

217/782-2113

CONSTRUCTION PERMIT/PSD APPROVAL
NSPS SOURCE

PERMITTEE

Nucor Steel Kankakee, Inc.
Attn: Mr. John Ohm and Mr. Ray Smith
One Nucor Way
Bourbonnais, Illinois 60914-4127

Application No.: 07120005 I.D. No.: 091801AAA
Applicant's Designation: EAF MOD. Date Received: December 4, 2007
Subject: Electric Arc Furnace Modifications
Date Issued: January 27, 2009
Location: One Nucor Way, Bourbonnais

Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of modifications to the electric arc furnace as described in the above referenced application. This Permit is subject to standard conditions attached hereto and the following special conditions:

In conjunction with this permit, approval is given with respect to the Prevention of Significant Deterioration of Air Quality Regulations (PSD) to operate the electric arc furnace and associated equipment, in that the Illinois Environmental Protection Agency (Illinois EPA) finds that the application fulfills all applicable requirements of 40 CFR 52.21. This approval is issued pursuant to the Clean Air Act, as amended, 42 U.S.C. 7401 *et. seq.*, the Federal regulations promulgated thereunder at 40 CFR 52.21 for Prevention of Significant Deterioration of Air Quality (PSD), and a Delegation of Authority agreement between the United States Environmental Protection Agency and the Illinois EPA for the administration of the PSD Program. This approval becomes effective in accordance with the provisions of 40 CFR 124.15 and may be appealed in accordance with the provisions of 40 CFR 124.19. This approval is also based upon and subject to the following findings and the conditions that follow:

Findings

- 1a. Nucor Steel is proposing to modify operations at their electric arc furnace (EAF) by upgrading the equipment used to introduce oxygen into the furnace, with improved operational control of the steel melting and refining processes in the furnace. The modifications will increase furnace yield compared to the existing lance technology by more evenly injecting oxygen into the molten bath, which, will reduce loss of iron to the layer of slag formed on top of the molten metal. The resultant increase in EAF performance and operational efficiency is anticipated to increase potential annual steel production to 1,100,000 tons from 876,000 tons, as allowed by Nucor's current permit. These modifications will result in increased emissions from the furnace.

- b. The affected furnace was installed pursuant to Construction Permit 88110038, replacing the previous furnace at the source. The affected furnace is a new furnace for purposes of the New Source Performance Standards, NSPS, 40 CFR 60 Subpart AAa. Emissions of particulate matter (PM) from the furnace are controlled by two baghouses, including a supplementary baghouse installed in 2005. The affected furnace underwent PSD permitting for emissions of carbon monoxide (CO) and nitrogen oxides (NO_x) in 1993 (Refer to Permit 93010095) and for VOM and SO₂ emissions in 2007 (Refer to Permit 04100024.)
2. The source is located in Kankakee County. The area is designated attainment for all criteria air pollutants.
3.
 - a. The project is subject to PSD review for emissions of sulfur dioxide (SO₂) and carbon monoxide (CO). This is because Nucor has requested limits that would allow significant increases in emission of SO₂ and CO, i.e., more than 40 and 100 tons/year respectively.
 - b. This permit is issued based on the project not being significant for other NSR pollutants. For this purpose, it is presumed that PM and PM₁₀ emissions from the furnace are essentially identical, as emissions are controlled by baghouses.
4. After reviewing the materials submitted by Nucor, the Illinois EPA has determined that the project, as proposed, would (i) be in compliance with applicable Board emission standards and (ii) utilize Best Available Control Technology (BACT) for emissions of SO₂ and CO.
5. The Illinois EPA has determined that the project, as proposed, would comply with all applicable Illinois Air Pollution Board Regulations and the federal Prevention of Significant Deterioration of Air Quality Regulations (PSD), 40 CFR 52.21.
6. A copy of the application and a summary of the Illinois EPA's review of the application and a draft of this permit were placed in a location in the vicinity of the project, and the public was given notice and an opportunity to examine this material and to submit comments and to request a public hearing on this matter.

The Illinois EPA is issuing this approval subject to the following conditions and consistent with the specifications and data included in the application. Any departure from the conditions of this approval or terms expressed in the application would need to receive prior written authorization by Illinois EPA.

