

To: File
From: John Legg
Date: August 18, 2016

John Legg
8/18/16

Subj: R13-2880B - Class II Administrative Update to R13-2880A
Skana Aluminum Company (Skana)
Wilsonburg Facility, Clarksburg, Harrison County, WV
Company ID: 033-00198
Permit No: R13-2880B

The above application was submitted by Skana to the DAQ on April 28, 2016. The \$300.00 permitting fee was paid on April 29, 2016 and the writer was assigned as the reviewing engineer the same day. Skana's legal advertisement ran in *The Exponent Telegram* on May 2, 2016. The newspaper's affidavit of publication arrived at the DAQ on May 31, 2016 and the application was deemed to be complete.

The purpose of this Class II Administrative Update is to allow for the installation and operation of a natural gas fired exothermic lean gas generator. This natural gas fueled equipment will generate a lean atmosphere for the annealing furnaces. Emissions are expected to be:

Pollutants	Emissions	
	(lb/hr)	(ton/yr)
CO	5.50	24.1
NOx	0.174	0.764
PM	0.0132	0.059
SO2	0.0010	0.0046
VOC	0.0096	0.042

FACILITY OVERVIEW

The following process description came from Attachment G in the application:

The Skana Aluminum Company process can best be described with respect to air emissions as follows:

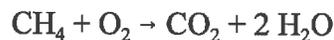
Aluminum coils are unloaded via fork truck in the Receiving Area, and are then transported to the Cold Rolling Mill, where a continuous sheet of aluminum is drawn through a set of rolls which physically reduce the sheet thickness. The mill used at Skana Aluminum is categorized as a 4-HI cold rolling mill. A light hydrocarbon oil (similar to kerosene) is applied to the aluminum sheet as it passes through the roll. The MSDS sheet for this oil was provided in the R13-2880 permit application.

After passing through the Cold Rolling Mill, the aluminum sheet is re-rolled into a coil and is annealed in Annealing Furnaces 1, 2, or 3. Each of these furnaces uses natural gas as fuel for the indirect burners. The actual furnace payload area which contains coils of aluminum is inerted with nitrogen to provide a non-oxidizing environment. The furnaces are heated to a maximum temperature of 600°C. The inerting atmosphere from the furnaces contains a limited VOC content which remains on the coils from the rolling process. The total VOC content per furnace load is estimated to be less than ten (10) pounds per furnace cycle.

Exothermic Lean Gas Used as a Furnace Atmosphere

The following information came from an article written by C.A. Stickels, in the June 1981 issue of the American Society for Metals's *Journal of Heat Treating*, Volume 2, Issue 1, pages 20 - 27. It was pulled from the internet by the writer and used here to help explain the use of the natural gas fired exothermic lean gas generator to be used in Skana's annealing process.

Annealing processes often use exothermic gas as a furnace atmosphere to protect against oxidation, i.e., exothermic gas atmospheres, formed from the nearly complete combustion of natural gas (methane) are used to protect many metals from oxidation during annealing. In most instances, the air/gas ratios used to form the atmosphere are on the gas-rich side of the ratio corresponding to complete combustion. For methane, the ratio of air to methane (A/M) for the reaction



is 9.57 (exothermic lean atmospheres); values of A/M from 5.6 to 9.2 are used for rich exothermic atmospheres.

Exothermic atmospheres are formed by burning air and hydrocarbon gas in the combustion chamber of a gas generator. After leaving the gas generator, the products of combustion are passed through a heat exchanger to reduce the dew point of the gas to ambient temperature or below. The combustion chamber (of the gas generator) may contain high surface area refractory cubes impregnated with NiO to catalyze the reaction. No external source of heat is needed, hence the name "exothermic"; "endothermic" atmospheres, produced with lower air/fuel ratios, do require external heating of the combustion chamber.

An important application of exothermic gas atmospheres is the subcritical annealing of low carbon steel, in which the atmosphere prevents oxidation of the steel. There is little problem in choosing and producing non-oxidizing atmospheres for furnace temperatures above about 625°C. Below this temperature, however, side reactions can occur which produce methane and carbon. While these reactions probably do not approach equilibrium in most furnaces, to the extent to which they do occur, they produce two deleterious effects: 1) sooting, and 2) alteration of a non-oxidizing atmosphere to an oxidizing one.

