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

Mitchell E. Daniels, Jr.
Governor

Thomas W. Easterly
Commissioner

100 North Senate Avenue
Indianapolis, Indiana 46204
(317) 232-8603
(800) 451-6027
www.IN.gov/idem

TO: Interested Parties / Applicant

DATE: April 27, 2006

RE: Nucor Steel / 107-21359-00038

FROM: Nisha Sizemore
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, 100 North Senate Avenue, Government Center North, Room 1049, 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 1/10/05

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Mr. David Sulc
Nucor Steel
4537 South Nucor Road
Crawfordsville, IN 47933

April 27, 2006

Re: Significant Source Modification (PSD)
107-21359-00038

Dear Mr. Sulc:

Nucor Steel – Crawfordsville submitted their Part 70 permit application for a steel mill 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 IDEM OAQ. An application was received on May 27, 2005, for a modification. The proposed modification will consist of the following:

(a) The Strip Caster (Castrip) Line will increase the throughput of molten metal from the existing electric arc furnaces (EAF) to a maximum rate of 270 tons per hour. The maximum molten metal production rate from the electric arc furnaces shall remain 502 tons per hour.

(b) The vacuum degasser increased capacity to 270 tons of steel per hour.

(c) The PSD BACT for the vacuum degasser and Castrip are being re-evaluated and modified.

(d) The addition of one ladle preheater, LP3, to the existing Castrip Line. The ladle preheater is used to preheat ladles to prevent rapid cooling and solidification of molten steel during tapping operations.

The Castrip LMS system was originally permitted as part of SSM 107-12143-00038 issued on January 19, 2001.

The modification also includes a vacuum degasser used with the Castrip Line originally permitted as SSM 107-18314-00038) issued on May 27, 2004.

Pursuant to the provisions of 326 IAC 2-7-10.5, a significant source modification is hereby approved as described in the attached Technical Support Document.

All other conditions of the permit shall remain unchanged and in effect.

This decision is subject to the Indiana Administrative Orders and Procedures Act - IC 4-21.5-3-5. If you have any questions on this matter call (800) 451-6027 and ask for Lawrence Stapf extension 2-8427, or directly dial (317) 232-8427.

Sincerely,
Original signed by

Nisha Sizemore, Chief
Permits Branch
Office of Air Quality

LS
cc: File - Montgomery County
Montgomery County Health Department
Air Compliance Section Inspector: Dick Sekula
Compliance Data Section
Administrative and Development

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PART 70 SIGNIFICANT SOURCE MODIFICATION and PREVENTION OF SIGNIFICANT DETERIORATION OFFICE OF AIR QUALITY

Nucor Steel
4537 South Nucor Road
Crawfordsville, Indiana 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.

The Permittee must comply with all conditions of this permit. Noncompliance with any provisions of this permit is grounds for enforcement action; permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. Noncompliance with any provision of this permit, except any provision specifically designated as not federally enforceable, constitutes a violation of the Clean Air Act. It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. An emergency does constitute an affirmative defense in an enforcement action provided the Permittee complies with the applicable requirements set forth in Section B, Emergency Provisions.

This permit 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 also addresses certain new source review requirements for existing equipment and is intended to fulfill the new source review procedures pursuant to 326 IAC 2-2 and 326 IAC 2-7-10.5, applicable to those conditions.

Source Modification No.: 107-21359-00038	
Original signed by: Nisha Sizemore, Chief Permits Branch Office of Air Quality	Issuance Date: April 27, 2006 Expiration Date: April 27, 2011

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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)] [326 IAC 2-7-1(22)]

The Permittee owns and operates a steel mill.

Responsible Official:	General Manager
Source Address:	4537 South Nucor Road, Crawfordsville, Indiana 47933
Mailing Address:	4537 South Nucor Road, Crawfordsville, Indiana 47933
Phone Number:	765-364-1323
SIC Code:	3312
County Location:	Montgomery
County Status:	Attainment for all criteria pollutants
Source Status:	Part 70 Permit Program Major Source under PSD Major Source pursuant to Section 112 of the Clean Air Act One of 28 Listed Categories

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

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

(a) A strip caster line rated at a maximum steel production rate of 270 tons per hour:

(1) One (1) ladle metallurgy station (LMS) identified as LMS-2. The LMS shall be equipped with a side draft hood that has a particulate matter capture efficiency of ninety-nine percent (99%). The captured particulate matter in the gas stream shall be controlled by the LMS-2 baghouse and the gas stream shall be exhausted through the LMS-2 baghouse stack identified as S-20. The remaining uncontrolled emissions shall be exhausted through the LMS-2 roof monitor identified as S-21;

(2) One (1) tundish that feeds the molten metal from the LMS-2 ladle to one (1) continuous strip caster. The continuous strip caster shall be equipped with a canopy hood that has a particulate matter capture efficiency of ninety-eight percent (98%). The captured particulate matter in the gas stream shall be controlled by the LMS-2 baghouse and the gas stream shall be exhausted though the LMS-2 baghouse stack identified as S-20. The remaining uncontrolled emissions shall be exhausted through the LMS-2 roof monitor identified as S-21;

(3) Two (2) hot rolling stands. These stands roll the steel strips from the continuous strip caster to the desired gauge. Fugitive particulate emissions from this process are suppressed by the application of water to the steel strips;

(4) Descaling operations utilizing water to remove scale from the steel strip;

(5) Two (2) coilers. After the strip passes the rolling mill it is then rolled into coils.

Fugitive particulate emissions from this process are suppressed by the application of water to the steel coils.

The strip caster line processes molten steel at a maximum rate of 270 tons per hour from the existing electric arc furnace (EAF) and is capable of producing all grades of carbon, low-carbon, alloy, and stainless steel at various widths and thicknesses. The coiled product from the strip caster may be shipped directly to the market or may be routed through the existing hot and/or cold mill.

(b) Combustion equipment associated with the strip caster plant exhausting to the LMS-2 baghouse stack identified as S-20:

(1) One (1) natural gas-fired ladle dryer identified as LD-1. Each ladle dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 12 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(2) Two (2) natural gas-fired tundish preheaters identified as TP-1 and TP-2. Each tundish preheater shall be equipped with oxy-fuel burners, shall not exceed a maximum heat input rate of 10 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(3) Two (2) natural gas-fired transition piece preheaters, utilizing propane as back up fuel. Each preheater shall be equipped with low-NOx burners and each preheater shall not exceed a heat input capacity of 2 MMBtu per hour for a combined total capacity of 4 MMBtu per hour. These preheaters shall be used in the tundish operations located on the caster deck; and

(4) Two (2) natural gas-fired tundish nozzle preheaters identified as TNP-1 and TNP-2. Each tundish nozzle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 2 MMBtu per hour, and has the capability to utilize propane as a backup fuel.

(c) Combustion equipment associated with the strip caster plant exhausting to the LMS-2 roof monitor identified as S-21:

(1) Two (2) natural gas-fired ladle preheaters identified as LP-1 and LP-2. Each ladle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 12 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(2) One (1) natural gas-fired ladle preheater identified as LP-3, was installed in 2004. The ladle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 12 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(3) One (1) natural gas-fired ladle preheater identified as LP-4, has not yet been installed. The ladle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 12 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(4) One (1) natural gas-fired tundish dryer identified as TD-1. The tundish dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 4 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(5) One (1) natural gas-fired tundish dryer identified as TD-2. The tundish dryer shall

be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 3 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(6) One (1) natural gas-fired tundish dryer identified as TD-3. The tundish dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 1 MMBtu per hour, and has the capability to utilize propane as a backup fuel; and

(7) Two (2) natural gas-fired transition piece dryers. Each transition piece dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 0.15 MMBtu per hour, and has the capability to utilize propane as a backup fuel.

(d) Ancillary equipment associated with the strip caster plant:

(1) One (1) LMS-2 baghouse enclosed dust handling system or equivalent, for material recovery and particulate matter control;

(2) Dumping, storage, and transfer operations of raw materials for the strip caster plant;

(3) Additional transport on new and existing paved roadways and parking lots, unpaved roadways, and unpaved areas around existing raw material storage piles;

(4) One (1) contact cooling tower system with an average water flow rate of 12,000 gallons per minute;

(5) One (1) non-contact cooling tower system with an average water flow rate of 14,400 gallons per minute;

(6) One (1) gas plant that supplies oxygen, nitrogen, hydrogen and argon gases to the strip caster operations;

(7) Chemical storage tanks for sulfuric or similar acid, sodium hypochlorite or similar disinfectant, caustic, polymer, and phosphate; and

(8) Associated VTD alloy unloading, storage and feed systems:
(a) One (1) truck dump station
(b) Truck unloading/conveyors
(c) Eight (8) storage hoppers, all exhausting to a common bin vent, rated at 0.01 grains/dry standard cubic foot, into the building.

(9) One (1) contact cooling tower associated with the vacuum degasser, with an average water flow rate of 8,000 gallons per minute, with drift/mist eliminators. Emissions from this cooling tower will exhaust through a stack identified as Stack 502;

(10) One (1) non-contact cooling tower associated with the vacuum degasser, with an average water flow rate of 8,000 gallons per minute, with drift/mist eliminators. Emissions from this cooling tower will exhaust through a stack identified as Stack 504;

(e) One (1) vacuum degasser with process gas lances. This vacuum degasser has a maximum capacity of 270 tons of steel/hour. This vacuum degasser will be used to

remove entrained gases from the steel. Desulfurization and/or decarburization may also occur during the degassing process.

This vacuum degasser will use an enclosed flare to control carbon monoxide (CO) emissions. The enclosed flare burner has a maximum capacity of 2 MMBTU/hour, uses natural gas as primary fuel with propane as back up fuel, and operates with a minimum temperature of 1,400 ^{0}F. The flare only operates when the vacuum degasser is in the degassing mode (i.e. when CO must be controlled). Controlled emissions will exhaust through a stack identified as Stack 500.

(f) One (1) continuous blasting system:

(1) One (1) prototype continuous blasting unit. The blasting unit has a maximum steel processing rate of four hundred (400) feet per minute. The blasting unit shall be equipped with a cyclone for material recovery and particulate emissions from the blasting system shall exhaust through one (1) baghouse and baghouse stack identified as S-22. The baghouse stack exhausts inside the cold mill building and roof monitor, identified as S-28, will also be constructed;

(2) One (1) storage silo. The silo is equipped with a bin vent filter for material recovery and has a maximum storage capacity of one thousand (1000) cubic feet; and

(3) Changes to pickle line number 2 include change in the electrical control system and the addition or replacement of an exit end crop shear and side trimmers, an exit end scrap conveyor, an exit end pinch roll/steering unit, an exit end five roll semi bridle/pinch rolls, an exit Fife centering guide system and mechanical side guides. All would be sized consistently with the present front and exit end equipment (up to 80-inch wide), which is also consistent with the strip caster maximum width.

The blasting system cleans the steel strip and shall be in series with the existing pickle line identified as PL-2. This system can handle the products from both the existing continuous caster line and the continuous strip caster line to be installed as described above.

(g) Eighteen (18) natural gas-fired batch annealing furnaces. The installation of seventeen (17) of the furnaces was authorized pursuant to PSD permit number 107-18314-00038. The furnaces utilize propane as a backup fuel. Each batch annealing furnace shall be equipped with low-NOx burners and shall not exceed a maximum heat input rate of 4.8 MMBtu per hour. These units can handle the product from both the existing continuous caster line and the continuous strip caster line to be installed as described above.

(h) One (1) natural gas fueled low NO_x boiler, rated at 71.04 MMBtu per hour (MMBTU/hour). This boiler, identified as Boiler No. 501, shall provide steam to the vacuum degasser. Propane will be used as back up fuel. Emissions from this boiler shall exhaust through a stack identified as Stack 501.

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

A.4 Superseded Source Modifications

This source modification supersedes source modifications 107-15289-00038, PSD/SSM 107-18314-00038 and PSD/SSM 107-12143-00038 issued on April 16, 2002, May 27, 2004, and

January, 19, 2001, respectively.

SECTION B GENERAL CONSTRUCTION CONDITIONS

B.1 General Construction Conditions

(a) This approval is based on the data and information submitted by the Permittee. Any change in the design or operation of the plant that could increase emissions or change applicable air pollution control requirements may require that the approval be amended in accordance with 326 IAC 2 as set forth in condition B.5 of this approval.

(b) This approval to construct does not relieve the Permittee of the responsibility to comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated there under, as well as other applicable local, state, and federal requirements.

(c) Notwithstanding Construction Condition B.5, all requirements and conditions of this approval shall remain in effect unless modified in a manner consistent with procedures established for modifications pursuant to 326 IAC 2 (Permit Review Rules).

(d) When the facility is constructed and placed into operation, the operation conditions required by Section C and Section D shall be met.

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

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

B.3 Effective Date of the Permit

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

B.4 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.5 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 this permit 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 to each individual phase.

(b) If actual construction 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 Permittee may not begin operation until the source

modification has been revised pursuant to the provisions of that rule 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 Permittee 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 receive an Operation Permit Validation Letter from the Chief of the Permit Administration & Development Section and attach it to this document.

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

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

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

(3) If the Title V permit has not gone thru final EPA review and would be issued after the Significant Source Modification is issued, then the Modification would be added to the proposed Title V permit, and the Title V permit will issued after EPA review.

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 approval or required by an applicable requirement, any application form, report, or compliance certification submitted under this approval 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, on the attached Certification Form, with each submittal.

(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 and maintain Preventive Maintenance Plans (PMPs) upon operation. The PMP shall include the following information on each designated piece of equipment:

(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; and

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

(b) 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 PMPs do not require the certification by the “responsible official” as defined by 326 IAC 2-7-1(34).

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

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

(a) The Permittee must comply with the requirements of 326 IAC 2-7-11 or 326 IAC 2-7-12 whenever the Permittee seeks to amend or modify this approval.

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

Indiana Department of Environmental Management
Permits Branch, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

Any such application should be certified by the “responsible official” as defined by 326 IAC 2-7-1(34) only if a certification is required by the terms of the applicable rule.

(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)]

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 Exemptions), opacity shall meet the following, unless otherwise stated in this approval:

(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.

C.5 Operation of Equipment [326 IAC 2-7-6(6)]

Except as otherwise provided by statute, rule, or in this approval, all air pollution control equipment listed in this approval and used to comply with an applicable requirement shall be operated at all times that an emission unit vented to a pollution control device is in operation.

C.6 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 by using good engineering practices (GEP) pursuant to 326 IAC 1-7-3. The provisions of 326 IAC 1-7-2, 326 IAC 1-7-3(c) and (d), 326 IAC 1-7-4(d)(3), (e), and (f), and 326 IAC 1-7-5(d) are not federally enforceable.

C.7 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, except as provided in 326 IAC 2-7-16.

(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
Indianapolis, Indiana 46204-2251

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) The Permittee seeking to establish the occurrence of an emergency shall make records available upon request to ensure that failure to implement a PMP did not cause or contribute to an exceedance of any limitations on emissions. However, 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.

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

C.8 Performance Testing [326 IAC 3-6][326 IAC 2-1.1-11]

(a) Compliance testing on new emission units shall be conducted within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up, if specified in Section D of this approval. All testing shall be performed according to the provisions of 326 IAC 3-6 (Source Sampling Procedures), except as provided elsewhere in this approval, 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 approval, shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

no later than thirty-five (35) days prior to the intended test date. The Permittee shall submit a notice of the actual test date to the above address so that it is received at least two weeks prior to the test date.

(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 the 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.

The documentation submitted by the Permittee does not require certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

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

C.9 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 upon startup. The Permittee shall be responsible for installing any necessary equipment and initiating any required monitoring related to that equipment.

C.10 Instrument Specifications [326 IAC 2-1.1-11] [326 IAC 2-7-5(3)] [326 IAC 2-7-6(1)]

(a) When required by any condition of this permit, an analog instrument used to measure a parameter related to the operation of an air pollution control device shall have a scale such that the expected maximum reading for the normal range shall be no less than twenty percent (20%) of full scale.

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

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

C.11 Response to Excursions or Exceedances [326 IAC 2-7-5][326 IAC 2-7-6]

(a) Upon detecting an excursion or exceedance, the Permittee shall restore operation of the emissions unit (including any control device and associated capture system) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions.

(b) The response shall include minimizing the period of any startup, shutdown or malfunction and taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of an excursion or exceedance (other than those caused by excused startup or shutdown conditions). Corrective actions may include, but are not limited to, the following:

(1) initial inspection and evaluation;

(2) recording that operations returned to normal without operator action (such as through response by a computerized distribution control system); or

(3) any necessary follow-up actions to return operation to within the indicator range, designated condition, or below the applicable emission limitation or standard, as applicable.

(c) A determination of whether the Permittee has used acceptable procedures in response to an excursion or exceedance will be based on information available, which may include, but is not limited to, the following:

(1) monitoring results;

(2) review of operation and maintenance procedures and records;

(3) inspection of the control device, associated capture system, and the process.

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

(e) The Permittee shall maintain the following records:

(1) monitoring data;

(2) monitor performance data, if applicable; and

(3) corrective actions taken.

C.12 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 noncompliant stack tests.

The documents submitted pursuant to this condition do not 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.13 General Record Keeping Requirements [326 IAC 2-7-5(3)][326 IAC 2-7-6] [326 IAC 2-2]

(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) If there is a reasonable possibility that a "project" (as defined in 326 IAC 2-2-1 (qq)) at an existing emissions unit, which is not part of a "major modification" (as defined in 326 IAC 2-2-1 (ee)) may result in significant emissions increase and the Permittee elects to utilize the "projected actual emissions" (as defined in 326 IAC 2-2-1 (rr)), the Permittee shall comply with following:

(1) Before beginning actual construction of the "project" (as defined in 326 IAC 2-2-1 (qq)) at an existing emissions unit, document and maintain the following records:
- (A) A description of the project.
- (B) Identification of any emissions unit whose emissions of a regulated new source review pollutant could be affected by the project.
- (C) A description of the applicability test used to determine that the project is not a major modification for any regulated NSR pollutant, including:
  - (i) Baseline actual emissions;
  - (ii) Projected actual emissions;
  - (iii) Amount of emissions excluded under section 326 IAC 2-2-1(rr)(2)(A)(iii); and
  - (iv) An explanation for why the amount was excluded, and any netting calculations, if applicable.

(2) Monitor the emissions of any regulated NSR pollutant that could increase as a result of the project and that is emitted by any existing emissions unit identified in (1)(B) above; and

(3) Calculate and maintain a record of the annual emissions, in tons per year on a calendar year basis, for a period of five (5) years following resumption of regular operations after the change, or for a period of ten (10) years following resumption of regular operations after the change if the project increases the design capacity of or the potential to emit that regulated NSR pollutant at the emissions unit.

C.14 General Reporting Requirements [326 IAC 2-7-5(3)(C)] [326 IAC 2-2]

(a) The Permittee 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 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 reports required in (a) of this condition and the reports required by conditions in Section D of this approval shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

(c) Unless otherwise specified in this approval, any notice, report, or other submission required by this approval 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 approval, 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 approval and ending on the last day of the reporting period. Reporting periods are based on calendar years, unless otherwise specified in this permit. For the purpose of this permit "calendar year" means the twelve (12) month period from January 1 to December 31 inclusive.

(f) If the Permittee is required to comply with the recordkeeping provisions of (c) in Section C.14 for any "project" (as defined in 326 IAC 2-2-1 (qq)) at an existing emissions unit, and the project meets the following criteria, then the Permittee shall submit a report to IDEM, OAQ:

(1) The annual emissions, in tons per year, from the project identified in (c)(1) in Section C- General Record Keeping Requirements exceed the baseline actual emissions, as documented and maintained under Section C- General Record Keeping Requirements (c)(1)(C)(i), by a significant amount, as defined in 326 IAC 2-2-1 (xx), for that regulated NSR pollutant, and

(2) The emissions differ from the preconstruction projection as documented and maintained under Section C- General Record Keeping Requirements (c)(1)(C)(ii).

(g) If Condition C.14(c) is triggered, then report for project at an existing emissions unit shall be submitted within sixty (60) days after the end of the year and contain the following:

(1) The name, address, and telephone number of the major stationary source.

(2) The annual emissions calculated in accordance with (c)(2) and (3) in Section C- General Record Keeping Requirements.

(3) The emissions calculated under the actual-to-projected actual test stated in 326 IAC 2-2-2(d)(3).

(4) Any other information that the Permittee deems fit to include in this report,

Reports required in this part shall be submitted to:

Indiana Department of Environmental Management
Air Compliance Section, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

(h) The Permittee shall make the information required to be documented and maintained in accordance with (c) in Section C- General Record Keeping Requirements available for review upon a request for inspection by IDEM, OAQ. The general public may request this information from the IDEM, OAQ under 326 IAC 17.1.

SECTION D.1 FACILITY OPERATION CONDITIONS

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

(a) A strip caster line rated at a maximum steel production rate of 270 tons per hour:

(1) One (1) ladle metallurgy station (LMS) identified as LMS-2. The LMS-2 shall be equipped with a side draft hood that has a particulate matter capture efficiency of ninety-nine percent (99%). The captured particulate matter in the gas stream shall be controlled by the LMS-2 baghouse and the gas stream shall be exhausted through the LMS-2 baghouse stack identified as S-20. The remaining uncontrolled emissions shall be exhausted through the LMS-2 roof monitor identified as S-21;

(2) One (1) tundish feeds the molten metal from the LMS-2 ladle to one (1) continuous strip caster. The continuous strip caster shall be equipped with a canopy hood that has a particulate matter capture efficiency of ninety-eight percent (98%). The captured particulate matter in the gas stream shall be controlled by the LMS-2 baghouse and the gas stream shall be exhausted though the LMS-2 baghouse stack identified as S-20. The remaining uncontrolled emissions shall be exhausted through the LMS-2 roof monitor identified as S-21;

(3) Two (2) hot rolling stands. These stands roll the steel strip from the continuous strip caster to the desired gauge. Fugitive particulate emissions from this process are suppressed by the application of water to the steel strip;

(4) Descaling operations utilizing water to remove scale from steel strip; and

(5) Two (2) coilers. After the strip passes the rolling mill it is then rolled into coils. Fugitive particulate emissions from this process are suppressed by the application of water to the steel coils.

The strip caster line accepts molten steel at a maximum rate of 270 tons per hour from the existing electric arc furnace (EAF) and is capable of producing all grades of carbon, low-carbon, alloy, and stainless steel at various widths and thicknesses. The coiled product from the strip caster may be shipped directly to the market or may be routed through the existing hot and/or cold mill.

(b) Combustion equipment associated with the strip caster plant exhausting to the LMS-2 baghouse stack identified as S-20:

(1) One (1) natural gas-fired ladle dryer identified as LD-1. Each ladle dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 12 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(2) Two (2) natural gas-fired tundish preheaters identified as TP-1 and TP-2. Each tundish preheater shall be equipped with oxy-fuel burners, shall not exceed a maximum heat input rate of 10 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(3) Two (2) natural gas-fired transition piece preheaters, utilizing propane as back up fuel. Each preheater shall be equipped with low-NOx burners and each preheater shall not exceed a heat input capacity of 2 MMBtu per hour for a combined total capacity of 4 MMBtu per hour. These preheaters shall be used in the tundish operations located on the caster deck; and

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

(4) Two (2) natural gas-fired tundish nozzle preheaters identified as TNP-1 and TNP-2. Each tundish nozzle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 2 MMBtu per hour for a combined capacity of 4 MMBtu per hour, and has the capability to utilize propane as a backup 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

D.1.1 Particulate Matter (PM and PM_{10}) Emission Limitations

(a) Pursuant to 326 IAC 2-2 (PSD Requirements), the strip caster line shall comply with the following requirements.

(1) The ladles associated with the strip caster shall be covered with lids which shall be closed at all times when transporting molten metal in the ladles, in order to minimize uncontrolled emissions.

(2) The LMS shall be equipped with a side draft hood that evacuates particulate fumes from the LMS to the LMS-2 baghouse. The side draft hood shall have a minimum capture efficiency of ninety-nine percent (99%).

(3) The tundish and continuous strip caster shall be controlled by a canopy hood that evacuates particulate fumes to the LMS-2 baghouse. The hood shall have a minimum capture efficiency of ninety-eight percent (98%).

(4) The filterable PM/PM_{10} emissions from the LMS-2 baghouse shall not exceed 0.0117 pounds of filterable PM/PM_{10} per ton of steel processed at the LMS-2 and 0.0018 grains per dry standard cubic feet (gr/dscf) at a maximum volumetric air flow rate of 200,000 dry standard cubic feet per minute.

(5) The filterable and condensable PM/PM_{10} emissions from the LMS-2 baghouse shall not exceed 0.0338 pounds of filterable and condensable PM/PM_{10} per ton of steel processed at the LMS-2 and 0.0052 gr/dscf at a maximum volumetric air flow rate of 200,000 dry standard cubic feet per minute.

(6) The opacity from the LMS-2 baghouse stack (S-20) shall not exceed three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9) when emitted from any baghouse, roof monitor or building opening. This limitation satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).

(b) Except as otherwise provided by statute, rule, or this permit, the baghouses for PM control shall be in operation and control emissions at all times the associated equipment controlled by the baghouse are in operation.

(c) In the event that bag failure is observed in a multi-compartment baghouse, if operations will continue for ten (10) days or more after the failure is observed before the failed units will be repaired or replaced, the Permittee shall promptly notify 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.1.2 Nitrogen Oxide (NOx) Emission Limitation [326 IAC 2-2]

(a) Pursuant to 326 IAC 2-2 (PSD Requirements), the above-mentioned combustion units shall comply with the following requirements:

(1) Each combustion facility shall utilize “good combustion practices”, utilize “pipeline quality” natural gas as the primary fuel and may utilize propane as a backup fuel; and

(2) The following combustion facilities shall vent to LMS-2 Baghouse stack S-20:

Combustion Facility	No. Units	Each Unit’s Max Heat Input Rate (MMBtu/hr)	Burner Type (or equivalent)	Stack
Ladle Dryer	1	12	Low-NOx	S-20
Tundish Preheaters	2	10	Oxy-Fuel	S-20
Transition Piece Preheaters	2	2	Low-NOx	S-20
Tundish Nozzle Preheaters	2	2	Low-NOx	S-20

(b) Pursuant to 326 IAC 2-2-3 (BACT), the total emissions from the Castrip LMS-2 Baghouse stack (S-20) shall not exceed 0.19 pounds NOx per ton of steel processed at the LMS-2.

D.1.3 Carbon Monoxide (CO) Emission Limitation [326 IAC 2-2]

Pursuant to 326 IAC 2-2-3 (BACT), the total emissions from the Castrip LMS-2 Baghouse stack (S-20) shall not exceed 0.141 pound of CO per ton of steel processed at the LMS-2.

D.1.4 Sulfur Dioxide (SO2) Emission Limitation [326 IAC 2-2]

Pursuant to 326 IAC 2-2-3 (BACT), the total emissions from the Castrip LMS-2 Baghouse stack (S-20) shall not exceed 0.210 pounds SO_2 per ton of steel processed at the LMS-2.

D.1.5 Lead (Pb) Emission Limitation [326 IAC 2-2]

To avoid the requirements of 326 IAC 2-2-3 (BACT), the total emissions from the Castrip LMS-2 Baghouse stack (S-20) shall not exceed 3.30×10^{-4} pounds of Pb per ton of steel processed at the LMS-2.

D.1.6 Operation Limitations [326 IAC 2-2]

Pursuant to 326 IAC 2-2-3 (BACT), the strip caster line shall not exceed a maximum steel throughput of 2,365,200 tons per twelve (12) consecutive month period. The Permittee shall demonstrate compliance with these steel processing limits based on a consecutive twelve (12) month period.

D.1.7 Preventive Maintenance Plan

A Preventive Maintenance Plan, in accordance with Section C - Preventive Maintenance Plan, of this permit, is required for the LMS-2, the continuous strip caster and the particulate capture and control system associated with the LMS-2 and continuous strip caster.

Compliance Determination and Monitoring

D.1.8 Performance Testing

(a) Pursuant to 326 IAC 2-1.1-11 and 326 IAC 2-2, the Permittee shall perform PM/PM_{10} (filterable and condensable), NOx, CO, SO2, and Pb compliance stack tests for the LMS-2 baghouse stack (S-20) within one hundred eighty (180) days of issuance of this source modification.

(b) Pursuant to 326 IAC 2-1.1-11 and 326 IAC 2-2, the Permittee shall perform opacity compliance stack tests for the LMS-2 baghouse stack (S-20) within one hundred eighty (180) days of issuance of this source modification.

(c) Opacity tests shall be performed concurrently with the particulate compliance stack test for the LMS-2 baghouse stack, unless meteorological conditions require rescheduling the opacity tests to another date.

(d) All compliance stack tests shall be repeated at least annually until such time that the Part 70 permit for this source is in effect.

IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform additional and future compliance testing as necessary. Testing shall be conducted in accordance with Section C – Performance Testing requirements.

D.1.9 Visible Emissions Notations

(a) Visible emission notations of the LMS-2 baghouse stack exhaust shall be performed once per day 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) If abnormal emissions are observed, the Permittee shall take reasonable response steps in accordance with Section C- Response to Excursions or Exceedances. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances shall be considered a deviation from this permit.

D.1.10 Parametric Monitoring for the Baghouse, Side Draft Hood, and Canopy Hood

(a) The Permittee shall record the pressure drop across the LMS-2 baghouse, at least once per day when the associated LMS or continuous strip caster is in operation. When for any one reading, the pressure drop across the is outside the normal range of 2.0 and 8.0 inches of water or a range established during the most recent compliant stack test, the Permittee shall take reasonable response steps in accordance with Section C – Response to Excursions or Exceedances. A pressure reading that is outside the above range is not a deviation from this permit. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances, shall be considered a violation of this permit.

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

(c) The Permittee shall record the fan amperes of LMS-2 baghouse fan, at least once per day when the associated LMS or continuous strip caster is in operation. When for any one reading, the fan amperes of the capture and control system is outside the range of plus or minus fifteen percent (15%) of the rate established during the most recent compliant stack test, the Permittee shall take reasonable response steps in accordance with Section C – Response to Excursions or Exceedances. A fan amperes reading that is outside the above range is not a deviation from this permit. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances, shall be considered a violation of this permit.

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

D.1.11 Broken or Failed Bag Detection [326 IAC 2-7-5(1)] [326 IAC 2-7-6(1)]

(a) For a single compartment baghouse controlling emissions from a process operated continuously, a failed unit and the associated process shall be shut down immediately until the failed unit has been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

(b) For a single compartment baghouse controlling emissions from a batch process, the feed to the process shall be shut down immediately until the failed unit has been repaired or replaced. The emissions unit shall be shut down no later than the completion of the processing of the material in the line unless the failed unit has been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

Bag failure can be indicated by a significant drop in the baghouse's pressure reading with abnormal visible emissions, by an opacity violation, or by other means such as gas temperature, flow rate, air infiltration, leaks, dust traces or triboflows.

Recordkeeping and Reporting Requirements

D.1.12 Recordkeeping Requirement

(a) The Permittee shall maintain records of the performance tests required by Operation Condition D.1.8 to demonstrate compliance with Operation Conditions D.1.1, D.1.2, D.1.3, D.1.4, and D.1.5.

(b) The Permittee shall maintain records of the parameters stated in Operation Conditions D.1.6, D.1.9, D.1.10, and D.1.11 to demonstrate compliance with Operation Condition D.1.1.

D.1.13 Reporting Requirements

(a) The Permittee shall submit performance test protocols and performance test reports required by Operation Condition D.1.8 in accordance with the reporting requirements established in Section C - Performance Testing and Section C - General Reporting Requirements, to demonstrate compliance with Operation Conditions D.1.1, D.1.2, D.1.3, D.1.4, and D.1.5.

(b) A quarterly summary of the information to document compliance with Condition D.1.6 shall be submitted using the reporting forms located at the end of this permit, or its equivalent, within thirty (30) days after the end of the quarter being reported. These reports require a certification by the responsible official.

SECTION D.2 FACILITY OPERATION CONDITIONS

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

(c) Combustion equipment associated with the strip caster plant exhausting to the LMS-2 roof monitor identified as S-21:

(1) Two (2) natural gas-fired ladle preheaters identified as LP-1 and LP-2. Each ladle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 12 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(2) One (1) natural gas-fired ladle preheater identified as LP-3, was installed in 2004. The ladle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 12 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(3) One (1) natural gas-fired ladle preheater identified as LP-4, has not yet been installed. The ladle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 12 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(4) One (1) natural gas-fired tundish dryer identified as TD-1. The tundish dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 4 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(5) One (1) natural gas-fired tundish dryer identified as TD-2. The tundish dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 3 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(6) One (1) natural gas-fired tundish dryer identified as TD-3. The tundish dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 1 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(7) Two (2) natural gas-fired transition piece dryers. Each transition piece dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 0.15 MMBtu per hour, and has the capability to utilize propane as a backup 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

D.2.1 Nitrogen Oxides (NO_X) Emission Limitations

(a) Pursuant to 326 IAC 2-2 (PSD Requirements), the small combustion units shall comply with the following requirements:

(1) Each combustion facility shall utilize “good combustion practices”, utilize “pipeline quality” natural gas as the primary fuel and may utilize propane as a backup fuel; and

(2) The following combustion facilities shall vent to S-21 roof monitor:

Combustion Facility	No. Units	Each Unit's Max Heat Input Rate (MMBtu/hr)	Burner Type (or equivalent)	Stack
Ladle Preheaters	4	12	Low-NOx	S-21
Tundish Dryer	1	4	Low-NOx	S-21
Tundish Dryer	1	3	Low-NOx	S-21
Tundish Dryer	1	1	Low-NOx	S-21
Transition Piece Dryers	2	0.15	Low-NOx	S-21

(b) Pursuant to 326 IAC 2-2-3 (BACT), the BACT for NOx from TD-1, TD-2, TD-3 and each transition piece dryer shall be proper equipment operation, the use of low NOx burners, and NOx emission rate shall not exceed an emission rate of 0.10 pounds per MMBtu. Further, the hourly NOx emission rate shall not exceed 0.40, 0.30, and 0.10 lbs per hour for emission units TD-1, TD-2, and TD-3, respectively, and the hourly NOx emission rate shall not exceed 0.015 lbs per hour for each transition piece dryer.

(c) Pursuant to 326 IAC 2-2-3 (BACT), the BACT for NOx from each ladle preheater shall be proper operation and shall not exceed a NOx mission rate of 0.05 pounds per MMBtu and 0.60 lbs per hour.

D.2.2 Sulfur Dioxide (SO_2) Emission Limitations

Pursuant to 326 IAC 2-2-3 (BACT), the combustion units specified in Condition D.2.1(a) shall utilize "good combustion practices", utilize "pipeline quality" natural gas as the primary fuel and may utilize propane as a backup fuel. The combustion units shall comply with the following requirements:

(a) BACT for SO_2 from TD-1, TD-2, TD-3 and each transition piece dryer shall be proper operation and shall not exceed a SO_2 emission rate of 0.0006 pounds per MMBtu. Further, the hourly SO_2 emission rate shall not exceed 0.0024, 0.0018, and 0.0006 lbs per hour for emission units TD-1, TD-2, and TD-3, respectively, and the hourly SO_2 emission rate shall not exceed 0.0001 lbs per hour for each transition piece dryer.

(b) BACT for SO_2 from each ladle preheater shall be proper operation and shall not exceed a SO_2 mission rate of 0.0006 pounds per MMBtu and 0.007 lbs per hour.

D.2.3 Carbon Monoxide (CO) Emission Limitations

Pursuant to 326 IAC 2-2-3 (BACT), the combustion units specified in Condition D.2.1(a) shall utilize "good combustion practices", utilize "pipeline quality" natural gas as the primary fuel and may utilize propane as a backup fuel, and comply with the following requirements:

(a) BACT for CO from TD-1, TD-2, TD-3 and each transition piece dryer shall be proper operation and shall not exceed a CO emission rate of 0.084 pounds per MMBtu. Further, the hourly CO emission rate shall not exceed 0.336, 0.252, and 0.084 lbs per hour for emission units TD-1, TD-2, and TD-3, respectively, and the hourly CO emission rate shall not exceed 0.013 lbs per hour for each transition piece dryer.

(b) BACT for CO from each ladle preheater shall be proper operation and shall not exceed a CO emission rate of 0.084 pounds per MMBtu and 1.01 lbs per hour.

D.2.4 Particulate Matter (PM/PM10) Emission Limitations

Pursuant to 326 IAC 2-2-3 (BACT), the combustion units specified in Condition D.2.1(a) shall utilize proper operation, utilize "pipeline quality" natural gas as the primary fuel and may utilize propane as a backup fuel, and comply with the following requirements:

(a) BACT for PM/PM10 (filterable plus condensable) from TD-1, TD-2, TD-3 and each transition piece dryer shall be utilization of "good combustion practices" and shall not exceed a PM/PM10 (filterable plus condensable) emission rate of 0.0076 pounds per MMBtu. Further, the hourly PM/PM10 (filterable plus condensable) emission rate shall not exceed 0.030, 0.023, and 0.008 lbs per hour for emission units TD-1, TD-2, and TD-3, respectively, and the hourly PM/PM10 (filterable plus condensable) emission rate shall not exceed 0.0011 lbs per hour for each transition piece dryer.

(b) BACT for PM/PM10 (filterable plus condensable) from each ladle preheater shall be utilization of "good combustion practices" and shall not exceed a PM/PM10 (filterable plus condensable) emission rate of 0.0076 pounds per MMBtu and 0.091 lbs per hour.

(c) The opacity from the LMS-2 roof monitor (S-21) shall not exceed three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9). Compliance with this limitation satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).

D.2.5 Volatile Organic Compounds (VOC) Emission Limitations

Pursuant to 326 IAC 2-2-3 (BACT), the combustion units specified in Condition D.2.1(a) shall utilize "good combustion practices", utilize "pipeline quality" natural gas as the primary fuel and may utilize propane as a backup fuel, and comply with the following requirements:

(a) BACT for VOC from TD-1, TD-2, TD-3 and each transition piece dryer shall be proper operation and shall not exceed a VOC emission rate of 0.0054 pounds per MMBtu. Further, the hourly VOC emission rate shall not exceed 0.011, 0.016, and 0.005 lbs per hour for emission units TD-1, TD-2, and TD-3, respectively, and the hourly VOC emission rate shall not exceed 0.0035 lbs per hour for each transition piece dryer.

(b) BACT for VOC from each ladle preheater shall be proper operation and shall not exceed a VOC emission rate of 0.0054 pounds per MMBtu and 0.065 lbs per hour.

D.2.6 Performance Testing

Testing of the combustion units specified in Condition D.2.1(a) is not required at this time. However, IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform future compliance testing as necessary.

SECTION D.3 FACILITY OPERATION CONDITIONS

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

(d) Ancillary equipment associated with the strip caster plant:

(1) One (1) LMS-2 baghouse enclosed dust handling system or equivalent, for material recovery and particulate matter control;

(2) Dumping, storage, and transfer operations of raw materials for the strip caster plant;

(3) Additional transport on new and existing paved roadways and parking lots, unpaved roadways, and unpaved areas around existing raw material storage piles;

(4) One (1) contact cooling tower system with an average water flow rate of 12,000 gallons per minute

(5) One (1) non-contact cooling tower system with an average water flow rate of 14,400 gallons per minute;

(6) One (1) gas plant that supplies oxygen, nitrogen, hydrogen and argon gases to the strip caster operations;

(7) Chemical storage tanks for sulfuric or similar acid, sodium hypochlorite or similar disinfectant, caustic, polymer, and phosphate; and

(8) Associated VTD alloy unloading, storage and feed systems:
(a) One (1) truck dump station
(b) Truck unloading/conveyors
(c) Eight (8) storage hoppers, all exhausting to a common bin vent, rated at 0.01 grains/dry standard cubic foot, into the building.

(9) One (1) contact cooling tower associated with the vacuum degasser, with an average flow rate of 8,000 gallons/minute, with drift/mist eliminators. Emissions from this cooling tower will exhaust through a stack identified as Stack 502.

(10) One (1) non-contact cooling tower associated with the vacuum degasser, with an average flow rate of 8,000 gallons/minute, with drift/mist eliminators. Emissions from this cooling tower will exhaust through a stack identified as Stack 504.

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

Emission Limitations and Standards

D.3.1 Particulate Matter (PM and PM_{10}) Emission Limitations

(a) Pursuant to 326 IAC 2-2 (PSD Requirements), the emissions from dumping, storage, and transfer operations of raw materials shall not exceed five percent (5%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9). This limitation satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).

(b) Pursuant to 326 IAC 2-2 (PSD Requirements), the paved surface silt loading shall not exceed 16.8 pounds of silt per mile and the average instantaneous opacity from paved roadways and parking lots shall not exceed ten percent (10%). The average

instantaneous opacity shall be the average of twelve (12) instantaneous opacity readings, taken for four (4) vehicle passes, consisting of three (3) opacity readings for each vehicle pass. The three (3) opacity readings for each vehicle pass shall be taken as follows:

(1) The first reading will be taken at the time of emission generation;

(2) The second reading will be taken five (5) seconds later; and

(3) The third reading will be taken five (5) seconds later or ten (10) seconds after the first reading.

The three (3) readings shall be taken at the point of maximum opacity. The observer shall stand at least fifteen (15) feet, but no more than one-fourth (1/4) mile, from the plume and as close to approximately right angles to the plume as permissible under EPA Reference Method 9. Each reading shall be taken approximately four (4) feet above the surface of the paved roadway.

(c) Pursuant to 326 IAC 2-2 (PSD Requirements), the visible emissions from unpaved roadways and unpaved areas around raw material storage piles shall not exceed an average instantaneous opacity of ten percent (10%). The average instantaneous opacity shall be the average of twelve (12) instantaneous opacity readings, taken for four (4) vehicle passes, consisting of three (3) opacity readings for each vehicle pass. The three (3) opacity readings for each vehicle pass shall be taken as follows:

(1) The first reading will be taken at the time of emission generation;

(2) The second reading will be taken five (5) seconds later; and

(3) The third reading will be taken five (5) seconds later or ten (10) seconds after the first reading.

The three (3) readings shall be taken at the point of maximum opacity. The observer shall stand at least fifteen (15) feet, but no more than one-fourth (1/4) mile, from the plume and as close to approximately right angles to the plume as permissible under EPA Reference Method 9. Each reading shall be taken approximately four (4) feet above the surface of the unpaved roadway.

(d) Pursuant to 326 IAC 2-2 (PSD Requirements), the two (2) cooling towers shall be equipped with drift eliminators.

(e) Except as otherwise provided by statute, rule, or this permit, the VTD material handling system bin vent filters for PM control shall be in operation and control emissions at all times the associated equipment controlled by the filters are in operation.

(f) In the event that filter failure is observed in a multi-compartment filter housing, if operations will continue for ten (10) days or more after the failure is observed before the failed units will be repaired or replaced, the Permittee shall promptly notify 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.3.2 Cooling Towers PSD BACT Limits [326 IAC 2-2]

Pursuant to 326 IAC 2-2 Prevention of Significant Deterioration (PSD), the Permittee shall comply with the following Best Available Control Technology (BACT) requirements for cooling towers constructed pursuant to this permit:

(a) The drift rate from each cooling tower shall not exceed 0.005%.

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

D.3.3 VTD Alloy Handling PSD BACT [326 IAC 2-2]

(a) Pursuant to 326 IAC 2-2 Prevention of Significant Deterioration (PSD), the Permittee shall perform alloy unloading in a 3-sided building.

