



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: July 11, 2005
RE: Ispat Inland, inc. / 089-20235-00316
FROM: Paul Dubenetzky
Chief, Permits Branch
Office of Air Quality

Notice of Decision: Approval - Effective Immediately

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

If you wish to challenge this decision, IC 4-21.5-3 and IC 13-15-6-1 require that you file a petition for administrative review. This petition may include a request for stay of effectiveness and must be submitted to the Office of Environmental Adjudication, 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



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

Mitchell E. Daniels, Jr.
Governor

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Mr. John Fekete
Ispat Inland, Inc.
3210 Watling Street
East Chicago, IN 46312

Re: 089-20235-00316
Significant Modification to:
Construction Permit No.: 089-3630-00316

Dear Mr. Fekete:

Ispat Inland, Inc., an integrated iron and steel mill, was issued a construction permit (089-3630-00316) on March 20, 1995 for modifications to the No.1 Electric Arc Furnace Shop. An application to make the following modifications to the No.1 Electric Arc Furnace Shop was received on January 10, 2005. Pursuant to IC13-15-7-1, the following emission units and modifications are approved for modification at the source:

Page 2 of 8

The modifications to the No.1 Electric Arc Furnace Shop consist of:

- h) replace the existing post combustion oxy-fuel burners/lance and carbon injection system with a Co-Jet Lance system utilizing a jet technology system in 2005.

Page 5 of 8 – Construction Conditions

12. That the sulfur dioxide (SO₂) emissions from the No. 1 electric arc furnace (EAF) and ladle metallurgy facility (LMF) shall be limited as follows:
 - a) SO₂ emissions from the EAF shall not exceed 336.7 tons per year rolled on a 12 month period based on the total tons of each series steel produced times the pounds of SO₂ per ton of steel (lbs SO₂/ ton of steel),
 - b) The EAF pounds of SO₂ divided by tons of steel for calculation purposes shall be: 0.643 pounds of SO₂ per ton of steel for non-sulfur bearing heats, 1.091 pounds of SO₂ per ton of steel for 1100 series steel, and 2.312 pounds of SO₂ per ton of steel for 1200 series steel,
 - c) during the first 12 months of operation after this modification, the sulfur dioxide emissions from the EAF are limited such that, total SO₂ emissions divided by months of operation shall not exceed an average of 28.1 tons per month from the EAF, and
 - d) the amount of molten steel to be processed in the LMF (ss-2) shall not exceed 792,077 tons per year and SO₂ shall not exceed 0.107 pounds per ton. During the first 12 months of operation after this modification, the average amount of molten steel processed shall not exceed an average of 66,006 tons per month. (Sulfur Dioxide Emission Limitations).

All other conditions of permit CP 089-3630-00316, its amendments and modifications shall remain unchanged and in effect. This permit decision is subject to the Indiana Administrative Orders and Procedures Act –IC4-21.5-3-5.

If you have any questions on this matter call (800) 451-6027, and ask for Walter Habeeb or extension 2 - 8422, or dial (317) 232- 8422.

Sincerely,

Original signed by
Paul Dubenetzky, Chief
Permits Branch
Office of Air Quality

Attachments

WVH

cc: File – Lake County
Lake County Health Department
Northwest Regional Office
Air Compliance Section Inspector – Rick Massoels
Compliance Data Section
Administrative and Development

**Indiana Department of Environmental Management
Office of Air Quality**

**Technical Support Document (TSD) for a Significant Modification
to a Construction Permit**

Source Background and Description

Source Name:	Ispat Inland, Inc.
Source Location:	3210 Watling Street, East Chicago, Indiana 46312
County:	Lake
SIC Code:	3312
Operation Permit No.:	089-3630-00316
Operation Permit Issuance Date:	March 29, 1995
Significant Modification No.:	089-20235-00316
Permit Reviewer:	Walter Habeeb

The Office of Air Quality (OAQ) has reviewed a modification application from Ispat Inland, Inc. relating to the construction of the following emission units and pollution control devices:

- a) The modification consists of replacing the existing post combustion oxy-fuel burners/lance and carbon injection system with a CO-Jet Lance system utilizing a coherent jet technology system.
- (b) The emission factors for SO₂ emissions from the production of the three steel grades produced at the EAF are being revised to reflect recent stack test results. This will require the following revision to emission levels from the EAF as specified in construction condition 12(b) of Construction Permit (089-3630- 00316). The EAF pounds of SO₂ divided by tons of steel for calculation purposes shall be changed from: 0.083 to 0.643 pounds of SO₂ per ton of steel for non-sulfur bearing heats, from 0.531 to 1.091 pounds of SO₂ per ton of steel for 1100 series steel, and from 1.752 to 2.312 pounds of SO₂ per ton of steel for 1200 series steel.

This will also require a revision to the method of calculating the rolling twelve- month total SO₂ emissions limits in order to stay within the 336.7 tons per 12 consecutive months compliance determination of the Construction Permit. The new total shop production limit will be changed from 975,900 to 792,077 tons per year to reflect the revised emission factors.

History

On January 10, 2005, Ispat Inland, Inc. submitted an application to the OAQ requesting to modify the lance system of their No.1 Electric Arc Furnace. The new Co-Jet Lance system uses multiple injection points to inject oxygen, carbon and natural gas into the steel inside of the EAF. The lance system will be utilized to melt and clear scrap for the insertion of the electrodes. The same lance will act as both a cutting lance and provide de-carburization of the liquid steel. It will produce a foamy slag which insulates the liquid steel during the refining phase of steelmaking. The lance will enhance post combustion, which is the oxidation of carbon monoxide in the headspace above the liquid steel in the EAF. This provides an alternative to some of the electrical energy used at the EAF, thus reducing electrical power consumption.

Ispat Inland, Inc. applied for a Part 70 permit on September 16, 1996. The Part 70 permit is currently under review. The No.1 Electric Arc Furnace was permitted under CP 089-3630-00316 issued March 29, 1995. Therefore, this application is being processed as a significant modification to CP 089-3630-00316.

Enforcement Issue

There are no enforcement issues pending related to this modification.

Recommendation

The staff recommends to the Commissioner that the Significant Modification be approved. This recommendation is based on the following facts and conditions:

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 January 10, 2005.

Emission Calculations

The calculations submitted by the applicant have been verified and found to be accurate and correct. These calculations are provided in Appendix A of this document (page 1 of 1).

Emissions Calculations

The table 1 below summarizes the existing limits, stack test results and proposed limits of SO₂ emissions from the EAF and LMF operations as a result of the most recent stack test.

TABLE 1 SO₂ Emissions

	Existing	Stack Test Results	Proposed
Permit No.	089-3630-00316 March 29, 1995		089-20235-00316 Pending
Control	Post combustion oxy/fuel burners/lance & carbon injection system	Post combustion oxy/fuel burners/lance & carbon injection system	CO-Jet Lance system utilizing a coherent jet technology
Throughput of molten steel in LMF	975,900 tons/yr		792,077 tons/12 consecutive month period
LMF SO ₂ limit	0.107 lbs/ton	0.107 lbs/ton	0.107 lbs/ton
EAF Limits	0.083 lbs SO ₂ /ton steel for non-sulfur bearing heat, 0.531 lbs SO ₂ /ton steel for 1100 series, 1.752 lbs SO ₂ /ton steel for 1200 series steel	0.643 lbs SO ₂ /ton steel for non-sulfur bearing heat, 1.091 lbs SO ₂ /ton steel for 1100 series, 2.312 lbs SO ₂ /ton steel for 1200 series steel	0.643 lbs SO ₂ /ton steel for non-sulfur bearing heat, 1.091 lbs SO ₂ /ton steel for 1100 series, 2.312 lbs SO ₂ /ton steel for 1200 series steel

This permit is being modified through a Significant Modification. As indicated in Condition 5 on page 3 of Construction Condition of permit 089-3630-00316, IDEM may revise the permit to adjust the SO₂ limitations. IDEM uses the authority under IC 13-15-7-1 to re-open and revise the limits to closely reflect actual stack test results.