New XH1500 Exothermic Lean Gas Generator

See Attachment 2 to this evaluation contains additional vendor information about the natural gas fired exothermic lean gas generator.

Table 1: NG Fired Exothermic Lean Gas Generator Added to the Emissions Unit Table at Skana's Wilsonburg, WV Facility.						
Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed/ Modified	Design Capacity	Date of Change	Control Device
401S	401E	Exothermic Lean Gas Generator	2016	1,744 ft ³ /hr	New 2016	None

Table 2: Emissions Unit Data Sheet for Skana's NG Fired Exothermic Lean Gas Generator.	
Name, Type & Model of Proposed Affected Source:	XH1500-NM-HE Exothermic Lean Gas Generator
Maximum Amount of Process Material Charged Per Hour:	1,744 scfh natural gas
Maximum Amount of Process Material Produced Per Hour:	15,000 scfh exothermic lean gas
Projected Operating Schedule:	24 hrs/day; 7 days/wk; 52 weeks/yr

SITE INSPECTION

The writer did not conduct an inspection for this Class II Administrative Update.

Skana's Wilsonburg facility was last inspected on March 3, 2015, by Enforcement Inspector Karl L. Dettinger out of the DAQ's North Central Regional Office in Fairmont, WV. The facility was found to be in compliance and was given the inspection code of 30. Karl wrote the following entry into the Airtrak inspection portion of the database:

F.C.E. inspection of Skana Aluminum Company's Wilsonburg facility was conducted on 3-2-15. Several issues were discovered during the inspection. This included the operation of Annealing Furnace 3 and no ability to individually monitor and record natural gas usage in each of the identified sources at the facility. Facility-wide natural gas usage was less than the total of the allowable unit-specific limits on natural gas usage. Photos were taken of the rolling mill exhaust and of the rolling mill equipment during the inspection.

Writer's Note: Updates R13-2880A and B do not address the problem of no ability to individually monitor and record natural gas usage in each of the identified sources at the facility.

The facility is located in an industrial area just off Route 50, west of downtown Clarksburg. The closest residential area is about 0.25 miles north-northeast of the facility. Directions as given in the application are:

From Clarksburg take US Route 50 West. Exit at Wilsonburg. Turn right at the stop sign. The plant is located on the left approximately 0.25 miles from the exit.

REGULATORY APPLICABILITY

This section will address the potential regulatory applicability/non-applicability of substantive state and federal air quality rules relevant to this permitting action.

45CSR2: To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers.

The natural gas fired exothermic lean gas generator does **NOT** meet the definition of “fuel burning unit” under 45CSR2 and is, therefore, **NOT** subject to the applicable requirements therein.

"Fuel Burning Unit" means and includes any furnace, boiler apparatus, device, mechanism, stack or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer.

The exothermic lean gas generator's primary purpose is to produce a furnace atmosphere to protect against the oxidation of the steel during the annealing process. It does not meet the definition of a “Fuel Burning Unit” under Rule 2.

45CSR7: To Prevent and Control Particulate Air Pollution from Manufacturing Process Operations

The purpose of this rule is to prevent and control particulate matter air pollution from manufacturing processes and associated operations.

Skana's manufacturing process produces thinner annealed coils of aluminum (see Facility Overview,above).

Skana's manufacturing process is thought by the writer to be a type “a” source operation causing/involving a physical change as opposed to being a type “b” source operation involved in the metallurgical manufacturing of aluminum.

The exothermic lean gas generator needs to meet the following requirements of Rule 7:

- 3.1. No person shall cause, suffer, allow or permit emission of smoke and/or particulate matter into the open air from any process source operation which is greater than twenty (20) percent opacity, except as noted in subsections 3.2, 3.3, 3.4, 3.5, 3.6, and 3.7.
- 3.2. The provisions of subsection 3.1 shall not apply to smoke and/or particulate matter emitted from any process source operation which is less than forty (40) percent opacity for any period or periods aggregating no more than five (5) minutes in any sixty (60) minute period.
- 4.1. No person shall cause, suffer, allow or permit particulate matter to be vented into the open air from any type source operation or duplicate source operation, or from all air pollution control equipment installed on any type source operation or duplicate source operation in excess of the quantity specified under the appropriate source operation type in Table 45-7A found at the end of this rule.