Conditions

1. Best Available Control Technology (BACT)

- a. The supply of scrap for the affected furnace shall be managed with a scrap management program that is developed and maintained to minimize the level of organics and other contaminants in the scrap accepted for the furnace that contribute to sulfur dioxide (SO₂) emissions from the furnace, as further addressed in Condition 2(c).
- b. The furnace shall be operated with a direct-shell evacuation control system to promote oxidation of carbon monoxide (CO) with enlarged fourth hole collection duct and an elbow with drop-out box to control emissions of CO.
- c. The affected furnace shall be operated and maintained in accordance with good air pollution control practices to minimize emissions. These practices shall include specific practices to minimize the emissions of SO₂ attributable to contaminants in the scrap supply, including use of low-sulfur charge carbon for the furnace that contains no more than 1.0 percent sulfur by weight.
- d. The affected furnace shall be operated and maintained to achieve CO and SO₂ emission rates that are no more than 2.0 and 0.50 pounds per ton of steel produced, respectively.

Condition 1(a), (b), (c) and (d) address BACT for SO₂ and CO emissions for the current project, as required by the PSD rules.

- e. This permit does not revise BACT requirements previously set for NO_x emissions from the affected furnace pursuant to Permit 93010095, as follows:
 - i. Emissions of NO_x from the affected furnace shall not exceed 0.26 pounds per ton of steel produced, respectively.
 - ii. Any fuel burners operated on the affected furnace shall be of the low-NO_x design, such as oxygen/natural gas burners, designed and maintained to generate no more than 0.14 pound NO_x per million Btu heat input from fuel.
- f. This permit does not revise BACT requirements previously set for VOM emissions from the affected furnace pursuant to Permit 04100024, as follows:
 - i. The affected furnace shall be operated and maintained in accordance with good air pollution control practices to minimize emissions. These practices shall include specific practices to minimize the emissions of VOM attributable to contaminants in the scrap supply. These practices shall

also include operation of the furnace with a direct-shell evacuation control system to facilitate combustion of VOM.

- ii. The affected furnace shall be operated and maintained to achieve VOM emission rate that are no more than 0.28 pounds per ton of steel produced.
- g. The affected furnace is subject to 40 CFR 63 Subpart YYYYYY, National Emission Standards For Hazardous Air Pollutants (NESHAP) For Area Sources, Electric Arc Furnace Steelmaking Facilities. The Permittee shall comply with all applicable requirements of this NESHAP.

2. Operational and Production Limitations

- a. The production of steel by the affected furnace shall not exceed 140 tons per hour and 1,100,000 tons per year. Compliance with the hourly limit shall be determined as a weekly average. Compliance with the annual limitation shall be determined from a running total of 12 months of data.
- b. This permit does not revise requirements for the baghouses, which are required to comply with the following limits:
 - i. The particulate matter (PM) emissions from the affected furnace (fabric filter), filterable and condensable, shall not exceed 0.0052 gr/dscf and 3% opacity and the emissions from the furnace shop shall not exceed 6% opacity, pursuant to the NSPS, 40 CFR 60.272a.
 - ii. The supplementary baghouse is required to comply with a filterable PM limit of 0.0018 gr/dscf pursuant to Construction Permit 04060012.
- c. The Permittee shall operate in accordance with a written plan for the management of scrap to minimize, to the extent practicable, the amount of organics (oil, other organic liquids, paint, rubber, etc.) or other contaminants in the charge materials for the affected furnace that would potentially contribute to emissions of VOM or SO₂. This plan shall be prepared and maintained by the Permittee and include the following elements. This plan must be kept onsite, with copies readily available to all plant personnel with duties related to acquisition, inspection or acceptance of scrap.
 - i. Procedures for scrap acquisition to restrict organic contamination in scrap delivered to and accepted by the plant, including specifications for scrap materials to be depleted (to the extent practicable) of the presence of used oil filters, plastic parts and organic liquids and to be drained of free liquids, a copy of which specification

must be provided to each scrap vendor or supplier for the furnace.