(b) Pursuant to 326 IAC 2-2 Prevention of Significant Deterioration (PSD), the visible emissions from the alloy unloading shall not exceed 3% opacity, based on a 6-minute average.

Compliance Determination and Monitoring

D.3.4 Control Operation [326 IAC 2-2]

The drift/mist eliminators shall be in operation at all times when the cooling towers are in operation.

D.3.5 Performance Testing

Testing of the above mentioned facilities is not required at this time. However, IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform future compliance testing as necessary.

D.3.6 Visible Emissions Notations

(a) Visible emission notations of the baghouse's enclosed dust handling system shall be performed once per week 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) If abnormal emissions are observed, the Permittee shall take reasonable response steps in accordance with Section C- Response to Excursions or Exceedances. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances shall be considered a deviation from this permit.

Recordkeeping and Reporting Requirements

D.3.7 Recordkeeping Requirement

(a) The Permittee shall maintain records of the visible emission notations stated in Operation Condition D.3.6 to demonstrate compliance with PSD requirements.

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

SECTION D.4 FACILITY OPERATION CONDITIONS

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

(e) One (1) vacuum degasser with process gas lances. This vacuum degasser has a maximum capacity of 270 tons of steel/hour. This vacuum degasser will be used to remove entrained gases from the steel. Desulfurization and/or decarburization may also occur during the degassing process.

This vacuum degasser will use an enclosed flare to control carbon monoxide (CO) emissions. The enclosed flare burner has a maximum capacity of 2 MMBTU/hour, uses natural gas as primary fuel with propane as back up fuel, and operates with a minimum temperature of 1,400 ^{0}F. The flare only operates when the vacuum degasser is in the degassing mode (i.e. when CO must be controlled). Controlled emissions will exhaust through a stack identified as Stack 500.

(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 Vacuum Degasser PSD BACT Limits [326 IAC 2-2]

Pursuant to 326 IAC 2-2 Prevention of Significant Deterioration (PSD), the Permittee shall comply with the following Best Available Control Technology (BACT) requirements:

(a) The carbon monoxide (CO) emissions from the vacuum degasser shall be controlled by a flare that uses natural gas as primary fuel, and propane as back up fuel.

(b) The carbon monoxide (CO) emissions from the vacuum degasser shall not exceed 0.075 pounds per ton of steel processed at the VTD, and 20.25 pounds per hour, based on a 3-hour block average.

(c) The sulfur dioxide (SO2) emissions from the vacuum degasser shall not exceed 0.022 pounds per ton of steel processed at the VTD, and 5.4 pounds per hour, based on a 3-hour block average.

(d) The nitrogen oxides (NOx) emissions from the vacuum degasser shall not exceed 0.0055 pounds per ton of steel processed at the VTD, and 1.35 pounds per hour, based on a 3-hour block average.

(e) The volatile organic compound (VOC) emissions from the vacuum degasser shall not exceed 0.005 pounds per ton of steel processed at the VTD, and 1.35 pounds per hour, based on a 3-hour block average.

(f) The PM/PM_{10} (filterable plus condensable) emissions from the vacuum degasser shall not exceed 0.008 grain per dry standard cubic foot, and 0.45 pounds per hour, based on a 3-hour block average.

(g) The opacity from the vacuum degasser enclosed flare stack (Stack 500) shall not exceed three percent (3%) opacity, based on a six-minute average.

D.4.2 Operational Flexibility [326 IAC 2-2]

Pursuant to 326 IAC 2-2 Prevention of Significant Deterioration (PSD), the Permittee may operate the vacuum degasser as follows:

(a) The gases can be removed from the steel after the steel has gone through the Castrip Ladle Metallurgical Station (LMS-2).
Or
(b) The gases can be removed from the steel before the steel goes through the Castrip Ladle Metallurgical Station (LMS-2).
Or
(c) The gases can be removed from the steel and the steel sent back to the Meltshop Continuous Casters for casting.
Or
(d) The steel may bypass the vacuum degassing process.

D.4.3 Flare (2 MMBTU/hour) PSD BACT Limits [326 IAC 2-2]

Pursuant to 326 IAC 2-2 Prevention of Significant Deterioration (PSD), the Permittee shall comply with the following Best Available Control Technology (BACT) requirements:

(a) The 2 million British Thermal Unit per hour (MMBTU/hour) enclosed flare burner shall use natural gas as primary fuel and propane as back up fuel.

(b) The collateral nitrogen oxide (NO_x) emissions from the 2 MMBTU/hour flare burner shall not exceed 0.10 pounds per MMBTU. The NOx emissions from the 2 MMBTU/hour flare burner shall not exceed 0.005 pounds per ton of steel, and 0.675 pounds per hour, based on a 3-hour block average.

(c) The collateral sulfur dioxide (SO_2) emissions from the 2 MMBTU/hour flare burner shall not exceed 0.0006 pounds per MMBTU. The SO_2 emissions from the 2 MMBTU/hour flare burner shall not exceed 0.02 pounds per ton of steel, and 2.7 pounds per hour, based on a 3-hour block average.

(d) The collateral carbon monoxide (CO) emissions from the 2 MMBTU/hour flare burner shall not exceed 0.084 pounds per MMBTU. The CO emissions from the 2 MMBTU/hour flare burner shall not exceed 0.075 pounds per ton of steel, and 10.125 pounds per hour, based on a 3-hour block average.

(e) The collateral volatile organic compound (VOC) emissions from the 2 MMBTU/hour flare burner shall not exceed 0.0055 pounds per MMBTU. The VOC emissions from the 2 MMBTU/hour flare burner shall not exceed 0.005 pounds per ton of steel, and 0.675 pounds per hour, based on a 3-hour block average.

(f) The opacity from the vacuum degasser stack (500) shall not exceed three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9). This limitation satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).

(g) The collateral PM/PM_{10} (filterable plus condensable) emissions from the 2 MMBTU/hour flare burner shall not exceed 0.0076 pounds per MMBTU. The PM/PM_{10} emissions from the 2 MMBTU/hour flare burner shall not exceed 0.008 grain per dry standard cubic foot, and 0.45 pounds per hour, based on a 3-hour block average.

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

A Preventive Maintenance Plan (PMP), in accordance with Section C - Preventive Maintenance Plan (PMP), of this permit, is required for the vacuum degasser and its associated control device, a flare.

Compliance Determination and Monitoring [326 IAC 2-1.1-11]

D.4.5 Control Equipment Operation [326 IAC 2-2]

The flare shall be in operation and control carbon monoxide (CO) emissions at all times when the vacuum degasser is in operation.

D.4.6 Testing Requirements [326 IAC 2-7-6(1),(6)] [326 IAC 2-1.1-11] [326 IAC 2-2]

(a) Within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up of the vacuum degasser and enclosed flare, the Permittee shall perform carbon monoxide (CO) testing on Stack 500 to show compliance with Condition D.4.3(d).

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

(c) 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.4.7 Flare Operating Parameters [326 IAC 2-7-5] [326 IAC 2-7-6]

(a) The flare for the carbon monoxide (CO) emissions reductions shall be operated with a flame present at all times when the vacuum degasser is in operation.

(b) The presence of a flare pilot flame shall be monitored using a thermocouple or any equivalent device to detect the presence of the flame.

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

D.4.8 Record Keeping Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

(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) 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.5 FACILITY OPERATION CONDITIONS

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

(f) One (1) continuous blasting system:

(1) One (1) prototype continuous blasting unit. The blasting unit has a maximum steel processing rate of 400 feet per minute. The blasting unit shall be equipped with a cyclone for material recovery and particulate emissions from the blasting system shall exhaust through one (1) baghouse and baghouse stack identified as S-22. The baghouse stack exhausts inside the cold mill and roof monitor, identified as S-28, will also be constructed;

(2) One (1) storage silo. The silo is equipped with a bin vent filter for material recovery and has a maximum storage capacity of 1000 cubic feet; and

(3) Changes to pickle line number 2 include change in the electrical control system and the addition or replacement of an exit end crop shear and side trimmers, an exit end scrap conveyor, an exit end pinch roll/steering unit, an exit end five roll semi bridle/pinch rolls, an exit Fife centering guide system and mechanical side guides. All would be sized consistently with the present front and exit end equipment (up to 80- inch wide), which is also consistent with the strip caster maximum width.

The blasting system cleans the steel strip and shall be in series with the existing pickle line identified as PL-2. This system can handle the products from both the existing continuous caster line and the continuous strip caster line to be installed as described above.

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

Emission Limitations and Standards

D.5.1 Particulate Matter (PM and PM_{10}) Emission Limitations

(a) Pursuant to 326 IAC 2-2 (PSD Requirements), the continuous blasting unit shall comply with the following requirements:

(1) The continuous blasting unit shall be equipped with one (1) cyclone for product recovery and one (1) baghouse for particulate matter control;

(2) The filterable and condensables PM/PM_{10} emissions from the continuous blasting unit baghouse shall not exceed 0.003 grains per dry standard cubic feet (gr/dscf) at a maximum volumetric air flow rate of 36,000 standard cubic feet per minute;

(3) The opacity from the cold mill building containing the continuous blasting unit baghouse shall not exceed three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9). This limitation satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).

(b) Pursuant to 326 IAC 2-2 (PSD Requirements), the storage silo shall comply with the following requirements:

(1) The storage silo shall be equipped with one (1) bin vent for product recovery and

particulate matter control;

(2) The filterable PM/PM_{10} emissions from the storage silo bin vent shall not exceed 0.01 grains per dry standard cubic feet (gr/dscf) at a maximum volumetric air flow rate of 1,000 standard cubic feet per minute; and

(3) The opacity from the cold mill building containing the storage silo bin vent shall not exceed three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9). This limitation satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).

(c) Pursuant to 326 IAC 6-3 (Particulate Emission Limitations for Process Operations), the filterable PM emissions from the continuous blasting system shall not exceed 48.6 pounds per hour when operating at the maximum process weight rate of 75 tons of steel per hour and blasting rate of 1 ton per hour.

The pounds per hour limitation was calculated using the following equation:

$E = 55.0P^{0.11} - 40$ where: E = Rate of emissions in pounds per hour; and
P = Process weight rate in tons per hour.

The above equation shall be used for extrapolation of the data for process weight rates in excess of 60,000 pounds per hour.

(d) Except as otherwise provided by statute, rule, or this permit, the bin vent filters for PM control shall be in operation and control emissions at all times the associated equipment controlled by the filters are in operation.

(e) In the event that filter failure is observed in a multi-compartment filter housing, if operations will continue for ten (10) days or more after the failure is observed before the failed units will be repaired or replaced, the Permittee shall promptly notify 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.5.2 Operation Limitations

Pursuant to 326 IAC 2-2 (PSD Requirements), the pickle line and the continuous blasting system shall not be operated in a parallel arrangement.

D.5.3 Preventive Maintenance Plan

A Preventive Maintenance Plan, in accordance with Section C - Preventive Maintenance Plan, of this permit, is required for the cyclone and baghouse to the continuous blasting unit and for the bin vent filter to the storage silo.

Compliance Determination and Monitoring:

D.5.4 Performance Testing

(a) Pursuant to 326 IAC 2-1.1-11 and 326 IAC 2-2, the Permittee shall perform filterable and condensable PM/PM10 compliance stack tests for the continuous blasting unit stack (S-22) within one hundred eighty (180) days of issuance of this source modification.

(b) Pursuant to 326 IAC 2-1.1-11 and 326 IAC 2-2, the Permittee shall perform opacity tests of the Cold Mill building while the continuous blasting unit is operating within one hundred eighty (180) days of issuance of this source modification.

(c) Opacity tests shall be performed concurrently with the particulate compliance stack test for the continuous blasting unit, unless meteorological conditions require rescheduling the opacity tests to another date.

(d) IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform additional and future compliance testing as necessary.

D.5.5 Visible Emissions Notations

(a) Visible emission notations of the baghouse stack to the continuous blasting unit and the bin vent to the silo shall be performed once per week 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) If abnormal emissions are observed, the Permittee shall take reasonable response steps in accordance with Section C- Response to Excursions or Exceedances. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances shall be considered a deviation from this permit.

D.5.6 Parametric Monitoring

(a) The Permittee shall record the pressure drop across the baghouse to the continuous blasting unit at least once per day when the associated blasting process is in operation. When for one reading, the pressure drop across the baghouse is outside the normal range of 4.0 and 10.0 inches of water or a range established during the most recent compliant stack test, the Permittee shall take reasonable response steps in accordance with Section C – Response to Excursions or Exceedances. A pressure reading that is outside the above mentioned range is not a deviation from this permit. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances, shall be considered a deviation from this permit.

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

D.5.7 Broken or Failed Bag Detection

(a) For a single compartment baghouse controlling emissions from a process operated continuously, a failed unit and the associated process shall be shut down immediately until the failed unit has been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

(b) For a single compartment baghouse controlling emissions from a batch process, the feed to the process shall be shut down immediately until the failed unit has been repaired or replaced. The emissions unit shall be shut down no later than the completion of the processing of the material in the line. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency

provisions of this permit (Section B - Emergency Provisions).

Bag failure can be indicated by a significant drop in the filter's pressure reading with abnormal visible emissions, by an opacity violation, or by other means such as gas temperature, flow rate, air infiltration, leaks, dust traces or triboflows.

Recordkeeping and Reporting Requirements

D.5.8 Recordkeeping Requirement

(a) The Permittee shall submit performance test protocols and performance test reports required by Operation Condition D.5.4 in accordance with the reporting requirements established in Section C - Performance Testing and Section C - General Reporting Requirements, to demonstrate compliance with Operation Condition D.5.1.

(b) A quarterly summary of the information to document compliance with Operation Conditions D.5.4, D.5.5, D.5.6 and D.5.7 shall be submitted using the reporting forms located at the end of this permit, or its equivalent, within thirty (30) days after the end of the quarter being reported. These reports require a certification by the responsible official.

D.5.9 Reporting Requirement

The Permittee shall submit performance test protocols and performance test reports required by Operation Conditions D.5.4 in accordance with the reporting requirements established in Section C - Performance Testing and Section C - General Reporting Requirements, to demonstrate compliance with Operation Conditions D.5.1(a)(2) and (3).

SECTION D.6 FACILITY OPERATION CONDITIONS

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

(g) Eighteen (18) natural gas-fired batch annealing furnaces. The installation of seventeen (17) of the furnaces was authorized pursuant to PSD Permit number 107-8314-00038. The furnaces utilize propane as a backup fuel. Each batch annealing furnace shall be equipped with low-NOx burners and shall not exceed a maximum heat input rate of 4.8 MMBtu per hour. These units can handle the product from both the existing continuous caster line and the continuous strip caster line to be installed as described above.

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

Emission Limitations and Standards

D.6.1 Nitrogen Oxides (NO_X) and CO Emission Limitations

Pursuant to 326 IAC 2-2 (PSD Requirements), the eighteen (18) batch annealing furnaces shall comply with the following requirements:

(a) Each batch annealing furnace shall be equipped with low-NOx burners;

(b) Each batch annealing furnace shall utilize natural gas as the primary fuel and may utilize propane as a backup fuel;

(c) The NOx emissions from each batch annealing furnace shall not exceed 0.10 pounds per MMBtu; and

(d) The CO emissions from each batch annealing furnace shall not exceed 0.084 pound per MMBtu.

D.6.2 Sulfur Dioxide (SO_2) Emission Limitations

Pursuant to 326 IAC 2-2 (PSD Requirements), the above-mentioned additional batch annealing furnaces shall utilize natural gas as the primary fuel and may utilize propane as a backup fuel.

Compliance Determination and Monitoring

D.6.3 Performance Testing

(a) IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform additional and future compliance testing as necessary.

D.6.4 Vendor Certification

The Permittee shall submit with the affidavit of construction (Condition B.5(a)) the vendor guarantees for the above-mentioned batch annealing furnaces to demonstrate compliance with Operation Conditions D.6.1(a), (c), and (d).

Recordkeeping and Reporting Requirements

D.6.5 Recordkeeping Requirement

The Permittee shall maintain records of the parameters required by Operation Condition D.6.3 to demonstrate compliance with Operation Condition D.6.1.

D.6.6 Reporting Requirement

The Permittee shall submit performance test protocols and performance test reports required by Operation Condition D.6.3 in accordance with the reporting requirements established in Section C - Performance Testing and Section C - General Reporting Requirements, to demonstrate compliance with Operation Condition D.6.1(c) and (d).

SECTION D.7 FACILITY OPERATION CONDITIONS

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

(h) One (1) natural gas fueled low NO_x boiler, rated at 71.04 million British Thermal Unit per hour (MMBTU/hour). This boiler, identified as Boiler No. 501, will provide steam to the vacuum degasser. Propane will be used as back up fuel. Emissions from this boiler will exhaust through a stack identified as Stack 501.

(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 Boiler No. 501 PSD BACT Limits [326 IAC 2-2]

Pursuant to 326 IAC 2-2 Prevention of Significant Deterioration (PSD), the Permittee shall comply with the following Best Available Control Technology (BACT) requirements:

(a) Boiler No. 501 shall use natural gas as primary fuel and propane as backup fuel.

(b) The nitrogen oxides (NO_x) emissions from Boiler No. 501 shall not exceed 0.035 pounds per MMBTU.

(c) The carbon monoxide (CO) emissions from Boiler No. 501 shall not exceed 0.061 pounds per MMBTU.

(d) The volatile organic compound (VOC) emissions from Boiler No. 501 shall not exceed 0.0026 pounds per MMBTU.

(e) The sulfur dioxide (SO_2) emissions from Boiler No. 501 shall not exceed 0.0006 pounds per MMBTU.

(f) The PM/PM_{10} (filterable and condensable) emissions from Boiler No. 501 shall not exceed 0.0076 pounds per MMBTU.

D.7.2 General Provisions Relating to NSPS and NESHAP
[326 IAC 12-1][40 CFR Part 60, Subpart A] [326 IAC 20-1-1] [40 CFR Part 63, 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 Boiler No. 501, except when otherwise specified in 40 CFR Part 60, Subpart Dc.

(b) The provisions of 40 CFR Part 63, Subpart A (General Provisions), which are incorporated by reference in 326 IAC 20-1-1, apply to Boiler No. 501, except when otherwise specified in 40 CFR Part 63, Subpart DDDDD.

D.7.3 National Emission Standards for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers and Process Heaters [40 CFR Part 63, Subpart DDDDD]

(a) Boiler No. 501 is subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers and Process Heaters, (40 CFR 63, Subpart DDDDD), and considered a new affected source because Boiler No. 501 is going to be constructed after January 13, 2003 and will be use for manufacturing and processing to provide steam.

(b) The definitions of 40 CFR 63, Subpart DDDDD at 40 CFR 63.7575 are applicable to

Boiler No. 501.

(c) Pursuant to 40 CFR Part 63.7500 and Table 1 to Subpart DDDDD, upon start up, the Permittee shall maintain the carbon monoxide (CO) emissions from Boiler No. 501 at or below an exhaust concentration of 400 parts per million (ppm) by volume on a dry basis corrected to 3% oxygen (3-run average for units less than 100 MMBTU/hour).

D.7.4 Startup, Shutdown or Malfunction Plan (SSMP) [40 CFR Part 63, Subpart DDDDD]

(a) Pursuant 40 CFR Part 63.7505(e), the Permittee shall develop and implement a written startup, shutdown and malfunction plan (SSMP) for carbon monoxide (CO) according to the provisions of 40 CFR Part 63.6(e)(3).

(b) Pursuant to 40 CFR Part 63.7540(c), during periods of startup, shutdown or malfunctions, the Permittee shall operate in accordance with the written SSMP.

(c) Pursuant to 40 CFR Part 63.7540(d), deviations that occur during a period of startup, shutdown, or malfunction are not violations if the Permittee demonstrate that operations were in accordance with the written SSMP.

D.7.5 Preventive Maintenance Plan (PMP) [326 IAC 2-7-5(13)]

(a) A Preventive Maintenance Plan (PMP), in accordance with Section C - Preventive Maintenance Plan (PMP), of this permit, is required for Boiler No. 501.

(b) To the extent the Permittee is required by 40 CFR Part 63, Subpart DDDDD to have a Startup, Shutdown or Malfunction plan (SSMP) for Boiler No. 501, such SSM Plan is deemed to satisfy the PMP requirements of 326 IAC 1-6-3 for Boiler No. 501.

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

D.7.6 Low NO_x Burners [326 IAC 2-2]

Pursuant to 326 IAC 2-2 Prevention of Significant Deterioration (PSD), the Permittee shall equip and operate Boiler No. 501 with natural gas fueled low NO_x burners and perform good combustion practices.

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

D.7.7 Initial Compliance [40 CFR Part 63, Subpart DDDDD]

Pursuant to 40 CFR Part 63.7530, the Permittee shall demonstrate initial compliance by conducting initial performance test for CO according to Table 5 of 40 CFR Part 63, Subpart DDDDD.

D.7.8 Annual Carbon Monoxide (CO) Performance Tests 40 CFR Part 63, Subpart DDDDD

Pursuant to 40 CFR Part 63.7515(a), the Permittee shall conduct a CO performance test on an annual basis. CO annual performance tests must be completed between 10 and 12 months after the previous performance test.

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

D.7.9 Initial Notification [40 CFR 63, Subpart DDDDD]

(a) Pursuant to 40 CFR 63.7545(c), the Permittee shall submit an Initial Notification no later than 120 days after the initial startup of Boiler No. 501. If the Permittee has submitted the initial notification pursuant to Prevention of Significant Deterioration Permit number 107-18314-00038, the initial notification pursuant to this condition shall be deemed completed.

(b) Pursuant to 40 CFR Part 63.7445(c)(1), the Initial Notification shall contain the information

specified in 40 CFR 63.9(b).

(c) The Initial Notification shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204

and

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

(d) The Initial Notification requires the certification by the responsible official as defined by 326 IAC 2-7-1(34).

D.7.10 Record Keeping Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

(a) Pursuant to 40 CFR 63.7555(d)(1) and 40 CFR Part 60, Subpart Dc, the Permittee shall keep records of monthly fuel used by Boiler No. 501, including the types of fuel and amount used.

(b) Pursuant to 40 CFR 63.7555(a)(1), the Permittee shall keep records of a copy of each notification and report to comply with 40 CFR Part 63, Subpart DDDDD, including all documentation supporting any Initial Notification or Notification of Compliance Status or semiannual compliance report.

(c) Pursuant to 40 CFR Part 63.7555(a)(2), the Permittee shall keep records related to startup, shutdown and malfunction.

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

(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.

D.7.11 Vendor Certification [326 IAC 2-2]

Pursuant to 326 IAC 2-2 Prevention of Significant Deterioration (PSD), the Permittee shall obtain and submit with the Affidavit of Construction (Condition B.4) all vendor guarantees for Boiler No. 501 to demonstrate compliance with the BACT limits specified in Condition D.2.1 of this permit.

D.7.12 Reporting Requirements [326 IAC 2-1.1-11] [40 CFR 63, Subpart DDDDD]

(a) Pursuant to 40 CFR Part 63. 7550 and Table 10 to Subpart DDDDD, the Permittee shall submit a semi annual compliance report, using the Semiannual Report Form at the end of this permit or its equivalent.

(i) The first semiannual compliance report must cover the period beginning on the compliance date specified in 40 CFR Part 63.7495 and ending June 30 or December 31, whichever date is the first date that occurs at least 180 days after the compliance date that is specified for this source in 40 CFR Part 63.7595.

This first compliance report must be postmarked or delivered no later than July 31 or January 31, whichever date is the first date following the end of the first calendar half after the compliance date that is specified in 40 CFR Part 63.7495.

(ii) Each subsequent compliance report must cover the semi annual reporting period from January 1 through June 30 or the semi annual reporting period from July 1 through December 31. Each subsequent compliance report must be postmarked or delivered no later than July 31 or January 31, whichever date is the first date following the end of the semi annual reporting period.

(iii) Pursuant to 40 CFR 63.7550(c)(1-4, 6 and 9), the compliance report must contain the following information:

(A) Company name and address
(B) Responsible Official Certification
(C) Date of report and beginning and ending dates of the reporting period
(D) The total fuel used by Boiler No. 501, for each calendar month within the semi annual reporting period, including, but not limited to a description of the fuel and the total fuel usage amount.
(E) A signed statement indicating that no new type of fuel was burned.
(F) Actions taken consistent with the SSMP during start up, shutdown, or malfunction.

(b) The natural gas boiler certification for Boiler No. 501 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).

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE DATA SECTION

PART 70 SOURCE MODIFICATION CERTIFICATION

Source Name:	Nucor Steel
Source Address:	4537 South Nucor Road, Crawfordsville, Indiana 47933
Mailing Address:	4537 South Nucor Road, Crawfordsville, Indiana 47933
Source Modification No.:	107-21359-00038

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:

- ☐ Test Result (specify)
- ☐ Report (specify)
- ☐ Notification (specify)
- ☐ Affidavit (specify)
- ☐ 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:

A certification by the responsible official must be submitted with this report.

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE DATA SECTION

Part 70 Source Modification Quarterly Reporting Form

Source Name:	Nucor Steel
Source Address:	4537 South Nucor Road, Crawfordsville, Indiana 47933
Mailing Address:	4537 South Nucor Road, Crawfordsville, Indiana 47933
Source Modification No.:	107-21359-00038
Facility:	Strip Caster Line
Parameter:	Steel Throughput/Production Limitation
Limit:	2,365,200 tons steel processing per year, based on a consecutive 12-month period

YEAR:

Month	Column 1 This Month	Column 2 Previous 11 Months	Column 1 + Column 2 12 Month Total

Submitted by:
Title / Position:
Signature:
Date:
Phone:

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE BRANCH
100 North Senate Avenue
Indianapolis, Indiana 46204-2251
Phone: 317-233-5674
Fax: 317-233-5967

PART 70 OPERATING PERMIT
EMERGENCY OCCURRENCE REPORT

Source Name:	Nucor Steel
Source Address:	4537 South Nucor Road, Crawfordsville, Indiana 47933
Mailing Address:	4537 South Nucor Road, Crawfordsville, Indiana 47933
Source Modification No.:	107-21359-00038

This form consists of 2 pages **Page 1 of 2**

☐ This is an emergency as defined in 326 IAC 2-7-1(12)
- 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
- The Permittee must submit notice in writing or by facsimile within two (**2**) days (Facsimile Number: 317-233-5967), and follow the other requirements of 326 IAC 2-7-16.

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:

If any of the following are not applicable, mark N/A **Page 2 of 2**

Date/Time Emergency started:
Date/Time Emergency was corrected:
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/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:

Phone:

A certification is not required for this report.

Mail to: Permit Administration & Development Section
Office Of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204

Nucor Steel - Crawfordsville
4537 South Nucor Road
Crawfordsville, Indiana 47933

Affidavit of Construction

I, _____, being duly sworn upon my oath, depose and say:
(Name of the Authorized Representative)

1. I live in _____ County, Indiana and being of sound mind and over twenty-one (21) years of age, I am competent to give this affidavit.

2. I hold the position of _____ for _____.
(Title) (Company Name)

3. By virtue of my position with _____,I have personal
(Company Name)

knowledge of the representations contained in this affidavit and am authorized to make these representations o behalf of _____ .
(Company Name)

4. I hereby certify that Nucor Steel - Crawfordsville, 4537 South Nucor Road, Crawfordsville, Indiana 47933, completed construction of one (1) ladle preheater at the Castrip Line of their steel mill on _____in conformity with the requirements and intent of the construction permit application received by the IDEM Office of Air Quality on May 27, 2005, and as permitted pursuant to **Significant Permit Modification No. 107-21359-00038, Plant ID No. 107-00038** issued on _____.

Further Affiant said not.

I affirm under penalties of perjury that the representations contained in this affidavit are true, to the best of my information and belief.

Signature

Date

STATE OF INDIANA)
)SS
COUNTY OF _____)

Subscribed and sworn to me, a notary public in and for _____ County and State of Indiana on this _____ day of _____, 20 _____ .

My Commission expires:

Signature

Name (typed or printed)

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

Mitchell E. Daniels, Jr.
Governor

Thomas W. Easterly
Commissioner

100 North Senate Avenue
Indianapolis, Indiana 46204
(317) 232-8603
(800) 451-6027
www.IN.gov/idem

PART 70 SIGNIFICANT SOURCE MODIFICATION and PREVENTION OF SIGNIFICANT DETERIORATION OFFICE OF AIR QUALITY

Nucor Steel
4537 South Nucor Road
Crawfordsville, Indiana 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.

The Permittee must comply with all conditions of this permit. Noncompliance with any provisions of this permit is grounds for enforcement action; permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. Noncompliance with any provision of this permit, except any provision specifically designated as not federally enforceable, constitutes a violation of the Clean Air Act. It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. An emergency does constitute an affirmative defense in an enforcement action provided the Permittee complies with the applicable requirements set forth in Section B, Emergency Provisions.

This permit 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 also addresses certain new source review requirements for existing equipment and is intended to fulfill the new source review procedures pursuant to 326 IAC 2-2 and 326 IAC 2-7-10.5, applicable to those conditions.

Source Modification No.: 107-21359-00038	
Issued by: Nisha Sizemore, Chief Permits Branch Office of Air Quality	Issuance Date: April 27, 2006 Expiration Date: April 27, 2011

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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)] [326 IAC 2-7-1(22)]

The Permittee owns and operates a steel mill.

Responsible Official:	General Manager
Source Address:	4537 South Nucor Road, Crawfordsville, Indiana 47933
Mailing Address:	4537 South Nucor Road, Crawfordsville, Indiana 47933
Phone Number:	765-364-1323
SIC Code:	3312
County Location:	Montgomery
County Status:	Attainment for all criteria pollutants
Source Status:	Part 70 Permit Program Major Source under PSD Major Source pursuant to Section 112 of the Clean Air Act One of 28 Listed Categories

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

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

(a) A strip caster line rated at a maximum steel production rate of 270 tons per hour:

(1) One (1) ladle metallurgy station (LMS) identified as LMS-2. The LMS shall be equipped with a side draft hood that has a particulate matter capture efficiency of ninety-nine percent (99%). The captured particulate matter in the gas stream shall be controlled by the LMS-2 baghouse and the gas stream shall be exhausted through the LMS-2 baghouse stack identified as S-20. The remaining uncontrolled emissions shall be exhausted through the LMS-2 roof monitor identified as S-21;

(2) One (1) tundish that feeds the molten metal from the LMS-2 ladle to one (1) continuous strip caster. The continuous strip caster shall be equipped with a canopy hood that has a particulate matter capture efficiency of ninety-eight percent (98%). The captured particulate matter in the gas stream shall be controlled by the LMS-2 baghouse and the gas stream shall be exhausted though the LMS-2 baghouse stack identified as S-20. The remaining uncontrolled emissions shall be exhausted through the LMS-2 roof monitor identified as S-21;

(3) Two (2) hot rolling stands. These stands roll the steel strips from the continuous strip caster to the desired gauge. Fugitive particulate emissions from this process are suppressed by the application of water to the steel strips;

(4) Descaling operations utilizing water to remove scale from the steel strip;

(5) Two (2) coilers. After the strip passes the rolling mill it is then rolled into coils.

Fugitive particulate emissions from this process are suppressed by the application of water to the steel coils.

The strip caster line processes molten steel at a maximum rate of 270 tons per hour from the existing electric arc furnace (EAF) and is capable of producing all grades of carbon, low-carbon, alloy, and stainless steel at various widths and thicknesses. The coiled product from the strip caster may be shipped directly to the market or may be routed through the existing hot and/or cold mill.

(b) Combustion equipment associated with the strip caster plant exhausting to the LMS-2 baghouse stack identified as S-20:

(1) One (1) natural gas-fired ladle dryer identified as LD-1. Each ladle dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 12 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(2) Two (2) natural gas-fired tundish preheaters identified as TP-1 and TP-2. Each tundish preheater shall be equipped with oxy-fuel burners, shall not exceed a maximum heat input rate of 10 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(3) Two (2) natural gas-fired transition piece preheaters, utilizing propane as back up fuel. Each preheater shall be equipped with low-NOx burners and each preheater shall not exceed a heat input capacity of 2 MMBtu per hour for a combined total capacity of 4 MMBtu per hour. These preheaters shall be used in the tundish operations located on the caster deck; and

(4) Two (2) natural gas-fired tundish nozzle preheaters identified as TNP-1 and TNP-2. Each tundish nozzle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 2 MMBtu per hour, and has the capability to utilize propane as a backup fuel.

(c) Combustion equipment associated with the strip caster plant exhausting to the LMS-2 roof monitor identified as S-21:

(1) Two (2) natural gas-fired ladle preheaters identified as LP-1 and LP-2. Each ladle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 12 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(2) One (1) natural gas-fired ladle preheater identified as LP-3, was installed in 2004. The ladle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 12 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(3) One (1) natural gas-fired ladle preheater identified as LP-4, has not yet been installed. The ladle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 12 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(4) One (1) natural gas-fired tundish dryer identified as TD-1. The tundish dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 4 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(5) One (1) natural gas-fired tundish dryer identified as TD-2. The tundish dryer shall

be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 3 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(6) One (1) natural gas-fired tundish dryer identified as TD-3. The tundish dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 1 MMBtu per hour, and has the capability to utilize propane as a backup fuel; and

(7) Two (2) natural gas-fired transition piece dryers. Each transition piece dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 0.15 MMBtu per hour, and has the capability to utilize propane as a backup fuel.

(d) Ancillary equipment associated with the strip caster plant:

(1) One (1) LMS-2 baghouse enclosed dust handling system or equivalent, for material recovery and particulate matter control;

(2) Dumping, storage, and transfer operations of raw materials for the strip caster plant;

(3) Additional transport on new and existing paved roadways and parking lots, unpaved roadways, and unpaved areas around existing raw material storage piles;

(4) One (1) contact cooling tower system with an average water flow rate of 12,000 gallons per minute;

(5) One (1) non-contact cooling tower system with an average water flow rate of 14,400 gallons per minute;

(6) One (1) gas plant that supplies oxygen, nitrogen, hydrogen and argon gases to the strip caster operations;

(7) Chemical storage tanks for sulfuric or similar acid, sodium hypochlorite or similar disinfectant, caustic, polymer, and phosphate; and

(8) Associated VTD alloy unloading, storage and feed systems:
(a) One (1) truck dump station
(b) Truck unloading/conveyors
(c) Eight (8) storage hoppers, all exhausting to a common bin vent, rated at 0.01 grains/dry standard cubic foot, into the building.

(9) One (1) contact cooling tower associated with the vacuum degasser, with an average water flow rate of 8,000 gallons per minute, with drift/mist eliminators. Emissions from this cooling tower will exhaust through a stack identified as Stack 502;

(10) One (1) non-contact cooling tower associated with the vacuum degasser, with an average water flow rate of 8,000 gallons per minute, with drift/mist eliminators. Emissions from this cooling tower will exhaust through a stack identified as Stack 504;

(e) One (1) vacuum degasser with process gas lances. This vacuum degasser has a maximum capacity of 270 tons of steel/hour. This vacuum degasser will be used to

remove entrained gases from the steel. Desulfurization and/or decarburization may also occur during the degassing process.

This vacuum degasser will use an enclosed flare to control carbon monoxide (CO) emissions. The enclosed flare burner has a maximum capacity of 2 MMBTU/hour, uses natural gas as primary fuel with propane as back up fuel, and operates with a minimum temperature of 1,400 ^{0}F. The flare only operates when the vacuum degasser is in the degassing mode (i.e. when CO must be controlled). Controlled emissions will exhaust through a stack identified as Stack 500.

(f) One (1) continuous blasting system:

(1) One (1) prototype continuous blasting unit. The blasting unit has a maximum steel processing rate of four hundred (400) feet per minute. The blasting unit shall be equipped with a cyclone for material recovery and particulate emissions from the blasting system shall exhaust through one (1) baghouse and baghouse stack identified as S-22. The baghouse stack exhausts inside the cold mill building and roof monitor, identified as S-28, will also be constructed;

(2) One (1) storage silo. The silo is equipped with a bin vent filter for material recovery and has a maximum storage capacity of one thousand (1000) cubic feet; and

(3) Changes to pickle line number 2 include change in the electrical control system and the addition or replacement of an exit end crop shear and side trimmers, an exit end scrap conveyor, an exit end pinch roll/steering unit, an exit end five roll semi bridle/pinch rolls, an exit Fife centering guide system and mechanical side guides. All would be sized consistently with the present front and exit end equipment (up to 80-inch wide), which is also consistent with the strip caster maximum width.

The blasting system cleans the steel strip and shall be in series with the existing pickle line identified as PL-2. This system can handle the products from both the existing continuous caster line and the continuous strip caster line to be installed as described above.

(g) Eighteen (18) natural gas-fired batch annealing furnaces. The installation of seventeen (17) of the furnaces was authorized pursuant to PSD permit number 107-18314-00038. The furnaces utilize propane as a backup fuel. Each batch annealing furnace shall be equipped with low-NOx burners and shall not exceed a maximum heat input rate of 4.8 MMBtu per hour. These units can handle the product from both the existing continuous caster line and the continuous strip caster line to be installed as described above.

(h) One (1) natural gas fueled low NO_x boiler, rated at 71.04 MMBtu per hour (MMBTU/hour). This boiler, identified as Boiler No. 501, shall provide steam to the vacuum degasser. Propane will be used as back up fuel. Emissions from this boiler shall exhaust through a stack identified as Stack 501.

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

A.4 Superseded Source Modifications

This source modification supersedes source modifications 107-15289-00038, PSD/SSM 107-18314-00038 and PSD/SSM 107-12143-00038 issued on April 16, 2002, May 27, 2004, and

January, 19, 2001, respectively.

SECTION B GENERAL CONSTRUCTION CONDITIONS

B.1 General Construction Conditions

(a) This approval is based on the data and information submitted by the Permittee. Any change in the design or operation of the plant that could increase emissions or change applicable air pollution control requirements may require that the approval be amended in accordance with 326 IAC 2 as set forth in condition B.5 of this approval.

(b) This approval to construct does not relieve the Permittee of the responsibility to comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated there under, as well as other applicable local, state, and federal requirements.

(c) Notwithstanding Construction Condition B.5, all requirements and conditions of this approval shall remain in effect unless modified in a manner consistent with procedures established for modifications pursuant to 326 IAC 2 (Permit Review Rules).

(d) When the facility is constructed and placed into operation, the operation conditions required by Section C and Section D shall be met.

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

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

B.3 Effective Date of the Permit

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

B.4 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.5 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 this permit 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 to each individual phase.

(b) If actual construction 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 Permittee may not begin operation until the source

modification has been revised pursuant to the provisions of that rule 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 Permittee 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 receive an Operation Permit Validation Letter from the Chief of the Permit Administration & Development Section and attach it to this document.

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

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

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

(3) If the Title V permit has not gone thru final EPA review and would be issued after the Significant Source Modification is issued, then the Modification would be added to the proposed Title V permit, and the Title V permit will issued after EPA review.

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 approval or required by an applicable requirement, any application form, report, or compliance certification submitted under this approval 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, on the attached Certification Form, with each submittal.

(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 and maintain Preventive Maintenance Plans (PMPs) upon operation. The PMP shall include the following information on each designated piece of equipment:

(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; and

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

(b) 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 PMPs do not require the certification by the “responsible official” as defined by 326 IAC 2-7-1(34).

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

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

(a) The Permittee must comply with the requirements of 326 IAC 2-7-11 or 326 IAC 2-7-12 whenever the Permittee seeks to amend or modify this approval.

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

Indiana Department of Environmental Management
Permits Branch, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

Any such application should be certified by the “responsible official” as defined by 326 IAC 2-7-1(34) only if a certification is required by the terms of the applicable rule.

(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)]

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 Exemptions), opacity shall meet the following, unless otherwise stated in this approval:

(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.

C.5 Operation of Equipment [326 IAC 2-7-6(6)]

Except as otherwise provided by statute, rule, or in this approval, all air pollution control equipment listed in this approval and used to comply with an applicable requirement shall be operated at all times that an emission unit vented to a pollution control device is in operation.

C.6 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 by using good engineering practices (GEP) pursuant to 326 IAC 1-7-3. The provisions of 326 IAC 1-7-2, 326 IAC 1-7-3(c) and (d), 326 IAC 1-7-4(d)(3), (e), and (f), and 326 IAC 1-7-5(d) are not federally enforceable.

C.7 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, except as provided in 326 IAC 2-7-16.

(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
Indianapolis, Indiana 46204-2251

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) The Permittee seeking to establish the occurrence of an emergency shall make records available upon request to ensure that failure to implement a PMP did not cause or contribute to an exceedance of any limitations on emissions. However, 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.

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

C.8 Performance Testing [326 IAC 3-6][326 IAC 2-1.1-11]

(a) Compliance testing on new emission units shall be conducted within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up, if specified in Section D of this approval. All testing shall be performed according to the provisions of 326 IAC 3-6 (Source Sampling Procedures), except as provided elsewhere in this approval, 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 approval, shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

no later than thirty-five (35) days prior to the intended test date. The Permittee shall submit a notice of the actual test date to the above address so that it is received at least two weeks prior to the test date.

(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 the 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.

The documentation submitted by the Permittee does not require certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

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

C.9 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 upon startup. The Permittee shall be responsible for installing any necessary equipment and initiating any required monitoring related to that equipment.

C.10 Instrument Specifications [326 IAC 2-1.1-11] [326 IAC 2-7-5(3)] [326 IAC 2-7-6(1)]

(a) When required by any condition of this permit, an analog instrument used to measure a parameter related to the operation of an air pollution control device shall have a scale such that the expected maximum reading for the normal range shall be no less than twenty percent (20%) of full scale.

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

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

C.11 Response to Excursions or Exceedances [326 IAC 2-7-5][326 IAC 2-7-6]

(a) Upon detecting an excursion or exceedance, the Permittee shall restore operation of the emissions unit (including any control device and associated capture system) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions.

(b) The response shall include minimizing the period of any startup, shutdown or malfunction and taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of an excursion or exceedance (other than those caused by excused startup or shutdown conditions). Corrective actions may include, but are not limited to, the following:

(1) initial inspection and evaluation;

(2) recording that operations returned to normal without operator action (such as through response by a computerized distribution control system); or

(3) any necessary follow-up actions to return operation to within the indicator range, designated condition, or below the applicable emission limitation or standard, as applicable.

(c) A determination of whether the Permittee has used acceptable procedures in response to an excursion or exceedance will be based on information available, which may include, but is not limited to, the following:

(1) monitoring results;

(2) review of operation and maintenance procedures and records;

(3) inspection of the control device, associated capture system, and the process.

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

(e) The Permittee shall maintain the following records:

(1) monitoring data;

(2) monitor performance data, if applicable; and

(3) corrective actions taken.

C.12 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 noncompliant stack tests.

The documents submitted pursuant to this condition do not 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.13 General Record Keeping Requirements [326 IAC 2-7-5(3)][326 IAC 2-7-6] [326 IAC 2-2]

(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) If there is a reasonable possibility that a "project" (as defined in 326 IAC 2-2-1 (qq)) at an existing emissions unit, which is not part of a "major modification" (as defined in 326 IAC 2-2-1 (ee)) may result in significant emissions increase and the Permittee elects to utilize the "projected actual emissions" (as defined in 326 IAC 2-2-1 (rr)), the Permittee shall comply with following:

(1) Before beginning actual construction of the "project" (as defined in 326 IAC 2-2-1 (qq)) at an existing emissions unit, document and maintain the following records:
- (A) A description of the project.
- (B) Identification of any emissions unit whose emissions of a regulated new source review pollutant could be affected by the project.
- (C) A description of the applicability test used to determine that the project is not a major modification for any regulated NSR pollutant, including:
  - (i) Baseline actual emissions;
  - (ii) Projected actual emissions;
  - (iii) Amount of emissions excluded under section 326 IAC 2-2-1(rr)(2)(A)(iii); and
  - (iv) An explanation for why the amount was excluded, and any netting calculations, if applicable.