The largest annealing furnace (#1) can process 30 ton/hr of aluminum. For a type "a" source operation (a manufacturing process source operation involving a physical change), Table 45-7A allows a process weight rate of 31 pounds per hour of particulate matter emissions.

The exothermic lean gas generator is estimated to emit only 0.0132 lb/hr of particulate matter and easily complies with Rule 7's emission limits.

45CSR10: To Prevent and Control Air Pollution from the Emission of Sulfur Oxides

45CSR10 has requirements limiting SO₂ emissions from "fuel burning units," limiting in-stack SO₂ concentrations of "manufacturing processes," and limiting H₂S concentrations in process gas streams.

The natural gas fired exothermic lean gas generator does **NOT** meet the definition of "fuel burning unit" under 45CSR10 and is, therefore, **NOT** subject to the applicable requirements therein.

"Fuel Burning Unit" means and includes any furnace, boiler apparatus, device, mechanism, stack or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer.

The exothermic lean gas generator's primary purpose is to produce a furnace atmosphere to protect against the oxidation of the steel during the annealing process. It does not meet the definition of a "Fuel Burning Unit" under Rule 10.

Only pipeline quality natural gas will be used/consumed in the gas generator, resulting in low SO₂ emissions that easily met Rule 10 emission limits.

45CSR13: Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation

Skana's Wilsonburg Facility is an existing stationary source that already has a Rule 13 permit (R13-2880B).

The installation of the natural gas fired exothermic lean gas generator is considered to be a class II administrative update because it results in an increase in emissions (of CO, NO_x, SO₂, PM and VOC) of less than:

- six (6) pounds per hour and ten (10) tons per year or more, or more than 144 pounds per calendar day, of any regulated air pollutant;
- 2 pounds per hour or 5 tons per year of hazardous air pollutants considered on an aggregated basis;

Skana submitted a complete application, ran a legal advertisement, and paid a \$300.00 application fee to update their permit.

45CSR14: Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration

Harrison County is classified as "in attainment" with all criteria pollutants. Therefore, as the Wilsonburg Plant is not a "listed source" under §45-14-2.43, the major source applicability threshold for all pollutants is 250 TPY. The post-updated PTE of all criteria pollutants is less than 250 TPY and, therefore, the provisions of 45CSR14 do not apply.

45CSR30: Requirements for Operating Permits

45CSR30 provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act.

The updated facility will not have criteria pollutant emissions in excess of 100 TPY or have any applicability to a federal performance standard and, therefore, will not be subject to the requirements of 45CSR30.

[The permit is still defined as a “synthetic minor” for the purposes of Title V permitting based on the limitation of rolling oil loss of 80.80 TPY, and the theoretical loss (if unlimited by the permit) of over 100 TPY of rolling oil.]

Emission Calculations

The writer checked and agrees with Skana’s emission calculations for the natural gas generator. Calculation were given in Attachment N to permit application R13-2880B.

Table 3: Estimate Emissions from Skana’s NG Fired Exothermic Lean Gas Generator.			
Pollutants	AP-42 Emission Factor	Emissions	
	(lb/10⁶ ft³)	(lb/hr)	(ton/yr)
CO	3,153.6 ⁽¹⁾	5.50	24.1
CO ₂	110, 092 ⁽¹⁾	192	841
NO _x	100 ⁽²⁾	0.174	0.764
SO ₂	0.6 ⁽²⁾	0.0010	0.0046
VOC	5.5 ⁽²⁾	0.0096	0.042
PM-CONDENSATE	5.7 ⁽²⁾	0.0099	0.044
PM-FILTER	1.9 ⁽²⁾	0.0033	0.015
PM (PM-CON + PM-FIL)	7.6	0.0132	0.059

- (1) Derived from information provided by the equipment vendor.
Vendor states: CO emissions limits are 5.5 lb/hr and 24.1 ton/yr and CO2 emission limits are 192 lb/hr and 841 ton.yr.
- (2) Emission Factor from USEPA AP-42 Chapter 1, Section 4, Tables 1.4-1 and 1.4-2, dated 7/1998.

