are protective of public health. Within the boundaries of the law, the OAQ has conducted appropriate analysis of the impacts of this proposed facility on human health. State Implementation Plan (SIP) requirements are examples of health-based standards, because the SIP requirements were proposed by the state and approved by the U.S. EPA for the purposes of maintaining the NAAQS. These standards are health-based standards and based on the assessment of public health risks associated with certain levels of pollution in the ambient environment. The CAA requires each state to develop air quality plans and outlines how the standards will be met.

Detailed analysis and results of hazardous air pollutants from this modification are specified in Appendix C.

For some pollutants, such as lead, U.S. EPA has established ambient levels that are protective of human health. Anticipated emissions can be modeled and the resulting ambient levels compared to the federal standard. If levels are not expected to increase above U.S. EPA's ambient standard, it is appropriate to conclude that the proposed facility will not pose an increased threat to public health. In this case, based on PTE calculations of the proposed modification, lead is not expected to increase above the PSD significant level.

Nucor Steel, IN cannot sell steel which contains any radioactive quantities. Therefore, there is great incentive to keep radioactive material from being accepted as scrap metal. The scrap management plan can be specified not to accept any loads of scrap material if radioactive materials or radiation sources are detected. The OAQ is not aware that radioactive materials will be used in this process

Noise Pollution

The OAQ does not have jurisdiction over noise pollution. There is no expected increase in noise level due to this proposed modification.

Environmental Justice (EJ)

Based on the 2000 US Census, there are 12.5% of Indiana residents who identified themselves as racial minority. An area is classified as High Racial Minority if it falls between 18.75% to 24.99 %. Montgomery County, IN, where Nucor Steel is located at, is not showing to be under this classification.

Based on the 1990 US Census, 28% of Indiana residents lived in households that received an income less than or equal to twice the poverty level. This is classified a Low Income Household. Montgomery County, IN is not showing to be under this classification.

If the source being reviewed is going to be located in an area considered to be either a High Racial Minority or Low Income Household, the OAQ attempts to published the notice for the public review in a non-English newspaper, and holds public meeting prior to the issuing a final action. Since Montgomery County is neither of these classifications, the OAQ will only publish the notice in the most circulated newspaper in the area.

For more information on EJ, please refer to http://www.in.gov/idem/environmetaljustice.

Environmental Impact and Assessment

Title 326 of the Indiana Administrative Code (IAC) lays out the requirements to regulate air emissions from sources in Indiana. 326 IAC 16 provides regulations for performing environmental assessments and environmental impact studies for recommendations or reports on proposals for legislation and other “major state actions significantly affecting the quality of the human environment.” However at 326 IAC 16-1-3(g), there are specific statutory exemptions to this requirement. One of these exemptions is the issuance of a license or permit by any agency of the state, as exempted by IC 13-1-10-6. This Indiana Code has been recodified to Indiana Code (IC) 13-12-4-8 on July 1, 1998. This recodification has no substantive effect on rule 326 IAC 16-1-3(g) as stated in IC 13-12-1-5. 326 IAC 16 and the Indiana Code 13-12-4-8 specifically states that an environmental impact statement is not required under state law for the issuance of a license or permit by any state agency. Therefore, no environmental impact statement under 326 IAC 16 has been performed for this permit. Similar provisions exempt PSD permit actions from the National Environmental Policy Act (15 USC 793(c)(1)).

LAER

The OAQ has the authority to permit an applicant pursuant 326 IAC 2-3 and 40 CFR 51.166 (Nonattainment Rules) only when the source is located in a designated nonattainment area as specified in 40 CFR 81.315. Montgomery County has been designated as attainment area in 40 CFR 81.315. Therefore, the OAQ does not have the authority to require lowest achievable emission rate (LAER).

However, in doing the analysis for BACT which is required by the PSD rules, there are several instances where BACT is equivalent to LAER. For instance, the PM limitations for the EAF is lowest limitation established for this type of facility. Another example is the VOC BACT limit for the Cold/Hot mills was based on an existing LAER limit.

