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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2532F
Plant ID No.:	011-00007
Applicant:	Huntington Alloys Corporation
Facility Name:	Huntington Facility (A Metal Rolling Mill Facility)
Location:	Cabell County
NAICS Code:	331491
Application Type:	Class II Administrative Update
Received Date:	June 8, 2015
Engineer Assigned:	Caraline Griffith
Fee Amount:	$300.00
Date Received:	June 9, 2015
Complete Date:	June 11, 2015
Due Date:	August 10, 2015
Applicant Ad Date:	June 5, 2015. Re-run June 10, 2015 to include latitude and longitude coordinates in degrees decimal.
Newspaper:	*The Herald-Dispatch*
UTM's:	Easting: 379.2 km Northing: 4,252.3 km Zone: 17
Description:	Arc Air Cutters (emission units TP-15-P, TP-16-P, TP-17-P, and TP-18-P) are to be install in the Thistle Processing building which prepares scrap metal/alloys by sizing, cleaning, and drying for internal use and for resale.

SUMMARY

Huntington Alloys Corporation owns and operates a metal rolling mill facility in Huntington, Cabell County, WV. The company submitted a Class II Administrative Update to the DAQ on June 8, 2015. The $300.00 application fee was paid on June 9, 2015. The company's legal advertisement ran in *The Herald-Dispatch* on June 5, 2015 and had to be re-run on June 10, 2015 to include latitude and longitude in decimal degrees. The DAQ received no public comments. The sixty (60) day review period will end on August 10, 2015. PM/PM_{10} and HAP emissions for the new Arc Cutters are summarized in Table 1 below:

Table 1: PM/PM10 and HAP Emissions for Arc Cutters					
Equipment	**Pollutant**	**Uncontrolled**		**Controlled**	
		(lb/hr)	**(ton/yr)**	**(lb/hr)**	**(ton/yr)**
Arc Cutter (TP-15-P)	PM/PM_{10}	0.03	0.13	Not Controlled (Same as Uncontrolled)	
Arc Cutter (TP-16-P)		0.03	0.13		
Arc Cutter (TP-17-P)		0.03	0.13		
Arc Cutter (TP-18-P)		0.03	0.13		
Total		0.012	0.52		
Arc Cutter (TP-15-P)	HAPs	0.002	0.008	Not Controlled (Same as Uncontrolled)	
Arc Cutter (TP-16-P)		0.002	0.008		
Arc Cutter (TP-17-P)		0.002	0.008		
Arc Cutter (TP-18-P)		0.002	0.008		
Total		0.008	0.032		

DESCRIPTION OF PROCESS

This Class II Administrative Update will allow for the installation and operation of four new emission units:

- Arc Cutter (Emission Unit TP-15-P)
- Arc Cutter (Emission Unit TP-16-P)
- Arc Cutter (Emission Unit TP-17-P)
- Arc Cutter (Emission Unit TP-18-P)

The new equipment will be installed in the Thistle Processing Building which prepares scrap material by sizing, cleaning, and drying available metal alloy pieces for internal use and for resale. The proposed new cutter will be used to size alloy scrap into smaller pieces before being melted and used in the manufacturing operations. The arc air cutter will be installed as a stationary source.

According to footnotes in the calculation section of the application (Attachment 3), arc-cutting operations utilize copper-enriched nickel based alloy metal welding rods.

Table 2: Emission Unit Data Sheet for Arc Cutters (TP-15-18-P).

Name or Type and Model	Arc Cutter
Name and Maximum Amount of Process Material Charged per Hour (lb/hr)	Metal - 15,000 lb/hr
Name and Maximum Amount of Proposed Material Produced per Hour (lb/hr)	Cut Metal - 15,000 lb/hr
Type of Welding Rods Used	Copper-enriched Nickel Based Alloy Metal
Maximum Rod Usage	20 Rods/hr Weight per Rod = 0.15 lb
Operating Schedule	24 hours/day; 7 days/week; 52 weeks/yr
Project Amount of Pollutants Emitted from this Affected Source (Uncontrolled)	PM10 - 0.03 lb/hr and 0.13 ton/yr HAPs - 0.002 lb/hr and 0.0083 ton/yr Manganese and Nickel
Recordkeeping	Record number of rods used per day.
Describe Operating Ranges and Maintenance Procedures Required by Manufacturer to Maintain Warranty	Apply generally approved industry practices and operating instructions

Table 3: Emissions Units Table for the New Arc Cutters.