Justification for Modification

The construction permit is being modified through a Significant Modification. This modification is being performed pursuant to IC13-15-7-1.

County Attainment Status

The source is located in Lake County.

Pollutant	Status
PM ₁₀	Attainment
PM 2.5	Nonattainment
SO ₂	Marginal Nonattainment
NO _x	Attainment
one (1) hour ozone	Nonattainment
eight (8) hour ozone	Severe Nonattainment
CO	Attainment
Lead	Attainment or unclassifiable

- (a) Volatile organic compounds (VOC) are precursors for the formation of ozone. Therefore, VOC emissions are considered when evaluating the rule applicability relating to the ozone standards. Lake County has been designated as nonattainment for both the 1 hour and the 8 hour ozone standards. Therefore, VOC emissions were reviewed pursuant to the requirements for Emission Offset, 326 IAC 2-3.
- (b) Lake County has been classified as nonattainment SO₂. Therefore, these emissions were reviewed pursuant to the requirements for Emission Offset, 326 IAC 2-3.
- (c) U.S.EPA in Federal Register Notice 70 FR 943 dated January 5, 2005 has designated Lake County as nonattainment for PM_{2.5}. On March 7, 2005 the Indiana Attorney General's Office on behalf of IDEM filed a law suit with the Court of Appeals for the District of Columbia Circuit challenging U.S. EPA's designation of non-attainment areas without sufficient data. However, in order to ensure that sources are not potentially liable for violation of the Clean Air Act, the OAQ is following the U.S. EPA's guidance to regulate PM₁₀ emissions as surrogate for PM_{2.5} emissions pursuant to the Non-attainment New Source Review requirements.
- (d) Lake County has been classified as attainment or unclassifiable for all other pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.
- (e) Fugitive Emissions
 Since this type of operation is one of the 28 listed source categories under 326 IAC 2-2, the fugitive PM emissions are counted toward determination of PSD and Emission Offset applicability.

Source Status

Existing Source PSD or Emission Offset Definition (emissions after controls, based upon 8760 hours of operation per year at rated capacity and/or as otherwise limited):

Pollutant	Emissions (tons/year)
PM	1,972
PM ₁₀	1,972
SO ₂	2,610
VOC	1,430
CO	42,943
NO _x	4,172

- (a) This existing source is a major stationary source because an attainment regulated pollutant is emitted at a rate of 100 tons per year or more, and it is one of the 28 listed source categories.
- (b) These emissions are based upon annual emission data for the year 2003 reported to IDEM by Ispat Inland, Inc.

Potential to Emit of Modification After Issuance

The table below summarizes the potential to emit, reflecting all limits, of the significant emission units after controls. The control equipment is considered federally enforceable only after issuance of this modification.

Process/facility	Potential to Emit (tons/year)						
	PM	PM10	SO ₂	VOC	CO	NO _x	HAPs
Co-Jet Lance	11.23	6.92	36.16	0.99	73.35	13.07	0.00
PSD/Emission Offset Level	25.0	15.0	40.0	40.0	100.0	40.0	-
Exceeds Level	NO	NO	NO	NO	NO	NO	-

This modification to an existing major stationary source is not major because the emissions increase is less than PSD or the Emission Offset significant levels. Therefore, pursuant to 326 IAC 2-2 and 326 IAC 2-3, the PSD and Emission Offset requirements do not apply.

Federal Rule Applicability

- (a) There are no New Source Performance Standard, 326 IAC 12, (40 CFR 60) applicable to this proposed modification.
- (b) There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs)(326 IAC 14, 20 and 40 CFR Part 61, 63) applicable to this proposed modification.

State Rule Applicability - Individual Facilities

326 IAC 2-2 (Prevention of Significant Deterioration) and 326 IAC 2-3 (Emission Offset)

The following limit and conditions will maintain emissions below 326 IAC 2-2 (Prevention of Significant Deterioration) and 326 IAC 2-3 (Emission Offset) level requirements for the EAF operations.