Indiana Department of Environmental Management
Office of Air Quality

Appendix C - - Air Quality Analysis for a Prevention of Significant Deterioration (PSD) and Part 70 Significant Source Modification (SSM)

Source Background and Description

Source Name:	Nucor Steel
Source Location:	4537 South Nucor Street, Crawfordsville, IN 47933
Mailing Address:	4537 South Nucor Street, Crawfordsville, IN 47933 RR2, Box 311, Crawfordsville, IN 47933
General Telephone Number:	765-364-2323
General Facsimile Number:	765-364-5311
Responsible Official:	General Manager
County Location:	Montgomery
SIC Code:	3312 (Steel Mill)
Source Categories:	1 of 28 Listed Source Categories Major PSD Source Major Source, CAA Section 112
Air Quality Modeler:	Krista Gremos

Introduction

Nucor Steel (Nucor) has applied for a Prevention of Significant Deterioration (PSD) permit to modify the electric arc furnace (EAF) and argon-oxygen decarburization (AOD) operations and other processes at its steel mill located in Crawfordsville, Indiana. The site is located at Universal Transverse Mercator (UTM) coordinates 514765.0 East and 4424987.0 North. Montgomery County is designated as attainment for the National Ambient Air Quality Standards. These standards for Nitrogen Dioxide (NO_2), Sulfur Dioxide (SO_2), Carbon Monoxide (CO), Volatile Organic Compounds (VOCs), and Particulate Matter less than 10 microns (PM_{10}) are set by the United States Environmental Protection Agency (U.S. EPA) to protect the public health and welfare.

URS Corporation prepared the PSD permit application for Nucor. The permit application was received by the Office of Air Quality (OAQ) on November 22, 2002 and was forwarded to modeling in January of 2003. Additional modeling information was received on February 10, 2003, March 18, 2003, March 24, 2003, April 3, 2003, and April 18, 2003. This document provides OAQ=s Air Quality Modeling Section's review of the PSD permit application including an air quality analysis performed by the OAQ.

Air Quality Analysis Objectives

The OAQ review of the air quality impact analysis portion of the permit application will accomplish the following objectives:

A. Establish which pollutants require an air quality analysis based on source emissions.

B. Demonstrate that the source will not cause or contribute to a violation of the National Ambient Air Quality Standard (NAAQS) or Prevention of Significant Deterioration (PSD) increment.

C. Utilize a three-tiered approach in evaluating ozone impacts.

D. Perform an analysis of any air toxic compound for the health risk factor on the general population.

E. Perform a brief qualitative analysis of the source's impact on general growth, soils, vegetation and visibility in the impact area with emphasis on any Class I areas.

Summary

Nucor Steel has applied for a Prevention of Significant Deterioration (PSD) permit to modify the electric arc furnace (EAF) and argon-oxygen decarburization (AOD) operations and other processes at its steel mill located in Crawfordsville, Indiana. The PSD application was prepared by URS Corporation of Rolling Meadows, Illinois. Montgomery County is currently designated as attainment for all criteria pollutants. Emission rates of five pollutants (NO_2, SO_2, CO, VOCs, and PM_{10}) associated with the proposed major modification exceeded significant emission rates established in state and federal law, thus requiring air quality modeling. Emissions rates for Lead (Pb) did not exceed the significant emission rates and are not subject to PSD review. Modeling results taken from the Industrial Source Complex Short Term (ISCST3) model showed pollutant impacts for NO_2, SO_2, VOCs, and PM_{10} were predicted to be greater than the significant impact levels for purposes of a National Ambient Air Quality Standards analysis. The modeling showed no violations of the NAAQS for NO_2, SO_2, and PM_{10}. Analysis for PSD increment consumption was also necessary for NO_2, SO_2, and PM_{10}. Results from the PSD increment analysis showed increment consumption below 80% of the available PSD increment for NO_2, SO_2, and PM_{10}. Hazardous Air Pollutant (HAPs) modeling was conducted for seventeen pollutants. HAP 8-hour maximum concentrations modeled below 0.5% of each Permissible Exposure Limit (PEL) for all pollutants except Cadmium. There was no impact review conducted for the nearest Class I area, which is Mammoth Cave National Park in Kentucky. No Class I analysis is required if a source is located more than 100 kilometers (61 miles) from the nearest Class I area. An additional impact analysis on the surrounding area was conducted and no significant impact on soils, vegetation, federal and state endangered species or visibility from the proposed facility was expected.