Example: $100 \text{ lb NO}_x/10^6 \text{ ft}^3 \times 1,744 \text{ ft}^3/\text{hr} = 0.174 \text{ lb/hr NO}_x$
 $0.174 \text{ lb NO}_x/\text{hr} \times 8,760 \text{ hr/yr} / 2,000 \text{ lb/ton} = 0.764 \text{ ton/yr NO}_x$

<p>1,744,000 Btu/hr 1,000 Btu/ft³ 1,744 ft³/hr 15,277,400 ft³/yr 8,760 hr/yr</p>	<p>Burner Size = Maximum Heat Input to Exothermic Gas Generator Natural Gas Heating Value Hourly Maximum Natural Gas Usage Rate Annual Maximum Natural Gas Usage Rate Maximum Annual Operating Hours</p>
--	--

Facility-wide emissions were calculated by the writer by taking the facility-wide emissions calculated in the engineering evaluation for R13-2880A and adding the estimated emissions from the natural gas fired exothermic lean generator.

Table 4: Facility-Wide Annual PTE Summary in TPY After the Addition of the Natural Gas Fired Exothermic Lean Gas Generator.

Source	CO	NO _x	PM _{2.5}	PM ₁₀	PM	SO ₂	VOCs
Rolling Oil Use ⁽¹⁾	n/a	n/a	n/a	n/a	n/a	n/a	80.80
Rolling Mill	n/a	n/a	0.58	0.58	0.58	n/a	n/a
Annealing Furnaces (1 & 2)	2.01	2.39	0.18	0.18	0.18	0.01	0.13
Annealing Furnace (3)	0.30	0.35	0.01	0.01	0.01	0.01	0.01
Space Heating	0.26	0.30	0.02	0.02	0.02	0.01	0.02
Paved Haulroads	n/a	n/a	0.08	0.33	1.67	n/a	n/a
Old Facility-Wide Totals →	2.57	3.04	0.87	1.12	2.46	0.03	80.96
Natural Gas Fired Exothermic Lean Generator	24.10	0.46	0.02	0.03	0.06	0.01	0.04
New Facility-Wide Totals	26.67	3.50	0.89	1.15	2.52	0.04	81.00

(1) As noted above, this accounts for all the oil lost in the process from various emission points.

CHANGES MADE TO R13-2880A

A file detailing the changes made to permit R13-2880A to arrive at permit R13-2880B is provided in Attachment 1 to this evaluation.

RECOMMENDATION TO DIRECTOR

The information supplied in permit application R13-2880B indicates that compliance with all applicable requirements will be achieved. Therefore, it is the writer's recommendation that this class II administrative update permit (for the installation of a natural gas fired exothermic lean gas generator) to Skana's Wisonburg, WV facility be granted.

Attachment 1

File Comparing Permit R13-2880A to Permit R13-2880B

Skana Aluminum Company
345 Wilsonburg Road
Clarksburg, WV 26301

WordPerfect Document Compare Summary

Original document: Q:\AIR_QUALITY\J_LEGG\Skana Aluminum
Company\033-00198_PERM_13-2880A.wpd

Revised document: @PFDesktop\MyComputer\Q:\AIR_QUALITY\J_LEGG\Skana Aluminum
Company\R13-2330B\033-00198_PERM_13-2880B.wpd

Deletions are shown with the following attributes and color:

~~Strikeout~~, **Blue** RGB(0,0,255).

Deleted text is shown as full text.

Insertions are shown with the following attributes and color:

Double Underline, Redline, **Red** RGB(255,0,0).

The document was marked with 18 Deletions, 29 Insertions, 0 Moves.

West Virginia Department of Environmental Protection

*Earl Ray Tomblin
Governor*

Division of Air Quality

*Randy C. Huffman
Cabinet Secretary*

Permit to Update



R13-2880**AB**

This permit is issued in accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§ 22-5-1 et seq.) and 45 C.S.R. 13 — Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation. The permittee identified at the facility listed below is authorized to construct the stationary sources of air pollutants identified herein in accordance with all terms and conditions of this permit.

Issued to:
Skana Aluminum Company
Wilsonburg Plant
033-00198

*William F. Durham
Director*

Issued: ~~June~~ August 19, 20156

Facility Location: Wilsonburg, Harrison County, West Virginia
Mailing Address: 345 Wilsonburg Road, Clarksburg, WV 26301
Facility Description: Aluminum Sheet Rolling and Sizing Facility
NAICS Codes: 331319
UTM Coordinates: 552.6 km Easting • 4,348.5 km Northing • Zone 17
Permit Type: Class II Administrative Update
Desc. of Change: Permit to ~~place back into service existing~~install a natural ~~gas-fired Annealing Furnace~~ gas
fired exothermic lean gas generator.

