

Facility Name: **Shaw Industries Group, Inc. Plant 4**

City: Dalton

County: Whitfield

AIRS #: 04-13-313-00084

Application #: 15412

Date SIP Application Received: June 14, 2004

Date Title V Application Received: June 14, 2004

Permit No: 2273-313-0084-V-01-3

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## **Introduction**

This narrative is being provided to assist the reader in understanding the content of the referenced SIP permit to construct and draft operating permit amendment. Complex issues and unusual items are explained in simpler terms and/or greater detail than is sometimes possible in the actual permit. This permit is being issued pursuant to: (1) Sections 391-3-1-.03(1) and 391-3-1-.03(10) of the Georgia Rules for Air Quality Control, (2) Part 70 of Chapter I of Title 40 of the Code of Federal Regulations, and (3) Title V of the Clean Air Act Amendments of 1990. The following narrative is designed to accompany the draft permit and is presented in the same general order as the permit. This narrative is intended only as an adjunct for the reviewer and has no legal standing. Any revisions made to the permit in response to comments received during the public comment period and EPA review process will be described in an addendum to this narrative.

**I. Facility Description**

A. Existing Permits

Table 1: Current Title V Permit and Amendments

Permit/Amendment Number	Date of Issuance	Comments	
		Yes	No
2273-313-0084-V-01-0	Mar-18-02	X	
2273-313-0084-V-01-1	Apr-17-03	X	
2273-313-0084-V-01-2	Apr-17-03	X	

Table 2: Comments on Specific Permits

Permit Number	Comments
2273-313-0084-V-01-0	Initial Title V Permit.
2273-313-0084-V-01-1	Revision to PSD Avoidance conditions for SO <sub>2</sub> emissions from coal-fired boilers.
2273-313-0084-V-01-2	Adding propane as backup fuel for heaters and dryers.

B. Regulatory Status

1. PSD/NSR/RACT - This facility is a major source under the PSD regulations.
2. Title V Major Source Status by Pollutant

Table 3: Title V Major Source Status

Pollutant	Is the Pollutant Emitted?	If emitted, what is the facility's Title V status for the Pollutant?		
		Major Source Status	Major Source Requesting SM Status	Non-Major Source Status
PM	Y	Y		
PM <sub>10</sub>	Y	Y		
SO <sub>2</sub>	Y	Y		
VOC	Y	Y		
NO <sub>x</sub>	Y	Y		
CO	Y	Y		
TRS	N			
H <sub>2</sub> S	N			
Individual HAP			Y	
Total HAPs			Y	

## II. Proposed Modification

### A. Description of Modification

This modification is for the construction and operation of wet scrubbers (WS01, WS02, and WS03) on each of the three existing coal-fired boilers (BL04, BL05, and BL06). This project involves the replacement of the existing, original boiler stacks with new stacks and the installation of in-stack, open spray tower wet scrubbers for acid gas removal from the exhaust gases of each coal-fired boiler. The main purpose of this modification is to reduce the potential HAP emissions from the facility below the 10/25 tpy threshold so the facility will not be subject to the MACT Standards for Industrial Boilers (40 CFR 63 Subpart DDDDD) and Fabric Coating (40 CFR 63 Subpart OOOO). Shaw claims that the only HAP emitted in significant quantities is HCl from the coal-fired boilers. Therefore, by limiting HCl emissions below 10 tpy, the entire facility will be a synthetic minor source for HAP emissions. This project will also result in the reduction of SO<sub>2</sub> emissions from the facility.