Part A - Pollutants Analyzed for Air Quality Impact

Indiana Administrative Code (326 IAC 2-2) PSD requirements apply in attainment and unclassifiable areas and require an air quality impact analysis of each regulated pollutant emitted in significant amounts by a new major stationary source or modification. Significant emission levels for each pollutant are defined in 326 IAC 2-2-1. CO, NO_x, SO_2, VOCs, and PM_{10} will be emitted from Nucor Steel and will exceed their significant emission rates as shown in Table 1. An air quality analysis is required. It should be noted that all emissions are based on the Best Available Control Technology (BACT) determination and other limitations resulting from the OAQ review of the application.

TABLE 1 – Nucor Steel Significant Emission Rates (tons/yr)		
Pollutant	**Maximum Allowable Emissions**	**Significant Emission Rate**
CO	2731.4	100.0
NO_x	819.5	40.0
SO_2	1033.4	40.0
PM_{10}	105.1	15.0
VOC (ozone)	193.7	40.0

Significant emission rates are established to determine whether a source is required to conduct an air quality analysis. If a source exceeds the significant emission rate for a pollutant, air dispersion modeling is required for that specific pollutant. A modeling analysis for each pollutant is conducted to determine whether the modeled concentrations will exceed significant impact levels. If concentrations are below significant impact levels no further air quality modeling is required. Modeled concentrations exceeding the significant impact level requires that more refined modeling be conducted, which includes source inventories and background data. These procedures are defined in AGuidelines for Air Quality Maintenance Planning and Analysis, Volume 10, Procedures for Evaluating Air Quality Impacts of New Stationary Sources@ October 1977, U.S. EPA Office of Air Quality Planning and Standards (OAQPS).

Part B - Significant Impact Analysis

An air quality analysis, including air dispersion modeling, was performed to determine the maximum concentrations of the source's emissions on receptors outside of the facility property lines. A worst case approach for emission estimates has been taken due to the nature of the operational capability of the facility.

Model Description

The Office of Air Quality review used the Industrial Source Complex Short-Term (ISCST3) model, Version 3, dated April 10, 2000 to determine maximum off-property concentrations or impacts for each pollutant. All regulatory default options were utilized in the United States Environmental Protection Agency (U.S. EPA) approved model, as listed in the 40 Code of Federal Register Part 51, Appendix W AGuideline on Air Quality Models@. The Auer Land Use Classification scheme was used to determine the land use in a 3-kilometer (1.9-mile) radius from the source. The area is considered agricultural with a portion of the area classified as industrial, therefore a rural classification was used. The model also utilized the Schulman-Scare algorithm to account for building downwash effects. Stacks associated with the proposed facility are below the Good Engineering Practice (GEP) formula for stack heights. This indicates that wind flow over and around surrounding buildings can influence the dispersion of concentrations coming from the stacks. 326 IAC 1-7-3 requires a study to demonstrate that excessive modeled concentrations will not result from stacks with heights less than the GEP stack height formula. These aerodynamic downwash parameters were calculated using U.S. EPA=s Building Profile Input Program (BPIP).

Meteorological Data

The meteorological data used in the ISCST3 model consisted of surface data from the Indianapolis Airport National Weather Service station merged with the mixing heights from Peoria, Illinois Airport National Weather Service Station for the latest available five-year period (1990-

1994). The 1990-1994 meteorological data was obtained from the U.S. EPA Support Center for Regulatory Air Model electronic Bulletin Board and preprocessed into ISCST3 format with U.S. EPA's PCRAMMET program.