Any person whose interest may be affected, including, but not necessarily limited to, the applicant and any person who participated in the public comment process, by a permit issued, modified or denied by the Secretary may appeal such action of the Secretary to the Air Quality Board pursuant to article one [§§ 22B-1-1 et seq.], Chapter 22B of the Code of West Virginia. West Virginia Code §22-5-14.

As a result of the granting of this permit, the source is not subject to 45CSR30.

1.0 Emission Units

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
101S	101E	Rolling Mill	1989	16.5 TPH	Mist Eliminator (101C)
210S	210E	Annealing Furnace 1	1989	18.00 mmBtu/hr 30 tons/cycle	None
220S	220E 221E 222E	Annealing Furnace 2	1989	5.00 mmBtu/hr 10.5 tons/cycle	None
230S	230E ⁽¹⁾ 231E ⁽²⁾	Annealing Furnace 3	1992	0.80 mm Btu/hr 917 lb/hr	None
300S	300E	Rolling Oil Storage Tank	1989	8,000 gal	None
<u>401S</u>	<u>401E</u>	<u>Exothermic Lean Gas Generator</u>	<u>2016</u>	<u>1.75 mmBtu/hr</u>	<u>None</u>
Various	Various	Natural Gas-Fired Space Heating	1989	1.39 mmBtu/hr	None
(1) Purge Stack. (2) Combustion Stack.					

2.3. Authority

This permit is issued in accordance with West Virginia Air Pollution Control Law W.Va. Code §§22-5-1 et seq. and the following Legislative Rules promulgated thereunder:

- 2.3.1. 45CSR13 – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation.*

2.4. Term and Renewal

- 2.4.1. This permit supercedes and replaces previously issued Permit R13-2880~~A~~. This permit shall remain valid, continuous and in effect unless it is revised, suspended, revoked or otherwise changed under an applicable provision of 45CSR13 or any applicable legislative rule.

2.5. Duty to Comply

- 2.5.1. The permitted facility shall be constructed and operated in accordance with the plans and specifications filed in Permit Applications R13-2880, R13-2880A, R13-2880B and any modifications, administrative updates, or amendments thereto. The Secretary may suspend or revoke a permit if the plans and specifications upon which the approval was based are not adhered to; [45CSR§§13-5.11 and 13-10.3]
- 2.5.2. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the West Virginia Code and the Clean Air Act and is grounds for enforcement action by the Secretary or USEPA;
- 2.5.3. Violations of any of the conditions contained in this permit, or incorporated herein by reference, may subject the permittee to civil and/or criminal penalties for each violation and further action or remedies as provided by West Virginia Code 22-5-6 and 22-5-7;
- 2.5.4. Approval of this permit does not relieve the permittee herein of the responsibility to apply for and obtain all other permits, licenses and/or approvals from other agencies; i.e., local, state and federal, which may have jurisdiction over the construction and/or operation of the source(s) and/or facility herein permitted.

2.6. Duty to Provide Information

The permittee shall furnish to the Secretary within a reasonable time any information the Secretary may request in writing to determine whether cause exists for administratively updating, modifying, revoking or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Secretary copies of records to be kept by the permittee. For information claimed to be confidential, the permittee shall furnish such records to the Secretary along with a claim of confidentiality in accordance with 45CSR31. If confidential information is to be sent to USEPA, the permittee shall directly provide such information to USEPA along with a claim of confidentiality in accordance with 40 C.F.R. Part 2.

4.0. Source-Specific Requirements

4.1. Limitations and Standards

4.1.1. The emission sources authorized to operate at the facility, excluding those as defined as *de minimis* sources under §45-13-2.6, are limited to those specified under Table 1.0 of this permit. Each source shall be:

- a. Designed, maintained, and operated so as to minimize any fugitive escape of pollutants; and
- b. Shall not exceed the specified design parameters; and
- c. Shall, where applicable, use the specified control device.