- ii. Procedures for inspection and acceptance of incoming scrap shipments to the plant to ensure that materials meet the above specifications, which shall be accompanied by documentation for each inspection, with results, and records for each rejection of a shipment, with description and explanation.
 - A. The inspection procedures must provide for inspection of a representative portion of the incoming scrap to the plant, including inspection of shipments from all suppliers and at least 10 percent of all shipments. The procedures must also identify the location(s) where inspections are to be performed for different types of shipments and provide reasonable vantage points and facilities for inspections considering worker safety. If inspections are performed at suppliers' sites, the procedures shall further identify the practices that are followed to ensure that such inspections are representative of material as delivered to the plant.
 - B. The acceptance procedures must provide for rejection of entire or partial shipments of scrap that do not meet specifications and additional punitive consequences for vendors whose shipments repeatedly fail to meet specifications.
 - C. Retention of the documentation for inspections of scrap shipment in accordance with the Permittee's established procedures for document retention and in no case for less than 12 months from the date of the inspection.
- ii. Upon written notification from the Illinois EPA of an observed or potential deficiency in the scrap management plan or a portion thereof, the Permittee shall submit a revised document addressing the cited deficiencies to the Illinois EPA within 45 days for its review. This submittal shall be accompanied with an explanation of the revisions to the plan that have been made and how they appropriately respond to the cited deficiencies.

3. Emission Limitations

- a. Emissions from the affected furnace shall not exceed the following limits. Compliance with the annual limitations shall be determined from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

Pollutant	Limit		
	Lbs/Hour	Lbs/Ton	Tons/Year
VOM	39.2	0.28	154.8
SO ₂	70.0	0.50	275.8
PM	22.78	0.163	89.5
CO	280.0	2.0	1100.0
NO _x	37.1	0.26	145.8

- b. Compliance with these limits shall be determined from: 1) operating information for the affected furnace at its control systems and 2) appropriate emission factors, that reflect the actual operating conditions of the furnace and its control systems, and are derived in order of preference from source-specific testing, source-specific evaluation, published USEPA factors, and other published factors. Hourly limits are based on a weekly average. This Condition replaces the listed emission factors in Condition 7.1.12 of the source's CAAPP Permit.
4. Good Operating Practices
- The Permittee shall operate, maintain, and repair the affected furnace and its control system in a manner that is consistent with the following:
- a. The affected furnace shall be operated and in accordance with written operating procedures that set forth good air control practice, as follows. These procedures shall be developed and maintained by the Permittee.
- i. Operating Procedures for the Furnace: These procedures shall address normal furnace operation, including startup, shutdown, and maintenance practices.
- ii. Operating Procedures for Fuel Burner: These procedures shall include target levels established for the following operating parameters for the burner:
- A. Air-fuel mixture
- iii. Operating Procedures for Control System: These procedures shall address normal air pollution control equipment operation, including startup and shutdown, and maintenance practices. The procedures may incorporate the manufacturers' recommended instructions for operation and maintenance.
- b. Inspections: Visual inspections of the affected furnace and its air pollution control and monitoring equipment shall be conducted on at least a weekly basis.
- c. Repairs: Prompt repairs shall be made upon identification of need either as a consequence of formal inspections or other

observations in conformance with good air pollution control practice.

- d. Records: Records of inspection, maintenance, and repair activities for all equipment affecting emissions shall be kept on site and shall include as a minimum:
 - i. Date of inspection, maintenance, and repair activities.
 - ii. Description of maintenance or repair activity if not routine preventative maintenance.
 - iii. Probable cause for requiring maintenance or repair if not routine or preventative.

5-1. Emission Testing Requirements

- a.
 - i. Within 365 days of commencement of operation of the modified affected furnace ,and at other times Upon request by the Illinois EPA, the Permittee shall have emission test(s) conducted for PM, PM₁₀, SO₂, NO_x, CO, VOM, and lead emissions from the affected furnace as follows.
 - ii. During the measurements of PM and PM₁₀ emissions, observations of opacity shall also be conducted in accordance with USEPA Method 9.
- b.
 - i. The following methods and procedures shall be used for testing of PM emissions:
 - A. Method 5 or Method 5D, as appropriate for the type of baghouse.
 - B. The sampling time and sample volume for each run shall be at least 4 hours and 4.5 dscm (160 dscf) and, when a single furnace is sampled, the sampling time shall include an integral number of heats.
 - ii. The following methods and procedures shall be used for testing emissions unless other methods are approved by the Illinois EPA as part of the approval of the test plan. Refer to 40 CFR 60, Appendix A and 40 CFR 51, Appendix M for USEPA test methods.