(2) Monitor the emissions of any regulated NSR pollutant that could increase as a result of the project and that is emitted by any existing emissions unit identified in (1)(B) above; and

(3) Calculate and maintain a record of the annual emissions, in tons per year on a calendar year basis, for a period of five (5) years following resumption of regular operations after the change, or for a period of ten (10) years following resumption of regular operations after the change if the project increases the design capacity of or the potential to emit that regulated NSR pollutant at the emissions unit.

C.14 General Reporting Requirements [326 IAC 2-7-5(3)(C)] [326 IAC 2-2]

(a) The Permittee 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 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 reports required in (a) of this condition and the reports required by conditions in Section D of this approval shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

(c) Unless otherwise specified in this approval, any notice, report, or other submission required by this approval 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 approval, 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 approval and ending on the last day of the reporting period. Reporting periods are based on calendar years, unless otherwise specified in this permit. For the purpose of this permit "calendar year" means the twelve (12) month period from January 1 to December 31 inclusive.

(f) If the Permittee is required to comply with the recordkeeping provisions of (c) in Section C.14 for any "project" (as defined in 326 IAC 2-2-1 (qq)) at an existing emissions unit, and the project meets the following criteria, then the Permittee shall submit a report to IDEM, OAQ:

(1) The annual emissions, in tons per year, from the project identified in (c)(1) in Section C- General Record Keeping Requirements exceed the baseline actual emissions, as documented and maintained under Section C- General Record Keeping Requirements (c)(1)(C)(i), by a significant amount, as defined in 326 IAC 2-2-1 (xx), for that regulated NSR pollutant, and

(2) The emissions differ from the preconstruction projection as documented and maintained under Section C- General Record Keeping Requirements (c)(1)(C)(ii).

(g) If Condition C.14(c) is triggered, then report for project at an existing emissions unit shall be submitted within sixty (60) days after the end of the year and contain the following:

(1) The name, address, and telephone number of the major stationary source.

(2) The annual emissions calculated in accordance with (c)(2) and (3) in Section C- General Record Keeping Requirements.

(3) The emissions calculated under the actual-to-projected actual test stated in 326 IAC 2-2-2(d)(3).

(4) Any other information that the Permittee deems fit to include in this report,

Reports required in this part shall be submitted to:

Indiana Department of Environmental Management
Air Compliance Section, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

(h) The Permittee shall make the information required to be documented and maintained in accordance with (c) in Section C- General Record Keeping Requirements available for review upon a request for inspection by IDEM, OAQ. The general public may request this information from the IDEM, OAQ under 326 IAC 17.1.

SECTION D.1 FACILITY OPERATION CONDITIONS

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

(a) A strip caster line rated at a maximum steel production rate of 270 tons per hour:

(1) One (1) ladle metallurgy station (LMS) identified as LMS-2. The LMS-2 shall be equipped with a side draft hood that has a particulate matter capture efficiency of ninety-nine percent (99%). The captured particulate matter in the gas stream shall be controlled by the LMS-2 baghouse and the gas stream shall be exhausted through the LMS-2 baghouse stack identified as S-20. The remaining uncontrolled emissions shall be exhausted through the LMS-2 roof monitor identified as S-21;

(2) One (1) tundish feeds the molten metal from the LMS-2 ladle to one (1) continuous strip caster. The continuous strip caster shall be equipped with a canopy hood that has a particulate matter capture efficiency of ninety-eight percent (98%). The captured particulate matter in the gas stream shall be controlled by the LMS-2 baghouse and the gas stream shall be exhausted though the LMS-2 baghouse stack identified as S-20. The remaining uncontrolled emissions shall be exhausted through the LMS-2 roof monitor identified as S-21;

(3) Two (2) hot rolling stands. These stands roll the steel strip from the continuous strip caster to the desired gauge. Fugitive particulate emissions from this process are suppressed by the application of water to the steel strip;

(4) Descaling operations utilizing water to remove scale from steel strip; and

(5) Two (2) coilers. After the strip passes the rolling mill it is then rolled into coils. Fugitive particulate emissions from this process are suppressed by the application of water to the steel coils.

The strip caster line accepts molten steel at a maximum rate of 270 tons per hour from the existing electric arc furnace (EAF) and is capable of producing all grades of carbon, low-carbon, alloy, and stainless steel at various widths and thicknesses. The coiled product from the strip caster may be shipped directly to the market or may be routed through the existing hot and/or cold mill.

(b) Combustion equipment associated with the strip caster plant exhausting to the LMS-2 baghouse stack identified as S-20:

(1) One (1) natural gas-fired ladle dryer identified as LD-1. Each ladle dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 12 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(2) Two (2) natural gas-fired tundish preheaters identified as TP-1 and TP-2. Each tundish preheater shall be equipped with oxy-fuel burners, shall not exceed a maximum heat input rate of 10 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(3) Two (2) natural gas-fired transition piece preheaters, utilizing propane as back up fuel. Each preheater shall be equipped with low-NOx burners and each preheater shall not exceed a heat input capacity of 2 MMBtu per hour for a combined total capacity of 4 MMBtu per hour. These preheaters shall be used in the tundish operations located on the caster deck; and

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

(4) Two (2) natural gas-fired tundish nozzle preheaters identified as TNP-1 and TNP-2. Each tundish nozzle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 2 MMBtu per hour for a combined capacity of 4 MMBtu per hour, and has the capability to utilize propane as a backup 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

D.1.1 Particulate Matter (PM and PM_{10}) Emission Limitations

(a) Pursuant to 326 IAC 2-2 (PSD Requirements), the strip caster line shall comply with the following requirements.

(1) The ladles associated with the strip caster shall be covered with lids which shall be closed at all times when transporting molten metal in the ladles, in order to minimize uncontrolled emissions.

(2) The LMS shall be equipped with a side draft hood that evacuates particulate fumes from the LMS to the LMS-2 baghouse. The side draft hood shall have a minimum capture efficiency of ninety-nine percent (99%).

(3) The tundish and continuous strip caster shall be controlled by a canopy hood that evacuates particulate fumes to the LMS-2 baghouse. The hood shall have a minimum capture efficiency of ninety-eight percent (98%).

(4) The filterable PM/PM_{10} emissions from the LMS-2 baghouse shall not exceed 0.0117 pounds of filterable PM/PM_{10} per ton of steel processed at the LMS-2 and 0.0018 grains per dry standard cubic feet (gr/dscf) at a maximum volumetric air flow rate of 200,000 dry standard cubic feet per minute.

(5) The filterable and condensable PM/PM_{10} emissions from the LMS-2 baghouse shall not exceed 0.0338 pounds of filterable and condensable PM/PM_{10} per ton of steel processed at the LMS-2 and 0.0052 gr/dscf at a maximum volumetric air flow rate of 200,000 dry standard cubic feet per minute.

(6) The opacity from the LMS-2 baghouse stack (S-20) shall not exceed three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9) when emitted from any baghouse, roof monitor or building opening. This limitation satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).

(b) Except as otherwise provided by statute, rule, or this permit, the baghouses for PM control shall be in operation and control emissions at all times the associated equipment controlled by the baghouse are in operation.

(c) In the event that bag failure is observed in a multi-compartment baghouse, if operations will continue for ten (10) days or more after the failure is observed before the failed units will be repaired or replaced, the Permittee shall promptly notify 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.1.2 Nitrogen Oxide (NOx) Emission Limitation [326 IAC 2-2]

(a) Pursuant to 326 IAC 2-2 (PSD Requirements), the above-mentioned combustion units shall comply with the following requirements:

(1) Each combustion facility shall utilize “good combustion practices”, utilize “pipeline quality” natural gas as the primary fuel and may utilize propane as a backup fuel; and

(2) The following combustion facilities shall vent to LMS-2 Baghouse stack S-20:

Combustion Facility	No. Units	Each Unit’s Max Heat Input Rate (MMBtu/hr)	Burner Type (or equivalent)	Stack
Ladle Dryer	1	12	Low-NOx	S-20
Tundish Preheaters	2	10	Oxy-Fuel	S-20
Transition Piece Preheaters	2	2	Low-NOx	S-20
Tundish Nozzle Preheaters	2	2	Low-NOx	S-20

(b) Pursuant to 326 IAC 2-2-3 (BACT), the total emissions from the Castrip LMS-2 Baghouse stack (S-20) shall not exceed 0.19 pounds NOx per ton of steel processed at the LMS-2.

D.1.3 Carbon Monoxide (CO) Emission Limitation [326 IAC 2-2]

Pursuant to 326 IAC 2-2-3 (BACT), the total emissions from the Castrip LMS-2 Baghouse stack (S-20) shall not exceed 0.141 pound of CO per ton of steel processed at the LMS-2.

D.1.4 Sulfur Dioxide (SO2) Emission Limitation [326 IAC 2-2]

Pursuant to 326 IAC 2-2-3 (BACT), the total emissions from the Castrip LMS-2 Baghouse stack (S-20) shall not exceed 0.210 pounds SO_2 per ton of steel processed at the LMS-2.

D.1.5 Lead (Pb) Emission Limitation [326 IAC 2-2]

To avoid the requirements of 326 IAC 2-2-3 (BACT), the total emissions from the Castrip LMS-2 Baghouse stack (S-20) shall not exceed 3.30×10^{-4} pounds of Pb per ton of steel processed at the LMS-2.

D.1.6 Operation Limitations [326 IAC 2-2]

Pursuant to 326 IAC 2-2-3 (BACT), the strip caster line shall not exceed a maximum steel throughput of 2,365,200 tons per twelve (12) consecutive month period. The Permittee shall demonstrate compliance with these steel processing limits based on a consecutive twelve (12) month period.

D.1.7 Preventive Maintenance Plan

A Preventive Maintenance Plan, in accordance with Section C - Preventive Maintenance Plan, of this permit, is required for the LMS-2, the continuous strip caster and the particulate capture and control system associated with the LMS-2 and continuous strip caster.

Compliance Determination and Monitoring

D.1.8 Performance Testing

(a) Pursuant to 326 IAC 2-1.1-11 and 326 IAC 2-2, the Permittee shall perform PM/PM_{10} (filterable and condensable), NOx, CO, SO2, and Pb compliance stack tests for the LMS-2 baghouse stack (S-20) within one hundred eighty (180) days of issuance of this source modification.

(b) Pursuant to 326 IAC 2-1.1-11 and 326 IAC 2-2, the Permittee shall perform opacity compliance stack tests for the LMS-2 baghouse stack (S-20) within one hundred eighty (180) days of issuance of this source modification.

(c) Opacity tests shall be performed concurrently with the particulate compliance stack test for the LMS-2 baghouse stack, unless meteorological conditions require rescheduling the opacity tests to another date.

(d) All compliance stack tests shall be repeated at least annually until such time that the Part 70 permit for this source is in effect.

IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform additional and future compliance testing as necessary. Testing shall be conducted in accordance with Section C – Performance Testing requirements.

D.1.9 Visible Emissions Notations

(a) Visible emission notations of the LMS-2 baghouse stack exhaust shall be performed once per day 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) If abnormal emissions are observed, the Permittee shall take reasonable response steps in accordance with Section C- Response to Excursions or Exceedances. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances shall be considered a deviation from this permit.

D.1.10 Parametric Monitoring for the Baghouse, Side Draft Hood, and Canopy Hood

(a) The Permittee shall record the pressure drop across the LMS-2 baghouse, at least once per day when the associated LMS or continuous strip caster is in operation. When for any one reading, the pressure drop across the is outside the normal range of 2.0 and 8.0 inches of water or a range established during the most recent compliant stack test, the Permittee shall take reasonable response steps in accordance with Section C – Response to Excursions or Exceedances. A pressure reading that is outside the above range is not a deviation from this permit. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances, shall be considered a violation of this permit.

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

(c) The Permittee shall record the fan amperes of LMS-2 baghouse fan, at least once per day when the associated LMS or continuous strip caster is in operation. When for any one reading, the fan amperes of the capture and control system is outside the range of plus or minus fifteen percent (15%) of the rate established during the most recent compliant stack test, the Permittee shall take reasonable response steps in accordance with Section C – Response to Excursions or Exceedances. A fan amperes reading that is outside the above range is not a deviation from this permit. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances, shall be considered a violation of this permit.

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

D.1.11 Broken or Failed Bag Detection [326 IAC 2-7-5(1)] [326 IAC 2-7-6(1)]

(a) For a single compartment baghouse controlling emissions from a process operated continuously, a failed unit and the associated process shall be shut down immediately until the failed unit has been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

(b) For a single compartment baghouse controlling emissions from a batch process, the feed to the process shall be shut down immediately until the failed unit has been repaired or replaced. The emissions unit shall be shut down no later than the completion of the processing of the material in the line unless the failed unit has been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

Bag failure can be indicated by a significant drop in the baghouse's pressure reading with abnormal visible emissions, by an opacity violation, or by other means such as gas temperature, flow rate, air infiltration, leaks, dust traces or triboflows.

Recordkeeping and Reporting Requirements

D.1.12 Recordkeeping Requirement

(a) The Permittee shall maintain records of the performance tests required by Operation Condition D.1.8 to demonstrate compliance with Operation Conditions D.1.1, D.1.2, D.1.3, D.1.4, and D.1.5.

(b) The Permittee shall maintain records of the parameters stated in Operation Conditions D.1.6, D.1.9, D.1.10, and D.1.11 to demonstrate compliance with Operation Condition D.1.1.

D.1.13 Reporting Requirements

(a) The Permittee shall submit performance test protocols and performance test reports required by Operation Condition D.1.8 in accordance with the reporting requirements established in Section C - Performance Testing and Section C - General Reporting Requirements, to demonstrate compliance with Operation Conditions D.1.1, D.1.2, D.1.3, D.1.4, and D.1.5.

(b) A quarterly summary of the information to document compliance with Condition D.1.6 shall be submitted using the reporting forms located at the end of this permit, or its equivalent, within thirty (30) days after the end of the quarter being reported. These reports require a certification by the responsible official.

SECTION D.2 FACILITY OPERATION CONDITIONS

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

(c) Combustion equipment associated with the strip caster plant exhausting to the LMS-2 roof monitor identified as S-21:

(1) Two (2) natural gas-fired ladle preheaters identified as LP-1 and LP-2. Each ladle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 12 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(2) One (1) natural gas-fired ladle preheater identified as LP-3, was installed in 2004. The ladle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 12 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(3) One (1) natural gas-fired ladle preheater identified as LP-4, has not yet been installed. The ladle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 12 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(4) One (1) natural gas-fired tundish dryer identified as TD-1. The tundish dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 4 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(5) One (1) natural gas-fired tundish dryer identified as TD-2. The tundish dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 3 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(6) One (1) natural gas-fired tundish dryer identified as TD-3. The tundish dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 1 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(7) Two (2) natural gas-fired transition piece dryers. Each transition piece dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 0.15 MMBtu per hour, and has the capability to utilize propane as a backup 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

D.2.1 Nitrogen Oxides (NO_X) Emission Limitations

(a) Pursuant to 326 IAC 2-2 (PSD Requirements), the small combustion units shall comply with the following requirements:

(1) Each combustion facility shall utilize “good combustion practices”, utilize “pipeline quality” natural gas as the primary fuel and may utilize propane as a backup fuel; and

(2) The following combustion facilities shall vent to S-21 roof monitor:

Combustion Facility	No. Units	Each Unit's Max Heat Input Rate (MMBtu/hr)	Burner Type (or equivalent)	Stack
Ladle Preheaters	4	12	Low-NOx	S-21
Tundish Dryer	1	4	Low-NOx	S-21
Tundish Dryer	1	3	Low-NOx	S-21
Tundish Dryer	1	1	Low-NOx	S-21
Transition Piece Dryers	2	0.15	Low-NOx	S-21

(b) Pursuant to 326 IAC 2-2-3 (BACT), the BACT for NOx from TD-1, TD-2, TD-3 and each transition piece dryer shall be proper equipment operation, the use of low NOx burners, and NOx emission rate shall not exceed an emission rate of 0.10 pounds per MMBtu. Further, the hourly NOx emission rate shall not exceed 0.40, 0.30, and 0.10 lbs per hour for emission units TD-1, TD-2, and TD-3, respectively, and the hourly NOx emission rate shall not exceed 0.015 lbs per hour for each transition piece dryer.

(c) Pursuant to 326 IAC 2-2-3 (BACT), the BACT for NOx from each ladle preheater shall be proper operation and shall not exceed a NOx mission rate of 0.05 pounds per MMBtu and 0.60 lbs per hour.

D.2.2 Sulfur Dioxide (SO_2) Emission Limitations

Pursuant to 326 IAC 2-2-3 (BACT), the combustion units specified in Condition D.2.1(a) shall utilize "good combustion practices", utilize "pipeline quality" natural gas as the primary fuel and may utilize propane as a backup fuel. The combustion units shall comply with the following requirements:

(a) BACT for SO_2 from TD-1, TD-2, TD-3 and each transition piece dryer shall be proper operation and shall not exceed a SO_2 emission rate of 0.0006 pounds per MMBtu. Further, the hourly SO_2 emission rate shall not exceed 0.0024, 0.0018, and 0.0006 lbs per hour for emission units TD-1, TD-2, and TD-3, respectively, and the hourly SO_2 emission rate shall not exceed 0.0001 lbs per hour for each transition piece dryer.

(b) BACT for SO_2 from each ladle preheater shall be proper operation and shall not exceed a SO_2 mission rate of 0.0006 pounds per MMBtu and 0.007 lbs per hour.

D.2.3 Carbon Monoxide (CO) Emission Limitations

Pursuant to 326 IAC 2-2-3 (BACT), the combustion units specified in Condition D.2.1(a) shall utilize "good combustion practices", utilize "pipeline quality" natural gas as the primary fuel and may utilize propane as a backup fuel, and comply with the following requirements:

(a) BACT for CO from TD-1, TD-2, TD-3 and each transition piece dryer shall be proper operation and shall not exceed a CO emission rate of 0.084 pounds per MMBtu. Further, the hourly CO emission rate shall not exceed 0.336, 0.252, and 0.084 lbs per hour for emission units TD-1, TD-2, and TD-3, respectively, and the hourly CO emission rate shall not exceed 0.013 lbs per hour for each transition piece dryer.

(b) BACT for CO from each ladle preheater shall be proper operation and shall not exceed a CO emission rate of 0.084 pounds per MMBtu and 1.01 lbs per hour.

D.2.4 Particulate Matter (PM/PM10) Emission Limitations

Pursuant to 326 IAC 2-2-3 (BACT), the combustion units specified in Condition D.2.1(a) shall utilize proper operation, utilize "pipeline quality" natural gas as the primary fuel and may utilize propane as a backup fuel, and comply with the following requirements:

(a) BACT for PM/PM10 (filterable plus condensable) from TD-1, TD-2, TD-3 and each transition piece dryer shall be utilization of "good combustion practices" and shall not exceed a PM/PM10 (filterable plus condensable) emission rate of 0.0076 pounds per MMBtu. Further, the hourly PM/PM10 (filterable plus condensable) emission rate shall not exceed 0.030, 0.023, and 0.008 lbs per hour for emission units TD-1, TD-2, and TD-3, respectively, and the hourly PM/PM10 (filterable plus condensable) emission rate shall not exceed 0.0011 lbs per hour for each transition piece dryer.

(b) BACT for PM/PM10 (filterable plus condensable) from each ladle preheater shall be utilization of "good combustion practices" and shall not exceed a PM/PM10 (filterable plus condensable) emission rate of 0.0076 pounds per MMBtu and 0.091 lbs per hour.

(c) The opacity from the LMS-2 roof monitor (S-21) shall not exceed three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9). Compliance with this limitation satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).

D.2.5 Volatile Organic Compounds (VOC) Emission Limitations

Pursuant to 326 IAC 2-2-3 (BACT), the combustion units specified in Condition D.2.1(a) shall utilize "good combustion practices", utilize "pipeline quality" natural gas as the primary fuel and may utilize propane as a backup fuel, and comply with the following requirements:

(a) BACT for VOC from TD-1, TD-2, TD-3 and each transition piece dryer shall be proper operation and shall not exceed a VOC emission rate of 0.0054 pounds per MMBtu. Further, the hourly VOC emission rate shall not exceed 0.011, 0.016, and 0.005 lbs per hour for emission units TD-1, TD-2, and TD-3, respectively, and the hourly VOC emission rate shall not exceed 0.0035 lbs per hour for each transition piece dryer.

(b) BACT for VOC from each ladle preheater shall be proper operation and shall not exceed a VOC emission rate of 0.0054 pounds per MMBtu and 0.065 lbs per hour.

D.2.6 Performance Testing

Testing of the combustion units specified in Condition D.2.1(a) is not required at this time. However, IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform future compliance testing as necessary.

SECTION D.3 FACILITY OPERATION CONDITIONS

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

(d) Ancillary equipment associated with the strip caster plant:

(1) One (1) LMS-2 baghouse enclosed dust handling system or equivalent, for material recovery and particulate matter control;

(2) Dumping, storage, and transfer operations of raw materials for the strip caster plant;

(3) Additional transport on new and existing paved roadways and parking lots, unpaved roadways, and unpaved areas around existing raw material storage piles;

(4) One (1) contact cooling tower system with an average water flow rate of 12,000 gallons per minute

(5) One (1) non-contact cooling tower system with an average water flow rate of 14,400 gallons per minute;

(6) One (1) gas plant that supplies oxygen, nitrogen, hydrogen and argon gases to the strip caster operations;

(7) Chemical storage tanks for sulfuric or similar acid, sodium hypochlorite or similar disinfectant, caustic, polymer, and phosphate; and

(8) Associated VTD alloy unloading, storage and feed systems:
(a) One (1) truck dump station
(b) Truck unloading/conveyors
(c) Eight (8) storage hoppers, all exhausting to a common bin vent, rated at 0.01 grains/dry standard cubic foot, into the building.

(9) One (1) contact cooling tower associated with the vacuum degasser, with an average flow rate of 8,000 gallons/minute, with drift/mist eliminators. Emissions from this cooling tower will exhaust through a stack identified as Stack 502.

(10) One (1) non-contact cooling tower associated with the vacuum degasser, with an average flow rate of 8,000 gallons/minute, with drift/mist eliminators. Emissions from this cooling tower will exhaust through a stack identified as Stack 504.

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

Emission Limitations and Standards

D.3.1 Particulate Matter (PM and PM_{10}) Emission Limitations

(a) Pursuant to 326 IAC 2-2 (PSD Requirements), the emissions from dumping, storage, and transfer operations of raw materials shall not exceed five percent (5%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9). This limitation satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).

(b) Pursuant to 326 IAC 2-2 (PSD Requirements), the paved surface silt loading shall not exceed 16.8 pounds of silt per mile and the average instantaneous opacity from paved roadways and parking lots shall not exceed ten percent (10%). The average

instantaneous opacity shall be the average of twelve (12) instantaneous opacity readings, taken for four (4) vehicle passes, consisting of three (3) opacity readings for each vehicle pass. The three (3) opacity readings for each vehicle pass shall be taken as follows:

(1) The first reading will be taken at the time of emission generation;

(2) The second reading will be taken five (5) seconds later; and

(3) The third reading will be taken five (5) seconds later or ten (10) seconds after the first reading.

The three (3) readings shall be taken at the point of maximum opacity. The observer shall stand at least fifteen (15) feet, but no more than one-fourth (1/4) mile, from the plume and as close to approximately right angles to the plume as permissible under EPA Reference Method 9. Each reading shall be taken approximately four (4) feet above the surface of the paved roadway.

(c) Pursuant to 326 IAC 2-2 (PSD Requirements), the visible emissions from unpaved roadways and unpaved areas around raw material storage piles shall not exceed an average instantaneous opacity of ten percent (10%). The average instantaneous opacity shall be the average of twelve (12) instantaneous opacity readings, taken for four (4) vehicle passes, consisting of three (3) opacity readings for each vehicle pass. The three (3) opacity readings for each vehicle pass shall be taken as follows:

(1) The first reading will be taken at the time of emission generation;

(2) The second reading will be taken five (5) seconds later; and

(3) The third reading will be taken five (5) seconds later or ten (10) seconds after the first reading.

The three (3) readings shall be taken at the point of maximum opacity. The observer shall stand at least fifteen (15) feet, but no more than one-fourth (1/4) mile, from the plume and as close to approximately right angles to the plume as permissible under EPA Reference Method 9. Each reading shall be taken approximately four (4) feet above the surface of the unpaved roadway.

(d) Pursuant to 326 IAC 2-2 (PSD Requirements), the two (2) cooling towers shall be equipped with drift eliminators.

(e) Except as otherwise provided by statute, rule, or this permit, the VTD material handling system bin vent filters for PM control shall be in operation and control emissions at all times the associated equipment controlled by the filters are in operation.

(f) In the event that filter failure is observed in a multi-compartment filter housing, if operations will continue for ten (10) days or more after the failure is observed before the failed units will be repaired or replaced, the Permittee shall promptly notify 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.3.2 Cooling Towers PSD BACT Limits [326 IAC 2-2]

Pursuant to 326 IAC 2-2 Prevention of Significant Deterioration (PSD), the Permittee shall comply with the following Best Available Control Technology (BACT) requirements for cooling towers constructed pursuant to this permit:

(a) The drift rate from each cooling tower shall not exceed 0.005%.

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

D.3.3 VTD Alloy Handling PSD BACT [326 IAC 2-2]

(a) Pursuant to 326 IAC 2-2 Prevention of Significant Deterioration (PSD), the Permittee shall perform alloy unloading in a 3-sided building.

(b) Pursuant to 326 IAC 2-2 Prevention of Significant Deterioration (PSD), the visible emissions from the alloy unloading shall not exceed 3% opacity, based on a 6-minute average.

Compliance Determination and Monitoring

D.3.4 Control Operation [326 IAC 2-2]

The drift/mist eliminators shall be in operation at all times when the cooling towers are in operation.

D.3.5 Performance Testing

Testing of the above mentioned facilities is not required at this time. However, IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform future compliance testing as necessary.

D.3.6 Visible Emissions Notations

(a) Visible emission notations of the baghouse's enclosed dust handling system shall be performed once per week 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) If abnormal emissions are observed, the Permittee shall take reasonable response steps in accordance with Section C- Response to Excursions or Exceedances. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances shall be considered a deviation from this permit.

Recordkeeping and Reporting Requirements

D.3.7 Recordkeeping Requirement

(a) The Permittee shall maintain records of the visible emission notations stated in Operation Condition D.3.6 to demonstrate compliance with PSD requirements.

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

SECTION D.4 FACILITY OPERATION CONDITIONS

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

(e) One (1) vacuum degasser with process gas lances. This vacuum degasser has a maximum capacity of 270 tons of steel/hour. This vacuum degasser will be used to remove entrained gases from the steel. Desulfurization and/or decarburization may also occur during the degassing process.

This vacuum degasser will use an enclosed flare to control carbon monoxide (CO) emissions. The enclosed flare burner has a maximum capacity of 2 MMBTU/hour, uses natural gas as primary fuel with propane as back up fuel, and operates with a minimum temperature of 1,400 ^{0}F. The flare only operates when the vacuum degasser is in the degassing mode (i.e. when CO must be controlled). Controlled emissions will exhaust through a stack identified as Stack 500.

(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 Vacuum Degasser PSD BACT Limits [326 IAC 2-2]

Pursuant to 326 IAC 2-2 Prevention of Significant Deterioration (PSD), the Permittee shall comply with the following Best Available Control Technology (BACT) requirements:

(a) The carbon monoxide (CO) emissions from the vacuum degasser shall be controlled by a flare that uses natural gas as primary fuel, and propane as back up fuel.

(b) The carbon monoxide (CO) emissions from the vacuum degasser shall not exceed 0.075 pounds per ton of steel processed at the VTD, and 20.25 pounds per hour, based on a 3-hour block average.

(c) The sulfur dioxide (SO2) emissions from the vacuum degasser shall not exceed 0.022 pounds per ton of steel processed at the VTD, and 5.4 pounds per hour, based on a 3-hour block average.

(d) The nitrogen oxides (NOx) emissions from the vacuum degasser shall not exceed 0.0055 pounds per ton of steel processed at the VTD, and 1.35 pounds per hour, based on a 3-hour block average.

(e) The volatile organic compound (VOC) emissions from the vacuum degasser shall not exceed 0.005 pounds per ton of steel processed at the VTD, and 1.35 pounds per hour, based on a 3-hour block average.

(f) The PM/PM_{10} (filterable plus condensable) emissions from the vacuum degasser shall not exceed 0.008 grain per dry standard cubic foot, and 0.45 pounds per hour, based on a 3-hour block average.

(g) The opacity from the vacuum degasser enclosed flare stack (Stack 500) shall not exceed three percent (3%) opacity, based on a six-minute average.

D.4.2 Operational Flexibility [326 IAC 2-2]

Pursuant to 326 IAC 2-2 Prevention of Significant Deterioration (PSD), the Permittee may operate the vacuum degasser as follows:

(a) The gases can be removed from the steel after the steel has gone through the Castrip Ladle Metallurgical Station (LMS-2).
Or
(b) The gases can be removed from the steel before the steel goes through the Castrip Ladle Metallurgical Station (LMS-2).
Or
(c) The gases can be removed from the steel and the steel sent back to the Meltshop Continuous Casters for casting.
Or
(d) The steel may bypass the vacuum degassing process.

D.4.3 Flare (2 MMBTU/hour) PSD BACT Limits [326 IAC 2-2]

Pursuant to 326 IAC 2-2 Prevention of Significant Deterioration (PSD), the Permittee shall comply with the following Best Available Control Technology (BACT) requirements:

(a) The 2 million British Thermal Unit per hour (MMBTU/hour) enclosed flare burner shall use natural gas as primary fuel and propane as back up fuel.

(b) The collateral nitrogen oxide (NO_x) emissions from the 2 MMBTU/hour flare burner shall not exceed 0.10 pounds per MMBTU. The NOx emissions from the 2 MMBTU/hour flare burner shall not exceed 0.005 pounds per ton of steel, and 0.675 pounds per hour, based on a 3-hour block average.

(c) The collateral sulfur dioxide (SO_2) emissions from the 2 MMBTU/hour flare burner shall not exceed 0.0006 pounds per MMBTU. The SO_2 emissions from the 2 MMBTU/hour flare burner shall not exceed 0.02 pounds per ton of steel, and 2.7 pounds per hour, based on a 3-hour block average.

(d) The collateral carbon monoxide (CO) emissions from the 2 MMBTU/hour flare burner shall not exceed 0.084 pounds per MMBTU. The CO emissions from the 2 MMBTU/hour flare burner shall not exceed 0.075 pounds per ton of steel, and 10.125 pounds per hour, based on a 3-hour block average.

(e) The collateral volatile organic compound (VOC) emissions from the 2 MMBTU/hour flare burner shall not exceed 0.0055 pounds per MMBTU. The VOC emissions from the 2 MMBTU/hour flare burner shall not exceed 0.005 pounds per ton of steel, and 0.675 pounds per hour, based on a 3-hour block average.

(f) The opacity from the vacuum degasser stack (500) shall not exceed three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9). This limitation satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).

(g) The collateral PM/PM_{10} (filterable plus condensable) emissions from the 2 MMBTU/hour flare burner shall not exceed 0.0076 pounds per MMBTU. The PM/PM_{10} emissions from the 2 MMBTU/hour flare burner shall not exceed 0.008 grain per dry standard cubic foot, and 0.45 pounds per hour, based on a 3-hour block average.

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

A Preventive Maintenance Plan (PMP), in accordance with Section C - Preventive Maintenance Plan (PMP), of this permit, is required for the vacuum degasser and its associated control device, a flare.

Compliance Determination and Monitoring [326 IAC 2-1.1-11]

D.4.5 Control Equipment Operation [326 IAC 2-2]

The flare shall be in operation and control carbon monoxide (CO) emissions at all times when the vacuum degasser is in operation.

D.4.6 Testing Requirements [326 IAC 2-7-6(1),(6)] [326 IAC 2-1.1-11] [326 IAC 2-2]

(a) Within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up of the vacuum degasser and enclosed flare, the Permittee shall perform carbon monoxide (CO) testing on Stack 500 to show compliance with Condition D.4.3(d).

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

(c) 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.4.7 Flare Operating Parameters [326 IAC 2-7-5] [326 IAC 2-7-6]

(a) The flare for the carbon monoxide (CO) emissions reductions shall be operated with a flame present at all times when the vacuum degasser is in operation.

(b) The presence of a flare pilot flame shall be monitored using a thermocouple or any equivalent device to detect the presence of the flame.

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

D.4.8 Record Keeping Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

(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) 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.5 FACILITY OPERATION CONDITIONS

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

(f) One (1) continuous blasting system:

(1) One (1) prototype continuous blasting unit. The blasting unit has a maximum steel processing rate of 400 feet per minute. The blasting unit shall be equipped with a cyclone for material recovery and particulate emissions from the blasting system shall exhaust through one (1) baghouse and baghouse stack identified as S-22. The baghouse stack exhausts inside the cold mill and roof monitor, identified as S-28, will also be constructed;

(2) One (1) storage silo. The silo is equipped with a bin vent filter for material recovery and has a maximum storage capacity of 1000 cubic feet; and

(3) Changes to pickle line number 2 include change in the electrical control system and the addition or replacement of an exit end crop shear and side trimmers, an exit end scrap conveyor, an exit end pinch roll/steering unit, an exit end five roll semi bridle/pinch rolls, an exit Fife centering guide system and mechanical side guides. All would be sized consistently with the present front and exit end equipment (up to 80- inch wide), which is also consistent with the strip caster maximum width.

The blasting system cleans the steel strip and shall be in series with the existing pickle line identified as PL-2. This system can handle the products from both the existing continuous caster line and the continuous strip caster line to be installed as described above.

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

Emission Limitations and Standards

D.5.1 Particulate Matter (PM and PM_{10}) Emission Limitations

(a) Pursuant to 326 IAC 2-2 (PSD Requirements), the continuous blasting unit shall comply with the following requirements:

(1) The continuous blasting unit shall be equipped with one (1) cyclone for product recovery and one (1) baghouse for particulate matter control;

(2) The filterable and condensables PM/PM_{10} emissions from the continuous blasting unit baghouse shall not exceed 0.003 grains per dry standard cubic feet (gr/dscf) at a maximum volumetric air flow rate of 36,000 standard cubic feet per minute;

(3) The opacity from the cold mill building containing the continuous blasting unit baghouse shall not exceed three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9). This limitation satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).

(b) Pursuant to 326 IAC 2-2 (PSD Requirements), the storage silo shall comply with the following requirements:

(1) The storage silo shall be equipped with one (1) bin vent for product recovery and

particulate matter control;

(2) The filterable PM/PM_{10} emissions from the storage silo bin vent shall not exceed 0.01 grains per dry standard cubic feet (gr/dscf) at a maximum volumetric air flow rate of 1,000 standard cubic feet per minute; and

(3) The opacity from the cold mill building containing the storage silo bin vent shall not exceed three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9). This limitation satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).

(c) Pursuant to 326 IAC 6-3 (Particulate Emission Limitations for Process Operations), the filterable PM emissions from the continuous blasting system shall not exceed 48.6 pounds per hour when operating at the maximum process weight rate of 75 tons of steel per hour and blasting rate of 1 ton per hour.

The pounds per hour limitation was calculated using the following equation:

$E = 55.0P^{0.11} - 40$ where: E = Rate of emissions in pounds per hour; and
P = Process weight rate in tons per hour.

The above equation shall be used for extrapolation of the data for process weight rates in excess of 60,000 pounds per hour.

(d) Except as otherwise provided by statute, rule, or this permit, the bin vent filters for PM control shall be in operation and control emissions at all times the associated equipment controlled by the filters are in operation.

(e) In the event that filter failure is observed in a multi-compartment filter housing, if operations will continue for ten (10) days or more after the failure is observed before the failed units will be repaired or replaced, the Permittee shall promptly notify 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.5.2 Operation Limitations

Pursuant to 326 IAC 2-2 (PSD Requirements), the pickle line and the continuous blasting system shall not be operated in a parallel arrangement.

D.5.3 Preventive Maintenance Plan

A Preventive Maintenance Plan, in accordance with Section C - Preventive Maintenance Plan, of this permit, is required for the cyclone and baghouse to the continuous blasting unit and for the bin vent filter to the storage silo.

Compliance Determination and Monitoring:

D.5.4 Performance Testing

(a) Pursuant to 326 IAC 2-1.1-11 and 326 IAC 2-2, the Permittee shall perform filterable and condensable PM/PM10 compliance stack tests for the continuous blasting unit stack (S-22) within one hundred eighty (180) days of issuance of this source modification.

(b) Pursuant to 326 IAC 2-1.1-11 and 326 IAC 2-2, the Permittee shall perform opacity tests of the Cold Mill building while the continuous blasting unit is operating within one hundred eighty (180) days of issuance of this source modification.

(c) Opacity tests shall be performed concurrently with the particulate compliance stack test for the continuous blasting unit, unless meteorological conditions require rescheduling the opacity tests to another date.

(d) IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform additional and future compliance testing as necessary.

D.5.5 Visible Emissions Notations

(a) Visible emission notations of the baghouse stack to the continuous blasting unit and the bin vent to the silo shall be performed once per week 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) If abnormal emissions are observed, the Permittee shall take reasonable response steps in accordance with Section C- Response to Excursions or Exceedances. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances shall be considered a deviation from this permit.

D.5.6 Parametric Monitoring

(a) The Permittee shall record the pressure drop across the baghouse to the continuous blasting unit at least once per day when the associated blasting process is in operation. When for one reading, the pressure drop across the baghouse is outside the normal range of 4.0 and 10.0 inches of water or a range established during the most recent compliant stack test, the Permittee shall take reasonable response steps in accordance with Section C – Response to Excursions or Exceedances. A pressure reading that is outside the above mentioned range is not a deviation from this permit. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances, shall be considered a deviation from this permit.

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

D.5.7 Broken or Failed Bag Detection

(a) For a single compartment baghouse controlling emissions from a process operated continuously, a failed unit and the associated process shall be shut down immediately until the failed unit has been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

(b) For a single compartment baghouse controlling emissions from a batch process, the feed to the process shall be shut down immediately until the failed unit has been repaired or replaced. The emissions unit shall be shut down no later than the completion of the processing of the material in the line. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency

provisions of this permit (Section B - Emergency Provisions).

Bag failure can be indicated by a significant drop in the filter's pressure reading with abnormal visible emissions, by an opacity violation, or by other means such as gas temperature, flow rate, air infiltration, leaks, dust traces or triboflows.

Recordkeeping and Reporting Requirements

D.5.8 Recordkeeping Requirement

(a) The Permittee shall submit performance test protocols and performance test reports required by Operation Condition D.5.4 in accordance with the reporting requirements established in Section C - Performance Testing and Section C - General Reporting Requirements, to demonstrate compliance with Operation Condition D.5.1.

(b) A quarterly summary of the information to document compliance with Operation Conditions D.5.4, D.5.5, D.5.6 and D.5.7 shall be submitted using the reporting forms located at the end of this permit, or its equivalent, within thirty (30) days after the end of the quarter being reported. These reports require a certification by the responsible official.

D.5.9 Reporting Requirement

The Permittee shall submit performance test protocols and performance test reports required by Operation Conditions D.5.4 in accordance with the reporting requirements established in Section C - Performance Testing and Section C - General Reporting Requirements, to demonstrate compliance with Operation Conditions D.5.1(a)(2) and (3).

SECTION D.6 FACILITY OPERATION CONDITIONS

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

(g) Eighteen (18) natural gas-fired batch annealing furnaces. The installation of seventeen (17) of the furnaces was authorized pursuant to PSD Permit number 107-8314-00038. The furnaces utilize propane as a backup fuel. Each batch annealing furnace shall be equipped with low-NOx burners and shall not exceed a maximum heat input rate of 4.8 MMBtu per hour. These units can handle the product from both the existing continuous caster line and the continuous strip caster line to be installed as described above.

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

Emission Limitations and Standards

D.6.1 Nitrogen Oxides (NO_X) and CO Emission Limitations

Pursuant to 326 IAC 2-2 (PSD Requirements), the eighteen (18) batch annealing furnaces shall comply with the following requirements:

(a) Each batch annealing furnace shall be equipped with low-NOx burners;

(b) Each batch annealing furnace shall utilize natural gas as the primary fuel and may utilize propane as a backup fuel;

(c) The NOx emissions from each batch annealing furnace shall not exceed 0.10 pounds per MMBtu; and

(d) The CO emissions from each batch annealing furnace shall not exceed 0.084 pound per MMBtu.

D.6.2 Sulfur Dioxide (SO_2) Emission Limitations

Pursuant to 326 IAC 2-2 (PSD Requirements), the above-mentioned additional batch annealing furnaces shall utilize natural gas as the primary fuel and may utilize propane as a backup fuel.

Compliance Determination and Monitoring

D.6.3 Performance Testing

(a) IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform additional and future compliance testing as necessary.

D.6.4 Vendor Certification

The Permittee shall submit with the affidavit of construction (Condition B.5(a)) the vendor guarantees for the above-mentioned batch annealing furnaces to demonstrate compliance with Operation Conditions D.6.1(a), (c), and (d).

Recordkeeping and Reporting Requirements

D.6.5 Recordkeeping Requirement

The Permittee shall maintain records of the parameters required by Operation Condition D.6.3 to demonstrate compliance with Operation Condition D.6.1.

D.6.6 Reporting Requirement

The Permittee shall submit performance test protocols and performance test reports required by Operation Condition D.6.3 in accordance with the reporting requirements established in Section C - Performance Testing and Section C - General Reporting Requirements, to demonstrate compliance with Operation Condition D.6.1(c) and (d).

SECTION D.7 FACILITY OPERATION CONDITIONS

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

(h) One (1) natural gas fueled low NO_x boiler, rated at 71.04 million British Thermal Unit per hour (MMBTU/hour). This boiler, identified as Boiler No. 501, will provide steam to the vacuum degasser. Propane will be used as back up fuel. Emissions from this boiler will exhaust through a stack identified as Stack 501.

(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 Boiler No. 501 PSD BACT Limits [326 IAC 2-2]

Pursuant to 326 IAC 2-2 Prevention of Significant Deterioration (PSD), the Permittee shall comply with the following Best Available Control Technology (BACT) requirements:

(a) Boiler No. 501 shall use natural gas as primary fuel and propane as backup fuel.

(b) The nitrogen oxides (NO_x) emissions from Boiler No. 501 shall not exceed 0.035 pounds per MMBTU.

(c) The carbon monoxide (CO) emissions from Boiler No. 501 shall not exceed 0.061 pounds per MMBTU.

(d) The volatile organic compound (VOC) emissions from Boiler No. 501 shall not exceed 0.0026 pounds per MMBTU.

(e) The sulfur dioxide (SO_2) emissions from Boiler No. 501 shall not exceed 0.0006 pounds per MMBTU.

(f) The PM/PM_{10} (filterable and condensable) emissions from Boiler No. 501 shall not exceed 0.0076 pounds per MMBTU.