4.1.2. Maximum combustion exhaust emissions from each specified combustion source shall **not** exceed those values given in the following table:

Table 4.1.2.: Combustion Emission Limits

Source (ID)	Emission Point ID	CO		NO _x		PM/PM ₁₀ ⁽¹⁾		SO ₂		VOCs ⁽²⁾	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Furnace #1 (210S) ⁽²⁾	210E	1.51	1.57	1.80	1.87	0.14	0.14	0.01	0.01	0.10	0.10
Furnace #2 (220S) ⁽²⁾	220E 221E 222E	0.42	0.44	0.50	0.52	0.04	0.04	0.01	0.01	0.03	0.03
Furnace #3 (230S) ⁽²⁾	230E 231E	0.07	0.30	0.08	0.35	0.01	0.03	0.01	0.01	0.01	0.02
<u>Exothermic Lean Gas Generator</u>	<u>401E</u>	<u>5.50</u>	<u>24.10</u>	<u>0.18</u>	<u>0.77</u>	<u>0.02</u>	<u>0.06</u>	<u>---</u>	<u>---</u>	<u>0.01</u>	<u>0.05</u>
Space Heating	Various	0.23	0.26	0.28	0.30	0.02	0.02	0.01	0.01	0.02	0.02

(1) All particulate matter emissions are assumed to be PM_{2.5} and include condensable emissions.

(2) VOC emissions from Annealing Furnaces do not account for rolling oil flashed off during heating process. These emissions are accounted for under 4.1.3.

4.1.3. Facility-wide emissions of VOCs from the use of rolling oil shall not exceed 80.80 TPY.

4.1.4. Emissions of total particulate matter (assumed for the purposes of this permit as PM_{2.5} or smaller), as emitted from the Mist Collector Stack (Emission Point 101E), and based on testing methods given under 45CSR7A, shall not exceed 0.40 lb/hr or 0.58 TPY.

4.1.5. Annealing Furnace 1, Annealing Furnace 2, Annealing Furnace 3, the Exothermic Lean Gas Generator and the Space Heaters shall only combust natural gas and shall be subject to the following annual natural gas combustion limits:

Source (ID)	Annual Natural Gas Combustion Limit (mmscf/yr)
Furnace #1 (210S)	37.44
Furnace #2 (220S)	10.40
Furnace #3 (230S)	2.08 ⁽¹⁾
<u>Exothermic Lean Gas Generator</u>	<u>15.28</u> ⁽²⁾
Space Heating	3.04

(1) Based on operating 2,600 hr/yr (10 hr/day x 5 day/wk x 52 wk/yr).
 (2) Based on operating 8,7560 hr/yr.

- 4.1.6. The permittee shall properly maintain the pavement on all haulroads and mobile work areas (including a reasonable shoulder area) within the plant boundary.
- 4.1.7. Annealing Furnace 4 shall be permanently removed from service. For the purposes of this permit, “removed from service” shall mean that the fuel supply to the furnace shall be cut in a such a manner that it may not be reasonably reconnected in a short time frame.
- 4.1.8. The fuel burning units, identified as the Annealing Furnaces and Natural Gas-Fired Space Heating, are subject to the applicable limitations and standards under 45CSR2, including the requirements as given below under (a) through (c).
- a. The permittee shall not cause, suffer, allow or permit emission of smoke and/or particulate matter into the open air from the fuel burning units which is greater than ten (10) percent opacity based on a six minute block average.
 [45CSR§2-3.1]
 - b. The permittee shall not cause, suffer, allow or permit the discharge of particulate matter into the open air from the fuel burning units, measured in terms of pounds per hour in excess of the amount determined as follows:
 - (1) The product of 0.09 and the total design heat input for the fuel burning units in million British Thermal Units (B.T.U.'s) per hour, provided however that no more than twelve hundred (1200) pounds per hour of particulate matter shall be discharged into the open air.
 [45CSR§2-4.1a]
 - c. The visible emission standards set forth in section 3 of 45CSR2 shall apply at all times except in periods of start-ups, shutdowns and malfunctions. Where the Director believes that start-ups and shutdowns are excessive in duration and/or frequency, the Director may require an owner or operator to provide a written report demonstrating that such frequent start-ups and shutdowns are necessary.
 [45CSR§2-9.1]