Receptor Grid

Ground-level points (receptors) surrounding the source were input into the model to determine the maximum modeled concentrations that would occur at each point. OAQ modeling utilized 1,717 receptors out to 10 kilometers (6.2 miles) from the mill for all pollutants. All stack heights were below the GEP stack height; therefore receptors were spaced every 100 meters (328 feet) near the property boundary.

Modeled Results

Maximum modeled concentrations for each pollutant over its significant emission rate are listed below in Table 2 and are compared to each pollutant's significant impact level for Class II areas, as specified by U.S. EPA in Federal Register, Volume 43, No. 118, page 26398 Monday, June 19, 1978.

TABLE 2 – Summary of OAQ Significant Impact Analysis for Nucor Steel – Montgomery County (ug/m3)

Pollutant	Year	Time-Averaging Period	Maximum Modeled Impacts	Significant Impact Levels	Significant Monitoring Levels
CO	1991	1-hour	737.6	2000.0	a
CO	1994	8-hour	217.3	500.0	575.0
NO_2	1991	Annual	4.3	1.0	14.0
SO_2	1994	3-hour	130.3	25.0	a
SO_2	1992	24-hour	64.8	5.0	13.0
SO_2	1991	Annual	5.4	1.0	a
PM_{10}	1994	24-hour	9.6	5.0	10.0
PM_{10}	1990	Annual	1.2	1.0	a

a No limit exists for this time-averaged period; **bolded numbers** require refined modeling

Modeled concentrations for NO_2, PM_{10}, and SO_2 at all applicable time-averaged periods were above the significant impact levels and SO_2 was above the significant monitoring de minimis level. Refined modeling was required for NO_2, PM_{10}, and SO_2. No additional modeling was required for CO.

Background Concentrations

Background concentrations for use in the NAAQS analysis were required since the results of the modeling for NO_2, PM_{10}, and SO_2 concentrations exceeded their significant impact levels. The background concentrations are listed below in Table 3.

TABLE 3 – Background Concentrations (ug/m3)			
Pollutant	Monitor Location	Time-Averaging Period	Monitored Concentrations
NO_2	Naval Avionics Center, Indpls (Marion Co)	Annual	34.2
SO_2	North of SR 234 East (Fountain Co)	2nd Highest 3-hr	327.5
SO_2	North of SR 234 East (Fountain Co)	2nd Highest 24-hr	128.4
SO_2	North of SR 234 East (Fountain Co)	Annual	16.2
PM_{10}	1600 Hulman St (Vigo Co)	2nd Highest 24-hr	55
PM_{10}	1600 Hulman St (Vigo Co)	Annual	26.3

Part C – Analysis of Source Impact on NAAQS and PSD Increment

NAAQS Compliance Analysis and Results

Emission inventories of NO_2, SO_2, and PM_{10} sources in Indiana within a 50 kilometer radius of Nucor Steel, taken from the OAQ emission statement database as required by 326 IAC 2-6, were supplied to the consultants. EPA and OAQ have approved a screening method, using the ISCST3 model, to eliminate NO_2, SO_2, and PM_{10} NAAQS sources and NO_2, SO_2, and PM_{10} PSD sources from the inventory that have no significant impact in the source significant impact area for each pollutant. This method modeled all NO_2, SO_2, and PM_{10} NAAQS and PSD sources in the 50 kilometer radius from the site. Any source that has modeled concentrations less than the significant impact level in the significant impact area of Nucor Steel was removed from the NAAQS and PSD inventories. Sources which did not screen out of the NAAQS and PSD inventories were included in the NO_2, SO_2, and PM_{10} refined air quality modeling. A summary of the screening results is listed in the permit application. In addition, URS included sources within close proximity to the Nucor Steel property in the refined modeling.

NAAQS modeling was conducted to compare to each pollutants respective NAAQS limits. OAQ modeling results are shown in Table 4. All maximum concentrations of NO_2, SO_2, and PM_{10} for every time-averaged period were below their respective NAAQS limit and further modeling was not required.