D.7.2 General Provisions Relating to NSPS and NESHAP
[326 IAC 12-1][40 CFR Part 60, Subpart A] [326 IAC 20-1-1] [40 CFR Part 63, 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 Boiler No. 501, except when otherwise specified in 40 CFR Part 60, Subpart Dc.

(b) The provisions of 40 CFR Part 63, Subpart A (General Provisions), which are incorporated by reference in 326 IAC 20-1-1, apply to Boiler No. 501, except when otherwise specified in 40 CFR Part 63, Subpart DDDDD.

D.7.3 National Emission Standards for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers and Process Heaters [40 CFR Part 63, Subpart DDDDD]

(a) Boiler No. 501 is subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers and Process Heaters, (40 CFR 63, Subpart DDDDD), and considered a new affected source because Boiler No. 501 is going to be constructed after January 13, 2003 and will be use for manufacturing and processing to provide steam.

(b) The definitions of 40 CFR 63, Subpart DDDDD at 40 CFR 63.7575 are applicable to

Boiler No. 501.

(c) Pursuant to 40 CFR Part 63.7500 and Table 1 to Subpart DDDDD, upon start up, the Permittee shall maintain the carbon monoxide (CO) emissions from Boiler No. 501 at or below an exhaust concentration of 400 parts per million (ppm) by volume on a dry basis corrected to 3% oxygen (3-run average for units less than 100 MMBTU/hour).

D.7.4 Startup, Shutdown or Malfunction Plan (SSMP) [40 CFR Part 63, Subpart DDDDD]

(a) Pursuant 40 CFR Part 63.7505(e), the Permittee shall develop and implement a written startup, shutdown and malfunction plan (SSMP) for carbon monoxide (CO) according to the provisions of 40 CFR Part 63.6(e)(3).

(b) Pursuant to 40 CFR Part 63.7540(c), during periods of startup, shutdown or malfunctions, the Permittee shall operate in accordance with the written SSMP.

(c) Pursuant to 40 CFR Part 63.7540(d), deviations that occur during a period of startup, shutdown, or malfunction are not violations if the Permittee demonstrate that operations were in accordance with the written SSMP.

D.7.5 Preventive Maintenance Plan (PMP) [326 IAC 2-7-5(13)]

(a) A Preventive Maintenance Plan (PMP), in accordance with Section C - Preventive Maintenance Plan (PMP), of this permit, is required for Boiler No. 501.

(b) To the extent the Permittee is required by 40 CFR Part 63, Subpart DDDDD to have a Startup, Shutdown or Malfunction plan (SSMP) for Boiler No. 501, such SSM Plan is deemed to satisfy the PMP requirements of 326 IAC 1-6-3 for Boiler No. 501.

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

D.7.6 Low NO_x Burners [326 IAC 2-2]

Pursuant to 326 IAC 2-2 Prevention of Significant Deterioration (PSD), the Permittee shall equip and operate Boiler No. 501 with natural gas fueled low NO_x burners and perform good combustion practices.

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

D.7.7 Initial Compliance [40 CFR Part 63, Subpart DDDDD]

Pursuant to 40 CFR Part 63.7530, the Permittee shall demonstrate initial compliance by conducting initial performance test for CO according to Table 5 of 40 CFR Part 63, Subpart DDDDD.

D.7.8 Annual Carbon Monoxide (CO) Performance Tests 40 CFR Part 63, Subpart DDDDD

Pursuant to 40 CFR Part 63.7515(a), the Permittee shall conduct a CO performance test on an annual basis. CO annual performance tests must be completed between 10 and 12 months after the previous performance test.

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

D.7.9 Initial Notification [40 CFR 63, Subpart DDDDD]

(a) Pursuant to 40 CFR 63.7545(c), the Permittee shall submit an Initial Notification no later than 120 days after the initial startup of Boiler No. 501. If the Permittee has submitted the initial notification pursuant to Prevention of Significant Deterioration Permit number 107-18314-00038, the initial notification pursuant to this condition shall be deemed completed.

(b) Pursuant to 40 CFR Part 63.7445(c)(1), the Initial Notification shall contain the information

specified in 40 CFR 63.9(b).

(c) The Initial Notification shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204

and

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

(d) The Initial Notification requires the certification by the responsible official as defined by 326 IAC 2-7-1(34).

D.7.10 Record Keeping Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

(a) Pursuant to 40 CFR 63.7555(d)(1) and 40 CFR Part 60, Subpart Dc, the Permittee shall keep records of monthly fuel used by Boiler No. 501, including the types of fuel and amount used.

(b) Pursuant to 40 CFR 63.7555(a)(1), the Permittee shall keep records of a copy of each notification and report to comply with 40 CFR Part 63, Subpart DDDDD, including all documentation supporting any Initial Notification or Notification of Compliance Status or semiannual compliance report.

(c) Pursuant to 40 CFR Part 63.7555(a)(2), the Permittee shall keep records related to startup, shutdown and malfunction.

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

(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.

D.7.11 Vendor Certification [326 IAC 2-2]

Pursuant to 326 IAC 2-2 Prevention of Significant Deterioration (PSD), the Permittee shall obtain and submit with the Affidavit of Construction (Condition B.4) all vendor guarantees for Boiler No. 501 to demonstrate compliance with the BACT limits specified in Condition D.2.1 of this permit.

D.7.12 Reporting Requirements [326 IAC 2-1.1-11] [40 CFR 63, Subpart DDDDD]

(a) Pursuant to 40 CFR Part 63. 7550 and Table 10 to Subpart DDDDD, the Permittee shall submit a semi annual compliance report, using the Semiannual Report Form at the end of this permit or its equivalent.

(i) The first semiannual compliance report must cover the period beginning on the compliance date specified in 40 CFR Part 63.7495 and ending June 30 or December 31, whichever date is the first date that occurs at least 180 days after the compliance date that is specified for this source in 40 CFR Part 63.7595.

This first compliance report must be postmarked or delivered no later than July 31 or January 31, whichever date is the first date following the end of the first calendar half after the compliance date that is specified in 40 CFR Part 63.7495.

(ii) Each subsequent compliance report must cover the semi annual reporting period from January 1 through June 30 or the semi annual reporting period from July 1 through December 31. Each subsequent compliance report must be postmarked or delivered no later than July 31 or January 31, whichever date is the first date following the end of the semi annual reporting period.

(iii) Pursuant to 40 CFR 63.7550(c)(1-4, 6 and 9), the compliance report must contain the following information:

(A) Company name and address
(B) Responsible Official Certification
(C) Date of report and beginning and ending dates of the reporting period
(D) The total fuel used by Boiler No. 501, for each calendar month within the semi annual reporting period, including, but not limited to a description of the fuel and the total fuel usage amount.
(E) A signed statement indicating that no new type of fuel was burned.
(F) Actions taken consistent with the SSMP during start up, shutdown, or malfunction.

(b) The natural gas boiler certification for Boiler No. 501 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).

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE DATA SECTION

PART 70 SOURCE MODIFICATION CERTIFICATION

Source Name:	Nucor Steel
Source Address:	4537 South Nucor Road, Crawfordsville, Indiana 47933
Mailing Address:	4537 South Nucor Road, Crawfordsville, Indiana 47933
Source Modification No.:	107-21359-00038

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:

- ☐ Test Result (specify)
- ☐ Report (specify)
- ☐ Notification (specify)
- ☐ Affidavit (specify)
- ☐ 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:

A certification by the responsible official must be submitted with this report.

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE DATA SECTION

Part 70 Source Modification Quarterly Reporting Form

Source Name:	Nucor Steel
Source Address:	4537 South Nucor Road, Crawfordsville, Indiana 47933
Mailing Address:	4537 South Nucor Road, Crawfordsville, Indiana 47933
Source Modification No.:	107-21359-00038
Facility:	Strip Caster Line
Parameter:	Steel Throughput/Production Limitation
Limit:	2,365,200 tons steel processing per year, based on a consecutive 12-month period

YEAR:

Month	Column 1 This Month	Column 2 Previous 11 Months	Column 1 + Column 2 12 Month Total

Submitted by:
Title / Position:
Signature:
Date:
Phone:

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE BRANCH
100 North Senate Avenue
Indianapolis, Indiana 46204-2251
Phone: 317-233-5674
Fax: 317-233-5967

PART 70 OPERATING PERMIT
EMERGENCY OCCURRENCE REPORT

Source Name:	Nucor Steel
Source Address:	4537 South Nucor Road, Crawfordsville, Indiana 47933
Mailing Address:	4537 South Nucor Road, Crawfordsville, Indiana 47933
Source Modification No.:	107-21359-00038

This form consists of 2 pages **Page 1 of 2**

☐ This is an emergency as defined in 326 IAC 2-7-1(12)
- 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
- The Permittee must submit notice in writing or by facsimile within two (**2**) days (Facsimile Number: 317-233-5967), and follow the other requirements of 326 IAC 2-7-16.

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:

If any of the following are not applicable, mark N/A **Page 2 of 2**

Date/Time Emergency started:
Date/Time Emergency was corrected:
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/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:

Phone:

A certification is not required for this report.

Mail to: Permit Administration & Development Section
Office Of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204

Nucor Steel - Crawfordsville
4537 South Nucor Road
Crawfordsville, Indiana 47933

Affidavit of Construction

I, _____, being duly sworn upon my oath, depose and say:
(Name of the Authorized Representative)

1. I live in _____ County, Indiana and being of sound mind and over twenty-one (21) years of age, I am competent to give this affidavit.

2. I hold the position of _____ for _____.
(Title) (Company Name)

3. By virtue of my position with _____,I have personal
(Company Name)

knowledge of the representations contained in this affidavit and am authorized to make these representations o behalf of _____ .
(Company Name)

4. I hereby certify that Nucor Steel - Crawfordsville, 4537 South Nucor Road, Crawfordsville, Indiana 47933, completed construction of one (1) ladle preheater at the Castrip Line of their steel mill on _____in conformity with the requirements and intent of the construction permit application received by the IDEM Office of Air Quality on May 27, 2005, and as permitted pursuant to **Significant Permit Modification No. 107-21359-00038, Plant ID No. 107-00038** issued on _____.

Further Affiant said not.

I affirm under penalties of perjury that the representations contained in this affidavit are true, to the best of my information and belief.

Signature

Date

STATE OF INDIANA)
)SS
COUNTY OF _____)

Subscribed and sworn to me, a notary public in and for _____ County and State of Indiana on this _____ day of _____, 20 _____ .

My Commission expires:

Signature

Name (typed or printed)

Indiana Department of Environmental Management
Office of Air Quality

Addendum to the
Technical Support Document for a Significant Source Modification

Source Name:	Nucor Steel
Source Location:	4537 South Nucor Road, Crawfordsville, IN 47933
County:	Montgomery
SIC Code:	3312
Operation Permit No.:	107-21359-00038
Permit Reviewer:	L. Stapf

On February 2, 2006, the Office of Air Quality (OAQ) had a notice published in the Journal Review in Crawfordsville, Indiana, stating that Nucor Steel had applied for a source modification to their existing steel mill. The notice also stated that OAQ proposed to issue a permit for this operation and provided information on how the public could review the proposed permit and other documentation. Finally, the notice informed interested parties that there was a period of thirty (30) days to provide comments on whether or not this permit should be issued as proposed.

IDEM does not amend the Technical Support Document (TSD). The TSD is maintained to document the original review. This addendum to the TSD (ATSD) is used to document responses to comments and changes made from the time the permit was drafted until a final decision is made.

Changes to the permit are shown in **bold** while items removed are shown in highlighted ~~strikethrough~~.

Air Permit Comments received from Nucor Steel in a letter dated February 27, 2006:

Nucor Comments:
Several references were missing from the table of contents. Nucor proposes that IDEM add the following:

In A.1 IDEM should include a reference to [326 IAC 2-7-1(22)]
In C.2, IDEM should include a reference to [326 IAC 1-6-3]
In C.11, IDEM should include a reference to [326 IAC 2-1.1-1], [326 IAC 2-7-5(3)], and [326 IAC 2-7-6(1)]
In C.12, IDEM should include a reference to [326 IAC 2-7-5] and [326 IAC 2-7-6]
In C.14, IDEM should include a reference to [326 IAC 2-2]
In C.15, IDEM should include a reference to [326 IAC 2-2]

In addition to including the above references, the table of contents should be revised as follows:
In C.8, IDEM should delete the reference to [326 IAC 3-5]
In C.10, IDEM should include “continuous” before “opacity”.
A reference to “Emergency Provisions [326 IAC 2-7-16]” is missing from the table of contents. Nucor proposes that IDEM move this condition to Condition C. See comment B.6 below. Nevertheless, IDEM should reference this condition in the table of contents.

IDEM Response:
The changes were made as requested. Note that Condition C.10 was removed in response to a comment which is discussed later in this document.

Nucor Comments to Condition A.2(a)(2):
The facility has more than one tundish. However, only one tundish is in use at any one time. To specify that only one tundish may be operated at a given time, Nucor proposes the first sentence be amended to “One (1) tundish may be operated at a given time. The tundish in operation feeds the molten metal from the LMS-2 ladle to one (1) continuous strip caster.”

IDEM Response to A.2(a)(2):
IDEM, OAQ recognizes that Nucor uses multiple tundish units for this operation. However, the description indicates that one tundish will be dedicated at any given time to the continuous caster; therefore, the condition as written is adequate. No changes were made as a result of this comment.

Nucor Comments:
Nucor proposes that the word "total" in the second sentence be moved from before "heat input" to after "combined." As a result, this sentence should read, "Each preheater shall be equipped with low-NOx burners and each preheater shall not exceed a heat input capacity of 2 MMBtu per hour for a combined total capacity of 4 MMBtu per hour."

IDEM Response:
IDEM agrees to make the following changes to A.2(b)(3):

(3) Two (2) natural gas-fired transition piece preheaters, utilizing propane as back up fuel. Each preheater shall be equipped with low-NOx burners and each preheater shall not exceed a ~~total~~ heat input capacity of 2 MMBtu per hour for a combined **total** capacity of 4 MMBtu per hour. These preheaters shall be used in the tundish operations located on the caster deck; and

Nucor Comments to A.2(c)(3):
In the first sentence "preheaters" should be changed to "preheater."

IDEM Response:
IDEM agrees to make the following change to A.2(c)(2) and (3):

(2) One (1) natural gas-fired ladle preheater~~s~~ identified as LP-3, was installed in 2004. The ladle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 12 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(3) One (1) natural gas-fired ladle preheater~~s~~ identified as LP-4, has not yet been installed. The ladle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 12 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

Nucor Comments to A.2(c)(4):
The tundish dryer is rated at 4 MMBtu/hour (not 2 MMBtu/hour). The condition should read as follows:

One (1) natural gas-fired tundish dryer identified as TD-1. The tundish dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 4 MMBtu per hour, and has the capability to utilize propane as a backup fuel.

IDEM Response:
IDEM agrees to make the following change to A.2(c)(4):

(4) One (1) natural gas-fired tundish dryer identified as TD-1. The tundish dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of ~~2~~ **4** MMBtu per hour, and has the capability to utilize propane as a backup fuel;

Nucor Comments to A.2(d)(1):
The facility has opted to not install the LMS-2 baghouse dust loading silo. Instead, the facility utilizes a closed-system that moves the dust directly into a "super sac" for removal from the site. Nucor recommends that this condition is removed in its entirety:

(d) Ancillary equipment associated with the strip caster plant:

(1) ~~One (1) LMS-2 baghouse dust loading silo equipped with a bin vent filter, or equivalent, for material recovery and particulate matter control. The emissions from the LMS-2 dust handling equipment shall also be controlled by the silo bin vent filter. Nucor may install an equivalent, enclosed system to store dust from the LMS-2~~;

IDEM Response:
IDEM agrees to make the following changes to A.2(d)(1) to reflect the changes to the dust handling operation:

(d) Ancillary equipment associated with the strip caster plant:

(1) One (1) LMS-2 baghouse~~ dust loading silo equipped with a bin vent filter,~~ **enclosed dust handling system** or equivalent, for material recovery and particulate matter control~~. The emissions from the LMS-2 dust handling equipment shall also be controlled by the silo bin vent filter. Nucor may install an equivalent, enclosed system to store dust from the LMS-2~~;

…

There is no increase in the PTE from the baghouse dust handling system as a result of this change.

Nucor Comments to A.2(d)(8):
IDEM should revise the description in (d)(8) to "Associated VTD alloy unloading, storage and feed systems."

IDEM Response:
IDEM agrees to make the following change to A.2(d)(8):

(8) Associated **VTD** alloy unloading, storage and feed systems:
- (a) One (1) truck dump station
- (b) Truck unloading/conveyors
- (c) Eight (8) storage hoppers, all exhausting to a common bin vent, rated at 0.01 grains/dry standard cubic foot, into the building.

Nucor Comments to B.5:
Nucor reiterates that IDEM include conditions (f) and (g) that Nucor need not resubmit documentation or repeat testing related to construction that occurred pursuant to a permit that permit 107-21359-00038 is superseding. Because this permit supersedes two previously issued source modification permits, 107-12143-00038 and 107-18314-00038, Nucor has submitted all the required documentation related to the construction of the equipment installed pursuant to those source modifications (see general comments) and has performed the required testing on this equipment. As a result, Nucor proposes IDEM include the following condition:

(f) Documentation submitted to IDEM for construction approved pursuant to PSD Permits 107-12143-00038 and 107-18314-00038 remains valid. Permittee need not resubmit any documentation, including but not limited to, Affidavits of Construction, submitted for construction authorized pursuant to permits 107-12143-00038 and 107-18314-00038.

(g) All testing completed as of the date this permit is issued that was performed pursuant to PSD Permit 107-12143-00038 and 107-18314-00038 remains valid. Permittee need not repeat any testing on equipment completed pursuant to PSD Permit 107-12143-00038 or 107-18314-00038.

IDEM Response to B.5:
Testing that has been performed and deemed adequate and compliant, need not be repeated. IDEM

recognizes that Nucor has completed the testing as established in the previously issued approvals. The affidavit that appears on page 47 of the source modification is solely for the construction of the new ladle preheater. No changes were made as a result of these comments.

Nucor Comments to B.6:
Nucor proposes that the Emergency Provisions section be moved from the General Construction Conditions, Section B, to the General Operation Conditions, Section C. It is unclear why the Emergency Provisions were placed in the Construction Conditions section instead of the Operation Conditions section.

IDEM Response to B.6:
The changes were incorporated by moving Section B.6 to Section C.7 (and renumbering the remaining "C" Conditions) as follows:

~~B.6~~ C.7 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, except as provided in 326 IAC 2-7-16.

(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
Indianapolis, Indiana 46204-2251

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) The Permittee seeking to establish the occurrence of an emergency shall make records available upon request to ensure that failure to implement a PMP did not cause or contribute to an exceedance of any limitations on emissions. However, 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.

Nucor Comments to existing C.9(a):
Nucor reiterates its objection to this condition's requirement that if the continuous monitoring equipment breaks down, supplemental or intermittent monitoring of the parameter must be implemented at intervals not less often that once an hour until the continuous monitoring equipment is back in operation. Once per hour monitoring of a parameter is burdensome and unnecessary. Instead, Nucor proposes that this condition incorporate the once per shift monitoring provision that IDEM has required in previous Nucor PSD permits. See Condition D.1.10, PSD Permit Number 107-16823-00038. Once per shift monitoring provides the assurance that if an emissions limitation is exceeded, if can be remedied in a timely fashion.

Nucor also proposes that if the CEMS is fixed prior to the end of the shift, that reactivation of the CEMS replaces the requirement for once-per-shift monitoring. Consequently, Nucor proposes that IDEM include the language "unless the CEMS is restored to operation before the end of the shift" to the end of the final sentence. In total, Nucor proposes the final sentence of this condition be revised to read:

> In the case of continuous monitoring, supplemental or intermittent monitoring of the parameter should be implemented at intervals no less often than once per shift until such time as the continuous monitor is back in operation, unless the CEMS is restored to operation before the end of the shift.

IDEM Response:

Since a CEMS is not included in this source modification, IDEM, OAQ has removed C.9 containing the CEMS language as follows:

~~C.9 Maintenance of Emission Monitoring Equipment [326 IAC 2-7-5(3)(A)(iii)]~~

~~(a) In the event that a breakdown of the emission monitoring equipment occurs, a record shall be made of the times and reasons of the breakdown and efforts made to correct the problem. To the extent practicable, supplemental or intermittent monitoring of the parameter should be implemented at intervals no less frequent than required in Section D of this permit until such time as the monitoring equipment is back in operation. In the case of continuous monitoring, supplemental or intermittent monitoring of the parameter should be implemented at intervals no less often than once an hour until such time as the continuous monitor is back in operation.~~

~~(b) The Permittee shall install, calibrate, quality assure, maintain, and operate all necessary monitors and related equipment. In addition, prompt corrective action shall be initiated whenever indicated.~~

IDEM has renumbered the remaining sections.

Nucor Comments to existing C.10:

Nucor reiterates that IDEM should remove this condition in its entirety. None of the equipment affected by this permit has a continuous opacity monitoring system and this condition is thus unnecessary.

IDEM Response:

IDEM agrees to remove the COM language in section C.10:

~~C.10 Maintenance of Continuous Opacity Monitoring Equipment [326 IAC 2-7-5(3)(A)(iii)]~~

~~(a) The Permittee shall install, calibrate, maintain, and operate all necessary continuous opacity monitoring systems (COMS) and related equipment. For a boiler, the COMS shall be in operation at all times that the induced draft fan is in operation.~~

~~(b) All COMS 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.~~

~~(c) In the event that a breakdown of a COMS occurs, a record shall be made of the times and reasons of the breakdown and efforts made to correct the problem.~~

~~(d) Whenever a COMS is malfunctioning or is down for maintenance or repairs for a period of twenty-four (24) hours or more and a backup COMS is not online within twenty-four (24) hours of shutdown or malfunction of the primary COMS the Permittee shall provide a certified opacity reader, who may be an employee of the~~

~~Permittee or an independent contractor, to self-monitor the emissions from the emission unit stack.~~

~~(1) Visible emission readings shall be performed in accordance with 40 CFR 60, Appendix A, Method 9, for a minimum of five (5) consecutive six (6) minute averaging periods beginning not more than twenty-four (24) hours after the start of the malfunction or down time.~~

~~(2) Method 9 opacity readings shall be repeated for a minimum of five (5) consecutive six (6) minute averaging periods at least twice per day during daylight operations, with at least four (4) hours between each set of readings, until a COMS is online.~~

~~(3) Method 9 readings may be discontinued once a COMS is online.~~

~~(4) Any opacity exceedances determined by Method 9 readings shall be reported with the Quarterly Opacity Exceedances Reports.~~

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

Nucor Comments on C.11(a):
Nucor proposes that IDEM include a list of the analog instruments this condition governs. A general condition governing "analog instruments" does not provide Nucor with the specificity to know what instruments must meet the terms of the condition. Consequently, Nucor proposes that the condition be revised to read:

(a) When required by a condition of this permit, the analog instruments listed in this condition that are used to measure a parameter related to the operation of an air pollution control device shall have a scale such that the expected maximum reading for the normal range shall be no less than twenty percent (20%) of full scale. The analog instruments to which this condition applies are differential pressure gauges, amp meters, and thermocouples.

IDEM Response to existing Condition C.11(a):
The changes were not incorporated; such a list of instruments would be subject to change without notice. The source should contact OAQ Compliance to inquire how this condition applies to the instruments at this source.

Nucor Comments on Section D.1 facility description for (a)(2):
The facility has more than one tundish. However, only one tundish is in use at any one time. To specify that only one tundish may be operated at a given time, Nucor proposes the first sentence be amended to "One (1) tundish may be operated at a given time. The tundish in operation feeds the molten metal from the LMS-2 ladle to one (1) continuous strip caster."

IDEM Response to D.1 description for (a)(2):
IDEM, OAQ recognizes that Nucor uses multiple tundish units for this operation. However, the description indicates that one tundish will be dedicated at any given time to the continuous caster; therefore, the condition as written is adequate. No changes were made as a result of this comment.

Nucor Comments on D.1 facility description for (b)(3):
Also, in (b)(3) Nucor proposes that the word "total" in the second sentence be moved from before "heat input" to after "combined." As a result, this sentence should read: "Each preheater shall be equipped with low-NOx burners and each preheater shall not exceed a heat input capacity of 2 MMBtu per hour for a combined total capacity of 4 MMBtu per hour."

IDEM Response to D.1 description for (b)(3):
IDEM agrees to make the following changes to the D.1 description for (b)(3):

(3) Two (2) natural gas-fired transition piece preheaters, utilizing propane as back up fuel. Each preheater shall be equipped with low-NOx burners and each preheater shall not exceed a ~~total~~ heat input capacity of 2 MMBtu per hour for a combined **total** capacity of 4 MMBtu per hour. These preheaters shall be used in the tundish operations located on the caster deck; and

Nucor Comments to D.1.1(a)(1):
Nucor proposes including the phrase "outside of a building" to the end of this condition. This specifies that the intent of this condition is to minimize uncontrolled emissions during transport outside the building rather than in the Castrip building.

IDEM Response to D.1.1(a)(1):
The change was not made as requested to Condition D.1.1(a)(1). The intent of the requirement is to minimize uncontrolled and fugitive emissions whether the emissions are generated inside or outside the building.

Nucor Comments to D.1.1(a)(4):
Nucor objects to the inclusion of the 0.0117 pounds of filterable PM/PM_{10} per ton of steel processed. This permit includes a filterable PM/ PM_{10} emissions limits of 0.0018 gr/dscf. IDEM has not provided any reason to include these additional emission limits. They are redundant and unnecessary.

Nucor Comments to D.1.1(a)(5):
Nucor has considerable concern with the proposed PM/ PM_{10} BACT proposed for the LMS-2 baghouse, particularly as it relates to the condensable and/or filterable + condensable fraction.

First, Nucor agrees that the LMS-2 baghouse, even with the minor contribution of other natural gas fired equipment, can achieve a filterable BACT limit of 0.0018 gr/dscf.

Second, Nucor disagrees that IDEM, OAQ has provided an adequate justification of the proposed 0.0052 gr/dscf limit for filterable+condensable particulate. The deficiencies in the IDEM, OAQ BACT demonstration include the following:

- All data cited by IDEM, OAQ for establishing the filterable+condensable limit are based on "melt shop" operations and not stand-alone LMS operations. There are significant differences between melt shop (which usually means EAF) operations and LMS operations, including: furnace type; raw materials; flux handling; arc practices; air infiltration; presence/absence of molten/liquid materials, that preclude application of EAF values automatically to the LMS situation.

- The cited ratios of filterable to condensable emissions vary widely between the different facilities and even at the same facility between tests and it is not clear that all of the reported condensable data are equivalent. For example, IDEM, OAQ analysis is not clear whether values of IPSCO and facilities other than SDI are condensable only or filterable+condensable values. In any event, the ratios of filterable to condensable (or filterable to filterable+condensable) ranges from a low of 1:1.71 to a high of 1:15 with a mean of 1:6 and a median of 1:3.7225 and a standard deviation of over 6. Yet IDEM, OAQ had specified a ratio of only 1:2.888, well below both the mean and the median of observed results, much less the observed range of emissions variance observed from IDEM, OAQ ordered tests at the SDI facility. The test data marshaled by IDEM, OAQ demonstrates that the proposed filterable+condensable limit is arbitrary and unsupported.

Third, while Nucor doubts that there is adequate data available yet to establish a technically-defensible limit for filterable+condensable fraction, IDEM, OAQ has indicated that it believes it must impose a limit. If IDEM, OAQ will impose a limit based on such scant data, then Nucor requests that the limit be set at the median (1:3.7225) plus standard deviation (6.09) of the ratio, or at a rate of 1:9.816. Accepting IDEM, OAQ's 0.0018 gr/dscf filterable limit, the filterable+condensable limit should be set at 0.0175 gr/dscf (0.0175/0.0018 = 9.816). However, Nucor is willing to accept filterable+condensable limit of 0.01 gr/dscf in this permit. This value conforms to the settlement negotiations between Nucor and IDEM related to PSD Permit number 107-16823-00038. This is no assurance that the facility can comply with the 0.0052 gr/dscf limit, as indicated by past test data on the melt shop LMS, which is substantially equivalent to the LMS-2 unit.

IDEM Response to D.1.1(a)(4) and D.1.1(a)(5):
IDEM has determined that it is necessary to limit the condensable fraction of PM/PM_{10} to ensure that all PM_{10}, which includes the condensable fraction, is accounted for in the PSD BACT for this facility. This determination is consistent with the following EAB decision and EPA guidance:

(a) <u>EAB decision: AES Puerto Rico L.P.</u>
On May 27, 1999, the Environmental Appeals Board (EAB) addressed the issue of condensable PM_{10} in a PSD permit issued by US EPA Region II. The permit was designed to address both the condensable and non-condensable fractions of PM_{10}. AES requested that the USEPA Region II require testing only by an in-stack test method and not impose a limit for the condensable fraction of PM_{10}. Region II insisted on retaining a limit for PM_{10} condensable because it is important to account for the significant condensable fraction of PM_{10} emissions. Region II acknowledged that there were little guidance and information on the PM_{10} condensable, thus they were left to derive a PM_{10} limit. The approach used to derive the PM_{10} (condensable) limit was similar to an existing approach upheld by the EAB. Through the permit, Region II claims that specifying PM_{10} limits with condensable will yield a more accurate picture of PM_{10} emissions, and also increases the likelihood that the next source subject to BACT for PM_{10} will take into account and evaluate the PM_{10} condensable fractions.

The EAB decided that there was no error on the part of Region II in establishing condensable PM_{10} limits as part of the BACT.

Comparisons have been made between this case and Nucor Steel, IN:
- - Both operations have the potential to emit condensable PM_{10}.
- - Both permitting agencies specified PM_{10} BACT limits with condensables 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 believe that specifying clear condensable fractions in the RACT/BACT clearinghouse will provide additional guidance to future permitting.

(b) <u>USEPA Letter dated March 31, 1994</u>
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 PM_{10} limits that contain condensable fraction.

This letter indicated that the definition of PM_{10} includes condensable PM_{10}. It further states that since condensable particulate is considered PM_{10}, PSD permits must address condensable fractions if the proposed unit is a potential condensable emitter.

There are sources (not including Nucor Steel, IN) shown in Appendix B -- PSD BACT

Evaluations - - that have PM_{10} BACT limits.

Since the EPA letter existed prior to the establishment of these PM_{10} limits, it can be concluded that these limits were established according to this guidance. (If PM_{10} is specified, it consists of filterable and condensable fractions).

IDEM does not believe the Nucor proposal of 0.01 gr/dscf is reasonable based on the BACT discussion in Appendix B of the Technical Support Document because the limits for the sources in the BACT discussion range from 0.0025 to 0.0052 gr/dscf. There is no change in the draft source modification due to these comments.

Nucor Comments to D.1.10(b) and (d):
Nucor reiterates its objection to the requirement that the instrument used for determining the pressure drop across the LMS-2 baghouse and the fan amperes of the LMS-2 baghouse fan be calibrated every six months. Calibrations of these devices are not required at this frequency and an annual calibration is consistent with other equipment at the facility. Consequently, Nucor proposes that these conditions be revised to require calibration once every year.

IDEM Response to D.1.10(b) and (d):
The Permittee has not provided the manufacturer's maintenance schedule or other documentation to justify changing the calibration to once per year.

Nucor Comments to D.2(c)(3):
Facility Description. In the first sentence of (c)(3), "preheaters" should be changed to "preheater". The tundish Dryer in (c)(4) is rated at 4 MMBtu/hour (not 2 MMBtu/hour).

IDEM Response to D.2 description (c)(2), (c)(3) and (c)(4):
IDEM made the changes as requested:

(2) One (1) natural gas-fired ladle preheater~~s~~ identified as LP-3, was installed in 2004. The ladle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 12 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(3) One (1) natural gas-fired ladle preheater~~s~~ identified as LP-4, has not yet been installed. The ladle preheater shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of 12 MMBtu per hour, and has the capability to utilize propane as a backup fuel;

(4) One (1) natural gas-fired tundish dryer identified as TD-1. The tundish dryer shall be equipped with low-NOx burners, shall not exceed a maximum heat input rate of ~~2~~ **4** MMBtu per hour, and has the capability to utilize propane as a backup fuel;

Nucor Comments to D.2.1(a)(2):
In the table, the tundish dryer (TD-1) rated at 2 MMBtu/hour should be changed to 4 MMBtu/hour.

IDEM Response to D.2.1(a)(2):
IDEM made the change as requested:

Combustion Facility	No. Units	Each Unit's Max Heat Input Rate (MMBtu/hr)	Burner Type (or equivalent)	Stack
Ladle Preheaters	4	12	Low-NOx	S-21
Tundish Dryer	1	~~2~~ **4**	Low-NOx	S-21
Tundish Dryer	1	3	Low-NOx	S-21
Tundish Dryer	1	1	Low-NOx	S-21
Transition Piece Dryers	2	0.15	Low-NOx	S-21

Nucor Comments to D.2.1(b):
In the second sentence, the hourly NOx emission rate for TD-1 should be changed from 0.20 lbs/hour to 0.40 lbs/hour. BACT for the NOx emissions is 0.10 pounds per MMBtu. Thus, because the tundish dryer has a rating of 4 MMBtu/hour instead of 2 MMBtu/hour the hourly emission limit should be 0.40 lbs/hour.

IDEM Response:
IDEM agrees to make the following changes to D.2.1(b) to account for the corrected Btu rating of the dryer:

(b) Pursuant to 326 IAC 2-2-3 (BACT), the BACT for NOx from TD-1, TD-2, TD-3 and each transition piece dryer shall be proper equipment operation, the use of low NOx burners, and NOx emission rate shall not exceed an emission rate of 0.10 pounds per MMBtu. Further, the hourly NOx emission rate shall not exceed ~~0.20~~ **0.40**, 0.30, and 0.10 lbs per hour for emission units TD-1, TD-2, and TD-3, respectively, and the hourly NOx emission rate shall not exceed 0.015 lbs per hour for each transition piece dryer.

Nucor Comments to D.2.2(a):
In the second sentence, the hourly SO_2 emission rate for TD-1 should be changed from 0.0012 lbs/hr to 0.0024 lbs/hr. BACT for SO_2 emissions is 0.0006 pounds per MMBtu. Thus, because the tundish dryer has a rating of 4 MMBtu/hr instead of 2 MMBtu/hr, the hourly emission limit should be 0.0024 lb/hr.

IDEM Response to D.2.2(a):
The change shall be made to account for the corrected Btu rating of the dryer:

(a) BACT for SO_2 from TD-1, TD-2, TD-3 and each transition piece dryer shall be proper operation and shall not exceed a SO_2 emission rate of 0.0006 pounds per MMBtu. Further, the hourly SO_2 emission rate shall not exceed ~~0.0012~~ **0.0024**, 0.0018, and 0.0006 lbs per hour for emission units TD-1, TD-2, and TD-3, respectively, and the hourly SO_2 emission rate shall not exceed 0.0001 lbs per hour for each transition piece dryer.

Nucor Comments to D.2.3(a):
In the second sentence, the hourly CO emission rate for TD-1 should be changed from 0.168 lbs/hr to 0.336 lbs/hr. BACT for the CO emission is 0.084 pounds per MMBtu. Thus, because the tundish dryer has a rating of 4 MMBtu/hr instead of 2 MMBtu/hr, the hourly emission limit should be 0.336 lbs/hr.

IDEM Response to D.2.3(a):
The change shall be made to account for the corrected Btu rating of the tundish dryer:

(a) BACT for CO from TD-1, TD-2, TD-3 and each transition piece dryer shall be proper operation and shall not exceed a CO emission rate of 0.084 pounds per MMBtu. Further, the hourly CO emission rate shall not exceed ~~0.168~~ **0.336**, 0.252, and 0.084 lbs per hour for emission units TD-1, TD-2, and TD-3, respectively, and the hourly CO emission rate shall not exceed 0.013 lbs per hour for each transition piece dryer.

Nucor Comments to D.2.4(a) through (d):
Nucor objects to the paragraphs (a) and (b) in this condition. Initially, there is not adequate test data regarding filterable emissions from natural gas fired equipment. More importantly, the filterable emissions limits (in (a) and (b)) and the filterable plus condensable limits (in (c) and (d)) are designed to be equally protective of health and the environment. As a result, it is unnecessary to institute separate filterable and filterable plus condensable limits. Because filterable emissions are a subset of filterable plus condensable emissions, meeting the filterable plus condensable emissions limitations provides the required protection of human health and the environment. IDEM, OAQ has previously agreed that separate filterable and filterable plus condensable limits are not necessary for natural gas fired combustion equipment when filterable plus condensable limits are established at 0.0076 pounds per MMBtu. Therefore, Nucor requests that IDEM eliminate the filterable limits in paragraphs (a) and (b) of Condition D.2.4.

If IDEM chooses to not eliminate paragraphs (a) and (b) of Condition D.2.4 entirely, it should revise the BACT PM/ PM_{10} filterable emissions rates to “0.0019” lb/MMBtu from 0.0018 lb/MMBtu. The AP-42 emission factor for natural gas fire equipment is 0.0019 lb/MMBtu. Also, in the second sentence, the hourly PM/ PM_{10} filterable emission rate for TD-1 should be changed from 0.0038 lb/hr to 0.0076 lb/hr. Because BACT for the PM/ PM_{10} filterable emissions is 0.0019 pounds per MMBtu and the tundish dryer has a rating of 4 MMBtu/hr (instead of 2 MMBtu/hr), the hourly emission limit should be 0.0076 lb/hr.

Nucor Comments to D.2.4(c):
In the second sentence, the hourly PM/ PM_{10} emission rate for TD-1 should be changed from 0.015 lbs/hr to 0.030 lb/hr. BACT for the PM/ PM_{10} emissions is 0.0076 pounds per MMBtu. Thus, because the tundish dryer has a rating of 4 MMBtu/hr instead of 2 MMBtu/hr, the hourly emission limit should be 0.030 lb/hr.

IDEM Response to D.2.4(a) and (b):
First, the hourly emissions were based on 0.0018 pounds per MMBtu because it is BACT for PM/ PM_{10} (filterable). However, IDEM has decided that in this case, based on the fact that there are no particulate controls associated with the emissions unit, the filterable particulate emission limit may be removed. Therefore, those subparts (a) and (b) referring to PM/ PM_{10} (filterable) were removed from the permit as follows:

~~(a) BACT for PM/PM10 (filterable) from TD-1, TD-2, TD-3 and each transition piece dryer shall be proper operation and shall not exceed a PM/PM10 (filterable) emission rate of 0.0018 pounds per MMBtu. Further, the hourly PM/PM10 (filterable) emission rate shall not exceed 0.0038 0.0057 and 0.0019 lbs per hour for emission units TD-1, TD-2, and TD-3, respectively, and the hourly PM/PM10 (filterable) emission rate shall not exceed 0.00029 lbs per hour for each transition piece dryer.~~

~~(b) BACT for PM/PM10 (filterable) from each ladle preheater shall be proper operation and shall not exceed a PM/PM10 (filterable) emission rate of 0.0018 pounds per MMBtu and 0.023 lbs per hour.~~

IDEM Response to D.2.4(c) and (d):
Note that the subparts of D.2.4 (c) and (d) are renumbered to (a) and (b). The hourly emissions were based on 0.0076 pounds per MMBtu for the tundish dryers and 0.0056 pounds per MMBtu for the transition piece dryers, respectively, because those are the BACT limits for PM/ PM_{10} (filterable plus condensable). The corrected Btu rating of the emission units resulted in the following changes:

(~~e~~**a**) BACT for PM/PM_{10} (filterable ~~and~~ **plus** condensable) from TD-1, TD-2, TD-3 and each transition piece dryer shall be ~~proper operation~~ **utilization of "good combustion practices"** and shall not exceed a PM/PM_{10} (filterable ~~and~~ **plus** condensable) emission rate of 0.0076 pounds per MMBtu. Further, the hourly PM/PM_{10} (filterable ~~and~~ **plus** condensable) emission rate shall not exceed ~~0.015~~ **0.030**, 0.023, and 0.008 lbs per hour for emission units TD-1, TD-2, and TD-3, respectively, and the hourly PM/PM_{10} (filterable ~~and~~ **plus** condensable) emission rate shall not exceed ~~0.0037~~ **0.0011** lbs per hour for each transition piece dryer.

(~~d~~**b**) BACT for PM/PM_{10} (filterable ~~and~~ **plus** condensable) from each ladle preheater shall be ~~proper operation~~ **utilization of "good combustion practices"** and shall not exceed a PM/PM_{10} (filterable ~~and~~ **plus** condensable) emission rate of 0.0076 pounds per MMBtu and ~~0.090~~ **0.091** lbs per hour.

(~~e~~**c**) The opacity from the LMS-2 roof monitor (S-21) shall not exceed three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9). Compliance with this limitation satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).

Refer to "IDEM Response 9" to "EPA Comment 9" (p. 35 of this ATSD) below for the complete changes to permit Condition D.2.4 concerning "good combustion practices" and to Appendix B.2, Step 5 (p.30 of BACT, Appendix B of TSD). Refer to "IDEM's Review" (p. 25 of this ATSD), for the explanation of the revisions to the PM/PM_{10} (filterable plus condensable) emission factor for the transition piece dryers.

Nucor Comments to D.3 description:
Facility Description. The facility description should be revised to remove (d)(1). As explained in its comments to Condition A.2(d)(1), Nucor has opted to not install the LMS-2 baghouse dust loading silo. Consequently, the description of the dust loading silo should be removed.

Also, as discussed in the comments to Condition A.2(d)(8), IDEM should revise the sentence to "Associated VTD alloy unloading, storage, and feed systems."

Finally, in (d)(4) and (5), "a" should be changed to "an".

IDEM Response to D.3 description (d)(1):
IDEM agrees to make the following changes to the D.3 description, D.3.1, D.3.4, D.3.6 and D.3.7 to reflect the changes to the dust handling operation:

(d) Ancillary equipment associated with the strip caster plant:

(1) One (1) LMS-2 baghouse~~ dust loading silo equipped with a bin vent filter,~~ **enclosed dust handling system** or equivalent, for material recovery and particulate matter control~~. The emissions from the LMS-2 dust handling equipment shall also be controlled by the silo bin vent filter. Nucor may install an equivalent, enclosed system to store dust from the LMS-2~~

…

D.3.1 Particulate Matter (PM and PM_{10}) Emission Limitations

~~(a) Pursuant to 326 IAC 2-2 (PSD Requirements), the LMS-2 baghouse dust loading silo shall comply with the following requirements:~~

~~(1) The LMS-2 baghouse dust loading silo shall be equipped with a bin vent;~~

~~(2) The filterable PM/PM_{10} emissions from the LMS-2 baghouse dust loading silo shall not exceed 0.01 gr/dscf at a maximum volumetric air flow rate of 100 standard cubic feet per minute; and~~

~~(3) The opacity from the LMS-2 baghouse dust loading silo shall not exceed three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9). This limitation satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).~~

(~~b~~**a**) Pursuant to 326 IAC 2-2 (PSD Requirements), the emissions from dumping, storage, and transfer operations of raw materials shall not exceed five percent (5%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9). This limitation satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).

(~~c~~**b**) Pursuant to 326 IAC 2-2 (PSD Requirements), the paved surface silt loading shall not exceed 16.8 pounds of silt per mile and the average instantaneous opacity from paved roadways and parking lots shall not exceed ten percent (10%). The average instantaneous opacity shall be the average of twelve (12) instantaneous opacity readings, taken for four (4) vehicle passes, consisting of three (3) opacity readings for each vehicle pass. The three (3) opacity readings for each vehicle pass shall be taken as follows:

(1) The first reading will be taken at the time of emission generation;

(2) The second reading will be taken five (5) seconds later; and

(3) The third reading will be taken five (5) seconds later or ten (10) seconds after the first reading.