- (1) The sulfur dioxide (SO₂) emissions from the No. 1 electric arc furnace (EAF) and ladle metallurgy facility (LMF) shall be limited as follows:
 - (a) Pursuant to CP 089-3630-00319, issued March 20, 1995, SO₂ emissions from the EAF shall be less than 336.7 tons per 12 consecutive months with compliance determined at the end of each month, based on the total tons of each series steel produced times the pounds of SO₂ per ton of steel (pounds of SO₂ divided by tons of steel).
 - (b) Pursuant to this permit modification the EAF pounds of SO₂ divided by tons of steel for calculation purposes shall be: 0.643 pounds of SO₂ per ton of steel for non-sulfur bearing heats, 1.091 pounds of SO₂ per ton of steel for 1100 series steel, and 2.312 pounds of SO₂ per ton of steel for 1200 series steel, and

- (c) Pursuant to this permit modification the amount of molten steel to be processed in the LMF (SS-2) shall be less than 792,077 tons per 12 consecutive months with compliance determined at the end of each month and SO₂ shall not exceed 0.107 pounds per ton.
- (d) Pursuant to CP 089-3630-00316 issued March 20, 1995, combustion sulfur dioxide emissions shall be limited by using natural gas-fired burners.

326 IAC 6-1-10.1 (Lake County PM₁₀ Emission Requirements)

There are specific emissions limitations established in 326 IAC 6-1-10.1(d)(19) for the facilities in this permit. Each emission limit applies to one (1) stack serving one (1) facility unless otherwise noted. Therefore, the requirements of 326 IAC 6-1-10.1(d)(19) apply as follows:

- (a) PM₁₀ emissions from the electric arc furnace shop ladle metallurgical station baghouse (143) shall not exceed 0.01 grains per dry standard cubic foot and 0.820 pounds per hour.
- (b) PM₁₀ emissions from the electric arc furnace shop direct shell evacuation system baghouse roof monitor (142) shall not exceed 0.0052 grains per dry standard cubic foot and 17.14 pounds per hour

Permit Changes

The following changes will be made to permit 089-3630-00316 (bolded language as been added and language with a strikeout as been omitted).

Page 2 of 8

The modifications to the No.1 Electric Arc Furnace Shop consist of:

- a) dedication of the existing control system, presently controlling the two existing furnaces, to control emissions from the one remaining furnace,
- b) construction of a curtain wall to extend the existing canopy and isolate the emissions from the roof monitor,
- c) installation of a tapping canopy to contain and direct the emissions to the related capture system,
- d) installation of a ladle turret,
- e) redesign of the scavenger duct to improve capture of escaping canopy hood emissions,
- f) modification of the existing fourth hole collection to improve capture efficiency of fume capture,
- g) installation of additional cooling tower capacity,
- h) ~~upgrade of the present oxygen/carbon injection with installation of state-of-the-art post combustion technology,~~ **replace the existing post combustion oxy-fuel burners/lance and carbon injection system with a Co-Jet Lance system utilizing a jet technology system in 2005.**
- i) Installation of a lime injection system to minimize hot spots on the water cooled panel to the remaining furnace, and
- j) Installation of additional electrical equipment.

Page 5 of 8 – Construction Conditions

12. That the sulfur dioxide (SO₂) emissions from the No. 1 electric arc furnace (EAF) and ladle metallurgy facility (LMF) shall be limited as follows:

- a) SO₂ emissions from the EAF shall not exceed 336.7 tons per year rolled on a 12 month period based on the total tons of each series steel produced times the pounds of SO₂ per