TABLE 4 – National Ambient Air Quality Standards Analysis Nucor Steel – Montgomery County (ug/m3)						
Pollutant	Year	Time-Averaging Period	Modeled Source Impacts	Background	Total	NAAQS Limits
NO_2	1991	Annual	14.1	34.2	48.3	100
SO_2	1994	Highest 2nd, high 3-	173.1	327.5	500.6	1300
SO_2	1990	Highest 2nd, high	62.8	128.4	191.2	365
SO_2	1991	Annual	8.4	16.2	24.6	80
PM_{10}	1994	Highest 2nd, high	29.4	55	84.4	150
PM_{10}	1990	Annual	6.2	26.3	32.5	50

PSD Compliance Analysis and Results

Maximum allowable increases (PSD increments) are established by 326 IAC 2-2 for NO_2, PM_{10}, and SO_2 . This rule limits a source to no more than 80% of the available PSD increment to allow for future growth. Since the impacts for NO_2, PM_{10}, and SO_2 from Nucor Steel were modeled above the significant impact levels, a PSD increment analysis for the existing major sources in Montgomery County and its surrounding counties was required. All PSD sources in Montgomery County and surrounding counties from Nucor Steel were screened.

326 IAC 2-2-6 describes the availability of PSD increment and maximum allowable increases as "increased emissions caused by the proposed major PSD source…will not exceed 80% of the available maximum allowable increase over the baseline concentrations for sulfur dioxide, particulate matter and nitrogen dioxide…". The baseline concentrations were determined from modeling the existing PSD sources that impact the Nucor Steel significant impact area. Table 5 shows the results of the PSD increment analysis for NO_2, SO_2, and PM_{10}. NO_2, SO_2, and PM_{10} (Annual) modeled concentrations were below the PSD increments. No further modeling was necessary for those time averaging periods.

TABLE 5 – Prevention of Significant Deterioration Analysis for Nucor Steel – Montgomery County (ug/m3)

Pollutant	Year	Time-Averaging Period	Modeled Source Impacts	PSD Increment	Impact on PSD Increments
NO_2	1991	Annual	14.1	25	56.3%
SO_2	1994	Highest 2nd, high 3-hour	173.1	512	33.8%
SO_2	1990	Highest 2nd, high 24-hour	61.3	91	67.3%
SO_2	1991	Annual	7.5	20	37.7%
PM_{10}	1994	Highest 2nd, high 24-hour	29.4	30	**97.8%**
PM_{10}	1990	Annual	6.2	17	36.7%

However, one or more values for the 24-hour time averaging period for PM_{10} was above the 80% available increment. A more detailed analysis was performed to verify that the predicted impact from Nucor does not exceed 80% of the available increment. An example of the process is provided below:

1. In 1994, one receptor was identified with a high second high concentration that was above 24.0 ug/m3 (80% of available increment). This receptor had a predicted high second high concentration of 28.85 ug/m3.

2. The predicted impact at this receptor was evaluated in order to determine the contribution from the plant modification and the concentration from all other sources. This showed that the contribution from existing sources was 27.41 ug/m3.

3. Based on the impact from other sources, the increment available was computed by subtracting the existing source impact from the total allowable impact of 30 ug/m3 and multiplying the result by 0.8. For this receptor, the available increment was computed to be 2.07 ug/m3 [(30-27.41) x 0.8].

4. The available increment was then compared to the concentration contributed by the plant

modification to assure that the available increment was not consumed. In this case, the modification concentration was 1.44 ug/m3, which is less than the available increment of 2.07.

This process was repeated for all receptors with a highest second high, highest third high, or highest fourth high over 24.0 ug/m3. The results of this analysis (Table 6) show that the Nucor modification has not violated the increment for the 24-hour time averaging period for PM_{10}.