### B. Emissions Change

**Table 4: Emissions Change Due to Modification**

Pollutant	Is the Pollutant Emitted?	Net Actual Emissions Increase (Decrease) (tpy)	Net Potential Emissions Increase (Decrease) (tpy)
PM	Y	0	0
PM <sub>10</sub>	Y	0	0
SO <sub>2</sub>	Y	0	0
VOC	Y	0	0
NO <sub>x</sub>	Y	0	0
CO	Y	0	0
TRS	Y	0	0
H <sub>2</sub> S	Y	0	0
Individual HAP	Y	0	(14.7)
Total HAPs	Y	0	(14.7)

### C. PSD/NSR Applicability

As mentioned previously, the scrubbers will also be effective at removing SO<sub>2</sub> emissions from the exhaust gases. The facility is already subject to a 250 tpy SO<sub>2</sub> PSD avoidance limit on the coal-fired boilers. SO<sub>2</sub> emissions are currently calculated based on the quantity of coal burned and the sulfur content of the coal. Shaw has requested that the SO<sub>2</sub> record keeping conditions be modified to account for the SO<sub>2</sub> removal by the scrubbers. This would allow them to burn more coal and still comply with the PSD avoidance limit. The SO<sub>2</sub> PSD avoidance limitation, itself (Condition 3.2.9), would not be changed. They also requested that the 1% coal sulfur limit in Condition 3.2.4 be relaxed back to the 2.5% sulfur limit in Rule (g).

**III. Facility Wide Requirements**

## A. Emission and Operating Caps:

Shaw is proposing a 10/25 tpy limit for HAPs. The main HAP of concern is HCl emissions from the coal-fired boilers. This limitation is being added as new condition 2.1.1

AP-42 reports an HCl emission factor of 1.2 lb/ton coal. The three coal-fired boilers are rated at 37.5 mmBtu/hr. A typical heat content of bituminous coal is 12,000 Btu/lb (or 24 mmBtu/ton). Therefore, potential HCl emissions from the coal-fired boilers are:

$$(3 \text{ boilers} \times 37.5 \text{ mmBtu/hr}) / (24 \text{ mmBtu/ton}) = 4.6875 \text{ ton/hr coal combustion}$$

$$4.6875 \text{ ton/hr coal} \times 1.2 \text{ lb HCl/ton} = 5.625 \text{ lb/hr HCl}$$

$$5.625 \text{ lb/hr HCl} \times (8760 \text{ hr/yr}) / (2000 \text{ lb/ton}) = 24.6 \text{ tpy HCl}$$

As these calculations demonstrate, without additional limitations, the facility is a major source of HAPs due to the HCl emissions from the coal-fired boilers.

AP-42 reports an HF emission factor of 0.15 lb/ton coal. Therefore, potential HF emissions from the coal-fired boilers are:

$$4.6875 \text{ ton/hr coal} \times 0.15 \text{ lb HF/ton} = 0.703 \text{ lb/hr HCl}$$

$$0.703 \text{ lb/hr HF} \times (8760 \text{ hr/yr}) / (2000 \text{ lb/ton}) = 3.1 \text{ tpy HF}$$

As these calculations demonstrate, potential HF emissions from the coal-fired boilers are below the HAP major source threshold, even without additional limitations or controls.

## B. Applicable Rules and Regulations: None

## C. Compliance Status: N/A

## D. Operational Flexibility: None

## E. Permit Conditions: None

Condition 2.1.1 is being added to limit HAP emissions below the major source threshold on a facility-wide basis.

**IV. Regulated Equipment Requirements**

A. Brief Process Description

This modification is for the construction and operation of wet scrubbers (WS01, WS02, and WS03) on each of the three existing coal-fired boilers (BL04, BL05, and BL06). This project involves the replacement of the existing, original boiler stacks with new stacks and the installation of in-stack, open spray tower wet scrubbers for acid gas removal from the exhaust gases of each coal-fired boiler. The main purpose of this modification is to reduce the potential HAP emissions from the facility below the 10/25 tpy threshold so the facility will not be subject to the MACT Standards for Industrial Boilers (40 CFR 63 Subpart DDDDD) and Fabric Coating (40 CFR 63 Subpart OOOO). Reduction of SO<sub>2</sub> emissions is an added benefit.