- ton of steel (lbs SO₂/ ton of steel),
- b) ~~The EAF lbs of SO₂/Tst for calculation purposes shall be: 0.083 lbs SO₂/Tst for non sulfur bearing heats, 0.531 lbs SO₂/Tst for 1100 series steel, and 1.752 lbs SO₂/Tst for 1200 series steel.~~ **The EAF pounds of SO₂ divided by tons of steel for calculation purposes shall be: 0.643 pounds of SO₂ per ton of steel for non-sulfur bearing heats, 1.091pounds of SO₂ per ton of steel for 1100 series steel, and 2.312 pounds of SO₂ per ton of steel for 1200 series steel, and,**
 - c) during the first 12 months of operation, the sulfur dioxide emission from the EAF limited such that, total SO₂ emissions divided by months of operation shall not exceed an average of 28.1 tons per month from the EAF, and
 - d) the amount of molten steel to be processed in the LMF (ss-2) shall not exceed ~~975,900~~ **792,077** tons per year and SO₂ shall not exceed 0.107 pounds per ton. During the first 12 months after this modification, the average amount of molten steel processed shall not exceed an average of ~~81,325~~ **66,006** tons per month. (Sulfur Dioxide Emission limitations).

Conclusion

The modification to the existing No. 1 electric arc furnace shall be subject to the conditions of the attached proposed Significant Modification No. 089-20235-00316.

Appendix A

Company Name: Ispat Inland, Inc.
 Address City IN Zip: 3210 Watling Street, East Chicago,
 Indiana 46312
 Permit No.: 089-20235
 Plt ID: No. 089- 00316
 Reviewer: Walter Habeeb
 Date: February 11, 2005

No.1 Electric Arc Furnace - Emission Rate Changes from Installation of CO-JET Lance						
Pollutant	Emission Factors lbs/ ton (steel tapped)					Emission Rates Increase ton/yr (m)
	Electric Arc Furnace (EAF)	Ladle Metallurgy Furnace (LMF)	Continuous Caster (CC)	Direct Reduced Iron Facility (k)	Total emission Factor (i)	
PM	0.241 (a)	0.022 (h)	0.007 (j)	0.035	0.305	11.23
PM ₁₀	0.142 (b)	0.022 (h)	0.003 (j)	0.021	0.188	6.92
SO ₂	0.875 (c)	0.107 (i)	0	0	0.982	36.16
CO	1.942 (d)	0.05 (i)	0	0	1.992	73.35
NO _x	0.302 (e)	0.003 (i)	0.05 (j)	0	0.355	13.07
VOC	0.027 (f)	0	0	0	0.027	0.99
Lead	0.004 (g)	0	0	0	0.004	0.15

- (a) Based on uncontrolled emission factor of 42.5 lbs PM/ton , DSE capture efficiency of 0.96, canopy hood capture efficiency of 0.96 and baghouse control efficiency of 99.60%. Emission capture efficiency factor determined by tests performed March 1994 for permit application (3630).
- (b) Based on uncontrolled emission factor of 25 lbs PM/ton and the same capture and control efficiencies as for PM (emission factors for PM & PM₁₀ were derived from a series of test performed on units in March, 1994 for permit 3630).
- (c) Based on stack tests for 15 unresulfured steel heats on Oct. 11 & 12, 2004. Results were used to scale up emission factors for resulfured steel grades. Product mix for baseline period was assumed to be the same as that for the future (projected actual) period.
- (d) Based on stack tests for 15 unresulfured steel heats on Oct. 11 & 12, 2004.
- (e) Based on emission tests at the baghouse inlet conducted in August and September 1993.
- (f) Based on emission tests at the baghouse inlet conducted in August and September 1993.
- (g) Assumes that lead emissions are 1.3 % of PM 10 emissions based on baghouse dust analysis.
- (h) Based on uncontrolled emission factor of 0.56 lbs PM/Pm₁₀ per ton, capture efficiency of 97% and baghouse control efficiency of 99.0%.
- (i) Based on stack tests at LMF baghouse stack on Dec. 10, 1990.
- (j) From March 1994 Construction Permit Application.
- (k) From TSD for Minor Source Modification for installation of DRI facility.
- (l) Sum of emission factors.
- (m) Adjusted Projected Actual Emissions minus Baseline Actual Emissions (i.e., portion of the increase attributable only to the physical change).