The three (3) readings shall be taken at the point of maximum opacity. The observer shall stand at least fifteen (15) feet, but no more than one-fourth (1/4) mile, from the plume and as close to approximately right angles to the plume as permissible under EPA Reference Method 9. Each reading shall be taken approximately four (4) feet above the surface of the paved roadway.

(~~d~~**c**) Pursuant to 326 IAC 2-2 (PSD Requirements), the visible emissions from unpaved roadways and unpaved areas around raw material storage piles shall not exceed an average instantaneous opacity of ten percent (10%). The average instantaneous opacity shall be the average of twelve (12) instantaneous opacity readings, taken for four (4) vehicle passes, consisting of three (3) opacity readings for each vehicle pass. The three (3) opacity readings for each vehicle pass shall be taken as follows:

(1) The first reading will be taken at the time of emission generation;

(2) The second reading will be taken five (5) seconds later; and

(3) The third reading will be taken five (5) seconds later or ten (10) seconds after the first reading.

The three (3) readings shall be taken at the point of maximum opacity. The observer shall stand at least fifteen (15) feet, but no more than one-fourth (1/4) mile, from the plume and as close to approximately right angles to the plume as permissible under EPA Reference Method 9. Each reading shall be taken

approximately four (4) feet above the surface of the unpaved roadway.

(~~e~~**d**) Pursuant to 326 IAC 2-2 (PSD Requirements), the two (2) cooling towers shall be equipped with drift eliminators.

(~~f~~**e**) Except as otherwise provided by statute, rule, or this permit, the VTD material handling system bin vent filters for PM control shall be in operation and control emissions at all times the associated equipment controlled by the filters are in operation.

(~~g~~**f**) In the event that filter failure is observed in a multi-compartment filter housing, if operations will continue for ten (10) days or more after the failure is observed before the failed units will be repaired or replaced, the Permittee shall promptly notify 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.3.4 Preventive Maintenance Plan~~

~~A Preventive Maintenance Plan, in accordance with Section C - Preventive Maintenance Plan, of this permit, is required for the bin vent filter to the LMS-2 baghouse dust loading silo.~~

…

Compliance Determination and Monitoring

D.3.**6**~~7~~ Visible Emissions Notations

(a) Visible emission notations of the **baghouse's enclosed dust handling system** ~~bin vent to the LMS-2 baghouse dust loading silo~~ shall be performed once per week during normal daylight operations when exhausting to the atmosphere. A trained employee shall record whether emissions are normal or abnormal.

D.3.**7**~~8~~ Recordkeeping Requirement

(a) The Permittee shall maintain records of the visible emission notations stated in Operation Condition D.3.**6**~~7~~ to demonstrate compliance with PSD requirements.

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

IDEM Response to D.3 description (d)(4), (d)(5), and (d)(8):
The following changes were made as requested:

(4) One (1) contact cooling tower system with ~~a~~ **an** average water flow rate of 12,000 gallons per minute

(5) One (1) non-contact cooling tower system with ~~a~~ **an** average water flow rate of 14,400 gallons per minute;

…

(8) Associated **VTD** alloy unloading, storage and feed systems:
(a) One (1) truck dump station
(b) Truck unloading/conveyors
(c) Eight (8) storage hoppers, all exhausting to a common bin vent, rated at 0.01 grains/dry standard cubic foot, into the building.

…

D.3.3 **VTD** Alloy Handling PSD BACT [326 IAC 2-2]

(a) Pursuant to 326 IAC 2-2 Prevention of Significant Deterioration (PSD), the Permittee shall perform alloy unloading in a 3-sided building.

(b) Pursuant to 326 IAC 2-2 Prevention of Significant Deterioration (PSD), the visible emissions from the alloy unloading shall not exceed 3% opacity, based on a 6-minute average.

…

Nucor Comments to D.3.3(b):
Nucor proposes that IDEM revise this Condition to require a visible emission limit of 5% opacity. Elsewhere in this permit, IDEM required an opacity limit of 5% for raw materials unloading. See Condition 3.1(b). Thus, the opacity limit for alloy unloading should also be 5%.

IDEM Response to Condition D.3.3:
This limit was incorporated directly from the previous permit (Condition D.3.3 of 107-18314-00038) which specified the opacity limit of 3% for the alloy unloading. There was no change as a result of this comment.

Nucor Comments to D.4.1(g):
Nucor reiterates its objection to the inclusion of a limit for PM_{10} filterable plus condensable emissions. There is no data for the condensable fraction of particulate emissions. Thus, it is improper to attempt to impose condensable limits upon the facility. Nucor proposes that IDEM remove the condensable condition and leave the 0.088 gr/dscf for filterable only.

IDEM Response:
First, to clarify, the limitation for the vacuum degasser is 0.008 and not 0.088 gr/dscf as Nucor stated. Consistent with the PSD permit number 107-19385-00038 changes, IDEM has decided that in a case where there are no particulate controls for an emissions unit, the particulate matter (filterable) emission limit may be removed. The flare does not act as a control device for particulate matter emissions.

However, IDEM does not agree to remove the particulate matter (filterable plus condensable) emissions limit. IDEM's position on this point is explained previously with the EAB decision and EPA guidance presented in the IDEM response to Conditions D.1.1(a)(4) and (a)(5) (p.9 of this ATSD). IDEM has determined that it is necessary to limit the condensable fraction of PM/PM_{10} to ensure that all PM_{10}, which includes the condensable fraction, is accounted for in the PSD BACT for this facility. Therefore, the following changes were made to the permit Condition D.4.1:

~~(f) The PM/**PM_{10} (filterable)** emissions from the vacuum degasser shall not exceed 0.008 grain per dry standard cubic foot, and 0.45 pounds per hour, based on a 3-hour block average.~~

(~~g~~f) The **PM/**PM_{10} (filterable ~~and~~ **plus** condensable) emissions from the vacuum degasser shall not exceed 0.008 grain per dry standard cubic foot, and 0.45 pounds per hour, based on a 3-hour block average.

(~~h~~g) The opacity from the vacuum degasser enclosed flare stack (Stack 500) shall not exceed three percent (3%) opacity, based on a six-minute average.

Nucor Comments to D.4.3(g):
IDEM should remove the collateral PM (filterable) emissions limit from the 2 MMBtu/hr flare. This limit was removed pursuant to Nucor's PSD permit number 107-19385-00038. As a result, it should not appear in

this PSD permit.

IDEM Response:
Changes to Condition D.4.3(g) were necessary in order to reflect the changes by Nucor's PSD permit number 107-19385-00038. The changes are as follows:

D.4.3 Flare (2 MMBTU/hour) PSD BACT Limits [326 IAC 2-2]

…

(g) ~~The collateral PM (filterable) emissions from the 2 MMBTU/hour flare burner shall not exceed 0.0019 pounds per MMBTU.~~ The collateral **PM/**PM_{10} (filterable ~~and~~ **plus** condensable) emissions from the 2 MMBTU/hour flare burner shall not exceed 0.0076 pounds per MMBTU. The PM/PM_{10} emissions from the 2 MMBTU/hour flare burner shall not exceed 0.008 grain per dry standard cubic foot, and 0.45 pounds per hour, based on a 3-hour block average.

In addition, changes were necessary to the public notice version of 107-21359-00038 in order to reflect 107-19385-00038 modifications. Here are the necessary changes:

D.4.8 Record Keeping Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

(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 operating temperature of the flare, and make available upon request to IDEM, OAQ and the US EPA.~~

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

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

Nucor Comments to D.4.4:
The PMP is required for the flare and not the vacuum degasser. The flare is the control device for the vacuum degasser and is thus the piece of equipment that must have a PMP. Consequently, Nucor reiterates that IDEM should remove the words "vacuum degasser and its" from this condition.

IDEM Response:
The Preventive Maintenance Plan requirement must be included in every applicable Title V permit and source modification pursuant to 326 IAC 2-7-5(13). This rule refers back to the Preventive Maintenance Plan requirement as described in 326 IAC 1-6-3. This Preventive Maintenance Plan rule sets out the requirements for:

(1) Identification of the individuals responsible for inspecting, maintaining and repairing the emission control equipment (326 IAC 1-6-3(a)(1)),

(2) The description of the items or conditions in the facility that will be inspected and the inspection schedule for said items or conditions (326 IAC 1-6-3(a)(2)), and

(3) The identification and quantification of the replacement parts for the facility which the Permittee will maintain in inventory for quick replacement (326 IAC 1-6-3(a)(3)).

It is clear from the structure of the wording in 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. 326 IAC 1-6-3(b) provides that "...as deemed necessary by the commissioner, any person operating a facility shall comply with the requirements of subsection (a) of this section."

Many types of facilities require maintenance in order to prevent excess emissions. In addition to preventive maintenance performed on the control devices, preventive maintenance should be performed on the vacuum degasser because lack of proper maintenance on the emission unit can result in leaks or improper operation which can result in increased air emissions.

Therefore, no changes were made as a result of this comment.

Nucor Comments to D.5.6:
Nucor objects to the requirement that the instrument used for determining the pressure drop across the baghouse to the continuous blasting unit be calibrated every six months. Calibrations of these devices are not required at this frequency and an annual calibration is consistent with other equipment at the facility. Consequently, Nucor proposes that these conditions be revised to require calibration once every year.

IDEM Response:
The Permittee has not provided the manufacturer's maintenance schedule or other documentation to justify changing the calibration to once per year.

Nucor Comments to D.7.5:
Nucor proposes that IDEM remove this condition. A preventative maintenance plan is required for a control device not an emission unit. As Boiler number 501 has no control device there is no reason for a PMP.

IDEM Response:
The Preventive Maintenance Plan requirement must be included in every applicable Title V permit and source modification pursuant to 326 IAC 2-7-5(13). This rule refers back to the Preventive Maintenance Plan requirement as described in 326 IAC 1-6-3. This Preventive Maintenance Plan rule sets out the requirements for:

(1) Identification of the individuals responsible for inspecting, maintaining and repairing the emission control equipment (326 IAC 1-6-3(a)(1)),

(2) The description of the items or conditions in the facility that will be inspected and the inspection schedule for said items or conditions (326 IAC 1-6-3(a)(2)), and

(3) The identification and quantification of the replacement parts for the facility which the Permittee will maintain in inventory for quick replacement (326 IAC 1-6-3(a)(3)).

It is clear from the structure of the wording in 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. 326 IAC 1-6-3(b) provides that "...as deemed necessary by the commissioner, any person operating a facility shall comply with the requirements of subsection (a) of this section."

Many types of facilities require maintenance in order to prevent excess emissions. In addition to preventive maintenance performed on the control devices, preventive maintenance should be performed on the boiler itself because lack of proper maintenance on the boiler can result in boiler tube leaks or improper burner air settings which can result in increased air emissions.

Therefore, no changes were made as a result of this comment.

Nucor Comments to D.7.9:

Nucor reiterates its request that IDEM revise this condition to specify that the facility need not provide an additional initial notification if one already has been provided pursuant to a previous permit. Nucor was issued a PSD permit that included this same notification condition for this equipment. *See* PSD Permit 107-18314-00038 Condition D.2.9. As a result, Nucor has already submitted the initial notification pursuant to that section. Consequently, Nucor proposes revising condition D.7.9(a) to read: "Pursuant to 40 CFR 63.7545(c), the Permittee shall submit an Initial Notification no later than 120 days after the initial startup of Boiler No. 501. If Permittee has submitted the initial notification pursuant to Prevention of Significant Deterioration Permit number 107-18314-00038, an initial notification pursuant to this condition is not required."

IDEM Response:
The initial notification procedures must still be part of the permit even if the Permittee has already satisfied the initial notification requirements. The source is under no obligation to resubmit this notification if it has previously submitted the notification and satisfied this part of the permit condition. No changes were made as a result of these comments.

Technical Support Document Comments:

IDEM does not amend the Technical Support Document (TSD) directly. The TSD is maintained to document the original review. This addendum to the TSD is used to document responses to comments and changes made from the time the permit was drafted until a final decision is made.

Nucor Comment Page 1:
Change the address from "South Nucor Street" to "South Nucor Road".

IDEM Response:
IDEM agrees to make the following changes to Page 1 source address:

Source Location: 4537 South Nucor ~~Street~~ **Road**, Crawfordsville, IN 47933

Nucor Comment Page 6:
In the "Existing PSD" column of the table, the melt shop caster rating should be "502" and not "135". In addition, this table has inappropriately lumped equipment together resulting in the impression that the proposed rate of the Castrip caster is 135 tons per hour. Nucor proposes that IDEM revise the table to show the Castrip LMS at 270 tons/hour in one row and the Castrip caster at 135 tons/hour in a separate row.

IDEM Response:
IDEM agrees to make the following changes to the Page 6 table; the change was made as requested:

Background and Proposed Modification

Unit/Process	Existing (PSD ID)	Proposed
Melt Shop Electric Arc Furnaces and Argon-Oxygen Decarburization	502 ton/hr (107-16823-00038)	502 ton/hr (no change)
Meltshop Caster	~~135~~ **502** ton/hr (107-16823-00038)	502 ton/hr (no change)
Vacuum Degasser	135 ton/hr (107-18314-00038)	270 ton/hr
Castrip LMS ~~and Caster~~	135 ton/hr (107-12143-00038)	270 ton/hr
Castrip Caster	**135 ton/hr (107-12143-00038)**	**135 ton/hr**

Nucor Comment Page 7:
The "Permit Level Determination - PSD" table on this page was apparently based on some inaccurate

information. First, in the "Ladle Preheaters" row, IDEM based the calculation on three rather than four ladle preheaters. As a result, IDEM should revise the emissions data to: Lead to 1.05E-4; PM to 0.4; PM_{10} to 1.18; SO_2 to 0.128; VOC to 1.16; CO to 17.66; NOx to 21.0 and HAPs to 0.39. In a similar way, the emissions in the row labeled "Other Combustion Units" included the three tundish dryers with a total rating of 6 MMBtu/hour. This is incorrect as the three dryers have a total rating of 8 MMBtu/hour. This changes the emissions in the "Other Combustion Units" row to: Lead to 1.87E-5; PM to 0.07; PM_{10} to 0.21; SO_2 to 0.023; VOC to 0.21; CO to 3.05; NOx to 3.6; and HAPs to 0.17. Finally, as a result of the above corrections, IDEM should revise the "Total for Modification" emissions to: PM 25.12; PM_{10} to 52.3; VOC to 18.5; CO to 232.3; NOx to 237.6 and HAPs to 1.26.

IDEM Response:
Because additional changes were made throughout the calculations as described elsewhere in this ATSD, the changes requested by Nucor to the Page 7, PTE (before controls) table were not made. Instead, IDEM made changes to the Page 7, PTE (before controls) table as follows:

Permit Level Determination – Part 70

Pollutant	PTE New Emission Units (tons/year)	Net Increase to PTE of Modified Emission Units (tons/year)	Total PTE for New and Modified Units (tons/year)
PM	~~0.100~~ **0.095**	~~197~~ **202.0**	~~282~~ **287.0**
PM_{10}	~~0.294~~ **0.399**	~~720~~ **727.0**	~~794~~ **801.1**
SO_2	0.031	~~122~~ **153.9**	~~245~~ **276.9**
VOC	0.284	~~5.7~~ **8.1**	~~18.1~~ **20.5**
CO	4.415	~~68~~ **138.0**	~~226~~ **296.0**
NO_X	2.63	~~147~~ **201.7**	~~231~~ **285.7**
HAPs	0.097	~~0.26~~ **0.37**	~~1.11~~ **1.22**

In addition, IDEM made changes to the Page 7, "Permit Level Determination - PSD" table as follows:

Permit Level Determination – PSD

	Limited Potential to Emit (tons/year)							
Process/Emission Unit	Pb	PM	PM_{10}	SO_2	VOC	CO	NO_X	HAPs
Fugitives	8.28E-3	8.9	8.9	2.2	0.1	23.87	1.9	~~neg~~ **0.008**
LMS Baghouse Stack S-20	0.390	13.8	~~40.1~~ **40.0**	~~218.9~~ **248.3**	11.1	~~98.98~~ **130.9**	~~205.2~~ **225.3**	~~0.705~~ **0.306**
Ladle Preheaters	~~7.88E-5~~ **1.05E-4**	~~0.289~~ **0.378**	~~1.09~~ **1.60**	~~0.093~~ **0.124**	~~0.851~~ **1.14**	~~13.24~~ **17.66**	~~13.1~~ **10.5**	~~0.290~~ **0.387**
Other Combustion Units	~~1.35E-5~~ **1.82E-5**	~~0.050~~ **0.066**	~~0.210~~ **0.274**	~~0.016~~ **0.021**	~~0.149~~ **0.196**	~~2.32~~ **3.05**	~~2.8~~ **3.6**	0.129
Vacuum Degasser Stack 500	5.91E-4	1.95	1.95	~~23.65~~ **26.02**	5.91	88.70	~~5.91~~ **6.50**	neg
Total for Modification	~~0.399~~ **0.400**	~~24.99~~ **30.3**	~~52.2~~ **59.2**	~~244.9~~ **276.9**	~~18.1~~ **20.5**	~~227.1~~ **296.0**	~~228.9~~ **285.7**	~~1.12~~ **1.22**

	Limited Potential to Emit (tons/year)							
Significant Level or Major Source Threshold	0.6	25	15	40	40	100	40	25

Nucor Comment Page 8:
Under "State Rule Applicability Determination," section (1)(b)(ii) should be removed. Nucor has removed the nozzle core milling/drilling. Thus this section is unnecessary.

IDEM Response:
IDEM agrees to make the following changes to Page 8, "State Rule Applicability Determination" as requested:

(1) 326 IAC 1-6-3 (PMP)

(a) Nucor Steel is subject to this rule even prior to this proposed modification.

(b) The OAQ has evaluated PMP requirements and recommends the following:

(i) PMP will be required for the Castrip LMS and associated baghouses 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 of them are exhausting to the same controls.

~~(ii) PMP is required for the Baghouse of the Castrip nozzle core milling/drilling, the bin vents and the scrubber to assure proper operation; however, no additional compliance monitoring will be required for the operation because the PTE after controls is minimal.~~

Nucor Comment Page 10:
Nucor proposes that IDEM revise Section 8(a) to clarify that the initiation of construction may be extended beyond 18 months. The regulations allow IDEM to extend this period upon a satisfactory showing an extension is justified. See 326 IAC 2-2-8(a)(1). Nucor proposes that IDEM include the sentence, "IDEM, OAQ may extend the eighteen (18) month period in which construction must be initiated upon a satisfactory showing that an extension is justified."

IDEM Response:
IDEM does recognize that they have the authority and discretion to extend the construction period upon a satisfactory showing by the source that the extension is justified. IDEM does not believe it is necessary to make changes to the permit conditions to state this. No changes were made as a result of these comments.

Appendix A Emission Calculations Comments:

IDEM General Response:
Many of the Nucor comments state that the emission calculations are not based on the AP-42 emission factors. When a BACT limit was indicated in Appendix B, that BACT limitation was used to determine the emissions from the source emission units. PSD BACT limitations are federally enforceable so they shall stand as the limited potential to emit calculations for the emission units.

Tundish Preheaters:

Nucor Comment:
In the criteria pollutants potential to emit (PTE) table, the TSP emissions for the tundish preheaters should be changed from 0.158 tpy to 0.166 tpy. It appears that IDEM used the value of 0.0018 lb/MMBtu instead of 0.0019 lb/MMBtu when calculating the TSP PTE. The AP-42 emissions factor for natural gas fired units is 0.0019 lb/MMBtu. Likewise, the PM_{10} values in this table should be changed from 0.456 tpy to 0.49 tpy.

IDEM Response:
The change was not made as indicated above (BACT versus AP-42 discussion). The 0.0018 lb/MMBtu emission factor is actually the PSD BACT limitation on the emission unit (Appendix B.1). The emissions remain at 0.158 tons/year.

Tundish Dryers:
Nucor Comment:
In both criteria pollutants PTE table, the PM_{10} emissions from the ladle preheaters should be changed from 0.80 tpy to 0.58 tpy. IDEM should have used an AP-42 emission factor of 0.0056 lb/MMBtu for the PM_{10} emissions instead of the 0.0076 lb/MMBtu value. Note that this change should be made in the row that included two ladle preheaters and not in the row that has the emissions for a single ladle preheater.

IDEM Response: The change was made as previously indicated in Condition D.2.1(a)(2). The correct heat input rating of the first tundish dryer is 4 MMBtu/hour (not 2 MMBtu/hour). The PTE for the criteria pollutants and HAPs emissions were recalculated for the tundish dryer, TD-1.

Ladle Preheaters (Existing and New Unit):
Nucor Comments:
In the criteria pollutants PTE table, the PM_{10} emissions from the ladle preheaters should be changed from 0.80 tpy to 0.58 tpy. IDEM should have used an AP-42 emission factor of 0.0056 lb/MMBtu for the PM_{10} emissions instead of the 0.0076 lb/MMBtu value. Note that this change should be made in the row that included two ladle preheaters and not in the row that has the emissions for a single ladle preheater.

In the criteria pollutants PTE table, the NOx potential to emit from the single ladle preheater should be changed from 2.63 tpy to 5.26 tpy. The emissions factor from AP-42 is 0.10 lb/MMBtu for NOx instead of the 0.05 lb/MMBtu value IDEM used.

In both the criteria pollutants PTE table and the HAPs PTE table, IDEM did not include the fourth ladle preheater, rated at 12 MMBtu/hour. Thus, IDEM should include an additional row in each table with the potential to emit from a ladle preheater that is the same as the row for the single ladle preheater. Please note that the NOx PTE for this ladle preheater should be 5.26 tpy as outlined in the preceding comment.

IDEM Response:
The change was not made as indicated above for the ladle preheaters concerning the 0.0076 lb/MMBtu emission factor because this factor is actually the PSD BACT limitation on the emission unit (Appendix B).

The calculations were revised to include three ladle preheaters instead of two in this row of the table.

The change was not made in the annual emissions from the new preheater as requested. The 0.10 lb/MMBtu emission factor for NOx was the PSD BACT limitation on the emission unit (Appendix B). However, based upon the resolution to EPA Comment 6 (to follow), because of the revision of the BACT under this reopening of the permit, all ladle preheaters shall be subject to a 0.05 lb/MMBtu limitation for NOx. See EPA Comment 6 below.

Ladle Dryer:
Nucor Comments:
In the criteria pollutants PTE table, the PM_{10} potential to emit for the ladle dryer should be changed from

0.40 tpy to 0.29 tpy. IDEM should have used an AP-42 emission factor of 0.0056 lb/MMBtu for the PM_{10} emissions instead of the 0.0076 lb/MMBtu value.

IDEM Response:
The change was not made as indicated above for the ladle dryer concerning the 0.0076 lb/MMBtu emission factor because this factor is actually the PSD BACT limitation on the emission unit (Appendix B).

Transition Piece Dryer:
Nucor Comments:
In the criteria pollutants PTE table, the PM_{10} potential to emit for the transition piece dryer should be changed from 0.01 tpy to 0.0074 tpy. IDEM should have used an AP-42 emission factor of 0.0056 lb/MMBtu for the PM_{10} emissions instead of the 0.0076 lb/MMBtu value

IDEM Response:
The change was not made for the transition piece dryer concerning the 0.0076 lb/MMBtu emission factor because the correct factor is actually the PSD BACT limitation for the tundish dryers. The transition piece dryers shall have a BACT of 0.0056 lb/MMBtu (Appendix B). The changes to Appendix B are included below for Appendix B.2 BACT (ATSD, p.26 and p.35).

Appendix B BACT Comments:

Nucor Comments Page 4:
Nucor appreciates that IDEM corrected the reference to "ladle preheaters" with "ladle dryers" in the NOx emissions table. However, in the paragraph following the NOx table, "ladle preheaters" should replace "ladle dryers."

IDEM Response:
IDEM agrees to make the following changes to Page 4, NOx emissions table text, as requested:

> The NOx stack test data was recorded without the ladle **dryer** ~~preheaters~~ exhausting to the LMS-2 baghouse. Further, the tundish preheaters and transition piece preheaters needed to be added to the limit. Finally, due to the standard deviation of the test results, a reasonable factor of safety is added to the NOx limitation. Nucor Steel proposed a NOx limitation of 0.19 lbs per ton of steel produced.

Nucor Comments Page 5:
Nucor appreciates that IDEM corrected the reference to "ladle preheaters" with "ladle dryers" in the CO emissions table. However, IDEM should revise the first sentence in the paragraph following the CO table to read: "The CO stack test data was recorded without the ladle dryer exhausting to the LMS-2 baghouse."

IDEM Response:
IDEM agrees to make the following changes to Page 5, CO emissions table text as requested:

> The CO stack test data was recorded **without the ladle dryer** exhausting to the LMS-2 baghouse.

Nucor Comments Page 5:
Nucor appreciates that IDEM corrected the reference to "ladle preheaters" with "ladle dryers" in the SO_2 emissions table. However, IDEM should revise the first sentence in the paragraph following the SO_2 table to read: "The SO_2 stack test data was recorded without the ladle dryer exhausting to the LMS-2 baghouse."

IDEM Response:
IDEM agrees to make the following changes to Page 5, SO_2 emissions table text as requested:

The SO_2 stack test data was recorded **without the ladle dryer** exhausting to the LMS-2 baghouse.

Nucor Comments Page 15:
The first paragraph after the emissions table should be revised to read: "The SO_2 stack test data was recorded without the ladle dryer, the tundish preheaters, the tundish nozzle preheaters, and the transition piece preheaters exhausting to the LMS-2 baghouse."

IDEM Response:
IDEM agrees to make the following changes to Page 15, SO_2 emissions table text as requested:

The SO_2 stack test data was recorded **without the ladle dryer, the tundish preheaters, the tundish nozzle preheaters, and the transition piece preheaters** exhausting to the LMS-2 baghouse.

Nucor Comments Page 36:
The table in Step 4 includes a 2003 Nucor NOx PSD BACT limit of 0.050. This limit is incorrect. The actual BACT limit was from Nucor's 2004 permit and was 0.10. See Permit 107-18314-00038.

IDEM Response:
IDEM agrees to make the following changes on Page 37, Step 4, to the NOx BACT limit table. Although the 2004 BACT limit was established as 0.10 lb NOx per MMBtu, the BACT analysis was revised and reopened under this PSD BACT analysis. Refer to the discussion in Response to EPA Comment 6, below for explanation to the changes to these conditions; therefore, the revised BACT is 0.05 lb NOx per MMBtu.

The table should read as follows:

PSD BACT Limits - - Ladle Preheater			
Company Name	Permit Issuance Date	Rating (MMBTU/hour)	NO_x
SDI Hendricks	August 2003	7.5	0.050
Nucor Steel	2005 (proposed)	12	~~0.10~~ **0.050**
	2003	12	0.050
	January 2001	15	0.10
SDI Whitley	July 1999	10	0.10

Appendix C Air Quality Comments:
Nucor Comments:
In letter "D" of the "Air Quality Impact Objectives", "standard" should be changed to "standards" and "increment" should be changed to "increments".

IDEM Response:
IDEM did not make a change to the Page 1, Air Quality Impact Objectives, Section D as requested. The US EPA refers to these standards as the National Ambient Air Quality Standards (NAAQS). The NAAQS standards and PSD increments include more than one standard because there is more than one pollutant involved in the air quality impact. No change was made as a result of this comment.

Nucor Comments:

In the "averaging period" column of Table 4, existing monitoring data used for background concentrations, "H2H 3 Hour" and "H2H 24 Hour" should be changed to "Second Highest 3-Hour" and "Second Highest 24-Hour", respectively. As explained in the text in the paragraph above the table, the averaged second highest monitoring values were used for short-term background concentrations.

IDEM Response:
IDEM agrees to make the following changes to Page 5, Table 4, "Averaging Period" column as requested.

…

TABLE 4
Existing Monitoring Data Used For Background Concentrations

Pollutant/Year of Data	Monitoring Site	Approximate Distance From Site	Averaging Period	Concentration ug/m3
SO_2 – '02/'04	Fountain County	50.5 km	~~H2H~~ Second Highest 3 Hour	206.1
SO_2 – '02/04	Fountain County	50.5 km	~~H2H~~ Second Highest 24 Hour	63.8
SO_2 – '02/'04	Fountain County	50.5 km	Annual	13.1
NOx - '02/04	Marion County	68.8 km	Annual	33.8

…
IDEM's Review

Upon further review IDEM has decided to make the following changes to the significant source modification PSD permit no. 107-21359-00038.

IDEM realized that the BACT for the transition piece dryers should be separate from the tundish dryers in Appendix B.2 of the Technical Support Document (P. 30) as follows:

Step 5 Select BACT:
…

BACT for PM/PM_{10} (filterable ~~and~~ **plus** condensable) from TD-1, TD-2, ~~TD-3~~ and ~~each transition piece dryer~~ **TD-3** shall be proper operation and shall not exceed a PM/PM_{10} filterable ~~and~~ **plus** condensable) emission rate of 0.0076 pounds per MMBtu.

BACT for PM/PM_{10} (filterable plus condensable) from each transition piece dryer shall be proper operation and shall not exceed a PM/PM_{10} (filterable plus condensable) emission rate of 0.0056 pounds per MMBtu.

IDEM has reviewed Permit Condition D.1.7 and will make the following changes:
The condition refers to the requirement for a PMP for only the control device. This is not the result of a change in IDEM policy; it was an oversight in the draft permit. This condition has been corrected to reflect that the PMP applies to the LMS, the Castrip and the baghouse control system. The changes are as follows:

D.1.7 Preventive Maintenance Plan

A Preventive Maintenance Plan, in accordance with Section C - Preventive Maintenance Plan, of this permit, is required for **the LMS-2, the continuous strip caster and** the particulate capture and control system~~s~~ associated with the LMS-2 and continuous strip caster.

Upon further review, IDEM has made changes to the calculations for the Vacuum Tank Degasser (VTD) in

Appendix A of the Technical Support Document. The VTD emissions were revised because the BACT limits from Appendix B were rounded off for purposes of including them in the emissions summary table. The rounding off had truncated the emissions enough to warrant revision. IDEM initiated this revision.

Comments by USEPA

USEPA has completed a review of the Nucor Steel's PSD permit (107-21359-00038) public noticed on/or around 2/2/06 (ending 3/2/06). The following are comments generated during this review.

EPA Comment 1:
BACT Analysis (page 9 of 42) - The NOx emission limit is a factor of times higher than most of the other sources listed in the BACT analysis. It does not seem justifiable to set a BACT emission limit on a worse one-time stack test at the facility when other mills are required to meet a much more stringent emission limit. Both NOx and CO are factors in combustion process and can be controlled to some degree, through good combustion practices. Has the company provided any justification or research regarding technologies used to measure the emission output of the LMS to determine if an off-gas based control system (such as the Techint Goodfellow EFSOP technology) might be effective at reducing emissions.

IDEM Response 1:
The continuous Castrip method is not truly comparable to the traditional sources represented in the RBLC. Because of the lack of individualized data for the LMS and the continuous casting, it is very difficult to segregate the LMS emissions and compare those to sources in the RBLC with BACT limits. The method of producing steel through the use of the continuous Castrip operations is innovative technology for steel production. No change was made after considering these comments.

EPA Comment 2:
BACT Analysis (pages 13 and 18) - Please note, based on the information presented, wet and dry scrubbing and flaring appear economically infeasible and <u>not</u> technically infeasible.

IDEM Response 2:
The following changes were made in Appendix B.1 (B)(1) Step 2, Step 3 and Step 4:

<u>Step 2 – Eliminate Technically Infeasible Control Options</u>
None of the technologies were found to be technically infeasible.

<u>Step 3 – Rank Remaining Control Technologies by Control Effectiveness</u>
FGD options - Wet Scrubbing, SDA, and DSI
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 a LMS.

- - 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 LMS 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 LMS particulate control device would make operation of the wet scrubber technically feasible. However, there is an expected low concentration of SO_2 in the exhaust gas stream.

The OAQ is not aware of a steel mill where a wet scrubber has been operated to control SO_2 emissions from a LMS.

- - 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 LMS 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 in wet scrubbing, there is an expected low concentration of SO_2 in the exhaust gas stream.

  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 a LMS.

- - 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 LMS exhaust gas is not much of a problem. Like wet scrubbing, there is an expected low concentration of SO_2 in the exhaust gas stream.

  The OAQ is not aware of a steel mill where dry sorbent injection has been operated to control SO_2 emissions from a LMS.

Adsorption and absorption control technologies have not been designed to control a gas stream of 5 ppm or less because:

(a) 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.

(b) 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.

~~Step 3 – Rank Remaining Control Technologies by Control Effectiveness~~

None of the SO_2 control technologies have been applied to an LMS; 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 LMS, 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.

Step 4 – Evaluate the Most Effective Controls and Document Results
The following summary outlines the economic feasibility of these technically feasible control options:

Control Option	Control Efficiency (%)	Total SO_2 Emissions (tons/yr)	SO_2 Emissions Removed (tons/yr)	Total Annual Cost ($) [A]	Annualized Cost ($/ton SO_2 removed) [A]
SDA	45	109.4	49.2	968,000	19,700
Wet Scrubbing	35	109.	38.3	746,000	19,500
DSI	25	109.4	27.4	418,000	15,300

[A] The cost analyses are based on values from the year 2000.

The above total and annualized costs are based on the cost estimating structure and guidance provided in the USEPA reference, "OAQPS Cost Control Manual", Fifth Edition, EPA 453/B-96-001 (February 1996), other relevant information provided by the respective equipment vendors, inputs from mill personnel and engineering judgment. The various cost factors are based on guidance provided under OAQPS Manual Chapter 9 - Gas Absorbers. Since SO_2 control technologies are not specifically covered in the OAQPS Manual, the chapter under Gas Absorbers was adopted as being appropriate.

Based on the information presented above, these technically feasible control options are not economically feasible.

~~**Step 4 – Evaluate the Most Effective Controls and Document Results**~~
…

EPA Comment 3:
BACT Analysis (page 15) - Since SO_2 emissions are largely a factor of the sulfur in the raw material (as stated in the introduction of the BACT analysis), I do not see a justification for substantially increasing the SO_2 BACT limit to 0.21 lb/ton. If the facility was tested at 0.029 lb/ton in 2003, it seems more appropriate that the limit be lowered to meet BACT for this industry (0.06 lb/ton). Furthermore, since the facility can control to some degree the sulfur contained in the raw material, such a large safety factor does not appear appropriate or necessary. Lastly, please explain why a scrap management plan for the raw material is not considered in the BACT analysis.

IDEM Response 3:
The LMS-2 is separate from the Meltshop EAF and LMS-1 (permitted under a separate source modification including a scrap management plan). IDEM believes the sulfur content in the emissions is proportional to the type of steel materials made on the production line. The other sources cited in the BACT analysis do not compare well to the Nucor – Crawfordsville operations. For instance, Roanoke (in Virginia) makes structural steel while Nucor – Crawfordsville runs a sheet mill. Structural steel requires a different chemistry than sheet steel. Hence the sulfur content could vary between the two sources in the steel material needed for production; therefore, the BACT for Roanoke would not be a direct comparison to Nucor – Crawfordsville. Nucor – Yamato (AR) also makes structural steel (wide-flange beams) and is not comparable to Nucor – Crawfordsville. Unfortunately, there are no sources making the same types of steel in sheet mills (such as Nucor Steel with plants in Decatur, Alabama; Berkeley, South Carolina; and Hickman, Arkansas) where those differentiate in the RBLC between the EAF BACT and LMS BACT limitations. Hence, there is no direct comparison for the LMS BACT at Nucor – Crawfordsville.

The Nucor LMS-1 BACT is 0.185 lb SO_2 per ton of steel produced [from Condition D.2.1(f) PSD/SSM 107-16823-00038]. It should be noted that there are differences between Nucor's LMS-1 line and the Castrip LMS-2 line that contribute to additional SO_2. The Castrip LMS-2 BACT is based on 0.210 lb SO_2 per ton of steel produced. The LMS-2 steel production and SO_2 contribution are a function of the types of steel produced and the alloy additions necessary to make steel on the Castrip production line.

The steel operations at Nucor are a batch process where ladles of steel are brought over from the EAF. The metal is melted in the EAF before being brought to the LMS-2 of the continuous Castrip line. Sometimes it is necessary to use vacuum degassing on the ladle before it enters the continuous caster. The permit allows for several ladles to be sitting with molten steel waiting to be processed. The Scrap Management Plan was included for the EAF that is under separate permit PSD/SSM 107-16823-00038. There was no reason to include it in this permit since the process starts at the LMS-2. No changes were made to the permit as result of these comments.

EPA Comment 4:
BACT Analysis (page 22) - Please explain why the combined CO limit in (4) does not match the CO limit in the table in Page 4. In addition, it does not seem necessary to include a 38% "safety factor" when the source is already receiving a combined limit (of which LMS-2 makes up almost half of the emissions) that will allow them additional flexibility.

IDEM Response 4:
There is an error in the summation of the emissions. Page 4 (App B BACT) is correct in listing 0.131 lb/ton of steel. Meanwhile, page 22 (App B BACT) is incorrect and shall be updated by IDEM, OAQ. The Permittee has stated that the process does not run at steady state conditions as indicated by individual test runs. The "safety factor" is based on the average mean test value plus a value less than the standard deviation of the ratio of the test results. The process of selecting the BACT is discussed in detail in the August 12, 2005, letter by Nucor Steel to IDEM, "Response to Notice of Deficiency #1". IDEM believes that the "safety factor" is justified and reasonable based on the fluctuations in the operations and the available test results.

EPA Comment 5:
BACT Analysis (page 34) - Was a hotwell considered for a potential control device for PM for the Vacuum Degasser (as required in the SteelCorr Inc. Bluewater Project and others)?

IDEM Response 5:
IDEM has confirmed that the Bluewater Project (Steelcorr) was never constructed; a footnote was added to the BACT tables in Appendix B. Hence, the hotwell technology was not evaluated as a PM control device for the vacuum degasser. No changes were made as a result of these comments.

EPA Comment 6:
BACT Analysis (page 37) - BACT is listed as 0.10 lb/MMBtu but according to the table two other emission units have limits of 0.050. Shouldn't this be considered BACT?

IDEM Response 6:
Although the 2004 BACT limit was established as 0.10 lb NOx/MMBtu, the BACT analysis was revised and reopened under this PSD BACT analysis. This new BACT analysis indicates the current standard obtained by similar emission units is 0.05 lb NOx/MMBtu. Hence, IDEM, OAQ agrees that Nucor shall have all four emission units (ladle preheaters) that were re-evaluated under this PSD BACT held to the more restrictive limit of 0.05 lb/MMBtu. The following changes were made as a result of this comment:

<u>Step 5 – Select BACT</u>
BACT for the ladle preheaters shall be as follows:
…
(4) The nitrogen oxides (NO_x) emissions from the ladle preheater shall not exceed ~~0.10~~ **0.05** pounds per MMBTU."

…

D.2.1 Nitrogen Oxides (NO_X) Emission Limitations

…

(c) Pursuant to 326 IAC 2-2-3 (BACT), the BACT for NOx from each ladle preheater shall be proper operation and shall not exceed a NOx mission rate of ~~0.10~~ **0.05** pounds per MMBtu and ~~1.20~~ **0.60** lbs per hour.

EPA Comment 7:
Permit Condition D.1.1: Please explain where the BACT determination, on page 28 of Appendix B, that visible emissions shall not exceed 3 percent from any baghouse, roof monitor or building opening, is located in the permit.

IDEM Response 7:
The visible emission standard is included in Condition D.1.1(a)(6). The following changes have been made to Condition D.1.1(a)(6) to clarify the BACT requirement:

(6) The opacity from the LMS-2 baghouse stack (S-20) shall not exceed three percent (3%) opacity based on a six-minute average (24 readings taken in accordance with 40 CFR Part 60, Appendix A, Method 9) **when emitted from any baghouse, roof monitor or building opening**. This limitation satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).

EPA Comment 8:
Permit Condition D.1.8: As stated in the BACT analysis, emissions from this unit are highly variable. It is therefore suggested that a CEM for CO, NOx, SO_2, and potentially filterable PM be required through this permitting action to provide the public reassurance that the source is meeting current permit limitations.

IDEM Response 8:
IDEM agrees that CEMS are the best compliance tools, where, in most situations CEMS are used to document compliance when a control device is used to reduce emissions.

For the other regulated pollutants (SO_2, CO and NOx) emitted from the LMS-2, there are no control devices used to lower emissions. Instead process controls and operating practices are used to control SO_2, CO and NOx. SO_2 emissions are directly proportional to the amount of sulfur being introduced into the process. The Scrap Management Plan at the EAF regulates the sulfur content. Sulfur content of the raw materials entering the EAF can be directly monitored. The EAF is part of the Melt Shop and is handled under separate permit number 107-16823-00038. More frequent stack testing will provide enough information to assess compliance with the CO and NOx limits. Therefore, the monitoring requirements included in the permit are sufficient to ensure compliance without the use of a CEM for SO_2, CO or NOx.

EPA Comment 9:
Permit Conditions D.2.1-D.2.5: The BACT analysis states that the natural gas must be "pipeline quality" and that "good combustion practices" must be observed, but I do not see these requirements in the permit.

IDEM Response 9:
“Proper operation” is used for PM/PM_{10} emission points. Meanwhile, “good production practices” are relevant to combustion where CO, NOx, or SO_2 is emitted. Likewise, “pipeline” natural gas was referring to “pipeline quality” fuel. IDEM, OAQ agrees to make these types of changes. See also the IDEM response to EPA Comment 6 above. These changes to the permit include:

D.1.2 Nitrogen Oxide (NOx) Emission Limitation [326 IAC 2-2]

(a) Pursuant to 326 IAC 2-2 (PSD Requirements), the above-mentioned combustion units shall comply with the following requirements:

(1) Each combustion facility shall **utilize "good combustion practices",** utilize **"pipeline quality"** natural gas as the primary fuel and may utilize propane as a backup fuel; and

…

D.2.1 Nitrogen Oxides (NO_X) Emission Limitations

(a) Pursuant to 326 IAC 2-2 (PSD Requirements), the small combustion units shall comply with the following requirements:

(1) Each combustion facility shall **utilize "good combustion practices",** utilize **"pipeline quality"** natural gas as the primary fuel and may utilize propane as a backup fuel; and

…

D.2.2 Sulfur Dioxide (SO_2) Emission Limitations

Pursuant to 326 IAC 2-2-3 (BACT), the combustion units specified in Condition D.2.1(a) shall **utilize "good combustion practices",** utilize **"pipeline quality"** natural gas as the primary fuel and may utilize propane as a backup fuel. The combustion units shall comply with the following requirements:

…

D.2.3 Carbon Monoxide (CO) Emission Limitations

Pursuant to 326 IAC 2-2-3 (BACT), the combustion units specified in Condition D.2.1(a) shall **utilize "good combustion practices",** utilize **"pipeline quality"** natural gas as the primary fuel and may utilize propane as a backup fuel, and comply with the following requirements:

…

D.2.4 Particulate Matter (PM/PM_{10}) Emission Limitations

Pursuant to 326 IAC 2-2-3 (BACT), the combustion units specified in Condition D.2.1(a) shall **utilize proper operation,** utilize **"pipeline quality"** natural gas as the primary fuel and may utilize propane as a backup fuel, and comply with the following requirements:

…

D.2.5 Volatile Organic Compounds (VOC) Emission Limitations

Pursuant to 326 IAC 2-2-3 (BACT), the combustion units specified in Condition D.2.1(a) shall **utilize "good combustion practices",** utilize **"pipeline quality"** natural gas as the primary fuel and may utilize propane as a backup fuel, and comply with the following requirements:

Changes to the Appendix B BACT include:

Appendix B.1
Best Available Control Technology (BACT) Determination
For the LMS-2 Baghouse Stack S-20

…

(A) Oxides of Nitrogen (NOx)

(1) LMS-2 - NOx BACT

…

Step 5 – Select BACT
BACT for NOx from the LMS-2 shall be ~~proper operation~~ **utilization of "good combustion practices"** and a NOx emission limit of 0.172 pounds per ton of steel processed at the LMS-2. Refer to subsection (A)(3) for a combined NOx limit.