B. Equipment List for the Process

Emission Units		Regulatory Basis	Pollutants of Concern	Air Pollution Control Devices	
ID No.	Description			ID No.	Description
BL04	Coal boiler #1	MACT Avoidance PSD Avoidance	HCl Reduction from scrubber SO <sub>2</sub> Reduction from scrubber	PC01 WS01	Multiclone Wet scrubber
BL05	Coal boiler #2	MACT Avoidance PSD Avoidance	HCl Reduction from scrubber SO <sub>2</sub> Reduction from scrubber	PC02 WS02	Multiclone Wet scrubber
BL06	Coal boiler #3	MACT Avoidance PSD Avoidance	HCl Reduction from scrubber SO <sub>2</sub> Reduction from scrubber	PC03 WS03	Multiclone Wet scrubber

C. Equipment & Rule Applicability

**Emission and Operating Caps –**

Shaw has requested that the 1% coal sulfur limit in existing Condition 3.2.4 be relaxed back to the 2.5% sulfur limit in Rule (g).

**Applicable Rules and Regulations –**

The coal-fired boilers are subject to a sulfur limit of 2.5% sulfur, by weight, in accordance with Rule (g). This limit is currently subsumed in the 1% sulfur limit in Condition 3.2.4. Since the 1% limit is being relaxed as a result of the installation of the scrubbers, the 2.5% limit from Rule (g) needs to be specifically added to the permit.

D. Compliance Status

The facility has reported that they are in compliance.

E. Operational Flexibility

None requested other than the flexibility afforded by the permit conditions described below.

F. Permit Conditions

Condition 3.4.6 is being added to increase the allowable maximum sulfur content of the coal from 1% to 2.5%. This condition will replace condition 3.2.4 (1% sulfur limit) after the scrubbers are tested and the test report has been approved by EPD.

Condition 3.5.1 explains when new permit conditions related to the construction and operation of the scrubbers take effect and when the superceded permit conditions are no longer applicable.

V. **Testing Requirements (with Associated Record Keeping and Reporting)**

A. Individual Equipment:

In order to determine the scrubbers' ability to remove HCl and SO<sub>2</sub> emissions from the exhaust gases, initial performance tests have been required for HCl and SO<sub>2</sub> removal efficiency on each of the coal-fired boilers after the scrubbers become operational.

VI. **Monitoring Requirements (with Associated Record Keeping and Reporting)**

A. Individual Equipment:

Each scrubber will be required to monitor the scrubbant liquid flow rate at least once every hour of operation and the scrubbant pH at least once every hour of operation. Excursions will be defined as any time that there are two consecutive readings outside the expected range of the parameters. For scrubbant liquid flowrate, that means any flowrate that is less than 80% of the average rate determined during the tests. For pH, that means any pH that is less than the average pH determined during the tests.

VII. **Other Record Keeping and Reporting Requirements**

Existing Condition 6.2.10 contains the methodology for calculating SO<sub>2</sub> emissions resulting from coal combustion in the coal-fired boilers. This methodology is based on all of the sulfur in the coal being emitted to the atmosphere as SO<sub>2</sub> emissions. There is no component for crediting any SO<sub>2</sub> emissions that are removed by a control device. This condition is not being changed as part of this modification. However, as part of this modification, it will be replaced once the scrubbers have been put in operation and the emissions have been tested successfully.

Existing Condition 5.2.1 requires Shaw to check visible emissions from the coal-fired boilers. Upon startup of the wet scrubbers, this condition will be replaced by monitoring requirements on the scrubber. Due to the wet scrubbers, the exhaust gases will have excessive moisture making visible emission readings impractical.

Condition 6.2.13 is being added to replace Condition 6.2.10 for calculating SO<sub>2</sub> emissions from the coal-fired boilers. The calculation method in 6.2.13 uses the same method for estimating uncontrolled SO<sub>2</sub> emissions as was used in 6.2.10 with the addition of a SO<sub>2</sub> removal factor. This factor will be the SO<sub>2</sub> removal efficiency as determined in the test required by Condition 4.2.2 minus 5% removal (i.e. if test shows 94% removal, then SO<sub>2</sub> removal factor in Condition 6.2.12 will be 89% and the SRE term in

Condition 6.2.11 would be 0.89). This reduction in the SO<sub>2</sub> removal efficiency accounts for the fact that the scrubbers are likely to be operating at their peak performance during their initial performance test.