TABLE 6 – PM10 (24-Hour) Increment Analysis for Nucor Steel, Montgomery County (ug/m3)

Year	Date	Total Concentration	Rank	Increment Consumed by Existing Sources	80% of Available Increment	Plant Modification Concentration	Violates Increment Levels
1990	6/27	24.2287	H3H	23.43	5.26	0.8	No
1990	7/4	25.25892	H2H	23.94	4.85	1.32	No
1990	7/21	27.73905	H2H	26.42	2.86	1.32	No
1990	7/21	24.43865	H2H	23.38	5.30	1.06	No
1990	8/27	25.19353	H4H	23.28	5.38	1.91	No
1990	9/6	25.87009	H3H	24.03	4.78	1.84	No
1990	9/6	24.0322	H3H	22.03	6.38	2.0	No
1990	10/31	24.5948	H2H	22.41	6.07	2.18	No
1991	6/10	24.2944	H2H	23.25	5.40	1.04	No
1992	3/2	24.44841	H2H	23.14	5.49	1.31	No
1992	7/28	24.58818	H2H	23.2	5.44	1.39	No
1992	10/30	27.14601	H2H	26.55	2.76	0.6	No
1994	1/3	25.59303	H2H	24.91	4.07	0.68	No
1994	6/2	24.86665	H3H	24.3	4.56	0.57	No
1994	8/25	24.07051	H2H	22.48	6.02	1.59	No
1994	8/26	28.84806	H2H	27.41	2.07	1.44	No
1994	8/26	27.54714	H2H	25.82	3.34	1.73	No
1994	8/26	26.35009	H2H	24.97	4.02	1.38	No
1994	8/26	25.34563	H2H	23.81	4.95	1.53	No
1994	8/26	25.26396	H2H	22.89	5.69	2.38	No
1994	11/16	25.22595	H2H	24.22	4.62	1.01	No

Note: 1993 did not have any predicted concentrations above 24.0 ug/m3

Part D - Ozone Impact Analysis

Ozone formation tends to occur in hot, sunny weather when NOx and VOC emissions photochemically react to form ozone. Many factors such as light winds, hot temperatures and sunlight are necessary for higher ozone production. URS submitted its own ozone transport analysis from the Nucor Steel Crawfordsville facility. This included a wind rose analysis and the Reactive Plume Model (RPM-IV) analysis, which URS has used in previous ozone analysis for other projects. The results of the wind rose analysis and the RPM-IV modeling show that any potential ozone impacts from the facility would occur to the northeast and relatively close to the facility.

OAQ Three-Tiered Ozone Review

OAQ incorporates a three-tiered approach in evaluating ozone impacts from a single source. The first step is to determine how NOx and VOC emissions from the new source compare to area-wide NOx and VOC emissions from Montgomery County as well as the surrounding counties of Boone, Clinton, Fountain, Hendricks, Parke, Putnam, and Tippecanoe. Results from this analysis show 819.5 tons/year of NOx would comprise 1.5% of the area-wide NOx emissions from point, area, on-road, non-road mobile sources and biogenic emissions (naturally-occurring emissions from trees, grass and plants). Nucor Steel's VOC emissions of 193.7 tons/year comprise less than 0.5% of the area-wide VOC emissions from the different sources listed above.

A second step is to review historical monitored data to determine ozone trends for an area and the applicable monitored value assigned to an area for designation determinations. This value is known as the design value for an area. The nearest ozone monitor within this region is the Whitestown monitor in Boone County, which is 37 kilometers or 23 miles to the northeast of the proposed site. This monitor is considered downwind of the proposed facility. The design value for the Whitestown monitor for the 1-hour ozone standard over the latest three years of monitoring data is 93 parts per billion (ppb). Wind rose analysis indicates that prevailing winds in the area occur from the southwest during the summer months of May through September when ozone formation is most likely to occur. Ozone impacts from Nucor Steel would likely fall northeast of the facility.

A third step in evaluating the ozone impacts from a single source is to estimate the source's individual impact through a screening procedure. The Reactive Plume Model-IV (RPM-IV) has been used in past air quality reviews to determine 1-hour ozone impacts from single VOC/NOx source emissions. RPM-IV is listed as an alternative model in Appendix B to the 40 Code of Federal Register Part 51, Appendix W AGuideline on Air Quality Models@. The model is unable to simulate all meteorological and chemistry conditions present during an ozone episode (period of days when ozone concentrations are high**).** Results from RPM-IV are an estimation of potential ozone impacts. Modeling for 1-hour ozone concentrations was conducted for a typical high ozone day to compare to the ozone NAAQS limit. The maximum cell concentration of ozone for each time and distance specified was used to compare to the ambient ozone. OAQ modeling results assumed the short-term emission rates of NO_2 and VOCs and are shown in Table 7. The impact (difference between the plume-injected and ambient modes) from Nucor Steel was 0.3 ppb early in the plume development.