…

(2) Combustion Units - NOx BACT for Combustion Units LD-1, TP-1, TP-2, TPP-1, TPP-2, TNP-1 and TNP-2

…

Step 5 – Select BACT
BACT for the tundish preheaters (TP-1 and TP-2) shall be **utilization of "good combustion practices" and** the use of oxy-fuel burners with an emission rate of 0.15 lb NOx/MMBtu.

BACT for the LD-1, TPP-1, TPP-2, TNP-1 and TNP-2 shall be **utilization of "good combustion practices" and** the use of low-NOx burners with an emission rate of 0.10 lbs NOx/MMBtu. Refer to subsection (A)(3) for a combined NOx limit.

(3) Combined Limit - NOx BACT

…
BACT for NOx from the total Castrip LMS-2 Baghouse Stack S-20 shall be utilization of "good combustion practices" and shall not exceed a NOx emission limit of 0.19 pounds NOx per ton of steel processed at the LMS-2.

In addition to the combined NOx emission limit for the total Castrip LMS-2 Baghouse Stack S-20, BACT for the small combustion units shall be as follows:

(a) The use of **"**pipeline **quality"** natural gas as primary fuel and propane as back up fuel.

(b) The small combustion units LD-1, TNP-1, TNP-2, TPP-1, TPP-2, TNP-1 and TNP-2 shall be the use of **"pipeline quality"** natural gas fuel and low-NOx burners.

(c) The small combustion units the TP-1 and TP-2 shall be the use of **"pipeline quality"** natural gas fuel and oxy-fuel burners.

(d) The ~~observation~~ **utilization** of good combustion practices.

(B) Sulfur Dioxide (SO_2)

(1) LMS-2 - SO_2 BACT

…
Step 5 – Select BACT
BACT for SO_2 from the Castrip LMS-2 shall **be utilization of "good combustion practices" and** meet an emission rate limit of 0.21 pounds SO_2 per ton of steel processed at the LMS-2. Refer to subsection (B)(3) for a combined SO_2 limit.

(2) Combustion Units - SO_2 BACT for Combustion Sources LD-1, TP-1, TP-2, TPP-1, TPP-2, TNP-1 and TNP-2

…

Step 5 – Select BACT
BACT for the tundish preheaters shall be **utilization of "**good combustion practices**"**.

BACT for the LD-1, TP-1, TP-2, TPP-1, TPP-2, TNP-1 and TNP-2 shall be good combustion practices.

Refer to subsection (B)(3) for a combined SO_2 limit.

(3) Combined Limit - SO_2 BACT

…

BACT for SO_2 from the total Castrip LMS-2 Baghouse Stack S-20 be **utilization of "good combustion practices" and** an emission limit of 0.21 pounds SO_2 per ton of steel processed at the LMS-2.

(C) Carbon Monoxide (CO)

(1) LMS-2 - CO BACT

…

Step 5 – Select BACT

BACT for CO from the LMS-2 shall be ~~proper operation~~ **utilization of "good combustion practices"** and a CO emission limit of 0.0982 pounds per ton of steel processed at the LMS-2. Refer to subsection (C)(4) for a combined CO limit.

(2) Continuous Caster - CO BACT

…

Step 5 – Select BACT

BACT for CO from the Castrip Caster shall be ~~proper operation~~ **utilization of "good combustion practices"** and a CO emission limit of 0.0202 pounds CO per ton of steel processed at the LMS-2. Refer to subsection (C)(4) for a combined CO limit.

(3) Combustion Units - CO BACT for Combustion Sources LD-1, TP-1, TP-2, TPP-1, TPP-2, TNP-1 and TNP-2

…

Step 5 – Select BACT

BACT for the LD-1, TP-1, TP-2, TPP-1, TPP-2, TNP-1 and TNP-2 shall be **utilization of** good combustion practices.

Refer to subsection (C)(4) for a combined CO limit.

(4) Combined Limit - CO BACT

…

BACT for CO from the total Castrip LMS-2 Baghouse Stack S-20 shall be ~~proper operation~~ **utilization of "good combustion practices"** and shall not exceed 0.131 pound of CO per ton of steel processed at the LMS-2.

(D) Particulate Matter (PM/PM_{10})

(1) LMS-2 - PM/PM_{10} BACT

…

Step 5 – Select BACT

BACT for filterable PM/PM_{10} shall be **proper operation and** use of a baghouse with a limit of 0.0018 grains per dry standard cubic feet at a maximum volumetric air flow rate of 200,000 dry standard cubic feet per minute. BACT for filterable and condensible PM/PM_{10} shall be **proper operation and** use of a baghouse with a limit of 0.0052 grains per dry standard cubic feet at a maximum volumetric air flow rate of 200,000 dry standard cubic feet per minute. Visible emissions shall not exceed 3 percent opacity when emitted from any baghouse, roof monitor or building opening. Refer to subsection (D)(3) for a combined PM/PM_{10} limit.

(2) Combustion Units - PM/PM_{10} BACT for Combustion Sources LD-1, TP-1, TP-2, TPP-1, TPP-2, TNP-1 and TNP-2

…

Step 5 – Select BACT

BACT for the LD-1, TP-1, TP-2, TPP-1, TPP-2, TNP-1 and TNP-2 shall be **proper operation**~~good combustion practices~~.

Refer to subsection (D)(3) for a combined PM/PM_{10} limit.

(3) Combined Limit - PM/PM_{10} BACT

Nucor Steel wants to retain the existing PM/PM_{10} limitation for the total Castrip LMS-2 Baghouse as it was determined from the previous BACT.

In order for the limitation to be readily enforceable, the above BACT limits are considered together to obtain the total BACT limitation for the Stack S-20:

BACT from the total Castrip LMS-2 Baghouse Stack S-20 for filterable PM/PM_{10} shall be **proper operation and** use of a baghouse and shall not exceed a limit of 0.0018 grains per dry standard cubic feet at a maximum volumetric air flow rate of 200,000 dry standard cubic feet per minute. BACT for filterable and condensible PM/PM_{10} shall be **proper operation and** use of a baghouse with a limit of 0.0052 grains per dry standard cubic feet at a maximum volumetric air flow rate of 200,000 dry standard cubic feet per minute. Visible emissions shall not exceed 3 percent opacity when emitted from any baghouse, roof monitor or building opening.

Appendix B.2
Best Available Control Technology (BACT) Determination
For Miscellaneous Combustion Emission Units

…

Step 5 – Select BACT

BACT for SO_2 from TD-1, TD-2, TD-3 and each transition piece dryer shall be ~~proper operation~~ **utilization of "good combustion practices"** and shall not exceed a SO_2 emission rate of 0.0006 pounds per MMBtu.

BACT for NOx from TD-1, TD-2, TD-3 and each transition piece dryer shall be ~~proper equipment operation~~ **utilization of "good combustion practices"**, the use of low NOx burners, and NOx emission rate shall not exceed an emission rate of 0.10 pounds per MMBtu.

BACT for CO from TD-1, TD-2, TD-3 and each transition piece dryer shall be ~~proper operation~~ **utilization of "good combustion practices"** and shall not exceed a CO emission rate of 0.084 pounds per MMBtu.

BACT for PM/PM_{10} (filterable) from TD-1, TD-2, TD-3 and each transition piece dryer shall be proper operation and shall not exceed a PM/PM_{10} (filterable) emission rate of 0.0018 pounds per MMBtu.

BACT for PM/PM_{10} (filterable ~~and~~ **plus** condensable) from TD-1, TD-2, ~~TD-3~~ and ~~each transition piece dryer~~ **TD-3** shall be proper operation and shall not exceed a PM/PM_{10} (filterable ~~and~~ **plus** condensable) emission rate of 0.0076 pounds per MMBtu.

BACT for PM/PM_{10} (filterable plus condensable) from each transition piece dryer shall be

proper operation and shall not exceed a PM/PM_{10} (filterable plus condensable) emission rate of 0.0056 pounds per MMBtu.

Appendix B.3
Best Available Control Technology (BACT) Determination
For the Vacuum Degasser
…

Step 5 – Select BACT

(A) CO PSD BACT Determination for Vacuum Degasser

BACT for CO from the vacuum degasser shall be ~~proper operation~~ **utilization of "good combustion practices"** and shall not exceed 0.075 pounds per ton of steel processed at the VTD, and 20.25 pounds per hour, based on a 3 hour block average.

(B) PM_{10}, SO_2 and NOx PSD BACT Determination for Vacuum Degasser

The BACT mass limits for the vacuum degasser were ~~based on the manufacturer's guarantee~~ **determined** as shown in the following table:

Vacuum Degasser (270 tons steel/hour)		
Pollutant	BACT limits (lbs/ton)	BACT limits (lbs/hour)
SO_2	0.022	5.4
NO_x	0.0055	1.35
PM/PM_{10} ~~(filterable)~~	0.008 grain/dscf	0.45

Appendix B.4
Best Available Control Technology (BACT) Determination
For the Ladle Preheaters
…

(A) Oxides of Nitrogen (NOx)

(1) NO_x BACT for Combustion Units LP-1, LP-2, LP-3, and LP-4
…
Step 5 – Select BACT
BACT for the ladle preheaters shall be as follows:

(1) The use of **"**pipeline **quality"** natural gas as primary fuel and propane as back up fuel.

(2) The Ladle Preheater equipped with low-NO_x burners.

(3) The ~~observation~~ **utilization** of good combustion practices.

(4) The nitrogen oxides (NO_x) emissions from the ladle preheater shall not exceed ~~0.10~~ **0.05** pounds per MMBTU.

(B) Sulfur Dioxides (SO_2)

(1) SO_2 BACT for Combustion Units LP-1, LP-2, LP-3, and LP-4
…
Step 5 – Select BACT

BACT for the ladle preheaters shall be as follows:

(1) The use of **"**pipeline **quality"** natural gas as primary fuel and propane as back up fuel.

(2) The ~~observation~~ **utilization** of good combustion practices.

(3) The sulfur dioxide (SO_2) emissions from the ladle preheaters shall not exceed 0.0006 pounds per MMBTU.

(C) Carbon Monoxide (CO)

(1) CO BACT for Combustion Units LP-1, LP-2, LP-3, and LP-4

…

Step 5 – Select BACT

BACT for the ladle preheaters shall be as follows:

(1) The use of **"**pipeline **quality"** natural gas as primary fuel and propane as back up fuel.

(2) The ~~observation~~ **utilization** of good combustion practices.

(3) The carbon monoxide (CO) emissions from the ladle preheaters shall not exceed 0.084 pounds per MMBTU.

(D) Particulate Matter (PM/PM_{10})

(1) PM/PM_{10} BACT for Combustion Units LP-1, LP-2, LP-3, and LP-4

…

Step 5 – Select BACT

BACT for the new ladle preheaters shall be as follows:

(1) The use of **"**pipeline **quality"** natural gas as primary fuel and propane as back up fuel.

(2) The **proper operation of equipment.** ~~observation of good combustion practices.~~

(3) The PM/PM_{10} (filterable) emissions from the ladle preheaters shall not exceed 0.0018 pounds per MMBTU.

(4) The PM/PM_{10} (filterable and condensable) emissions from the ladle preheaters shall not exceed 0.0076 pounds per MMBTU.

EPA Comment 10:
Permit Condition D.2.6: To make the BACT limits in this section practically enforceable, it seems that at a minimum the source should be required to maintain records on natural gas usage and fuel type for the ladle preheaters and other combustion devices.

IDEM Response 10:
The TSD should have stated that there were several BACT units (Condition D.2) that don't have monitoring or recordkeeping requirements because IDEM believes that those units do not warrant such requirements based on the size and capacity of the units. IDEM does not believe a fuel usage limitation is warranted; the permit already has a restriction of pounds of pollutant per hour based on the BACT limitation of pounds of pollutant per MMBtu heat input and the maximum rated capacity of each burner. There are no changes to the permit as a result of this comment.

EPA Comment 11:

Permit Conditions D.2.6, D.3.6: The statement that "testing of the combustion units are not required" does not appear to be an applicable requirement and should not be included in the permit. If this is an applicable SIP, NSPS, or other requirement please cite the origin and authority for these statements.

IDEM Response 11:
There is reasonable assurance that the Permittee will meet the emission limitations because there is very little variability in low-NOx burners, utilizing natural gas and propane combustion for emission units that are of such a small size. Although, IDEM has determined that testing is not required at this time, IDEM retains the authority to require testing at a later time. There are no changes as a result of this comment.

Other changes to the permit:

Upon further review, IDEM has decided to remove (d) concerning nonroad engines from C.2 Permit Amendment or Modification. 40 CFR 89, Appendix A specifically indicates that states are not precluded from regulating the use and operation of nonroad engines, such as regulations on hours of usage, daily mass emission limits, or sulfur limits on fuel; nor are permits regulating such operations precluded, once the engine is no longer new.

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

(a) The Permittee must comply with the requirements of 326 IAC 2-7-11 or 326 IAC 2-7-12 whenever the Permittee seeks to amend or modify this approval.

(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
Indianapolis, Indiana 46204-2251

Any such application should be certified by the “responsible official” as defined by 326 IAC 2-7-1(34) only if a certification is required by the terms of the applicable rule.

(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.~~

Comments by John Peebles (Crawfordsville, Indiana)

On February 6, 2006, an email was received from a private citizen, Mr. John Peebles of Crawfordsville, Indiana. Mr. Peebles submitted comments on the draft version of Nucor Steel's PSD permit (107-21359-00038) during the public notice period. The comments are summarized below:

“I am writing in opposition to permit number SSM107-21359-00038. This Notice of Thirty Day Period allows me to comment on this expansion of ‘Limit Potential to Emit’." (Mr. Peebles is referring to an increase in emissions for the source by this source modification.)

I oppose this increase on the grounds (that) the additional pollution will impact the lives of Hoosiers who will suffer an increase of asthma and other respiratory diseases.

The sum total of all the misery from increased air emissions includes possible deaths and certain hospital

visits for the most vulnerable: the children and the aged.

To any economic benefit, subtract the public health consequences of lost wages and taxes as well as lower worker productivity (time spent going to/coming from hospital to care for themselves and dependents) from the increase of airborne contaminants.

Already Indianapolis crosses EPA thresholds for 'no-ozone' days. Limits on exposure to the outside will restrict children to indoor play on even more days as the number of pollutants west of Indianapolis grows. Nucor lies north west of the city of Indianapolis and particularly its west side, which lies downwind in the prevailing flow of air current.

There are other environmental issues associated with the plant that don't help its case. The amount of water it uses is unsustainable. Already 4 cavernous wells suck up so much water for the foundry operations that only 2 can be used at once.

Will proportionally more water be needed as Nucor scales up production? Water table depletion may impact a wide area.

Sustainability is the mantra of the new age economy. If Nucor's model of growth requires exponential increases to pollution, how will Hoosiers benefit when the company, succeeding, greatly increases the amount of pollution it needs to continue to grow?

Denying the additional emissions encourages more efficient control over emissions. Developing or implementing a gentler environmental footprint can encourage the company to proactively deal with the inevitable changes necessary to deal with global warming. As a matter of fact, Nucor can even steer its own course by adopting industry-leading, state-of-the-art production methods to decrease its dependency on pollution.

Through a denial of permitting, State government can put the company in a forward-looking position, advocate increased productivity and energy efficiency, and reduce emissions.

Increased plant efficiencies will allow the company to improve production while consuming energy at a slower rate, which effects the amount of pollutants produced by secondary sources. The idea of energy conservation works well alongside lower tolerance thresholds for air pollution.

A permit denial encourages responsible growth, which is in the company's best long-term interest. Higher Efficiency => Lower Energy Costs => Less Pollution => Greater Profitability.

I urge the State to deny the permit under the levels being offered. By looking forward, a better model for growth can do far less damage to the health of Central Indiana Hoosiers."

IDEM Response:
This particular source is not increasing emissions by adding new equipment. Steel production is not increased overall because the initial arc furnace equipment still has the same output of 502 tons of steel per hour. After the arc furnace the steel goes to one of two LMS lines: LMS-1 in the traditional Meltshop area or LMS-2 which is for the continuous Castrip line. By increasing the amount of steel per hour that can be processed at the LMS-2 and by keeping the EAF production the same, production at the LMS-1 will have to be less. What is effectively happening is that materials usually processed on LMS-1 are now being diverted for processing on LMS-2. The reason that this permit shows an increase is because this permit is for only the LMS-2 line. Although the permit limit will not be decreased for the EAF and LMS-1 at this time, the overall LMS-1 production of steel must decrease if LMS-2 operations are to increase.

In areas currently satisfying federal ambient standards, the intent of regulations is to protect and maintain the current high level of air quality. Thus, although offset ratios and lower-than-usual major source thresholds do not apply, new sources must demonstrate that they will not significantly reduce air quality or

cause violations of the National Ambient Air Quality Standards (NAAQS) as well as the Title 326 Air Pollution Control Board regulations for the State of Indiana.

For companies intending to construct a new or modified facility in an existing attainment area (such as Montgomery County, Indiana), the source is subject to a review under the Prevention of Significant Deterioration (PSD) requirements. This PSD process is fully described in the Section 4 of the document "Complying with Clean Air Act Regulations: Issues & Techniques" (ISBN: 0-444-10001-6).

The steps to obtain a PSD permit for a source include:

- Conducting an ambient air quality analysis;
- Analyzing impacts to visibility;
- Determining that there will be no adverse impact on a Class I area;
- Facilitate adequate public participation (i.e. public notice); and
- Apply Best Available Control Technology (BACT).

The air quality analysis was conducted and is included in Appendix C of the Technical Support Document prepared by IDEM. There will be no adverse impact on a Class I area. The draft permit was available through public participation through the 30-day public notice period. BACT was reviewed as detailed in Appendix B of the Technical Support Document prepared by IDEM.

The discussion of use of ground water is outside of the scope of this permitting process. This process is for the issuing of an air quality permit to operate. Questions or concerns about groundwater should be asked / requested of the IDEM Office of Water Quality (OWQ) at phone number 1-800-451-6027.

If the applicant demonstrates they can comply with all applicable air pollution rules, regulations and requirements, then IDEM is legally required to issue a permit to operate the source.

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
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 107-21359-00038
Permit Reviewer:	L. Stapf

History

Nucor Steel submitted an application on May 27, 2005, to IDEM, OAQ applying for a significant source modification to their existing steel mill operations at 4537 South Nucor Street, Crawfordsville, Indiana 47933.

Nucor Steel has a maximum capacity of 502 tons/hour of steel production at the electric arc furnaces (EAF) 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. There are two LMF areas: one in the Meltshop and one in the Castrip area. From either of 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 Castrip area includes the LMS, small combustion units, vacuum degasser and continuous casting system.

Existing Approvals

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 IDEM OAQ.

The table below lists the air approvals issued to Nucor Steel – Crawfordsville. 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 – Crawfordsville.

Air Approvals		
Permit No.	Type	Issuance Date
107-21611-00038	Administrative Amendment	August 24, 2005
107-21337-00038	Review Request	July 7, 2005
107-21172-00038	Administrative Amendment	June 7, 2005
107-20888-00038	Administrative Amendment	April 21, 2005
107-20510-00038	Minor Source Modification	January 31, 2005
107-19847-00039	Exemption	December 14, 2004
107-19387-00038	Administrative Amendment	September 10, 2004
107-19385-00038	Administrative Amendment	August 23, 2004
107-19231-00039	Exemption	August 2, 2004
107-19155-00038	Administrative Amendment	June 11, 2004
107-19466-00038	Administrative Amendment	November 12, 2004
107-14782-00038	Significant Source Modification	May 27, 2004
107-17390-00038	Administrative Amendment	July 12, 2003
107-16946-00039	Exemption	June 12, 2003
107-16943-00038	Administrative Amendment	January 8, 2003
107-16823-00038	Prevention of Significant Deterioration	November 21, 2003
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

Air Approvals		
Permit No.	Type	Issuance Date
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

County Attainment Status

The source is located in Montgomery County. This table shows the attainment status of Montgomery County.

Pollutant	Status
PM_{10}	Attainment
$PM_{2.5}$	Attainment
SO_2	Attainment
NO_2	Attainment
1-Hour Ozone	Attainment
8-Hour Ozone	Attainment
CO	Attainment
Lead	Attainment

(1) Volatile organic compounds (VOC) and Nitrogen Oxides (NOx) are regulated under the Clean Air Act (CAA) for the purposes of attaining and maintaining the National Ambient Air

Quality Standards (NAAQS) for ozone. Therefore, VOC and NOx emissions are considered when evaluating the rule applicability relating to ozone. Montgomery County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NOx emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

(2) Montgomery County has been classified as attainment for $PM_{2.5}$ (effective April 5, 2005). U.S. EPA has not yet established the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 for $PM_{2.5}$ emissions. Therefore, until the U.S.EPA adopts specific provisions for PSD review for $PM_{2.5}$ emissions, it has directed states to regulate PM_{10} emissions as a surrogate for $PM_{2.5}$ emissions.

(3) Criteria Pollutants
Montgomery County has been classified as attainment or unclassifiable for all other criteria pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

(4) Since this source is classified as a steel mill, it is considered one of the twenty-eight (28) source categories, as specified in 326 IAC 2-2-1(gg)(1).

(5) Fugitive Emissions
Since this type of operation is one of the 28 listed source categories under 326 IAC 2-2, fugitive emissions are counted toward determination of PSD applicability.

Source Status

The table below summarizes the potential to emit of the entire source, prior to the proposed modification, after consideration of all enforceable limits established in the effective permits.

Pollutant	Emission (tons/year)
PM	greater than 100
PM_{10}	greater than 100
SO_2	greater than 100
NOx	greater than 100
VOC	greater than 100
CO	greater than 100

(1) The existing source is a major stationary source, under PSD (326 IAC 2-2), because a regulated pollutant is emitted at a rate of 100 tons per year or more, and it is one of the 28 listed source categories, as specified in 326 IAC 2-2-1(gg)(1).

(2) These emissions are based upon the IDEM, OAQ Emission Inventory, for Nucor Steel in Crawfordsville, Indiana, calendar year 2003.

The table below summarizes the potential to emit of HAPs for the entire source, prior to the proposed modification, after consideration of all enforceable limits established in the effective permits:

HAP	Potential to Emit (tons/year)
Mercury	Less than 0.1
Beryllium	Less than 0.0004
Asbestos	Less than 0.007
Vinyl Chloride	Less than 1.0

HAP	Potential to Emit (tons/year)
Fluorides	Less than 3.0
Sulfuric Acid Mist	Less than 7.0
Hydrogen Sulfide	Less than 10
Total Reduced Sulfur	Less than 10
Benzene	Less than 10
Formaldehyde	Less than 10
Hexane	Less than 10
Naphthalene	Less than 10
Toluene	Less than 10
Hydrochloric Acid	Greater than 10
Total HAPs	Less than 25

This existing source is a major source of HAPs, as defined in 40 CFR 63.41, because HAP emissions are greater than ten (10) tons per year for a single HAP. The source meets the major source threshold requirements because of its potential to emit hydrochloric acid. Therefore, this source is an area source under Section 112 of the Clean Air Act (CAA).

Actual Emissions

The following table shows the actual emissions from the source. This information reflects the 2003 calendar year OAQ emission data.

Pollutant	Actual Emissions (tons/year)
PM_{10}	123.68
SO_2	151.81
NOx	238.12
VOC	53.92
CO	641.65
Pb	0.40
HAPs	Not available

Background and Description of Proposed Modification

Nucor Steel – Crawfordsville submitted their Part 70 permit application for a steel mill 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 IDEM OAQ. The proposed modification will consist of the following:

(a) The Strip Caster (Castrip) Line will increase the throughput of molten metal from the existing electric arc furnaces (EAF) to a maximum rate of 270 tons per hour. The maximum molten metal production rate from the electric arc furnaces shall remain 502 tons per hour.

(b) The vacuum degasser increased capacity to 270 tons of steel per hour.

(c) The PSD BACT for the vacuum degasser and Castrip are being re-evaluated and modified.

(d) The addition of one ladle preheater, LP-3, to the existing Castrip Line. The ladle preheater

is used to preheat ladles to prevent rapid cooling and solidification of molten steel during tapping operations.

The Castrip LMS system was originally permitted as part of SSM 107-12143-00038 issued on January 19, 2001.

The modification also includes a vacuum degasser used with the Castrip Line originally permitted as SSM 107-18314-00038 issued on May 27, 2004.

The goal of the proposed modification is to utilize more of the maximum capacity of the steel mill on the Castrip, which will result in an increase in utilization from 135 tons of steel per hour to 270 tons of steel per hour on the Castrip Line. However, increased utilization on some units can be attained without physical modifications to the existing units. It is important to note that the production rate from the EAFs will remain 502 tons of steel per hour after this modification. Further, the Meltshop LMS and Caster system will not be modified under this source modification.

The table below summarizes a comparison of the plant as previously permitted and as proposed.

Unit/Process	Existing (PSD ID)	Proposed
Melt Shop Electric Arc Furnaces and Argon-Oxygen Decarburization	502 ton/hr (107-16823-00038)	502 ton/hr (no change)
Meltshop Caster	135 ton/hr (107-16823-00038)	502 ton/hr (no change)
Vacuum Degasser	135 ton/hr (107-18314-00038)	270 ton/hr
Castrip LMS and Caster	135 ton/hr (107-12143-00038)	270 ton/hr

Because a Title V operating permit has not been issued for this source, the source operates on their issued source modification approvals. Based on the proposed changes under this source modification (107-21359-00038), three previous source modifications will be superseded (107-15289-00038, 107-12143-00038 and 107-18314-00038) are hereby null and void. All conditions from those previous source modifications are included in this source modification even though some of the emission units were not modified under the proposed changes of this source modification.

Enforcement Issues

IDEM is aware that there are pending enforcement actions for this source related to the units involved in this modification. IDEM is reviewing this matter and will take the appropriate action.

Emission Calculations

See Appendix A for detailed calculations.

Permit Level Determination – Part 70

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as “the maximum capacity of a stationary source or emissions unit 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, inclulding 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, the department, or the appropriate local air pollution control agency.”

The following table is used to determine the appropriate level under 326 IAC 2-7-10.5. This table

reflects the PTE before controls. Control equipment is not federally enforceable until it has been required in a federally enforceable permit.

Pollutant	PTE New Emission Units (tons/year)	Net Increase to PTE of Modified Emission Units (tons/year)	Total PTE for New and Modified Units (tons/year)
PM	0.100	197	282
PM_{10}	0.294	720	794
SO_2	0.031	122	245
VOC	0.284	5.7	18.1
CO	4.415	68	226
NO_X	2.63	147	231
HAPs	0.097	0.26	1.11

This source modification is subject to 326 IAC 2-7-10.5(f)(1), because this modification is major for PSD review, because the net emissions increase from this modification is greater than the significant thresholds under 326 IAC 2-2-1.

Permit Level Determination - PSD

The table below summarizes the potential to emit, reflecting all limits, of the emission units. Any control equipment is considered federally enforceable only after issuance of this Part 70 source modification, and only to the extent that the effect of the control equipment is made practically enforceable in the permit.

	Limited Potential to Emit (tons/year)							
Process/Emission Unit	Pb	PM	PM_{10}	SO_2	VOC	CO	NO_X	HAPs
Fugitives	8.28E-3	8.9	8.9	2.2	0.1	23.87	1.9	neg
LMS Baghouse Stack S-20	0.390	13.8	40.1	218.9	11.1	98.98	205.2	0.705
Ladle Preheaters	7.88E-5	0.289	1.09	0.093	0.851	13.24	13.1	0.290
Other Combustion Units	1.35E-5	0.050	0.210	0.016	0.149	2.32	2.8	0.129
Vacuum Degasser Stack 500	5.91E-4	1.95	1.95	23.65	5.91	88.70	5.91	neg
Total for Modification	0.399	24.99	52.2	244.9	18.1	227.1	228.9	1.12
Significant Level or Major Source Threshold	0.6	25	15	40	40	100	40	25

This modification to an existing major stationary source is major because the emissions increase is greater than the PSD significant levels. Therefore, pursuant to 326 IAC 2-2, the PSD requirements do apply.

Due to the nature of the modifications and increase in emissions, it was necessary to re-evaluate the BACT for each pollutant that met the significant level in the table above. This included emissions of the pollutants PM/PM_{10}, SO_2, CO and NOx.

A detailed explanation of the BACT requirements established as part of this modification are included in Appendix B.

Federal Rule Applicability Determination

(1) New Source Performance Standards (NSPS)

There are no New Source Performance Standards (NSPS)(326 IAC 12 and 40 CFR Part 60) affected by this modification.

(2) National Emission Standards for Hazardous Air Pollutants (NESHAP)

A National Emission Standards for Hazardous Air Pollutants (NESHAPs)(326 IAC 14 and 40 CFR Part 63) for integrated iron and steel manufacturing plants concerns sinter plants, blast furnaces and BOP shops. This source is not subject to this 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 does have a potential to emit HAPs greater than 10 tons/year for a single HAP. The source meets the major source threshold requirements because of its potential to emit hydrochloric acid.

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.

State Rule Applicability Determination

(1) <u>326 IAC 1-6-3 (PMP)</u>

(a) Nucor Steel is subject to this rule even prior to this proposed modification.

(b) The OAQ has evaluated PMP requirements and recommends the following:

(i) PMP will be required for the Castrip LMS and associated baghouses 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 of them are exhausting to the same controls.

(ii) PMP is required for the Baghouse of the Castrip nozzle core milling/drilling, the bin vents and the scrubber to assure proper operation; however, no additional compliance monitoring will be required for the operation because the PTE after controls is minimal.

(2) <u>326 IAC 1-7-1 (Stack height requirements)</u>

Nucor Steel is subject to this rule because it emits more than twenty-five (25) ton/yr of PM and SO_2. The stack heights of the Mill are less than the good engineering practice (GEP) stack heights, thus dispersion modeling has been performed to analyze the air quality impact. Detailed analysis of this is included in Appendix C.

(3) <u>326 IAC 2-1.1-11 and 326 IAC 2-2 (Performance Testing)</u>

(a) Pursuant to 326 IAC 2-1.1-11 and 326 IAC 2-2, the Permittee shall perform PM,

PM_{10} (filterable and condensable), NOx, CO, SO2, and Pb compliance stack tests for the LMS baghouse stack (S-20) within one hundred eighty (180) days after issuance.

(b) Pursuant to 326 IAC 2-1.1-11 and 326 IAC 2-2, the Permittee shall perform opacity compliance stack tests for the LMS baghouse stack (S-20) and the LMS roof monitor (S-21) within sixty (60) days after achieving maximum capacity, but no later than one hundred eighty (180) days after initial start-up.

(c) Opacity tests shall be performed concurrently with the particulate compliance stack test for the LMS baghouse stack, unless meteorological conditions require rescheduling the opacity tests to another date.

(d) All compliance stack tests shall be repeated at least annually until such time that the Part 70 permit for this source is in effect.

(e) IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform additional and future compliance testing as necessary.

(4) 326 IAC 2-2-1(PSD)
The proposed modification is considered a major modification and is therefore subject to PSD review for PM_{10}, NOx, CO and SO_2, based on the emissions calculation. The emission calculations appear in Appendix A of this technical support document.

PSD annual productions are specified in a twelve (12) consecutive month period, rolled on a monthly basis.

(5) 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.

(6) 326 IAC 2-2-6 (PSD increment consumption)
Analysis of this requirement is explained in Appendix C. Demonstration has been shown that the increase in emissions do not exceed eighty percent (80%) of the available maximum allowable increases over the baseline for SO_2, PM and NO_x .

(7) 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 forty-four percent (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.

(8) 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)]

(9) 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."

(10) 326 IAC 2-2-10 (PSD source information)

Nucor Steel has submitted the information necessary to perform an analysis or make the determinations required under PSD review.

(11) 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.

(12) 326 IAC 2-2-12 (PSD permit rescission)

The construction permit remains in effect, unless it is rescinded, modified, revoked, or expires.

(13) 326 IAC 2-2-13 (Area designation and re-designation)

Nucor Steel does not fall on any of the listed areas.

(14) 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.

(15) 326 IAC 2-2-15 (Public participation)
A copy of the application has been provided to the Crawfordsville Public Library on May 27, 2005. 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.

(16) 326 IAC 2-6-1 (Emission Reporting)
Even prior to this proposed modification, Nucor Steel is subject to 326 IAC 2-6 (Emission Reporting) because it has the potential to emit more than one hundred (100) tons per year of at least one criteria pollutant. Pursuant to this rule, the owner/operator of this source must annually submit an emission statement for this source. The annual statement must be received by July 1st of each year and must contain the minimum requirements as specified in 326 IAC 2-6-4.

(17) 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.

(18) 326 IAC 5-1 (Opacity Regulations)
Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Exemptions), 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.

This source will comply with the above limitations by complying with facility-specific BACT opacity limits specified in operating conditions in the permit.

(19) 326 IAC 6.5-1 (PM Nonattainment limitation)
This rule does not apply to Nucor Steel because it is not located in a nonattainment area.

(20) 326 IAC 6-3 (Particulate Emission Limitation for Manufacturing Operations)
Pursuant to 326 IAC 6-3-1(c)(1), this shall not apply because a particulate matter limitation is already established under 326 IAC 2-2-3 PSD BACT control technology review.

(21) 326 IAC 6-4 (Fugitive Dust Emissions)
This source is subject to the requirements of 326 IAC 6-4 (Fugitive Dust Emissions). This rule requires the owner/operator to 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.

(22) 326 IAC 6-5 (Fugitive Particulate Matter Emissions)
This source is subject to the requirements of 326 IAC 6-5 (Fugitive Particulate Matter Emissions) and shall comply with the existing Fugitive Dust Control Plan.

(23) 326 IAC 7-1 (SO_2 Limitation)
The proposed modification is subject to the requirements of 326 IAC 7-1.1 (Sulfur Dioxide Emission Limitations) because it has a potential to emit more than twenty-five (25) tons of SO_2 per year. However, there are no specific SO_2 limitations that apply to this facility.

(24) 326 IAC 9-1 (Carbon Monoxide Emission Limits)
Nucor Steel is subject to this rule because it commenced operation after March 21, 1972; however, no emission limit is specified for steel Mill. The proposed modification is not subject to the requirements of 326 IAC 9-1 (Carbon Monoxide Emission Limits) because the equipment associated with the modification (i.e. strip caster line) does not fit one of the categories identified in this rule (i.e., petroleum refining, ferrous metal smelters, or refuse incineration and burning equipment). The strip caster line does not include an electric arc furnace which would be defined as a ferrous metal smelter.

(25) 326 IAC 10 (Nitrogen Oxides)
This NO_x rule does not apply to Nucor Steel because it is not located in Clark or Floyd Counties.

(26) 326 IAC 11 (Source Specific limitations)
Steel Mill is not one of the operation listed in this rule.

(27) 326 IAC 12 (NSPS)
Compliance with this rule has been addressed under the Federal Rules Applicability of this TSD.

(29) 326 IAC 14 (HAPs Emission)
This rule incorporates by reference the 40 CFR Part 61. No 40 CFR Part 61 applies to this source.

(30) 326 IAC 15 (Lead Rules)
Nucor Steel, IN is not of the listed sources subject to this rule.

(31) 326 IAC 16 (Environmental Assessment, Activities of State Agencies)
The air permitting review process indirectly satisfies this rule.

(32) 326 IAC 17 (Public records)
There is no confidentiality request made regarding the application submitted.

(33) 326 IAC 18 (Asbestos Management at School)
Not applicable.

Compliance Determination and Monitoring

Permits issued under 326 IAC 2-7 are required to ensure that sources can demonstrate compliance with applicable state and federal rules on a more or less continuous basis. All state and federal rules contain compliance provisions; however, these provisions do not always fulfill the requirement for a more or less continuous demonstration. When this occurs IDEM, OAQ in conjunction with the source, must develop specific conditions to satisfy 326 IAC 2-7-5. As a result, compliance requirements are divided into two sections: Compliance Determination Requirements and Compliance Monitoring Requirements.

Compliance Determination Requirements in Section D of the permit are those conditions that are found more or less directly within state and federal rules and the violation of which serves as

grounds for enforcement action. If these conditions are not sufficient to demonstrate continuous compliance, they will be supplemented with Compliance Monitoring Requirements, also in Section D of the permit. Unlike Compliance Determination Requirements, failure to meet Compliance Monitoring conditions would serve as a trigger for corrective actions and not grounds for enforcement action. However, a violation in relation to a compliance monitoring condition will arise through a source's failure to take the appropriate corrective actions within a specific time period.

The following will be required for the Castrip LMF baghouse to assure compliance with the PSD BACT limits:

(1) Performance testing;

(2) Visible emissions;

(3) Parametric monitoring;

(4) Compliance monitoring; and

(5) Recordkeeping

Recommendation

Based on the facts, conditions and evaluations made, OAQ recommends to the IDEM Commissioner that the preliminary findings in the PSD/SSM 107-21359-00038 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 May 27, 2005, with additional information received on August 16, 2005.

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

This proposed modification shall be subject to the conditions of the attached proposed Part 70 SSM and PSD Permit No. 107-21359-00038.

Appendix A: Emission Calculations

Company Name: Nucor Steel
Address: Crawfordsville, Indiana 46933
Permit No: 107-21359
Plt ID: 107-00038
Reviewer: L. Stapf
Date: 3/10/2006

Total Potential to Emit Emissions of Criteria Pollutants from Modification (After Controls and Limits)

Facility	Pollutant, tons/year						
	SO2	NOx	VOC	PM/PM10 (filterable + condensible)	PM/PM10 (filterable)	CO	Pb
Strip Caster Plant							
LMS (stack) (1)	218.8	183.3	10.20	39.0	13.5	84.26	0.39
LMS (fugitive)	2.2	1.85	0.10	8.9	8.9	23.87	0.008
FoS LMS	29.4	20.1	----	----	----	31.9	----
Tundish preheaters	0.052	13.14	0.473	0.456	0.158	7.36	4.38E-05
Tundish nozzle preheaters	0.010	1.75	0.09	0.091	0.032	1.47	8.76E-06
Tundish dryers	0.021	3.50	0.189	0.266	0.063	2.94	1.75E-05
Ladle preheaters	0.093	7.88	0.851	1.20	0.284	13.25	7.88E-05
Ladle dryers	0.031	5.26	0.284	0.29	0.100	4.42	2.63E-05
Refractory transition piece preheaters	0.010	1.75	0.09	0.09	0.032	1.47	8.76E-06
Transition piece dryers	0.00078	0.13	0.0071	0.0074	0.0025	0.110	6.57E-07
Vacuum degasser	26.02	6.50	5.91	1.95	1.95	88.70	5.91E-04
Ladle preheater, new construction	0.031	2.63	0.284	0.399	0.095	4.415	2.63E-05
Continuous blaster unit	----	----	----	4.05	4.05	----	----
Blasting media storage silo	----	----	----	0.38	0.38	----	----
Batch annealing furnaces	0.22	37.84	2.04	2.12	0.72	31.79	1.89E-04
Fugitives	2.2	1.9	0.1	8.9	8.9	23.87	8.28E-03
Emissions to Stack S-20	248.3	225.3	11.1	40.0	13.8	130.9	3.90E-01
Emissions from misc combustion units	0.021	3.6	0.196	0.274	0.066	3.054	1.82E-05
Emissions from ladle preheaters	0.124	10.5	1.135	1.598	0.378	17.660	1.05E-04
Emissions to vacuum degasser stack	26.02	6.5	5.91	1.95	1.95	88.70	5.91E-04
TOTAL EMISSIONS, tons/year	**276.9**	**285.7**	**20.5**	**59.2**	**30.3**	**296.0**	**0.400**
PSD Significant Threshold Levels, tons/year	40	40	40	15	25	100	0.6

Total Potential to Emit Emissions of Hazardous Air Pollutants (HAPs) from Modification (After Controls and Limits

Facility	Pollutant, tons/year						
	Benzene	Hydrogen Chloride	Formaldehyde	Hexane	Naphthalene	Toluene	Total HAP (2)
Strip Caster Plant							
LMS (1)	----	----	----	----	----	----	0.390
FoS LMS	----	----	----	----	----	----	0.008
Tundish Preheaters	1.80E-04	0.00E+00	6.48E-03	1.54E-01	5.24E-05	2.92E-04	0.161
Tundish Nozzle Preheaters	3.61E-05	0.00E+00	1.30E-03	3.08E-02	1.05E-05	5.83E-05	0.032
Tundish Dryers	1.44E-04	0.00E+00	5.19E-03	1.23E-01	4.19E-05	2.33E-04	0.129
Ladle Preheaters	3.25E-04	0.00E+00	1.17E-02	2.78E-01	9.43E-05	5.25E-04	0.290
Ladle Dryers	1.08E-04	0.00E+00	3.89E-03	9.25E-02	3.14E-05	1.75E-04	0.097
Refractory Transition Piece Preheaters	1.80E-05	0.00E+00	6.48E-04	1.54E-02	5.24E-06	2.92E-05	0.016
Transition piece dryers	----	----	----	----	----	----	0.000
Vacuum Degasser	----	----	----	----	----	----	0.000
Ladle preheater, new construction	1.08E-04	0.00E+00	3.89E-03	9.25E-02	3.14E-05	1.75E-04	0.097
Fugitives	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Emissions to Stack S-20	3.43E-04	0.00E+00	1.23E-02	2.93E-01	9.95E-05	5.54E-04	0.306
Emissions from Ladle Preheaters	4.33E-04	0.00E+00	1.56E-02	3.70E-01	1.26E-04	7.00E-04	0.387
Emissions from Misc Combustion Units	1.44E-04	0.00E+00	5.19E-03	1.23E-01	4.19E-05	2.33E-04	0.129
TOTAL EMISSIONS, tons/year	**9.20E-04**	**0.00E+00**	**3.31E-02**	**7.86E-01**	**2.67E-04**	**1.49E-03**	**1.22E+00**
HAP Significant Threshold Levels, tons/year	10	10	10	10	10	10	25

Note: Arsenic Compounds, Beryllium Compounds, Cadmium Compounds, Chromium Compounds, Cobalt Compounds, Manganese Compounds, Mercury Compounds, Nickel Compounds and Selenium Compounds are all emitted in trace amounts that total less than 0.005 tons per year. Therefore, these were not included in the HAP calculations.

(1) The continuous caster emissions are included here.

(2) The total HAPs include the criteria pollutant lead (Pb) emissions as well.

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 Road, Crawfordsville, IN 47933
Mailing Address:	4537 South Nucor Road, 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:	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 107-21359-00038
Permit Reviewer:	LStapf

PSD BACT Overview

The Prevention of Significant Deterioration (PSD) Program requires a best 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.