- 4.1.9. The Cold Rolling Mill ~~is and the Exothermic Lean Gas Generator are~~ subject to the applicable limitations and standards under 45CSR7, as given below under (a) through (c).
- a. ~~The permittee~~ No person shall not cause, suffer, allow or permit emission of smoke and/or particulate matter into the open air from ~~the Cold Rolling Mill~~ any process source operation which is greater than twenty (20) percent opacity, except as noted under 4.1.69.b of this permit.
[45CSR§7-3.1]
 - b. The provisions of subsection 4.1.9.a of this permit shall not apply to smoke and/or particulate matter emitted from ~~the Cold Rolling Mill~~ any process source operation which is less than forty (40) percent opacity for any period or periods aggregating no more than five (5) minutes in any sixty (60) minute period.
[45CSR§7-3.2]
 - c. ~~The permittee~~ No person shall ~~not~~ cause, suffer, allow or permit particulate matter to be vented into the open air from any ~~manufacturing process type~~ source operation or duplicate source operation, or from all air pollution control equipment installed on any ~~manufacturing process type~~ source operation; or duplicate source operation in excess of the quantity specified under the appropriate source operation type in Table 45-7A found at the end of 45CSR7 this rule.-
[45CSR§7-4.1]
- 4.1.10. The fuel burning units, identified as the Annealing Furnaces and Natural Gas-Fired Space Heating, are subject to the applicable limitations and standards under 45CSR10, as given below under (a).
- a. The permittee shall not cause, suffer, allow or permit the discharge of sulfur dioxide into the open air from the fuel burning units measured in terms of pounds per hour, in excess of the product of 3.2 and the total design heat of the boilers in million BTU's per hour.
[45CSR§10-3.1]
- 4.1.11. **Operation and Maintenance of Air Pollution Control Equipment.** The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.
[45CSR§13-5.11.]

4.2. Monitoring and Compliance Demonstration Requirements

- 4.2.1. For the purposes of demonstrating compliance with the VOC limit set forth in 4.1.3., the permittee shall monitor and record, on a monthly and rolling twelve month basis, the facility-wide VOC emissions associated with the use of rolling oil. The permittee shall use the following equation to determine the VOC emissions for a given month associated with the use of rolling oil:

$E_m = (A - B) * C$; where

- E_m = lb-VOCs emitted/month
A = lbs new rolling oil used in process/month
B = lbs rolling oil landfilled/month
C = percent by weight of VOC in rolling oil

Attachment 2

Vendor Information

XH1500 Exothermic Lean Gas Generator

Skana Aluminum Company
345 Wilsonburg Road
Clarksburg, WV 26301

The following information came from Attachment L to Skana's permit application R13-2880B.

XH1500 Exothermic Lean Gas Generator

Gas Atmospheres offers to supply a Model XH1500 Exothermic Lean Gas Generator designed and manufactured in accordance with the following specifications.

The Gas Atmospheres Model XH1500-NM-HE Gas Generator shall provide 15,000 SCFH of exothermic lean gas at the following adjustable analysis:

* <u>Analysis</u>	<u>% by Volume (adjustable)</u>
Carbon Monoxide	0.25 to 5.0%
Hydrogen	0.25 to 5.0%
Oxygen	<100 ppm
Carbon dioxide	12 to 9%
Nitrogen	Balance

To process:

Volume	15,000 SCFH
Pressure	14" W.C.
Temperature	15°F above entering cooling water temperature.
W/Refrigerant Dryer	40°F Temperature/Dewpoint

ASSUMED SITE CONDITIONS:

Fuel: Natural Gas	5 PSIG min.
Cooling Water In:	Treated Tower Water (Max 85°F)
Electricity:	460/3/60
Area Classification	Indoor, unclassified
Elevation	Unknown

* Analysis based on the use of natural gas for combustion fuel

Equipment

Combustion System

The combustion system employs a nozzle mix burner mounted on a carbon steel face plate with pilot assembly, ultra violet flame supervision and flame viewing port. The face plate is gasketed and bolted to the combustion chamber. The burner is supplied with a pre-piped air and fuel control package for controlling combustion air and fuel volumes and is complete with safeties and interlocks. The combustion system includes:

- Nozzle mix burner with intermittent pilot (Pyronics).
- Ultra violet flame supervision-self checking (Fireye).
- Combustion air blower, with inlet filter/silencer and ODP motor (Spencer Turbine).
- Air flow switch - LOW
- High/Low fuel gas pressure switches
- Fuel safety shut off valve and Fuel blocking valve
- Ratio control regulator
- Limiting orifice, flow elements and flow adjusting valves

The combustion system is designed to meet NFPA 86 Standards and to operate at 3 PSIG. A fuel pressure regulator maybe necessary depending upon incoming Natural Gas pressure.