TABLE 7 - RPM-IV Modeling for Nucor Steel – Montgomery County				
Time	**Distance**	**Ambient**	**Plume-Injected**	**Source Impact**
(hours)	(meters)	(ppb)	(ppb)	(ppb)
700	118	51.0	51.3	0.3
800	6390	65.1	65.4	0.3
900	13700	80.1	80.0	-0.1
1000	20800	95.6	95.3	-0.3
1100	27500	111.0	110.0	-1.0
1200	36200	121.0	122.0	1.0
1300	48400	128.0	127.0	-1.0
1400	62200	132.0	130.0	-2.0
1500	75900	133.0	130.0	-3.0
1600	88700	134.0	130.0	-4.0
1700	101000	135.0	130.0	-5.0
1759	113000	135.0	130.0	-5.0
1900	125000	135.0	130.0	-5.0

From this three-tiered approach, ozone formation is a regional issue and the emissions from Nucor Steel will represent a small fraction of NOx and VOC emissions in the area. Ozone contribution from Nucor Steel emissions is expected to be minimal. Nucor Steel ozone impact based on the emissions and modeling will have minimal impact on ozone concentrations in the area.

Part E - Hazardous Air Pollutant Analysis and Results

As part of the air quality analysis, OAQ requests data concerning the emission of 188 Hazardous Air Pollutants (HAPs) listed in the 1990 Clean Air Act Amendments which are either carcinogenic or otherwise considered toxic. These substances are listed as air toxic compounds on the State of Indiana, Department of Environmental Management, Office of Air Quality=s construction permit application Form Y. Any one HAP over 10 tons/year or all HAPs with total emissions over 25 tons/year will be subject to toxic modeling analysis. OAQ performed toxic modeling using the ISCST3 model for all HAPs. Maximum 8-hour concentrations were determined and the concentrations were recorded as a percentage of each HAP Permissible Exposure Limit (PEL). The PELs were established by the Occupational Safety and Health Administration (OSHA) and represent a worker=s exposure to a pollutant over an 8-hour work day or a 40-hour work week. In Table 8 below, the results of the HAP analysis with the emission rates, modeled concentrations and the percentages of the PEL for each HAP are listed. All HAP concentrations except Cadmium were modeled below 0.5% of their respective PELs. The 0.5% of the PEL represents a safety factor of 200 taken into account when determining the health risk of the general population.

TABLE 8 - HAPs Analysis for Nucor Steel

Hazardous Air Pollutants	Total HAP Emissions	Maximum 8-hour concentrations	PEL	0.5 % PEL	Modeled Percent of PEL
	(tons/year)	(ug/m3)	(ug/m3)	(ug/m3)	(%)
Antimony	0.13	0.02024	500	2.5	0.004048
Arsenic	0.0029	0.00043	10	0.05	0.0043
Benzene	0.0005	0.00038	3200	16	0.000011875
Beryllium	0.0014	0.00022	2	0.01	0.0065
Cadmium	0.028	0.00445	5	0.025	**0.089**
Chromium	0.2	0.03146	500	2.5	0.006292
Cobalt	0.041	0.00656	100	0.5	0.00656
Dichlorobenzene	0.0003	0.00022	450	2.25	0.00004889
Formaldehyde	0.016	0.01369	930	4.65	0.001472043
Hexane	0.39	0.32662	1800000	9000	0.00001815
Lead	0.0001	0.0001	50	0.25	0.0002
Manganese	3.3	0.52356	5000	25	0.0104712
Mercury	0.014	0.00224	100	0.5	0.00224
Naphthalene	0.0001	0.00011	50000	250	0.00000022
Nickel	0.24	0.03847	1000	5	0.003847
Toluene	0.0008	0.00063	750000	3750	0.000000084
Selenium	0.029	0.00454	200	1	0.00227

Part F - Additional Impact Analysis

PSD regulations require additional impact analysis be conducted to show that impacts associated with the facility would not adversely affect the surrounding area. The Nucor Steel PSD permit application for modification provided an additional impact analysis performed by URS Corporation. This analysis included an impact on soils, vegetation and visibility and is listed in Section 6 of their application.