Location of Sample Points	USEPA Method 1
Gas Flow and Velocity	USEPA Method 2
Flue Gas Weight	USEPA Method 3
Moisture	USEPA Method 4
Sulfur Dioxide	USEPA Method 6
Nitrogen Oxides	USEPA Method 7
Carbon Monoxide	USEPA Method 10
PM	USEPA Method 5

PM ₁₀	USEPA Methods 5 and 202
Volatile Organic Material	USEPA Method 18 and 25 or 25A, as appropriate
Lead	USEPA Method 12 or 29*

* If Method 29 is used, measurements for metal other than lead shall be conducted.

- c. At least 60 days prior to the actual date of testing, a written test plan shall be submitted to the Illinois EPA for review and approval. This plan shall describe the specific procedures for testing including as a minimum:
 - i. The person(s) who will be performing sampling and analysis and their experience with similar tests.
 - ii. The specific conditions under which testing will be performed, including a discussion of why these conditions will be representative of the maximum emissions, the levels of operating parameters at or within which compliance is intended to be shown, if parameters for the process and any control equipment will be determined.
 - iii. The specific determination of emissions and operations intended to be made, including sampling and monitoring locations.
 - iv. The test methods that will be used, with the specific analysis method.
 - v. Any minor changes in standard methodology proposed to accommodate the specific circumstances of testing, with justification.
 - vi. A statement that the testing will be performed by a qualified independent testing service.
- d.
 - i. Prior to carrying out these tests, the Illinois EPA shall be notified a minimum of 30 days prior to the scheduled date of these tests with the exact date, time and place of these tests, to enable the Illinois EPA to witness these tests.
 - ii. If the scheduled date for the test is changed, the Permittee shall inform the Illinois EPA within five (5) working days of the scheduled test date and must specify the date and time of the rescheduled test.
- e. A copy of the Final Reports for these tests and compliance status shall be submitted to the Illinois EPA within 14 days after the test results are compiled and finalized. These reports shall include detailed information on the operation of the furnace and

associated control system during the period of testing, including the type of steel being made and intended product.

5-2. Opacity Testing Requirements

- a. The Permittee shall comply with the requirements of the NSPS for monitoring and/or observations of opacity, as further addressed in the CAAPP permit for the source.

6. Instrumentation

- a. The Permittee shall install, operate and maintain instrumentation for the following parameters in the capture system and baghouses for the affected furnace.
 - i. Fan motor amperes;

7. Inspection Requirements and Operational Monitoring

- a. For the affected furnace, the Permittee shall perform detailed operational inspections on at least a monthly basis of the equipment that is important to the performance of the total capture system (i.e., pressure sensors, dampers, and damper switches). This inspection shall include observations of the physical appearance of the equipment (e.g., presence of holes in ductwork or hoods, flow constrictions caused by dents or accumulated dust in ductwork, and fan erosion). Any deficiencies shall be noted and proper maintenance performed.
- b. The Permittee shall perform all applicable operational monitoring required by 40 CFR 60 Subpart AAa, including:
 - i. Recording the furnace static pressure and control system fan motor amperes and damper position, in accordance with 40 CFR 60.274(a) or monitoring for volumetric flow through each separately ducted hood or monitoring for volumetric flow rate at the control device inlet and recordkeeping for damper position in accordance with 40 CFR 60.274a(b).
 - ii. Monitoring for the pressure in the free space inside the arc furnace or conducting daily observations for shop opacity in accordance 40 CFR 60.274(f).

8. Recordkeeping Requirements

- a. The Permittee shall keep a file containing the specifications for the maximum sulfur content of each charge carbon product used in the affected furnace (percent by weight), with supporting documentation.
- b. The Permittee shall keep the following operating records for the affected furnace:

- i. Steel (metal) production (tons/day, tons/month, and tons/year).
- ii. Fuel consumption, as determined directly from fuel meters or indirectly from operating hours of the burners and their rated capacity.
- c.
 - i. The Permittee shall keep an operating log or other records for the affected furnace which includes information on unit status and operating schedule.
 - ii. The Permittee shall maintain an operating and maintenance log for the fabric filter system for the affected furnace, including the following as applicable:
 - A. Documentation for daily observations by Method 9 of the opacity of the baghouse exhaust and of the opacity of the melt shop, when conducted as an alternative to monitoring of EAF shell pressure once per shift in accordance with 40 CFR 60.273a(d);
 - B. Data for pressure drop across the system, on an hourly basis;
 - C. Data for damper positions for the evacuation system (percent open/closed) and the amperage of the baghouse fans, once per shift; and
 - D. Information for incidents of malfunction, with date, description impact on emissions, duration of event, probable cause, and corrective actions.
 - iii. The Permittee shall keep inspection, maintenance and repair log(s) or other records for the affected furnace and associated hooding, ductwork and baghouse that includes the inspection and preventative maintenance schedules and a description of inspection, maintenance activities that are performed, with date and responsible party.
- d. The Permittee shall maintain records of the following items related to emissions of the affected furnace:
 - i. The standard emission factors (lbs/ton) used by the Permittee for estimating controlled emissions from the furnace, which information shall be based on site-specific test data, representative test data or emission determination methodology published by USEPA, with supporting explanation and calculations.
 - ii. Emissions of PM, PM₁₀, SO₂, NO_x, VOM, CO, and lead (tons/month and tons/year), with supporting calculations.

- e. The Permittee shall keep records for all opacity measurements for the affected furnace made in accordance with USEPA Method 9 that the Permittee conducts or that are conducted at its behest by individuals who are qualified to make such observations. For each occasion on which such measurements are made, these records shall include the formal report for the measurements, if one was prepared, or otherwise the identity of the observer, a description of the measurements that were made, the operating condition of the furnace operations, the observed opacity, and copies of the raw data sheets for the measurements.

9. Retention and Availability of Records

- a. The Permittee shall retain all records required by this permit at the source for at least five years, at a location where the records are readily accessible for inspection by the Illinois EPA.
- b. The Permittee shall make all records required by this permit available for inspection at the source by the Illinois EPA, providing copies of records to the Illinois EPA upon request. For this purpose, the Permittee may keep records in a computerized data system provided that, upon request by the Illinois EPA during the sources normal working hours, requested information is retrieved and available prior to inspection completion to the Illinois EPA.

10. Notification

The Permittee shall promptly notify the Illinois EPA of deviations of the affected furnace with the permit requirements. Reports shall describe the probable cause of such deviations, and any corrective actions or preventive measures taken:

- a. The Permittee shall fulfill all reporting requirements as required by 40 CFR 60.276a, Subpart AAa. [40 CFR 60 Subpart AAa]
- b. If there is an exceedance of the annual emission limits of this permit as determined by the records required by this permit or by other means, the Permittee shall submit a report to the Illinois EPA within 30 days after the exceedance. The report shall include the emissions released in accordance with the recordkeeping requirements, a copy of the relevant records, and a description of the exceedance or violation and efforts to reduce emissions and future occurrences.

11. Illinois EPA Addresses

Any required reports and notifications shall be sent to the Illinois EPA at the following address unless otherwise indicated:

Illinois Environmental Protection Agency
Division of Air Pollution Control
Compliance Section (#40)
P.O. Box 19276
Springfield, Illinois 62794-9276

Telephone: 217/782-5811 Fax: 217/524-4710

A copy of all required reports and notifications, except the Annual Emission Report required by 35 IAC Part 254, shall also be sent to the Illinois EPA at the following address:

Illinois Environmental Protection Agency
Division of Air Pollution Control
9511 West Harrison Street
Des Plaines, Illinois 60016

Telephone: 847/294-4010

12. a. The Permittee is allowed to operate the affected furnace under this construction permit until final action is taken to incorporate this emission unit in a revision to or renewal of their CAAPP permit.
- b. This permit shall expire twelve months from the date of issuance, unless a continuous program of construction or development on this project has started by such time.

13. Other Requirements

This permit does not relieve the Permittee of the responsibility to comply with all applicable local, state and federal requirements which are part of Illinois State implementation Plan, as well as all other applicable local, state and federal requirements.

If you have any questions concerning this permit, please contact Kevin Smith at 217/782-2113.

Edwin C. Bakowski, P.E.
Acting Manager, Permit Section
Division of Air Pollution Control

Date Signed: _____

ECB:KLS:jws

cc: Region 1