Step 1: Identify all control technologies.
Step 2: Eliminate technically infeasible options.
Step 3: Rank the remaining control technologies by effectiveness.
Step 4: Evaluate the most effective controls and document results.
Step 5: 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.

A summary of the BACT review for the LMS-2 Baghouse Stack S-20 is provided in Section B.1, the BACT review for the miscellaneous combustion emission units is provided in Section B.2, the BACT review for the Vacuum Degasser is provided in Section B.3, and the BACT review for the ladle preheaters are provided in Section B.4. These BACT determinations are based on the following information:

(a) The BACT analysis submitted by Nucor Steel on May 27, 2005;
(b) Information from vendors/suppliers;
(c) Supplemental information submitted by Nucor Steel on August 16, 2005;
(d) The EPA RACT/BACT/LAER (RBLC) Clearinghouse; and
(e) State and local air quality permits.

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Appendix B.1
Best Available Control Technology (BACT) Determination
For the LMS-2 Baghouse Stack S-20

Introduction:

Nucor Steel is located in Montgomery County, Indiana, which is designated as attainment or unclassifiable for all criteria pollutants. The emissions calculations are included in Appendix A. The proposed modification is to increase steel production from 135 tons of steel per hour to 270 tons of steel per hour. As shown in the table, these pollutant emissions exceed the PSD significant threshold levels stated in 326 IAC 2-2-1 for PM/PM_{10}, NO_x, CO and SO_2. Therefore, these pollutants were reviewed under the PSD Program (326 IAC 2-2).

Pollutant	Test 11/20/03	Test 04/29/04	Test 12/21/04	Emission Limit 107-2764 / 107-12143	Limit Proposed in 21359 application
NOx (lb/ton steel)	0.0180	0.0149	0.0555	0.0176	0.19
SO2 (lb/ton steel)	0.05	NM	0.114	0.185	0.21
PM (gr/dscf)	0.0010	NM	0.00152	0.0018	No change
PM10 (gr/dscf)	0.0033	NM	0.00443	0.0052	No change
VOC (lb/ton)	NM	NM	NM	0.0086	No change
CO (lb/ton)	0.050	NM	0.05439	0.07125	0.131
CO (lb/hr)	11.17	NM	NM	9.62	35.1
Opacity (%)	0	NM	NM	3	No change
Max Rate (ton steel / hour)	270	135	135	135	270
Avg Rate (ton steel / hour)	206	205	171.9	--	--
Pb (lb/hr)	0.00047	NM	0.013	0.136	No change

NM = not measured.

Since the primary goal of Nucor Steel's PSD modification is to achieve the maximum capacity of the steel mill, it will clearly result in an increased utilization of those existing units and operations. This PSD BACT analysis will revisit the original BACT. The table summarizes recent stack test results, the existing BACT limits and the proposed limits. The stack test data obtained by Nucor between March 24 and March 27, 2005, indicates that the Castrip process does not operate on a steady state basis. Nucor Steel requested that IDEM take into account the data range and standard deviations when considering the BACT limit for this process. Each contribution to the NOx limitation is summarized in the following table:

Emission Unit Description	Emissions (lbs NOx per ton steel produced)
Emission Units to LMS-2 Baghouse	0.155
Ladle Dryer	0.0044
Tundish preheaters	0.0111
Tundish nozzle preheaters	0.00074
Transition piece preheaters	0.0015
Safety Factor	0.017
Totals	0.19

The NOx stack test data was recorded without the ladle dryer exhausting to the LMS-2 baghouse. Further, the Tundish preheaters, Tundish nozzle preheaters and transition piece preheaters

needed to be added to the limit. Finally, due to the standard deviation of the test results, a reasonable factor of safety is added to the NOx limitation. Nucor Steel proposed a NOx limitation of 0.19 lbs per ton of steel produced.

Each contribution to the CO limitation is summarized in the following table:

Emission Unit Description	**Emissions (lbs CO per ton steel produced)**
LMS-2 Baghouse	0.07125
Ladle Dryer	0.00374
Tundish preheaters	0.00622
Tundish nozzle preheaters	0.00124
Transition piece preheaters	0.00124
Continuous Caster	0.0202
Safety Factor	0.027
Totals	0.131

The CO stack test data was recorded without the ladle dryer exhausting to the LMS-2 baghouse. Further, the Tundish preheaters, Tundish nozzle preheaters and transition piece preheaters needed to be added to the limit. Nucor Steel recently discovered that the continuous caster contributes additional CO based on an engineering study. Finally, due to the standard deviation of the test results, a reasonable factor of safety is added to the CO limitation. Nucor Steel proposed a CO limitation of 0.131 lbs per ton of steel produced.

Each contribution to the SO_2 limitation is summarized in the following table:

Emission Unit Description	**Emissions (lbs SO2 per ton steel produced)**
LMS-2 Baghouse	0.185
Ladle Dryer	$2.6x10^{-5}$
Tundish preheaters	$4.44x10^{-5}$
Tundish nozzle preheaters	$8.89x10^{-6}$
Transition piece preheaters	$8.89x10^{-6}$
Safety Factor	0.0249
Totals	0.21

The SO_2 stack test data was recorded without the ladle dryer exhausting to the LMS-2 baghouse. Further, the Tundish preheaters, Tundish nozzle preheaters and transition piece preheaters needed to be added to the limit. Finally, due to the standard deviation of the test results, a reasonable factor of safety is added to the SO_2 limitation. Nucor Steel proposed a SO_2 limitation of 0.21 lbs per ton of steel produced.

Nucor Steel wants to retain the existing PM/PM_{10} limitation for the LMS-2 as it was determined from the previous BACT.

The following is a summary of the potential to emit:

Pollutant	PTE (tons/year)	PSD Significant Levels (tons/year)
SO_2	244.9	40
NO_x	230.7	40
VOC	18.3	40
CO	228.7	100
PM	282	25

Pollutant	PTE (tons/year)	PSD Significant Levels (tons/year)
PM_{10}	794	15
Pb	0.399	0.6

The emissions increase attributed to this source modification exceeds the PSD significant threshold levels stated in 326 IAC 2-2-1 for PM/PM_{10}, NOx, CO and SO2. Therefore, these pollutants were reviewed under the PSD Program (326 IAC 2-2).

The included BACT determinations are based on information obtained from the PSD permit application submitted by Nucor Steel on May 27, 2005, as well as additional documentation provided by Nucor Steel on August 16, 2005, 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.

Description

The emissions generated from the strip caster equipment include the ladle metallurgy station and the continuous caster. A BACT discussion of the two facilities for the strip caster line is presented below.

A portion of the molten metal produced by the existing EAFs shall be tapped to the strip caster line at a maximum rate of 270 tons per hour. The molten metal shall be transported by a combination of an overhead crane (inside the existing Meltshop) and a Kress carrier (between the Meltshop and the strip caster (Castrip) building), and associated overhead crane movements inside the existing Castrip building. The overhead crane transports the molten metal to the ladle metallurgy station (LMS) identified as LMS-2. At the LMS-2, a sample of the molten steel will be taken and analyzed for its various constituents. Processes occurring at the LMS-2 at various times include the addition of materials to achieve the desired chemistry and temperature, heating with electrodes, argon stirring and lancing, electromagnetic stirring, and desulfurization.

(A) Oxides of Nitrogen (NOx)

(1) LMS-2 - NOx BACT

NOx is formed from the chemical reaction between nitrogen and oxygen at high temperatures. NOx formation occurs by different mechanisms. In the case of LMS, 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 LMSs.

<u>Step 1 – Identify Control Options</u>
Four (4) available technologies were evaluated to control NOx emissions from the LMS:

Combustion Controls
Selective Catalytic Reduction (SCR)
Non-Selective Catalytic Reduction (NSCR)
Selective Non-Catalytic Reduction (SNCR) Options:
- Exxon's Thermal DeNOx
- Nalco Fuel Tech's NOxOUT

Step 2 – Eliminate Technically Infeasible Control Options

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 the LMS. 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 LMS.

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 LMS operation is a highly transient process and is a batch operation. The temperature of the LMS exhaust gas will vary widely over the 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 LMS 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 ^oF), thus the gas stream would have to be reheated from approximately 200 ^oF 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 a LMS. 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.

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 LMS is not considered a combustion process. Steady-state near-stoichiometric combustion conditions do not exist in the 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 LMS. 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 a LMS.

Selective Non-Catalytic Reduction (SNCR) options - Exxon's Thermal $DeNO_x$® and Nalco Fuel Tech's NO_xOUT®
The two (2) commercially available selective non-catalytic reduction (SNCR) systems are *Exxon's Thermal $DeNO_x$® system* and *Nalco Fuel Tech's NO_xOUT® system*. In order for the Thermal $DeNO_x$® system and NO_xOUT® 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 LMS exhaust gas varies widely over the cycle, and does not remain in the desired temperature window during all phases of the LMS operation. Similarly, the gas flow rates do not remain stable during the LMS 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 a LMS.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness
The use of low NOx burners (combustion controls) is the only remaining technically feasible control option of emissions from the emission units.

Step 4 – Evaluate the Most Effective Controls and Document Results
The EPA RACT/BACT/LAER Clearinghouse (RBLC) is a database system that provides emission limit data for industrial processes throughout the United States. The following table summarizes previous BACT determinations for NOx on similar operations:

Source	NOx Emission Limit	BACT Control Technology
Trico Steel, AL	0.02 lbs/ton steel 440 tons steel/hr	Proper Operation
Roanoke Steel, VA	6 lbs/hr 100 tons steel/hr (0.06 lb/ton steel)	Proper Operation
Roanoke Electric Steel Corp, VA	15 tons/yr 500,000 tons steel/yr (0.06 lb/ton steel)	Proper Operation
Nucor Steel, IN (Melt Shop LMS)	0.0176 lbs/ton steel 502 tons steel/hr	Proper Operation
Nucor Steel, IN (Castrip LMS-2)	0.0176 lbs/ton steel 135 tons steel/hr (current)	01/03/03: 238 tons steel/hr, 0.007 lb/ton; 11/20/03: 206 ton steel/hr, 0.0180 lb/ton.
Nucor Steel, IN (Castrip LMS-2)	0.172 lbs/ton steel 270 tons steel/hr (proposed)	Proper Operation
Nucor-Yamato, AR	0.02 lbs/ton steel 225 tons steel/hr	Proper Operation
Steelcorr, AR *	0.02 lbs/ton steel 350 tons steel/hr	Proper Operation
Corus Tuscaloosa, AL	None	N/A

* Steelcorr was never constructed; therefore, compliance was never determined with the chosen emission limitations.

Nucor Steel proposes to minimize NOx emissions by proper operation of the unit, which is consistent with BACT determinations for similar sources.

Nucor Steel proposed in their BACT application a new limitation for NOx based on stack testing of the LMS-2 and various engineering evaluations of the process. Each contribution to the NOx limitation from the Castrip LMS-2 is summarized in the following table:

Emission Unit Description	**Emissions (lbs NOx per ton steel produced)**
Emission Units to LMS-2 Baghouse	0.155
Safety Factor	0.017
Totals	0.172

The NOx stack test data was recorded without the Tundish preheaters and transition piece preheaters. Further, due to the standard deviation of the test results, a reasonable factor of safety is added to the NOx limitation. IDEM proposed a NOx limitation of 0.172 lbs per ton of steel produced for LMS-2 operations.

Step 5 – Select BACT
BACT for NOx from the LMS-2 shall be utilization of "good combustion practices" and a NOx emission limit of 0.172 pounds per ton of steel processed at the LMS-2. Refer to subsection (A)(3) for a combined NOx limit.

(2) Combustion Units - NOx BACT for Combustion Units LD-1, TP-1, TP-2, TPP-1, TPP-2, TNP-1 and TNP-2

The strip caster line (Castrip) utilizes the following combustion units under this PSD application, with clarifications to be made on the heat input ratings:

- One (1) natural gas-fired ladle dryer (LD-1) (12 MMBtu/hr)
- Two (2) natural gas-fired Tundish preheaters (TP-1 and TP-2) (10 MMBtu/hr each)
- Two (2) natural gas-fired transition piece preheaters (TPP-1, TPP-2) (2 MMBtu/hr each)
- Two (2) natural gas-fired tundish nozzle preheaters identified as TNP-1 and TNP-2

These emission units are exhausted through the existing LMS-2 Baghouse, which exhausts through Stack S-20.

All emissions from these natural gas-fired combustion sources are products of combustion. Propane, a similar fuel to natural gas, shall be utilized as a backup fuel for these combustion sources.

Step 1 – Identify Control Options
Add-on controls are considered impractical due to the small amount of NO_x that will be emitted, small size of the burners, and lack of exhaust gas capture systems. IDEM, OAQ, is not aware of any steel mills using any add-on control technology to control combustion-related emissions from these small combustion sources. The following integral control systems were investigated:

Low NOx Burners
Ultra Low NOx Burners

Step 2 – Eliminate Technically Infeasible Control Options
The possibility of using ultra low-NO_x burners as combustion controls was investigated. The concept behind ultra low-NO_x burners is to use sealed combustion chambers such as boilers and furnaces where baffle design controls air staging. Also of importance is to control NO_x through the recirculation of gases, which allows heat to dissipate slower thereby reducing NO_x formation. These burners do not have sealed combustion chambers to allow the recirculation of gases and it is designed to rely on ambient air for facilitate the combustion process. Information from vendors indicates that ultra-low NOx burners would be infeasible; therefore, this technology is not considered technically feasible.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness
Low NOx burners have been required for the combustion sources, with the exception of the Tundish preheaters. The Tundish preheaters will use oxy-fuel burners because of the more intense heat needed to quickly return the Tundish units to operation. Because the

Tundish preheaters must heat the Tundish at a rapid rate, the heat generated from this process creates additional NOx emissions.

Step 4 – Evaluate the Most Effective Controls and Document Results
Low NOx burners have been required for these types of combustion sources. The achievable emission rate of the low NOx burners varies depending on the type of operation. Information from vendors indicates that an emission rate of 0.1 lb/MMBtu is achievable for this particular type of operation.

Step 5 – Select BACT
BACT for the Tundish preheaters (TP-1 and TP-2) shall be utilization of "good combustion practices" and the use of oxy-fuel burners with an emission rate of 0.15 lb NOx/MMBtu.

BACT for the LD-1, TPP-1, TPP-2, TNP-1 and TNP-2 shall be utilization of "good combustion practices" and the use of low-NOx burners with an emission rate of 0.10 lbs NOx/MMBtu. Refer to subsection (A)(3) for a combined NOx limit.

(3) Combined Limit - NOx BACT

The LMS-2, continuous caster, and above noted combustion units are all part of the strip caster line (Castrip) where the emissions vent to the LMS-2 baghouse and Stack S-20.

Each contribution to the NOx limitation is summarized in the following table:

Emission Unit Description	Emissions (lbs NOx per ton steel produced)
Emission Units to LMS-2 Baghouse	0.155
Ladle Dryer	0.0044
Tundish preheaters	0.0111
Tundish nozzle preheaters	0.00074
Transition piece preheaters	0.0015
Safety Factor	0.017
Totals	0.19

The NOx data from the Nucor engineering study and stack test at the LMS-2 baghouse recorded 0.155 lbs NOx per ton of steel processed at the LMS-2. Additional equipment was not running during the test. The ladle dryer contributes 0.0044 lbs NOx per ton of steel produced. Further, the Tundish preheaters, Tundish nozzle preheaters and transition piece preheaters contribute 0.0111, 0.00074 and 0.0015 lbs NOx per ton of steel processed at the LMS-2, respectively. Finally, due to the standard deviation of the test results, a reasonable factor of safety is added to the NOx limitation of 0.017 lbs NOx per ton of steel processed at the LMS-2. Nucor Steel proposed a total Castrip LMS-2 Baghouse NOx limitation of 0.19 lbs per ton of steel processed at the LMS-2.

In order for the limitation to be readily enforceable, the above BACT limits are added together to obtain the total BACT limitation for the Stack S-20:

BACT for NOx from the total Castrip LMS-2 Baghouse Stack S-20 shall be utilization of "good combustion practices" and shall not exceed a NOx emission limit of 0.19 pounds NOx per ton of steel processed at the LMS-2.

In addition to the combined NOx emission limit for the total Castrip LMS-2 Baghouse Stack S-20, BACT for the small combustion units shall be as follows:

(a) The use of "pipeline quality" natural gas as primary fuel and propane as back up fuel.

(b) The small combustion units LD-1, TNP-1, TNP-2, TPP-1, TPP-2, TNP-1 and TNP-2 shall be the use of "pipeline quality" natural gas fuel and low-NOx burners.

(c) The small combustion units the TP-1 and TP-2 shall be the use of "pipeline quality" natural gas fuel and oxy-fuel burners.

(d) The utilization of good combustion practices.

(B) Sulfur Dioxide (SO_2)

(1) LMS-2 - SO_2 BACT

The source of SO_2 emissions from a LMS are attributable to the sulfur content of the raw materials added to the LMS, and residual sulfur carried over in the molten metal matrix from the melting and refining process.

Step 1 – Identify Control Options

The following available technologies were evaluated to control SO_2 emissions from the LMS:

Flue Gas Desulfurization (FGD) Options:
- Spray Dryer Absorption (SDA)
- Wet Scrubbing
- Dry Sorbent Injection (DSI)

Step 2 – Eliminate Technically Infeasible Control Options

None of the technologies were found to be technically infeasible.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

FGD options - Wet Scrubbing, SDA, and DSI

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 a LMS.

- - 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 LMS 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 LMS particulate control device would make operation of the wet scrubber technically feasible. However, there is an expected low concentration of SO_2 in the exhaust gas stream.

The OAQ is not aware of a steel mill where a wet scrubber has been operated to control SO_2 emissions from a LMS.

- - 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 LMS 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 in wet scrubbing, there is an expected low concentration of SO_2 in the exhaust gas stream.

  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 a LMS.

- - 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 LMS exhaust gas is not much of a problem. Like wet scrubbing, there is an expected low concentration of SO_2 in the exhaust gas stream.

  The OAQ is not aware of a steel mill where dry sorbent injection has been operated to control SO_2 emissions from a LMS.

Adsorption and absorption control technologies have not been designed to control a gas stream of 5 ppm or less because:

(a) 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.

(b) 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.

None of the SO_2 control technologies have been applied to an LMS; 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 LMS, 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.

Step 4 – Evaluate the Most Effective Controls and Document Results

The following summary outlines the economic feasibility of these technically feasible control options:

Control Option	Control Efficiency (%)	Total SO_2 Emissions (tons/yr)	SO_2 Emissions Removed (tons/yr)	Total Annual Cost ($) [A]	Annualized Cost ($/ton SO_2 removed) [A]
SDA	45	109.4	49.2	968,000	19,700
Wet Scrubbing	35	109.	38.3	746,000	19,500
DSI	25	109.4	27.4	418,000	15,300

[A] The cost analyses are based on values from the year 2000.

The above total and annualized costs are based on the cost estimating structure and guidance provided in the USEPA reference, “OAQPS Cost Control Manual”, Fifth Edition, EPA 453/B-96-001 (February 1996), other relevant information provided by the respective equipment vendors, inputs from mill personnel and engineering judgment. The various cost factors are based on guidance provided under OAQPS Manual Chapter 9 - Gas Absorbers. Since SO_2 control technologies are not specifically covered in the OAQPS Manual, the chapter under Gas Absorbers was adopted as being appropriate.

Based on the information presented above, these technically feasible control options are not economically feasible.

The EPA RACT/BACT/LAER Clearinghouse (RBLC) is a database system that provides emission limit data for industrial processes throughout the United States. The following table summarizes other BACT determinations for SO_2 on similar operations (LMS):

Source	SO_2 Limit	BACT Control Technology	Compliance Status
Trico Steel, AL	None	None	N/A
Roanoke Steel, VA	6.0 lb/hr 100 tons steel/hr (0.06 lb/ton steel)	None	1.14 lb/hr
Roanoke Electric Steel Corp, VA	15 tons/yr 500,000 tons steel/yr (0.06 lb/ton steel)	None	Information Not Available
Nucor Steel, IN (Melt Shop LMS)	0.185 lb/ton 502 tons steel/hr	None	Information Not Available
Nucor Steel, IN (Castrip LMS-2)	0.185 lb/ton 135 tons steel/hr (existing)	None	01/03/03: 238 tons steel/hr; 0.029 lb/ton
Nucor Steel, IN (Castrip LMS-2)	0.210 lb/ton 270 tons steel/hr (proposed)	None	Information Not Available
Nucor- Yamato, AR	0.076 lb/ton 225 tons steel/hr	None	Information Not Available
Steelcorr, AR *	0.08 lb/ton 350 tons steel/hr	None	Information Not Available
Corus Tuscaloosa, AL	None	None	N/A

* Steelcorr was never constructed; therefore, compliance was never determined with the chosen emission limitations.

The majority of sources exhaust the emissions from the LMS to a common stack. Only the sources listed above have a separate exhaust system for the LMS. None of these facilities have applied SO_2 control technologies to an LMS.

Nucor Steel proposed in their BACT application a new limitation for SO_2 based on stack testing of the LMS-2 and various engineering evaluations of the process. Each contribution to the SO_2 limitation from only the Castrip LMS-2 is summarized in the following table:

Emission Unit Description	**Emissions (lbs SO2 per ton steel produced)**
LMS-2 Baghouse	0.185
Safety Factor	0.0249
Totals	0.21

The SO_2 stack test data was recorded without the ladle dryer, the tundish preheaters, the tundish nozzle preheaters, and the transition piece preheaters for the LMS-2 baghouse as

0.185 lbs SO_2 per ton of steel processed at the LMS-2. Due to the standard deviation of the test results, a reasonable factor of safety of 0.0249 lbs SO_2 per ton of steel processed at the LMS-2 is added to the SO_2 limitation. IDEM proposed a SO_2 limitation of 0.21 lbs per ton of steel processed at the LMS-2.

Step 5 – Select BACT
BACT for SO_2 from the Castrip LMS-2 shall be utilization of "good combustion practices" and meet an emission rate limit of 0.21 pounds SO_2 per ton of steel processed at the LMS-2. Refer to subsection (B)(3) for a combined SO_2 limit.

(2) Combustion Units - SO_2 BACT for Combustion Sources LD-1, TP-1, TP-2, TPP-1, TPP-2, TNP-1 and TNP-2

The strip caster line (Castrip) utilizes the following combustion units under this PSD application, with clarifications to be made on the heat input ratings:

- One (1) natural gas-fired ladle dryer (LD-1) (12 MMBtu/hr)
- Two (2) natural gas-fired Tundish preheaters (TP-1 and TP-2) (10 MMBtu/hr each)
- Two (2) natural gas-fired transition piece preheaters (TPP-1, TPP-2) (2 MMBtu/hr each)
- Two (2) natural gas-fired tundish nozzle preheaters identified as TNP-1 and TNP-2

These emission units are exhausted through the existing LMS-2 Baghouse, which exhausts through Stack S-20.

All emissions from these natural gas-fired combustion sources are products of combustion. Propane, a similar fuel to natural gas, shall be utilized as a backup fuel for these combustion sources.

Step 1 – Identify Control Options
Add-on controls are considered impractical due to the small amount of SO_2 that will be emitted, small size of the burners, and lack of exhaust gas capture systems. IDEM, OAQ, is not aware of any steel mills using any add-on control technology to control combustion-related emissions from these small combustion sources. There were no add-on controls or integral control systems investigated.

Step 2 – Eliminate Technically Infeasible Control Options
These burners do not have sealed combustion chambers to allow the recirculation of gases and they are designed to rely on ambient air to facilitate the combustion process. There are no technically infeasible controls for SO_2 to discuss.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness
There are no technically feasible control technologies for SO_2 to discuss.

Step 4 – Evaluate the Most Effective Controls and Document Results
There are no technically feasible control technologies for SO_2 to evaluate.

Step 5 – Select BACT
BACT for the Tundish preheaters shall be utilization of "good combustion practices".

BACT for the LD-1, TP-1, TP-2, TPP-1, TPP-2, TNP-1 and TNP-2 shall be good combustion practices.

Refer to subsection (B)(3) for a combined SO_2 limit.

(3) Combined Limit - SO_2 BACT

Each contribution to the SO_2 limitation is summarized in the following table:

Emission Unit Description	Emissions (lbs SO2 per ton steel produced)
LMS-2 Baghouse	0.185
Ladle Dryers	2.6x10-5
Tundish preheaters	4.44x10-5
Tundish nozzle preheaters	8.89x10-6
Transition piece preheaters	8.89x10-6
Safety Factor	0.0249
Totals	0.210

The SO_2 stack test data was recorded for the LMS-2 baghouse as 0.185 lbs SO_2 per ton of steel processed at the LMS-2. Due to the standard deviation of the test results, a reasonable factor of safety of 0.0249 lbs SO_2 per ton of steel processed at the LMS-2 is added to the SO_2 limitation. There are other emission units not included in the stack testing. The ladle dryer contribute $2.6x10^{-5}$ lbs SO_2 per ton of steel processed at the LMS-2. In addition, the Tundish preheaters, Tundish nozzlepreheaters and transition piece preheaters contribute $4.44x10^{-5}$, $8.89x10^{-6}$ and $8.89x10^{-6}$ lbs SO_2 per ton of steel processed at the LMS-2, respectively. Nucor Steel proposed a total Castrip LMS-2 Baghouse SO_2 limitation of 0.21 lbs per ton of steel processed at the LMS-2.

In order for the limitation to be readily enforceable, the above BACT limits are added together to obtain the total BACT limitation for the Stack S-20:

BACT for SO_2 from the total Castrip LMS-2 Baghouse Stack S-20 be utilization of “good combustion practices” and an emission limit of 0.21 pounds SO_2 per ton of steel processed at the LMS-2.

(C) Carbon Monoxide (CO)

(1) LMS-2 - CO BACT

CO will be emitted as a byproduct of incomplete or inefficient combustion of the molten matrix in the LMS. 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 LMS, CO emissions are predicated by residual incomplete oxidation reactions of matrix constituents during alloying operations.

Step 1 – Identify Control Options

Six (6) available technologies were evaluated to control CO emissions from the LMS:

(1) Fuel Spec: Clean-Burn Fuel;
(2) Good Combustion Practices;
(3) Flaring of CO Emissions;
(4) Low CO Burners;
(5) CO Oxidation Catalysts; and
(6) Post-Construction Reaction Chamber.

Step 2 – Eliminate Technically Infeasible Control Options

Fuel Spec: Clean-Burn Fuel and Good Combustion Practices

Combustion controls are technically infeasible because of the absence of fuel combustion activities at the LMS.

Flaring

The OAQ has found no known applications of flaring for similar LMS exhaust gases for CO control. Flaring of emissions for CO destruction would require raising the exhaust gas temperature to 1,300 degrees Fahrenheit at a residence time of 0.5 second. Presently, the exhaust gas stream is around 200,000 dscfm at 150 degrees Fahrenheit. 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 LMS. 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 LMS 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 LMS. 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 LMS 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 LMS. 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.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness
There are no technically feasible control options for emissions from these units.

Step 4 – Evaluate the Most Effective Controls and Document Results
The EPA RACT/BACT/LAER Clearinghouse (RBLC) is a database system that provides emission limit data for industrial processes throughout the United States. The following table summarizes previous BACT determinations for CO on similar operations:

Source	CO Emission Limit	BACT Control Technology
Trico Steel	0.30 lbs/ton steel 440 tons steel/hr	Proper Operation
Roanoke Electric Steel, VA	48 lbs/hr 100 tons steel/hr (0.48 lb/ton steel)	Proper Operation
Roanoke Electric Steel Corp, VA	120 tons/yr 500,000 tons steel/yr (0.48 lb/ton steel)	Proper Operation
Nucor Steel, IN (Melt Shop LMS)	0.07125 lbs/ton steel 502 tons steel/hr	Proper Operation
Nucor Steel, IN (Castrip LMS-2)	0.07125 lbs/ton steel 135 tons steel/hr (existing)	01/03/03: 238 tons steel/hr; 0.039 lb/ton
Nucor Steel, IN (Castrip LMS-2)	0.0982 lbs/ton steel 270 tons steel/hr (proposed)	Proper Operation
Nucor-Yamato, AR	0.28 lbs/ton 225 tons steel/hr	Proper Operation
Steelcorr, AR *	0.05 lbs/ton 350 tons steel/hr	Proper Operation
Corus Tuscaloosa, AL	32 lbs/hr 160 tons steel/hr (0.2 lb/ton steel)	Proper Operation

* Steelcorr was never constructed; therefore, compliance was never determined with the chosen emission limitations.

Nucor Steel proposes to minimize CO emissions by proper operation of the unit, which is consistent with BACT determinations for similar sources. Nucor Steel calculated the CO emissions from the LMS-2 using internal stack test data from its existing LMS. Because the molten steel from the existing EAF shall serve both the Melt Shop LMS and the Castrip LMS-2, the CO emissions are expected to be the same.

Nucor Steel proposed in their BACT application a new limitation for CO based on stack testing of the LMS-2 and various engineering evaluations of the process. Each contribution to the CO limitation is summarized in the following table:

Emission Unit Description	Emissions (lbs CO per ton steel produced)
LMS-2 Baghouse	0.0712
Safety Factor	0.027
Totals	0.0982

The CO stack test data was recorded for the LMS-2 baghouse. Due to the standard deviation of the test results, a reasonable factor of safety of 0.027 lbs CO per ton of steel processed at the LMS-2 is added to the CO limitation. Nucor proposed a LMS-2 CO limitation of 0.0982 lbs per ton of steel produced.

Step 5 – Select BACT
BACT for CO from the LMS-2 shall be utilization of "good combustion practices" and a CO emission limit of 0.0982 pounds per ton of steel processed at the LMS-2. Refer to subsection (C)(4) for a combined CO limit.

(2) Continuous Caster - CO BACT

The caster will form a solid continuous slab of steel as molten metal passes through a set of water-cooled rolls. The caster uses a set of water-cooled rolls that are replaced or adjusted depending upon product type. Carbon monoxide is generated from the casting operation. The emissions are captured and evacuated to the LMS-2 baghouse (S-20).

Step 1 – Identify Control Options
Two (2) available technologies were evaluated to control CO emissions from the continuous caster:

(1) CO Oxidation Catalysts; and
(2) Post- Combustion Reaction Chamber.

Step 2 – Eliminate Technically Infeasible Control Options

CO Oxidation Catalysts
The OAQ has found no known applications of CO oxidation catalysts to control CO emissions from a steel mill continuous caster. 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 continuous caster will be below the minimum 500 degrees Fahrenheit threshold for effective operation of CO oxidation catalysts. 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 continuous caster. Consequently, this control alternative is not considered technically feasible.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness
There are no technically feasible control options for emissions from the emission unit.

Step 4 – Evaluate the Most Effective Controls and Document Results
The EPA RACT/BACT/LAER Clearinghouse (RBLC) is a database system that provides emission limit data for industrial processes throughout the United States. There were no previous BACT determinations for similar operations.

Nucor Steel proposes to minimize CO emissions by proper operation of the unit. Nucor Steel proposed in their BACT application a new limitation for CO based on engineering evaluations of the process. Nucor proposed a CO limitation of 5.45 pounds CO per hour (0.0202 pounds CO per ton of steel produced).

Step 5 – Select BACT
BACT for CO from the Castrip Caster shall be utilization of "good combustion practices" and a CO emission limit of 0.0202 pounds CO per ton of steel processed at the LMS-2. Refer to subsection (C)(4) for a combined CO limit.

(3) Combustion Units - CO BACT for Combustion Sources LD-1, TP-1, TP-2, TPP-1, TPP-2, TNP-1 and TNP-2

The strip caster line (Castrip) utilizes the following combustion units under this PSD application, with clarifications to be made on the heat input ratings:

- One (1) natural gas-fired ladle dryer (LD-1) (12 MMBtu/hr)
- Two (2) natural gas-fired Tundish preheaters (TP-1 and TP-2) (10 MMBtu/hr each)
- Two (2) natural gas-fired transition piece preheaters (TPP-1, TPP-2) (2 MMBtu/hr each)
- Two (2) natural gas-fired tundish nozzle preheaters identified as TNP-1 and TNP-2

These emission units are exhausted through the existing LMS-2 Baghouse, which exhausts through Stack S-20.

All emissions from these natural gas-fired combustion sources are products of combustion. Propane, a similar fuel to natural gas, shall be utilized as a backup fuel for these combustion sources.

Step 1 – Identify Control Options
Add-on controls are considered impractical due to the small amount of CO that will be emitted, small size of the burners, and lack of exhaust gas capture systems. IDEM, OAQ, is not aware of any steel mills using any add-on control technology to control combustion-related emissions from these small combustion sources. There were no add-on controls or integral control systems investigated.

Step 2 – Eliminate Technically Infeasible Control Options
These burners do not have sealed combustion chambers to allow the recirculation of gases and it is designed to rely on ambient air for facilitate the combustion process. There are no technically infeasible controls for CO to discuss.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness
There are no technically feasible control technologies for CO to discuss.

Step 4 – Evaluate the Most Effective Controls and Document Results
There are no technically feasible control technologies for CO to evaluate.

Step 5 – Select BACT
BACT for the LD-1, TP-1, TP-2, TPP-1, TPP-2, TNP-1 and TNP-2 shall be utilization of good combustion practices.

Refer to subsection (C)(4) for a combined CO limit.

(4) Combined Limit - CO BACT

Each contribution to the CO limitation is summarized in the following table:

Emission Unit Description	Emissions (lbs CO per ton steel produced)
LMS-2 Baghouse	0.07125
Ladle Dryer	0.00374
Tundish preheaters	0.00622
Tundish nozzle preheaters	0.00124
Transition piece preheaters	0.00124
Continuous Caster	0.0202
Safety Factor	0.027
Totals	0.131

The CO stack test data was recorded for the LMS-2 baghouse. Due to the standard deviation of the test results, a reasonable factor of safety of 0.027 lbs CO per ton of steel processed at the LMS-2 is added to the CO limitation. This is a LMS-2 CO limitation of 0.0982 lbs per ton of steel produced. Further, the ladle dryer contributes 0.00374 lbs CO per ton of steel processed at the LMS-2. Further, the Tundish preheaters and transition piece preheaters contribute 0.00124 and 0.00124 lbs CO per ton of steel processed at the LMS-2. Nucor Steel recently discovered that the continuous caster contributes an additional 0.0202 lbs CO per ton of steel processed at the LMS-2 based on an engineering study. Nucor Steel proposed a total Castrip LMS-2 Baghouse CO limitation of 0.131 lbs per ton of steel processed at the LMS-2.

In order for the limitation to be readily enforceable, the above BACT limits are added together to obtain the total BACT limitation for the Stack S-20:

BACT for CO from the total Castrip LMS-2 Baghouse Stack S-20 shall be proper operation and shall not exceed 0.131 pound of CO per ton of steel processed at the LMS-2.

(D) Particulate Matter (PM/PM_{10})

(1) LMS-2 - PM/PM_{10} BACT

Particulate matter emissions are generated at a LMS due to the addition of materials, heating with electrodes, argon stirring and lancing, electromagnetic stirring and desulfurization. Fumes from these operations are captured by the side draft hood.

Step 1 – Identify Control Options
Four (4) available technologies were evaluated to control filterable particulate emissions from the LMS:

Electrostatic Precipitator (ESP)
High Efficiency Cyclone
High Energy Scrubber
Fabric Filter (baghouse)

Step 2 – Eliminate Technically Infeasible Control Options

Electrostatic Precipitator (ESP)
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 a LMS. 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 a LMS contains high levels of zinc (10% - 20%) and other metal compounds which can foul ESP electrodes, thereby, making the ESP ineffective. Therefore, the ESP is considered technically infeasible for controlling particulate emissions from a LMS.

The OAQ is not aware of a steel mill where an ESP has been operated to control particulate emissions from an LMS.

High Efficiency Cyclone
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 LMS.

The OAQ is not aware of a steel mill where a cyclone collector has been operated to effectively control particulate emissions from a LMS.

High Energy Scrubber
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 mill where a high energy wet scrubber has been operated to control particulate emissions from a LMS.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness
The fabric filter has the highest removal efficiency of the technically feasible particulate control devices, and is therefore considered BACT. Because a fabric filter is in use for the LMS, no further evaluation is necessary.

Step 4 – Evaluate the Most Effective Controls and Document Results

Fabric Filter (Baghouse)
Fabric filters or baghouses are technically feasible for collecting fine particulate matter emissions associated with metals from a LMS 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 a LMS.

The EPA RACT/BACT/LAER Clearinghouse (RBLC) is a database system that provides emission limit data for industrial processes throughout the United States. The following table summarizes previous BACT determinations for PM and PM_{10} on similar operations (LMS):

Source Name (Production Capacity)	PM and PM_{10} limit	Control Technology
Arkansas Steel, AK (50 tons/hr)	0.0052 gr/dscf (filterable PM/PM_{10})	Negative Pressure Baghouse
Gallatin Steel, KY (200 tons/hr)	0.0018 gr/dscf (filterable PM/PM_{10})	Positive Pressure Baghouse
IPSCO Steel, IA (164 tons/hr)	0.0025 gr/dscf (filterable and condensible PM_{10})	Negative Pressure Baghouse
NUCOR Steel, Huger, SC (165 tons/hr)	0.0035 gr/dscf (filterable PM/PM_{10})	Negative Pressure Baghouse
Trico Steel, AL (440 tons/hr)	0.0032 gr/dscf filterable PM/PM_{10}	Negative Pressure Baghouse
Tuscaloosa Steel, AL	0.0035 gr/dscf	Negative Pressure

Source Name (Production Capacity)	PM and PM_{10} limit	Control Technology
(160 tons/hr)	filterable PM/PM_{10}	Baghouse
Stafford Railsteel, AK (125 tons/hr)	0.0018 gr/dscf (filterable PM/PM_{10})	Positive Pressure Baghouse
NUCOR Steel, AK (475 tons/hr)	0.0018 gr/dscf (filterable PM/PM_{10})	Positive Pressure Baghouse
NUCOR-Yamato Steel, AK (350 tons/hr)	0.0018 gr/dscf (filterable PM/PM_{10})	Positive Pressure Baghouse
Roanoke Electric Steel Company, VA (70 tons/hr)	0.0034 gr/dscf (filterable PM/PM_{10})	Negative Pressure Baghouse
Mac Steel, AK (86 tons/hr)	0.0018 gr/dscf (filterable PM/PM_{10})	Positive Pressure Baghouse
Steel Dynamics, Inc., DeKalb Co., IN (400 tons/hr)	0.0032 gr/dscf (filterable PM/PM_{10})	Negative Pressure Baghouse
Qualitech Steel, IN (135 tons/hr)	0.0032 gr/dscf (filterable PM/PM_{10})	Negative Pressure Baghouse
NUCOR Steel, IN (260 tons/hr)	0.0018 gr/dscf (filterable PM/PM_{10})	Positive Pressure Baghouse
Beta Steel, IN (132 tons/hr)	0.0052 gr/dscf (filterable PM/PM_{10})	Negative Pressure Baghouse

With respect to baghouse technology, there are two types of design configurations including 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 LMS 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 LMS, through the fabric filters, then push the air up through a central stack.

Review of the RBLC indicates that 0.0032 grains per dry standard cubic feet is considered BACT for negative pressure baghouses compared to 0.0018 grains per dry standard cubic feet for positive pressure baghouses. Although there is this distinction, baghouse and bag manufacturer's claim that there is no difference in filtering capability between these types of baghouses. This claim is supported by the following available stack test information for negative pressure baghouses:

Facility	PM/PM10 Limit	Compliance Information
IPSCO Steel, IA Issued on 8/14/96	0.0025 gr/dscf @ 164 tph steel; 0.0033 gr/dscf @ 200 tph steel; 0.0033 gr/dscf @ 230 tph steel (limits represent filt+condens PM/PM10 and are for Meltshop operations) (Permit requires tes by Method 5 and 201A with 202)	11/17-19/98 Test: PM (filt): 0.0008 gr/dscf PM10 (condens): 0.0037 gr/dscf @ 62.5 tph steel. State plans to adjust total (filt+condens) PM/PM10 limit up to 0.0045 gr/dscf.
Nucor Steel-Huger, SC Issued on 8/16/95	0.0035 gr/dscf - (filterable PM/PM10) from Meltshop operations) (Permit requires testing by Method 5)	8/5-7/97 Test: PM (filt): 0.00107 gr/dscf @ 202 tph steel rate
Trico Steel, AL	0.0032 gr/dscf (filterable PM/PM10)	9/21/98 Test: PM (filt): 0.0015 gr/dscf, 16 lb/hr (Method 5)
Tuscaloosa Steel, AL 12/15/94	0.0035 gr/dscf, 32.5 lb/hr - Use Method 5 Test (filterable PM/PM10) from Meltshop operations (Permit requires Method 5)	No Test Data Available for PM
Roanoke Electric Steel, VA 11/6/98	0.0034 gr/dscf TSP (filterable), 9.8 lb/hr PM, 43.1 tpy PM, 7.5 lb/hr PM10, 32.8 tpy PM10 for EAF Only 0.0052 gr/dscf TSP (filterable), 2.8 lb/hr PM, 12.2 tpy PM, 2,8 lb/hr PM10, 12.2 tpy PM10 for LMS Only (Permit requires test, but no method given)	4/30-5/2/97 Test: PM (fiilt) from EAF: 0.001 gr/dscf PM (filt) from LMS: 0.0007 gr/dscf
Steel Dynamics-Butler, IN Issued on 6/25/97 (Mod for 2nd EAF)	0.0032 gr/dscf, 35.7 lb/hr (filterable PM/PM10) from Meltshop operations	11/17-20/98 Test: PM (filt): 0.00106 gr/dscf PM10 (filt+condens): 0.00299 gr/dscf @ 319 tph steel production 2/2/99 Test: PM (filt): 0.00034 gr/dscf PM10 (filt+condens): 0.00186 gr/dscf @ 329 tph steel production
Qualitech Steel, IN Issued on 10/31/96	0.0032 gr/dscf, 17.36 lb/hr (filterable PM/PM10) for Meltshop operations	9/8/99 Test: 1/15/99 Test: PM (filt): 1.52 lb/hr, 0.0004 gr/dscf @ 97 tph steel rate (Method 5 Used)
Beta Steel, IN Issued on 2/24/92	0.0052 gr/dscf, 58.8 lb/hr, 257 tpy (filterable PM/PM10) for Meltshop operations	1/19-27/98 Test: PM (filt): 0.000187 gr/dscf PM10 (condens): 0.00032 gr/dscf

		@ 151 tpy steel production rate 1/31-2/2/99 Test: PM (filt): 0.0003 gr/dscf PM10 (condens): 0.0045 gr/dscf @ 92 tph steel production rate

Although none of the facilities listed in the table above were limited to 0.0018 gr/dscf for filterable PM/PM_{10}, all of the available stack test data demonstrates compliance with this limitation for filterable PM/PM_{10}. The stack test data also demonstrates compliance with Nucor Steel's total PM/PM_{10} limit of 0.0052 gr/dscf, including both the filterable and condensible fractions.

Because it is well documented that a negative pressure baghouse can achieve the most stringent BACT limit of 0.0018 grains per dry standard cubic foot for filterable PM/PM_{10} , this emissions limit shall apply to the baghouse for the LMS-2 and CC at Nucor Steel.