Condition 6.2.14 is being added to provide the HCl emission calculation methodology. This equation is very similar to the one in Condition 6.2.13 for SO<sub>2</sub>. The main difference is that potential uncontrolled HCl emissions are based on the AP-42 emission factor rather than material balance as is done with SO<sub>2</sub>.

Conditions 6.2.15, 16, and 17 are being added to determine and report HAP emissions on a facility-wide basis.

Condition 6.1.8 is being added to provide the new/modified excess emission/exceedance/excursion thresholds for the new scrubbers. The exceedance for the sulfur content of coal limit has been revised from 1% to 2.5% consistent with new Condition 3.4.6. A new exceedance has been defined as any 12 consecutive month period with HCl emissions equal to, or greater than, 10 tpy. Excursion thresholds have been defined as any two consecutive readings in which the scrubbant flow rate is less than 80% of the average values determined in the performance tests required by Conditions 4.2.2 and 4.2.3 or any two consecutive readings in which the scrubbant pH is less than the average values determined in the performance tests required by Conditions 4.2.2 and 4.2.3.

## VIII. Specific Requirements

### A. Operational Flexibility

Not applicable.

### B. Alternative Requirements

Not applicable.

### C. Insignificant Activities

None added.

### D. Temporary Sources

None.

### E. Short-Term Activities

None.

### F. Compliance Schedule/Progress Reports

The facility indicated that they were in compliance.

### G. Emissions Trading

Not applicable.

H. Acid Rain Requirements

Not applicable.

I. Prevention of Accidental Releases

This modification does not change the source's applicability.

J. Stratospheric Ozone Protection Requirements

This modification does not change the source's applicability to Title VI.

K. Pollution Prevention

None.

L. Specific Conditions

None.

## Addendum to Narrative

The 30-day public review started on November 26, 2004 and ended on December 27, 2004. Comments were received by the Division.

Comments were submitted by Shaw Industries dated December 27, 2004. No comments were received from anyone else. Since the comments are resulting in some changes to the permit amendment, the original construction permit amendment is being revoked and a new amendment is being issued with the amendment counter increased by 1.

Shaw Comment #1: Condition 6.1.8c.ii., as drafted, defines an excursion as any two consecutive pH readings that are less than the average pH during the initial startup test. Shaw commented that this was overly restrictive and requested that it be revised to allow for some slight variation (reduction) in the pH without that having to be reported as an excursion. Specifically, they requested that the definition be changed as follows:

“Any two consecutive readings during which the scrubant pH for a wet scrubber (WS01, WS02, or WS03) is less than 0.2 units below the average rate determined during the tests required by Conditions 4.2.2 and 4.2.3”

EPD Response #1: EPD agrees and the condition has been changed accordingly.

Shaw Comment #2: Condition 6.2.15, as drafted, requires the facility to track monthly usage of HAP containing material. As drafted, this condition does not acknowledge that many industrial chemicals denoted as HAP free by the suppliers and on the products' MSDS may contain trace HAP materials. These HAP constituents are not intended by the manufacturer to remain in the product, they are not part of the product's specification, they impart no beneficial value or property, and in most instances are not known to exist by the end user. The use of the term “all HAP containing materials” could be so broadly interpreted that incoming tap water from the local utility could be subject to tracking by the facility.

Therefore, Shaw requested that the Division either amend the permit condition to establish certain de minimis HAP content boundaries around the materials to be tracked, or clearly state in the Permit Narrative that the expectations for tracking are the OSHA MSDS reporting levels (i.e. 1.0% for most HAPs and 0.1% for carcinogens).