Combustion Chamber

The combustion chamber is a water cooled, modified two-pass scotch boiler design consisting of a stainless steel firing tube, stainless steel tube sheets and return flue tubes enclosed in a water tight carbon steel shell. Exothermic gas, cooled to approximately 500°F, is discharged from combustion chamber assembly through an outlet on the burner end of the unit. The fabricated assembly is supplied with the following:

- Water tight carbon steel shell with flanged ends for mounting the burner plate and rear door.
- Type 304 stainless steel firing tube.
- Type 304 stainless steel tube sheets and return flue tubes rolled and TIG seal welded.
- 40 psig design pressure waterside.
- Water cooled rear door of carbon steel construction with thermocouple and peep sight.
- Hard refractory surrounding the burner.
- Water temperature swithc - HIGH.
- Water flow switch.

Gas Cooling

The effluent atmosphere gas from the combustion chamber passes through the tube side of the shell and tube after-cooler. Water condensed in the after-cooler is removed from the gas stream.

- Gas After-cooler, carbon steel shell with removable bundle, copper tubes, steel tube sheets and baffles; ASME Section VIII designed and stamped for 150 psig.
- Gas/Water Separator
 - Carbon steel vessel with Tp 304 S.S. mist eliminator connected to the discharge of the gas cooler
 - Condensate drainer, thermometer, temperature switch, level switch, and pressure gauge.
- Atmosphere Over-pressure Relief Regulator shipped as a loose item for installation in the product gas piping or installed on Gas/Water Separator depending upon capacity of generator.

Automatic Turndown

Floating on line turndown with a range of 100% to 30% of design rated capacity is composed of a butterfly valve with a 4-20mA positioner located in the combustion air supply to the burner and a pressure transducer sensitive to the generated gas discharge pressure. As pressure changes at the generator discharge due to a rise or fall of product gas required the output (4-20mA) from the pressure transducer changes to increase or decrease generator capacity and maintain pressure setpoint. When capacity reached the 30% rate any additional pressure increase in Product Gas pressure will cause the Inert Gas Relief Valve to open venting excess product Inert Gas to atmosphere.

Controls

Electrical controls for the generator are mounted on the side of the generator in a NEMA 12 dust tight enclosure and included:

- Fused interlocking door disconnect switch
- Control power transformer, 460/3/60 to 120/1/60
- Automatic Start-up control (Fireye)
- Flame Supervision (Fireye)
- Motor starter
- Cover elements including:
 - Pilot Lights: Air Blower Run
 - Purge Complete
 - Flame ON
 - Alarm OFF

Pushbuttons: Emergency Stop
Selector Switch: Alarm ON-OFF
 Alarm Horn
 System On-Off

Note: Generator start-up shall be automatic with the following steps:

1. Isolate the generator from the process use.
2. Start system with selector switch in main control panel and purging with air will start automatically. When purge completes pilot is established, U.V. supervision of pilot flame hold the circuit in. When system recognizes that the pilot flame is established main fuel blocking valves will open automatically establishing main flame.
3. Adjustments of fuel and cooling water flow may be necessary after lite-off.

ESTIMATED OPERATING INFORMATION

Utility Requirements		<u>XH-150</u>
Fuel: (Natural Gas)	SCFH	1744
Power:	KWH	7
Cooling Water	GPM	140
Length		168"
Width		63"
Height		74"
Weight (Dry)		8,800 lbs.

PACKAGE ASSEMBLY

The package with options shall be assembled, piped and wired. An operational test (within test facility limits) to demonstrate mechanical, volumetric, and analytical performance alone with logic and safeties is performed in our test area prior to shipment. You are invited to witness this test work. Testing does not include the refrigerant ga dryer when furnished. Refrigerant dryer is tested separately at point of manufacturer. Prior to shipment, generator package shall be cleaned and finish painted with one coat of blue enamel.