Step 5 – Select BACT
BACT for filterable PM/PM_{10} shall be utilization of "good combustion practices" and use of a baghouse with a limit of 0.0018 grains per dry standard cubic feet at a maximum volumetric air flow rate of 200,000 dry standard cubic feet per minute. BACT for filterable and condensible PM/PM_{10} shall be utilization of "good combustion practices" and use of a baghouse with a limit of 0.0052 grains per dry standard cubic feet at a maximum volumetric air flow rate of 200,000 dry standard cubic feet per minute. Visible emissions shall not exceed 3 percent opacity when emitted from any baghouse, roof monitor or building opening. Refer to subsection (D)(3) for a combined PM/PM_{10} limit.

(2) Combustion Units - PM/PM_{10} BACT for Combustion Sources LD-1, TP-1, TP-2, TPP-1, TPP-2, TNP-1 and TNP-2

The strip caster line (Castrip) utilizes the following combustion units under this PSD application, with clarifications to be made on the heat input ratings:

- One (1) natural gas-fired ladle dryer (LD-1) (12 MMBtu/hr)
- Two (2) natural gas-fired Tundish preheaters (TP-1 and TP-2) (10 MMBtu/hr each)
- Two (2) natural gas-fired transition piece preheaters (TPP-1, TPP-2) (2 MMBtu/hr each)
- Two (2) natural gas-fired tundish nozzle preheaters identified as TNP-1 and TNP-2

These emission units are exhausted through the existing LMS-2 Baghouse, which exhausts through Stack S-20.

All emissions from these natural gas-fired combustion sources are products of combustion. Propane, a similar fuel to natural gas, shall be utilized as a backup fuel for these combustion sources.

Step 1 – Identify Control Options
Add-on controls are considered impractical due to the small amount of PM/PM_{10} that will be emitted, small size of the burners, and lack of exhaust gas capture systems. IDEM, OAQ, is not aware of any steel mills using any add-on control technology to control

combustion-related emissions from these small combustion sources. There were no add-on controls or integral control systems investigated.

Step 2 – Eliminate Technically Infeasible Control Options
These burners do not have sealed combustion chambers to allow the recirculation of gases and it is designed to rely on ambient air for facilitate the combustion process. There are no technically infeasible controls for PM/PM_{10} to discuss.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness
There are no technically feasible control technologies for PM/PM_{10} to discuss.

Step 4 – Evaluate the Most Effective Controls and Document Results
There are no technically feasible control technologies for PM/PM_{10} to evaluate.

Step 5 – Select BACT
BACT for the LD-1, TP-1, TP-2, TPP-1, TPP-2, TNP-1 and TNP-2 shall be proper operation.

Refer to subsection (D)(3) for a combined PM/PM_{10} limit.

(3) Combined Limit - PM/PM_{10} BACT

Nucor Steel wants to retain the existing PM/PM_{10} limitation for the total Castrip LMS-2 Baghouse as it was determined from the previous BACT.

In order for the limitation to be readily enforceable, the above BACT limits are considered together to obtain the total BACT limitation for the Stack S-20:

BACT from the total Castrip LMS-2 Baghouse Stack S-20 for filterable PM/PM_{10} shall be proper operation and use of a baghouse and shall not exceed a limit of 0.0018 grains per dry standard cubic feet at a maximum volumetric air flow rate of 200,000 dry standard cubic feet per minute. BACT for filterable and condensible PM/PM_{10} shall be proper operation and use of a baghouse with a limit of 0.0052 grains per dry standard cubic feet at a maximum volumetric air flow rate of 200,000 dry standard cubic feet per minute. Visible emissions shall not exceed 3 percent opacity when emitted from any baghouse, roof monitor or building opening.

Appendix B.2
Best Available Control Technology (BACT) Determination
For Miscellaneous Combustion Emission Units

Introduction

Nucor Steel has a roof monitor identified as Stack S-21 which is associated with general ventilation of several emission units in the steel the production plant where the production is increased to 270 tons of steel/hour. The small percentage of fugitive emissions released from the Castrip Line may also pass out the roof monitor exhaust. This modification includes:

- One (1) natural gas-fired Tundish dryer (TD-1) (4 MMBtu/hr)
- One (1) natural gas-fired Tundish dryer (TD-2) (3 MMBtu/hr)
- One (1) natural gas-fired Tundish dryer (TD-3) (1 MMBtu/hr
- Two (2) natural gas-fired transition piece dryers (0.15 MMBtu/hr)

These units will be undergoing PSD BACT review for PM_{10}, SO_2, NO_x, and CO.

Step 1 – Identify Control Options

Add-on controls are considered impractical due to the small amount of PM_{10}, SO_2, CO, and NO_x that will be emitted, small size of the burner, and lack of exhaust gas capture systems. IDEM, OAQ, is not aware of any steel mills using any add-on control technology to control combustion-related emissions from small combustion units. The following integral control systems were investigated:

Low NOx Burners
Ultra Low NOx Burners

Step 2 – Eliminate Technically Infeasible Control Options

The possibility of using ultra low-NO_x burners as combustion controls was investigated. The concept behind ultra low-NO_x burners is to use sealed combustion chambers such as boilers and furnaces where baffle design controls air staging. Also of importance is to control NO_x through the recirculation of gases, which allows heat to dissipate slower thereby reducing NO_x formation. Reconfiguring the equipment for this type of controls was infeasible therefore the control technology is infeasible for these operations.

Due to the relatively small PM_{10}, SO_2 and CO emissions from the small combustion units, there are no additional controls that can be considered feasible to control these pollutants. Emissions are due to combustion. Evaluation of the information taken from the RBLC showed that no other control technologies have been used to reduce PM_{10}, SO_2 and CO emissions from small combustion units.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

The use of low NOx burners is the only technically feasible control option of emissions from the small combustion units.

Step 4 – Evaluate the Most Effective Controls and Document Results

Low NOx burners have been required for these types of small combustion units. The achievable emission rate of the low NOx burners varies depending on the type of operation. Information from vendors indicates that an emission rate of 0.1 is achievable for this particular type of operation.

No information was listed in the RBLC for small combustion units.

The most effective control technology is the use of low NOx burners. Based on the information presented above, the BACT standards and mass emission limitations for the small combustion units are:

(1) The use of low NOx burners.

(2) The mass NOx emissions limit is 0.1 pounds of NOx per MMBtu of heat input capacity.

The natural gas combustion calculations were used to establish limits for SO_2, NOx, CO and PM/PM10 from TD-1, TD-2, TD-3 and each transition piece dryer.

Step 5 – Select BACT

BACT for SO_2 from TD-1, TD-2, TD-3 and each transition piece dryer shall be utilization of "good combustion practices" and shall not exceed a SO_2 emission rate of 0.0006 pounds per MMBtu.

BACT for NOx from TD-1, TD-2, TD-3 and each transition piece dryer shall be utilization of "good combustion practices", the use of low NOx burners, and NOx emission rate shall not exceed an emission rate of 0.10 pounds per MMBtu.

BACT for CO from TD-1, TD-2, TD-3 and each transition piece dryer shall be utilization of "good combustion practices" and shall not exceed a CO emission rate of 0.084 pounds per MMBtu.

BACT for PM/PM10 (filterable plus condensable) from TD-1, TD-2, and TD-3 shall be proper operation and shall not exceed a PM/PM10 (filterable plus condensable) emission rate of 0.0076 pounds per MMBtu.

BACT for PM/PM10 (filterable plus condensable) from each transition piece dryer shall be proper operation and shall not exceed a PM/PM10 (filterable plus condensable) emission rate of 0.0056 pounds per MMBtu.

Appendix B.3
Best Available Control Technology (BACT) Determination
For the Vacuum Degasser

Introduction

Nucor Steel has a vacuum degasser with a maximum capacity of 135 tons of steel/hour. This vacuum degasser will be used to remove entrained gases from the steel. Desulfurization also occurs during the degassing process. The maximum capacity of the vacuum degasser is the same as the LMS-2 while the Caster in the Castrip Line has a capacity of 135 tons of steel per hour.

The vacuum degasser will be undergoing PSD BACT review for PM_{10}, SO_2, NO_x, and CO.

Step 1 – Identify Control Options

To control pollutant emissions form the vacuum degasser, Nucor Steel reviewed the following four control technologies:

1. Carbon Adsorption;
2. Wet Scrubbers;
3. Thermal Oxidation; and
4. Flare

Step 2 – Eliminate Technically Infeasible Control Options

(A) CO PSD BACT Review for Vacuum Degasser

After reviewing the above technologies, Nucor Steel eliminated several control technologies as not technically feasible for this type of operation. The reasons for eliminating these technologies are as follows:

Carbon Adsorption: Carbon adsorption is not effective for controlling CO emissions. Therefore, carbon adsorption is not typically used for controlling the CO emissions from the vacuum degasser.

Wet Scrubbers: Wet scrubbers are not effective for controlling CO emissions.

Thermal Oxidizers: Thermal oxidation is intended for continuous emission units; however, Nucor Steel states this process is too sporadic in order to use thermal oxidation as an effective control method. Therefore, the thermal oxidizer is considered a technically infeasible option for vacuum degassing for CO emissions.

(B) PM_{10}, SO_2 and NOx PSD BACT Review for Vacuum Degasser

Due to the relatively small PM_{10}, SO_2 and NO_x emissions from the vacuum degasser, there are no add-controls that can be considered feasible to control these pollutants.

Emissions are due to degassing of the liquid steel and due to combustion. Evaluation of the information taken from the RBLC showed that no controls have been used to reduce PM_{10}, SO_2 and NO_x emissions from vacuum degassers in steel mills.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

A flare is the only technically feasible control option of CO emissions from the vacuum degasser. Nucor Steel reviewed industry data to determine the control efficiency of the remaining control technology. The results of this review are summarized in the following table.

Control Technology	CO Control Efficiency (%)
Flare	95

The table below summarizes the existing BACT limits for vacuum degasser. Some information was listed in the RBLC, and some was taken from existing PSD permits issued by IDEM. The search of the RBLC was based on the Process Code 81.007 (Vacuum Degasser). Sources are listed in alphabetical order.

Step 4 – Evaluate the Most Effective Controls and Document Results

(A) CO PSD BACT Review for Vacuum Degasser

Carbon Monoxide (CO) is the main pollutant exhausting from the vacuum degasser.

CO PTE before control = 888 tons/year

Nucor Steel controls CO emissions from the vacuum degasser by using a flare. The flare has a maximum capacity of 12 MMBTU/hour, uses natural gas as fuel and operates within the temperature range of 1,400 to 1,600 ^{0}F. CO emissions are estimated to be reduced by approximately 95%.

CO PTE after control = 44 tons/year

Sources not considered for the BACT Determinations
Based on the preliminary evaluations as indicated in the table below, the following sources were eliminated for BACT considerations:

- - Birmingham Steel, AL
- - Charter Steel, WI
- - CSC Limited, OH
- - North Star Steel, MI
- - Nucor Steel, NE
- - Nucor-Yamato, AR
- - Oregon Steel, OR
- - Pennsylvania Steel Technologies, PA
- - Republic Technologies, OH
- - SDI, Whitley, IN and
- - Stafford Railsteel Corp, AR

PSD BACT Limits - - Vacuum Degasser		
Company Name	CO (control device)	Additional Information
Birmingham Steel, AL	- -	Permits do not specify limits for the degasser. This will not be considered for BACT evaluation.
CF&I Steel, CO (dba Rocky Mountain Steel)	2.57 tons/year (flare)	The degassing operations were limited to 600,000 tons of steel year to process. The supporting document indicated the CO emission factor to be 0.00875 lbs/ton of steel. No stack testing was required to verify this limit.
Charter Steel, WI	- -	The degasser is electric powered. The degasser exhausts to the Meltshop baghouse. No specific limits for the degasser. This will not be considered for BACT evaluation.
CSC Limited, OH	4lbs/hour (flare)	The degasser is no longer operating. This will not be considered for BACT evaluation.
North Star Steel, MI	- -	The degasser is part of the ladle refining station. No limits specified for the degasser. This will not be considered for BACT evaluation.
Nucor Steel, IN	- -	The degasser in the Meltshop area is no longer operating. This will not be considered for BACT evaluation.
	0.075 lbs/ton (flare) (existing)	A vacuum degasser in the Castrip area. This vacuum degasser is used to remove entrained gases from the steel. Testing has not occurred.
	0.075 lbs/ton (flare) (proposed)	A vacuum degasser in the Castrip area. This vacuum degasser is used to remove entrained gases from the steel.
Nucor Steel, NE	- -	Permits do not specify limits for the degasser. This will not be considered for BACT evaluation.
Nucor-Yamato, AR	0.005 lbs/ton (flare)	The vacuum degasser has a maximum capacity of 225 tons of steel per hour. However, the degasser was never built. This will not be considered for BACT evaluation.
Oregon Steel, OR	- -	No specific limit for the degasser. The plant has a plant wide allowable limit. This will not be considered for BACT evaluation.
Pennsylvania Steel Technologies, PA	- -	Permits do not specify limits for the degasser. This will not be considered for BACT evaluation.
Republic Technologies, OH	- -	The degasser exhausts into the Meltshop baghouse, no specific limits for the degasser only. This will not be considered for BACT evaluation.
SDI, Hendricks, IN (formerly Qualitech)	- - (flare)	No limits were specified for the degasser. The permit specified that the flare shall operate at all time when the vacuum degasser is in operation. Limits were specified for the boiler associated with the degasser.
SDI, Whitley, IN	- -	No limits were specified for the degasser itself, because the gases from the tank drawn off the tank will be vented to the boiler to be combusted. Limits were specified with the boiler associated with the degasser. This is different configuration with the proposed modification. This will not be considered for BACT evaluation.
Stafford Railsteel Corp, AR	4.3 tons/year 0.99 lbs/hour (flare)	The Meltshop operations have a maximum capacity of 125 tons of steel per hour. This plant was never built. This will not be considered for BACT evaluation.

Based on the evaluation of the available information, there are no consistent PSD BACT limits for vacuum degassers due to different arrangement of the degasser and its associated operations in steel mills. However, there are few sources that used flare as control device to reduce CO emissions.

Eliminating the sources not considered in the BACT determinations, the table below summarizes the sources considered for evaluations (sources are arranged in terms of CO BACT limits (lbs/ton) in ascending order):

CO BACT Comparison				
Company Name	Vacuum Degasser Capacity (tons/hour)	Control	BACT Limits	
			(lbs/ton)	--
CF&I Steel, CO	600,000 tons/year	Flare	0.00875	2.57 tons/year
Nucor Steel, IN (existing)	135	Flare	0.075	10.125 lbs/hour
SDI, Hendricks, IN	125	Flare	- -	- -

CF&I Steel, CO uses their degasser to remove hydrogen from the steel and not carbon monoxide (CO), while Nucor Steel, IN will decarbonize the steel. Removal of carbon from steel contributes to the significant potential emissions of CO. Due to the difference in operations, the CO BACT limit (0.00875 lbs/ton) will not be considered as BACT for this evaluation. In addition, CF&I, CO was not required to perform testing to verify compliance with the lbs/ton emission rate.

The most effective control technology is the use of a flare. Based on the information presented above, the CO BACT standards and mass emission limitations for the vacuum degasser are:

(1) The use of flare to control the CO emissions.

(2) The mass CO emissions limit is 0.075 pounds of CO per ton of steel processed at the VTD.

CO = (0.075 lbs/ton)*(270 tons/hour) = 20.25 lbs/hour.

(B) PM_{10}, SO_2 and NOx PSD BACT Determination for Vacuum Degasser

There are no effective control technologies to control these pollutants from the vacuum degasser.

<u>Step 5 – Select BACT</u>

(A) CO PSD BACT Determination for Vacuum Degasser

BACT for CO from the vacuum degasser shall be utilization of “good combustion practices” and shall not exceed 0.075 pounds per ton of steel processed at the VTD, and 20.25 pounds per hour, based on a 3 hour block average.

(B) PM_{10}, SO_2 and NOx PSD BACT Determination for Vacuum Degasser

The BACT mass limits for the vacuum degasser were determined as shown in the following table:

Vacuum Degasser (270 tons steel/hour)		
Pollutant	BACT limits (lbs/ton)	BACT limits (lbs/hour)
SO_2	0.022	5.4
NO_x	0.0055	1.35
PM/PM_{10}	0.008 grain/dscf	0.45

Appendix B.4
Best Available Control Technology (BACT) Determination
For the Ladle Preheaters

Introduction

Nucor Steel has several ladle preheaters (LP-1, LP-2, LP-3 and LP-4) with a maximum capacity of 270 tons of steel/hour. The maximum capacity of the ladle preheaters is the same as the LMS-2 and Caster in the Castrip Line. This modification includes:

- Two (2) natural gas-fired ladle preheaters (LP-1 and LP-2) (12 MMBtu/hr, each)
- One (1) natural gas-fired ladle preheater (LP-4) (12 MMBtu/hr)

The following emission unit was added under this PSD application to the strip caster line (Castrip) operations:

- One (1) natural gas-fired ladle preheater (LP-3) (12 MMBtu/hr)

These emission units are exhausted through the existing Roof Monitor, Stack S-21.

All emissions from these natural gas-fired combustion sources are products of combustion. Propane, a similar fuel to natural gas, shall be utilized as a backup fuel for these combustion sources.

The ladle preheaters will be undergoing PSD BACT review for PM_{10}, SO_2, NO_x, and CO.

(A) Oxides of Nitrogen (NOx)

(1) NO_x BACT for Combustion Units LP-1, LP-2, LP-3, and LP-4

There are three (3) existing ladle preheaters (LP-1, LP-2 and LP-4). One (1) additional natural gas-fired ladle preheater, LP-3, with a maximum heat input rate of 12 MMBtu/hr, will be used to preheat ladles to prevent rapid cooling and solidification of molten steel during tapping operations. All emissions generated from this natural gas-fired combustion source are products of combustion. Propane, a similar fuel to natural gas, shall be utilized as a backup fuel for these combustion sources. The emissions are currently vented to a baghouse; however, the control device does not reduce the emissions of NO_x.

Step 1 – Identify Control Options
Add-on controls are considered impractical due to the small amount of NO_x that will be emitted, small size of the burner, and lack of exhaust gas capture systems. IDEM, OAQ, is not aware of any steel mills using any add-on control technology to control combustion-related emissions from small combustion sources. The following integral control systems were investigated:

Low NOx Burners
Ultra Low NOx Burners

Step 2 – Eliminate Technically Infeasible Control Options

Ultra Low NOx Burners
The possibility of using ultra low-NO_x burners as combustion controls was investigated. The concept behind ultra low-NO_x burners is to use sealed combustion chambers such as boilers and furnaces where baffle design controls air staging. Also of importance is to control NO_x through the recirculation of gases, which allows heat to dissipate slower thereby reducing NO_x formation. Reconfiguring the equipment for this type of controls was infeasible therefore the control technology is infeasible for these operations.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness
The use of low NOx burners is the only remaining technically feasible control option for NOx emissions from the small combustion units.

Step 4 – Evaluate the Most Effective Controls and Document Results
The table below summarizes the PSD BACT of Recently Issued PSD permits for similar ladle preheaters:

PSD BACT Limits - - Ladle Preheater			
Company Name	Permit Issuance Date	Rating (MMBTU/hour)	NO_x
SDI Hendricks	August 2003	7.5	0.050
Nucor Steel	2005 (proposed)	12	0.050
	2003	12	0.050
	January 2001	15	0.10
SDI Whitley	July 1999	10	0.10

Previous BACT standards and mass emissions limitations for the Ladle Preheater are:

(1) The use of pipeline natural gas as primary fuel and propane as back up fuel.

(2) The Ladle Preheater equipped with low-NO_x burners.

(3) The observation of good combustion practices.

(4) The nitrogen oxides (NO_x) emissions from the ladle preheater shall not exceed 0.10 pounds per MMBTU.

Compliance with the BACT mass limits is verified by vendor certification and guarantee.

Step 5 – Select BACT
BACT for the ladle preheaters shall be as follows:

(1) The use of “pipeline quality” natural gas as primary fuel and propane as back up fuel.

(2) The Ladle Preheater equipped with low-NO_x burners.

(3) The utilization of good combustion practices.

(4) The nitrogen oxides (NO_x) emissions from the ladle preheater shall not exceed 0.05 pounds per MMBTU.

(B) Sulfur Dioxides (SO_2)

(1) SO_2 BACT for Combustion Units LP-1, LP-2, LP-3, and LP-4

There are three (3) existing ladle preheaters (LP-1, LP-2, and LP-4). One (1) additional natural gas-fired ladle preheater, LP-3, with a maximum heat input rate of 12 MMBtu/hr, will be used to preheat ladles to prevent rapid cooling and solidification of molten steel during tapping operations. All emissions generated from this natural gas-fired combustion source are products of combustion. Propane, a similar fuel to natural gas, shall be utilized as a backup fuel for these combustion sources. The emissions are currently vented to a baghouse; however, the control device does not reduce the emissions of SO_2, CO, and NO_x .

Step 1 – Identify Control Options
Add-on controls are considered impractical due to the small amount of SO_2 that will be emitted, small size of the burners, and lack of exhaust gas capture systems. IDEM, OAQ, is not aware of any steel mills using any add-on control technology to control combustion-related emissions from these small combustion sources. There were no add-on controls or integral control systems investigated.

Step 2 – Eliminate Technically Infeasible Control Options
These burners do not have sealed combustion chambers to allow the recirculation of gases and it is designed to rely on ambient air for facilitate the combustion process. There are no technically infeasible controls for SO_2 to discuss.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness
There are no technically feasible control technologies for SO_2 to discuss.

Step 4 – Evaluate the Most Effective Controls and Document Results
The table below summarizes the PSD BACT of Recently Issued PSD permits for similar ladle preheaters:

PSD BACT Limits - - Ladle Preheater			
Company Name	Permit Issuance Date	Rating (MMBTU/hour)	SO_2
SDI Hendricks	August 2003	7.5	0.0006
Nucor Steel	2005 (proposed)	12	0.0006
	2003	12	0.0006
	January 2001	15	- -
SDI Whitley	July 1999	10	- -

Previous BACT standards and mass emissions limitations for the Ladle Preheater are:

(1) The use of pipeline natural gas as primary fuel and propane as back up fuel.

(2) The observation of good combustion practices.

(3) The sulfur dioxide (SO_2) emissions from the ladle preheater shall not exceed 0.0006 pounds per MMBTU.

Compliance with the BACT mass limits is verified by vendor certification and guarantee.

Step 5 – Select BACT
BACT for the ladle preheaters shall be as follows:

(1) The use of "pipeline quality" natural gas as primary fuel and propane as back up fuel.

(2) The utilization of good combustion practices.

(3) The sulfur dioxide (SO_2) emissions from the ladle preheaters shall not exceed 0.0006 pounds per MMBTU.

(C) Carbon Monoxide (CO)

(1) CO BACT for Combustion Units LP-1, LP-2, LP-3, and LP-4

There are three (3) existing ladle preheaters (LP-1, LP-2, and LP-4). One (1) additional natural gas-fired ladle preheater, LP-3, with a maximum heat input rate of 12 MMBtu/hr, will be used to preheat ladles to prevent rapid cooling and solidification of molten steel during tapping operations. All emissions generated from this natural gas-fired combustion source are products of combustion. Propane, a similar fuel to natural gas, shall be utilized as a backup fuel for these combustion sources. The emissions are currently vented to a baghouse; however, the control device does not reduce the emissions of CO.

Step 1 – Identify Control Options
Add-on controls are considered impractical due to the small amount of CO that will be emitted, small size of the burners, and lack of exhaust gas capture systems. IDEM, OAQ, is not aware of any steel mills using any add-on control technology to control combustion-related emissions from these small combustion sources. There were no add-on controls or integral control systems investigated.

Step 2 – Eliminate Technically Infeasible Control Options
These burners do not have sealed combustion chambers to allow the recirculation of gases and it is designed to rely on ambient air for facilitate the combustion process. There are no technically infeasible controls for CO to discuss.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness
There are no technically feasible control technologies for CO to discuss.

Step 4 – Evaluate the Most Effective Controls and Document Results
The table below summarizes the PSD BACT of Recently Issued PSD permits for similar ladle preheaters:

PSD BACT Limits - - Ladle Preheater			
Company Name	Permit Issuance Date	Rating (MMBTU/hour)	CO
SDI Hendricks	August 2003	7.5	0.084
Nucor Steel	2005 (proposed)	12	0.084
	2003	12	0.084
	January 2001	15	- -
SDI Whitley	July 1999	10	- -

Previous BACT standards and mass emissions limitations for the Ladle Preheater are:

(1) The use of pipeline natural gas as primary fuel and propane as back up fuel.

(2) The observation of good combustion practices.

(3) The carbon monoxide (CO) emissions from the ladle preheater shall not exceed 0.084 pounds per MMBTU.

Compliance with the BACT mass limits is verified by vendor certification and guarantee.

Step 5 – Select BACT
BACT for the ladle preheaters shall be as follows:

(1) The use of "pipeline quality" natural gas as primary fuel and propane as back up fuel.

(2) The utilization of good combustion practices.

(3) The carbon monoxide (CO) emissions from the ladle preheaters shall not exceed 0.084 pounds per MMBTU.

(D) Particulate Matter (PM/PM_{10})

(1) PM/PM_{10} BACT for Combustion Units LP-1, LP-2, LP-3, and LP-4

There are three (3) existing ladle preheaters (LP-1, LP-2 and LP-4). One (1) additional natural gas-fired ladle preheater, LP-3, with a maximum heat input rate of 12 MMBtu/hr, will be used to preheat ladles to prevent rapid cooling and solidification of molten steel during tapping operations. All emissions generated from this natural gas-fired combustion source are products of combustion. Propane, a similar fuel to natural gas, shall be utilized as a backup fuel for these combustion sources. The emissions are currently vented to a baghouse; however, the control device does not reduce the emissions of PM/PM_{10}.

Step 1 – Identify Control Options

Add-on controls are considered impractical due to the small amount of PM/PM_{10} that will be emitted, small size of the burners, and lack of exhaust gas capture systems. IDEM, OAQ, is not aware of any steel mills using any add-on control technology to control combustion-related emissions from these small combustion sources. There were no add-on controls or integral control systems investigated.

Step 2 – Eliminate Technically Infeasible Control Options
These burners do not have sealed combustion chambers to allow the recirculation of gases and it is designed to rely on ambient air for facilitate the combustion process. There are no technically infeasible controls for PM/PM_{10} to discuss.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness
There are no technically feasible control technologies for PM/PM_{10} to discuss.

Step 4 – Evaluate the Most Effective Controls and Document Results
The table below summarizes the PSD BACT of Recently Issued PSD permits for similar ladle preheaters:

PSD BACT Limits - - Ladle Preheater				
Company Name	Permit Issuance Date	Rating (MMBTU/hour)	PM/PM_{10} (filterable)	PM/PM_{10} (filterable + condesible)
SDI Hendricks	August 2003	7.5	0.0018	0.0076
Nucor Steel	2005 (proposed)	12	0.0018	0.0076
	2003	12	0.0018	0.0076
	January 2001	15	- -	- -
SDI Whitley	July 1999	10	- -	- -

Previous BACT standards and mass emissions limitations for the Ladle Preheater are:

(1) The use of pipeline natural gas as primary fuel and propane as back up fuel.

(2) The observation of good combustion practices.

(3) The PM/PM_{10} (filterable) emissions from the ladle preheaters shall not exceed 0.0018 pounds per MMBTU.

(4) The PM/PM_{10} (filterable and condensable) emissions from the ladle preheaters shall not exceed 0.0076 pounds per MMBTU.

Compliance with the BACT mass limits is verified by vendor certification and guarantee.

Step 5 – Select BACT
BACT for the new ladle preheaters shall be as follows:

(1) The use of “pipeline quality” natural gas as primary fuel and propane as back up fuel.

(2) The proper operation of equipment.

(3) The PM/PM_{10} (filterable) emissions from the ladle preheaters shall not exceed 0.0018 pounds per MMBTU.

(4) The PM/PM_{10} (filterable and condensable) emissions from the ladle preheaters shall not exceed 0.0076 pounds per MMBTU.

Nucor Steel Air Quality Analysis

NAAQS and PSD Increment Addendum Appendix C

On July 26, 2005, ERM submitted appended modeling data for SO_2 at the Nucor facility. The permit limit from the original modeling data submitted on June 16, 2005 was based on the current permit limit of 0.185 lb/ton SO_2 rather than the proposed limit of 0.21 lb/ton. The model was run with the new data and the results are listed below.

NAAQS Compliance Analysis and Results

NAAQs modeling for the appropriate time-averaging periods for SO_2 was conducted and compared to the respective NAAQs limit. OAQ modeling results are shown in Table 1. All maximum-modeled concentrations were conducted and compared to the respective NAAQS limit. All maximum-modeled concentrations during the five years were below the NAAQS limits and further modeling was not required.

TABLE 1
NAAQS Analysis

Pollutant	Year	Time-Averaging Period	Maximum Concentration ug/m3	Background Concentration ug/m3	Total ug/m3	NAAQS Limit ug/m3	NAAQS Violation
SO_2	1994	3 Hour (H2H)	213.8	206.1	419.9	1300	No
SO_2	1990	24 hour (H2H)	69.27	63.8	133.1	365	No
SO_2	1991	Annual	8.78	13.1	21.9	80	No

Analysis and Results of Source Impact on the PSD Increment

Applicability

Maximum allowable increases (PSD increments) are established by 326 IAC 2-2 for SO_2. This rule also limits a source to no more than 80 percent of the available PSD increment to allow for future growth.

Source Impact

Since the impacts for SO_2 from Nucor modeled above significant impact levels, a PSD increment analysis for the existing major sources in Montgomery County and its surrounding counties was required. Results of the increment modeling are summarized in Table 2 below.

TABLE 2
Increment Analysis

Pollutant	Year	Time-Averaging Period	Maximum Concentration ug/m3	PSD Increment Ug/m3	Percent Impact on the PSD Increment	Increment Violation
SO_2	1994	3 Hour (H2H)	200.2	512	39.1%	No
SO_2	1990	24 Hour (H2H)	69.0	91	75.8%	No
SO_2	1991	Annual	8.2	20	41.2%	No

The results of the increment analysis shows all pollutants for all averaging periods were below 80% of the available increment.

Appendix C
Nucor Steel Air Quality Analysis

Tracking and Plant ID 107-21359-00038

Proposed Project

Nucor Steel proposes a modification to the castrip facility in Montgomery County. The modification will consist of increasing the production at the ladle metallurgy station and the vacuum tank degasser.

Environmental Resources Management (ERM) of Vernon Hills, Illinois prepared the permit application for Nucor Steel. The Modeling Section in the Office of Air Quality (QAQ) received the permit application on June 16, 2005. This technical support document provides the air quality analysis review of the permit application.

Analysis Summary

Based on the potential emissions after controls, a PSD air quality analysis was triggered for SO_2, NO_x, and CO. The significant impact analysis determined that modeling concentrations for SO_2 and NO_x did exceed significant impact levels. A refined analysis was required for SO_2 and NO_x and showed no violation of the NAAQS and the PSD increment. The pre-and post-construction monitoring requirements are not necessary. An additional impact analysis was conducted and showed no significant impact. Based on the modeling results, the source will not have a significant impact upon federal air quality standards.

Air Quality Impact Objectives

The purpose of the air quality impact analysis in the permit application is to accomplish the following objectives. Each objective is individually addressed in this document in each section outlined below.

A. Establish which pollutants require an air quality analysis based on PSD significant emission rates.

B. Provide analyses of actual stack heights with respect to Good Engineering Practice (GEP), the meteorological data used, a description of the model used in the analysis, and the receptor grid utilized for the analyses.

C. Determine the significant impact level, the area impacted by the source's emissions and background air quality levels.

D. Demonstrate that the source will not cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) or PSD increments if the applicant exceeds significant impact levels.

E. Perform an analysis of any air toxic compound with a health risk factor on the general population.

F. Perform a 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. The nearest Class I area is Kentucky's Mammoth Cave National Park.

G. Summarize the Air Quality Analysis

Section A - Pollutants Analyzed for Air Quality Impact

Applicability

The PSD requirements, 326 IAC 2-2, apply in attainment and unclassifiable areas and require an air quality impact analysis of each regulated pollutant emitted in significant amounts by a major stationary source or modification. Significant emission levels for each pollutant are defined in 326 IAC 2-2-1 and in the Code of Federal Register (CFR) 52.21(b)(23)(i).

Proposed Project Emissions

Sulfur Dioxide (SO_2), Nitrogen Dioxide (NO_2), Volatile Organic Compounds (VOC) (an Ozone (O_3) precursor), and Carbon Monoxide (CO) are the pollutants that will be emitted from the proposed modification project. Therefore, an air quality analysis is required for these pollutants which exceeded their significant emission rates, except as noted, as shown in Table 1:

TABLE 1
Significant Emission Rates for PSD

POLLUTANT	SOURCE EMISSION RATE (Modification Totals)	SIGNIFICANT EMISSION RATE	PRELIMINARY AQ ANALYSIS REQUIRED
	(tons/year)	(tons/year)	
NO_2	77.0	40.0	Yes
VOCs (O_3) [1]	6.8	40.0	No
CO	110.6	100.0	Yes
SO_2	107.2	40.0	Yes

[1] An air quality analysis is not performed for VOCs because it is a photochemically reactive pollutant and did not exceed an emission threshold of 250 tons per year. A cursory review is performed when the threshold is exceeded but does not involve modeling.

Modeled emission rates came from Table 2-1of the permit application.

Section B – Good Engineering Practice (GEP), Met Data, Model Used, Receptor Grid

Stack Height Compliance with Good Engineering Practice (GEP)

Applicability

Stacks should comply with GEP requirements established in 326 IAC 1-7-1. If stacks are lower than GEP, excessive ambient concentrations due to aerodynamic downwash may occur. Stacks taller than 65 meters (213 feet) are limited to GEP, the stack height for establishing emission limitations. The GEP stack height takes into account the distance and dimensions of nearby structures, which would affect the downwind wake of the stack. The downwind wake is considered to extend five times the lesser of the structure's height or width. A GEP stack height is determined for each nearby structure by the following formula:

$Hg = H + 1.5L$

Where: Hg is the GEP stack height
H is the structure height
L is the structure's lesser dimension (height or width)

Proposed Project Stack

Since the stack height of the modification was below GEP stack height, the effect of aerodynamic downwash will be accounted for in the air quality analysis for the project.

Meteorological Data

The meteorological data used in the Industrial Source Complex Short Term (ISCST3) model consisted of 1990 through 1994 surface data from the Indianapolis Airport Weather Service station merged with the mixing heights from Peoria, Illinois Airport National Weather Service station. The meteorological data was purchased through the National Oceanic and Atmospheric Administration (NOAA) and National Climatic Data Center (NCDC) and preprocessed into ISCST3 ready format using U.S.EPA's PCRAMMET.

Model Description

ERM and OAQ used ISCST3, Version 02035, to determine maximum off-property concentrations or impacts for each pollutant. All regulatory default options were utilized in the U.S. EPA approved model, as listed in the 40 Code of Federal Register Part 51, Appendix W "Guideline on Air Quality Models".

The Auer Land Use Classification Scheme was used to determine the land use in the area. The area is considered primarily rural; therefore, a rural classification was used.

Receptor Grid

OAQ modeling utilized the same receptor grids generated by ERM. The receptor grid extended to approximately 10 kilometers from the plant. Since all of the proposed emission sources have stack heights less than GEP stack height, receptors were closely spaced (100 meters) near the plant boundary to identify the influence of aerodynamic building downwash.

Section C - Significant Impact Level/Area (SIA) and Background Air Quality Levels

A significant impact analysis is conducted to determine whether a more refined analysis is required. A significant impact analysis was conducted for this modification to determine if the source exceeded the PSD significant impact levels (concentrations). If the source's concentrations exceed these levels, further air quality analysis is required. Modeling for $S0_2$ and NO_x was required because the results did exceed significant impact levels. CO did not exceed significant impact levels and refined modeling was not necessary. Significant impact levels are defined by the time periods listed in Table 2 with all maximum-modeled concentrations from the worst case operating scenarios.

TABLE 2
Significant Impact Analysis

POLLUTANT	TIME AVERAGING PERIOD	MAXIMUM MODELED IMPACTS (ug/m^3)	SIGNIFICANT IMPACT LEVEL (ug/m^3)	REFINED AQ ANALYSIS REQUIRED
SO_2	3 Hour	72.6	25	Yes
SO_2	24 Hour	22.9	5	Yes
SO_2	Annual	2.1	1	Yes
CO	1 Hour	101.3	2000	No
CO	8 Hour	36.0	500	No
NOx	Annual	1.5	1	Yes

Pre-construction Monitoring Analysis

A comparison of the preliminary modeling results was compared to the PSD preconstruction monitoring thresholds. The results are shown in the table below.

TABLE 3
Preconstruction Monitoring Analysis

POLLUTANT	TIME AVERAGING PERIOD	MAXIMUM MODELED IMPACT (ug/m3)	DEMINIMIS LEVEL (ug/m3)	ABOVE DE MINIMIS LEVEL
SO_2	24 Hour	22.9	13	Yes
CO	8 Hour	36.0	575	No
NO_2	Annual	1.5	14	No

For the criteria pollutants, SO_2 did trigger the preconstruction monitoring. Nucor can satisfy the preconstruction monitoring requirement for SO_2 since there is existing air quality monitoring data representative of the area. The Ambient Monitoring Guidelines for Prevention of Significant Deterioration [EPA 450/4-87-007, May 1987] states that as a general rule, modeling impacts are preferred and ambient monitoring for non-criteria pollutants should not be required. More recent guidance from EPA, including the 1990 New Source Review Workshop Manual, reiterates this guidance.

Background Concentrations

Applicability

EPA's "Ambient Monitoring Guidelines for Prevention of Significant Deterioration" (EPA-450/4-87-007) Section 2.4.1 is cited for approval of the regional monitoring sites for this area.

Background Monitors

Nucor is located in a rural area in which there are relatively few major emissions sources. The background concentrations were determined from various IDEM monitoring stations operated during 2002

through 2004. For short-term background concentrations, the averaged second highest monitoring values were used. Annual background concentrations were taken from the maximum annual values.

TABLE 4
Existing Monitoring Data Used For Background Concentrations

Pollutant/Year of Data	Monitoring Site	Approximate Distance From Site	Averaging Period	Concentration ug/m3
SO_2 – '02/'04	Fountain County	50.5 km	Second Highest 3 Hour	206.1
SO_2 – '02/04	Fountain County	50.5 km	Second Highest 24 Hour	63.8
SO_2 – '02/'04	Fountain County	**50.5 km**	Annual	13.1
NOx - '02/04	Marion County	68.8 km	Annual	33.8

Section D - NAAQS and PSD Increment

NAAQS Compliance Analysis and Results

IDEM supplied all emission inventories of sources within a 50-kilometer radius of Nucor. Inventories were taken from IDEM air quality web site.

NAAQs modeling for the appropriate time-averaging periods for SO_2 and NO_x was conducted and compared to the respective NAAQs limit. OAQ modeling results are shown in Table 5. All maximum-modeled concentrations were conducted and compared to the respective NAAQS limit. All maximum-modeled concentrations during the five years were below the NAAQS limits and further modeling was not required.

TABLE 5
NAAQS Analysis

Pollutant	Year	Time-Averaging Period	Maximum Concentration ug/m3	Background Concentration ug/m3	Total ug/m3	NAAQS Limit ug/m3	NAAQS Violation
SO_2	1994	3 Hour (H2H)	213.8	206.1	419.9	1300	No
SO_2	1990	24 hour (H2H)	64.37	63.8	128.2	365	No
SO_2	1991	Annual	8.19	13.1	21.3	80	No
NOx	1991	Annual	16.1	33.8	49.9	100	No

Analysis and Results of Source Impact on the PSD Increment

Applicability

Maximum allowable increases (PSD increments) are established by 326 IAC 2-2 for SO_2 and NO_x. This rule also limits a source to no more than 80 percent of the available PSD increment to allow for future growth.

Source Impact

Since the impacts for SO_2 and NO_x from Nucor modeled above significant impact levels, a PSD

increment analysis for the existing major sources in Montgomery County and its surrounding counties was required. Results of the increment modeling are summarized in Table 6 below.

TABLE 6
Increment Analysis

Pollutant	**Year**	**Time-Averaging Period**	**Maximum Concentration ug/m3**	**PSD Increment Ug/m3**	**Percent Impact on the PSD Increment**	Increment Violation
SO_2	1994	3 Hour (H2H)	184.7	512	36.1%	No
SO_2	1990	24 Hour (H2H)	63.6	91	69.9%	No
SO_2	1991	Annual	7.7	20	38.3%	No
NO_X	1991	Annual	15.0	25	60.2%	No

The results of the increment analysis shows all pollutants for all averaging periods were below 80% of the available increment.

Part E - Hazardous Air Toxics Analysis and Results

The OAQ presently requests data concerning the emission of 189 HAPs listed in the 1990 Clean Air Act Amendments (CAAA) which are either carcinogenic or otherwise considered toxic and may be used by industries in the State of Indiana. 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 GSD-08.

There are no HAPs associated with the emission sources being modified at the Nucor plant; therefore a HAPs analysis was not required.

Part F – Qualitative Analysis

Additional Impact Analysis

All PSD permit applicants must prepare additional impacts analysis for each pollutant subject to regulation under the Act. This analysis assesses the impacts on soils and vegetation, caused by any increase in emissions of any regulated pollutant from the source. The Nucor PSD permit application provided an additional impact analysis performed by ERM.

Economic Growth

This project involves a production increase rather than a construction change. There would be no increase in growth in the area. This project will not have a negative impact on regional residential trends.

Soils and Vegetation Analysis

Predicted pollutant concentrations in the study area are well below the secondary NAAQS for all pollutants, therefore, no significant adverse impact on soil is anticipated.

Vegetation in the vicinity of the proposed facility consists mainly of agricultural species including corn, soybean, winter wheat, tall fescue, and orchard grass alfalfa hay. No sensitive aspects of the soil and vegetation in the area surrounding the facility have been identified. The secondary NAAQs, which establish the ambient concentration levels to protect soil or vegetation, will not be violated.

Federal Endangered Species Analysis

Federally endangered or threatened species are listed by the U.S. Fish and Wildlife Service; Division of Endangered Species for Indiana and includes 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 maximum air quality impact of the proposed modification is generally located close to the mill fence line in a rural area. It is highly unlikely that the impact from the mill would affect the habitats of endangered species.

Federally endangered or threatened plants as listed by 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 in industrialized and residential areas. The facility is not expected to impact the area.

Additional Analysis Conclusions

The nearest Class I area to the proposed facility is Mammoth Cave National Park in Kentucky outside the 100 km Class I range. Thus no visibility analysis is required.

Finally, the results of the additional impact analysis conclude the operation of the proposed facility will have no significant impact on economic growth, soils, or vegetation in the immediate vicinity or on any Class I area.

Part G - Summary of Air Quality Analysis

Nucor has applied for a PSD construction permit to modify the castrip facility in Montgomery County. ERM of Vernon Hills, Illinois prepared the PSD application. Montgomery County is designated as attainment for all criteria pollutants. SO_2, NO_x, and CO emission rates associated with the proposed modification exceeded the respective significant emission rates. Modeling results taken from the latest version of the ISC3 model showed SO_2 and NO_x impacts were predicted to be greater than the significant impact levels. The NAAQS and increment modeling for both those pollutants showed no violations of the standards. An air toxic analysis was not performed because HAPs were not above the thresholds required to do an analysis. The nearest Class I area is Mammoth Cave National Park in Kentucky over 100 kilometers away from the source. Additional impact analysis was required but the operation of the proposed facility will have no significant impact.