EPD Response #2:

Shaw has a valid concern about recordkeeping standards. The Textile MACT (40 CFR 63, Subpart OOOO) acknowledges the importance of the MSDS and/or Manufacturer's formulation data in tracking HAP content and compliance with MACT-base HAP emission standards. EPD chooses to not amend the permit but to address their concerns in this Narrative addendum.

For the purpose of Condition 6.2.15, EPD believes that the term “all HAP containing materials” can be interpreted to exclude materials, on an as-received basis prior to any on-site alteration, meeting the definition of “No organic HAP” found in the Textile MACT (§63.4371). This principle may also be extended for the non-organic HAPs, although the methods for determining HAP content of a regulated material will obviously be different for non-organic HAPs. The definition of “No organic HAP” is:

*No organic HAP* means no organic HAP is present at 0.1 percent by mass or more for OSHA-defined carcinogens as specified in 29 CFR 1910.1200(d)(4) and at 1.0 percent by mass or more for

other compounds. The organic HAP content of a regulated material is determined according to § 63.4321(e)(1).

The methods used to determine HAP content are specified in §63.4321(e)(1) and are included below.

Methods for Determining Organic HAP Content (40 CFR63, Subpart OOOO)

§63.4321(e)(1) *Determine the mass fraction of organic HAP for each material.*

You must determine the mass fraction of organic HAP for each regulated material applied during the compliance period by using one of the options in paragraphs (e)(1)(i) through (v) of this section. You must use the option in paragraph (e)(1)(iv) of this section for each printing, slashing, dyeing, or finishing material applied during the compliance period.

(i) *Method 311 (appendix A to 40 CFR part 63).*

You may use Method 311 for determining the mass fraction of organic HAP. Use the procedures specified in paragraphs (e)(1)(i)(A) and (B) of this section when performing a Method 311 test.

(A) Count each organic HAP that is measured to be present at 0.1 percent by mass or more for Occupational Safety and Health Administration (OSHA)-defined carcinogens as specified in 29 CFR 1910.1200(d)(4) and at 1.0 percent by mass or more for other compounds. For example, if toluene (not an OSHA carcinogen) is measured to be 0.5 percent of the material by mass, you don't have to count it. Express the mass fraction of each organic HAP you count as a value truncated to no more than four places after the decimal point (*e.g.*, 0.3791).

(B) Calculate the total mass fraction of organic HAP in the regulated material being tested by adding up the individual organic HAP mass fractions and truncating the result to no more than three places after the decimal point (*e.g.*, 0.763).

(ii) *Method 24 (appendix A to 40 CFR part 60).*

You may use Method 24 to determine the mass fraction of nonaqueous volatile matter and use that value as a substitute for mass fraction of organic HAP. For a multi-component coating with reactive chemicals, you may use Method 24 on the coating as applied to determine the mass fraction of nonaqueous volatile matter and use that value as a substitute for the mass fraction of organic HAP determined from the sum of organic HAP in each component.

(iii) *Alternative method.* You may use an alternative test method for determining the mass fraction of organic HAP, mass fraction of solids, or fraction of organic HAP emitted from a reactive coating once the Administrator has approved it. You must follow the procedure in § 63.7(f) to submit an alternative test method for approval.

Shaw Comment #3: Condition 6.2.16 requires the use of records from Conditions 6.2.13, 6.2.14, and 6.2.15 for the Permittee to determine total monthly emissions of hazardous air pollutants (HAP). However, Condition 6.2.13 requires the calculation of monthly SO<sub>2</sub> emissions; since SO<sub>2</sub> is not a HAP, the two references to Condition 6.2.13 should be removed.

EPD Response #3: EPD agrees and the condition has been changed accordingly.

Shaw Comment #4: The first sentence for both Condition 4.2.2 and Condition 4.2.3 begins "Within 60 days after after". The second "after" should be removed.

EPD Response #4: EPD agrees and the condition has been changed accordingly.