Economic Growth and Impact of Construction Analysis

Secondary emissions are not expected to significantly impact the area as all roadways will be paved. Industrial and residential growth is predicted to have negligible impact in the area since it will be dispersed over a large area and new home construction will is not expected to significantly increase. Any commercial growth, as a result of the proposed modification, will occur at a gradual rate and will be accounted for in the background concentration measurements from air quality monitors. A minimal number of support facilities will be needed. There will be no adverse impact in the area due to industrial, residential, or commercial growth.

Soils Analysis

Secondary NAAQS limits were established to protect general welfare, which includes soils, vegetation, animals and crops. Soil types in Montgomery County are of the Miami-Crosby Silt Loams Associations (Soil Survey of Montgomery County, U.S. Department of Agriculture). The general landscape consists of Tipton Till Plain or flat terrain (1816-1966 Natural Features of Indiana - Indiana Academy of Science). According to the insignificant modeled concentrations of NO_2, SO_2 and PM_{10} and the HAPs analysis, the soils will not be adversely affected by the proposed facility.

Vegetation Analysis

Due to the agricultural nature of the land, crops in the Montgomery County area consist mainly of corn, soybeans, wheat, tall fescue, orchard grass, and hay (1997 Agricultural Census for Montgomery County). The maximum modeled concentrations of the proposed power facility for NO_2, SO_2 and PM_{10} are well below the threshold limits necessary to have adverse impacts on surrounding vegetation such as autumn bent, nimblewill, barnyard grass, bishopscap and horsetail milkweed (Flora of Indiana - Charles Deam). Livestock in the county consist mainly of hogs, beef and milk cows, and sheep (1997 Agricultural Census for Montgomery County) and will not be adversely impacted from Nucor. Trees in the area are mainly Beech, Maple, Oak and Hickory. These are hardy trees and due to the insignificant modeled concentrations, no significant adverse impacts are expected.

Federal and State Endangered Species Analysis

Federally endangered or threatened species as listed in the U.S. Fish and Wildlife Service , Division of Endangered Species for Indiana include 12 species of mussels, 4 species of birds, 2 species of bat and butterflies and 1 specie of snake. The mussels and birds listed are commonly found along major rivers and lakes while the bats are found near caves. The agricultural nature of the land overall has disturbed the habitats of the butterflies and snake. The PSD application is for an existing facility and is not expected to further impact the area.

Federally endangered or threatened plants as listed in the U.S. Fish and Wildlife Service, Division of Endangered Species for Indiana list two threatened and one endangered species of plants. The endangered plant is found along the sand dunes in northern Indiana while the two threatened species do not thrive on cultivated or grazing land. The facility is not expected to impact the area.

The state of Indiana=s list of endangered, special concern and extirpated nongame species, as listed in the Department of Natural Resources, Division of Fish and Wildlife, contains species of birds, amphibians, fish, mammals, mollusks and reptiles which may be found in the area of the Nucor Steel proposed facility. However, the impacts are not expected to have any additional adverse effects on the habitats of the species than what has already occurred from the agricultural activity in the area.

Additional Analysis Conclusions

The nearest Class I area to Nucor is the Mammoth Cave National Park in Kentucky. This park is located approximately 410 kilometers southwest of the facility. Since this Class I area is located more than 100 kilometers from this Class I area no analysis is required.

The results of the additional impact analysis conclude the Nucor Steel's proposed power facility will have no adverse impact on soils, vegetation, endangered or threatened species or visibility on any Class I area.