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed/ Modified	Design Capacity	Control Device
TP-15-P	TP-15-S	Arc Cutter	2015	15,000 lb/hr	None
TP-16-P	TP-16-S	Arc Cutter	2015	15,000 lb/hr	None
TP-17-P	TP-17-S	Arc Cutter	2015	15,000 lb/hr	None
TP-18-P	TP-18-S	Arc Cutter	2015	15,000 lb/hr	None

PREVIOUS EVALUATION'S (R13-2532D) WARNING

The writer reviewed the warning section given in the previous evaluation (R13-2532E), which was taken from evaluation R13-2532D, and concluded that it did not apply to the current permit application (R13-2532F) because the crusher hourly and annual scrap metal processing rates are not being increased. The warning is given below for the reader's information:

NEXT MODIFICATION OR UPDATE

Closely review application(s) submitted after R13-2532D.

Class II Administrative Update versus a Modification Permit

Application R13-2532D was processed as a class II administrative update. During the course of the review, Huntington Alloys Corporation wanted to increase the processing rate of metal through the crusher. In doing this, the annual HAP emission limit for the scrap metal process would have exceeded 5.0 ton/yr which would have caused the application to become a modification application requiring two 30 day public comment periods, i.e., the company and the DAQ would have had to each run a legal ad, instead of just the company. Also, because of the crusher's increase in annual processing rate, the total process PM and HAP emission rates advertised by the company in their legal ad would have under-estimated emissions and would have had to have been corrected in the DAQ's legal ad. Because the second public comment period would have extended the processing period for the application by 30 additional days, the company decided just to double the crusher's hourly rate and leave the annual crusher rate alone. The hourly HAP emission rate for the scrap metal process increased from 1.22 lb/hr to 1.96 lb/hr, but did not exceed the 2.0 lb/hr HAP trigger for a modification permit. To avoid any appearance of having purposely under-estimating HAP emission to the public in the event that the company later requested that the processing rate of the crusher be increased, the following footnote was added to Section 5.1.4. (Scrap Metal Processing Rates) of permit R13-2532E:

> Crusher hourly and annual scrap metal processing rates can not be increased for five (5) years from the date of issuance for R13-2532D. These rates were set here such that the 45CSR13 Modification Permitting Threshold limits of 2 lb/hr and 5 ton/yr for HAP emissions were not crossed.

SITE INSPECTION

The writer did not inspect Huntington Alloys. The facility was last inspected by DAQ Enforcement Inspector James Robertson on September 26, 2013 at which time it was given the inspection code of 30 which means that no violations were found.

The Directions to the facility as given in the permit application are:

Interstate 63 W to 29th Street Exit, go towards Huntington on Route 60 to Washington Blvd intersection. Make a right and go across Washingto Blvd Bridge. Right turn of

Riverside Drive. Enter plant through Main Gate.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The writer reviewed Huntington Alloys Corporation's calculates and found them to be logical and mathematically correct.

Table 4: PM/PM_{10} Emission Estimates for Arc-Cutting found in Permit Application R13-2532F, Attachment 3.

Process	Rod Weight (1) (lb/rod)	Maximum Rod Usage [1] (# rods/hr)	Emission Factor[2] (lbs/1,000 lbs)	PM/PM10 Emission Estimates	
				Hourly Average [a] (lb/hr)	Total Annual [b] (ton/yr)
Arc-Cutting	0.15	20	10.1	0.03	0.13
Arc-Cutting	0.15	20	10.1	0.03	0.13
Arc-Cutting	0.15	20	10.1	0.03	0.13
Arc-Cutting	0.15	20	10.1	0.03	0.13
Total				0.12	0.52

(a) Hourly Average Emissions (lb/hr) = Emission factor (lb/1,000 lb) X Rod Weight (lb/rod) X Maximum Rod Usage (# rods/hr)/1,000

(b) Total Annual Emission Estimate (ton/yr) = Hourly Average Emissions (lb/hr) X 8,760 hr/yr X 1 ton/2,000 lbs

(1) Information provided via Huntington Aloy calculated emission sheet.

(2) AP-42 Chapter 12.19, Table 12.19-1 "PM-10 Emission Factors for Welding Operations." Arc-cutting operations utilize copper-enriched nickel based alloy metal.

Table 5: HAP Emission Estimates for Arc-Cutting found in Permit Application R13-2532F, Attachment 3.

Pollutant	CAS	Arc-Cutting Emissions Estimates		
		Emission Factor (lb/1000 lb)	Hourly Average [a] (lb/hr)	Total Annual [b] (ton/yr)
Chromium	7440-47-3	---	---	---
Cobalt	7440-48-4	---	---	---
Manganese	7439-96-5	8.48	0.0025	0.011
Nickel	7440-02-0	16.92	0.0051	0.022
Total HAP Emissions		--	0.0076	0.033

(a) Hourly Average Emissions (lb/hr) = Emission Factor X Rod Weight X Maximum Rod Usage (# rod/hr)/1000

(b) Total Annual Emissions (ton/yr) = Hourly Average Emission (lb/hr) X 8,760 hr/yr X 1 ton/2,000 lb

Arc-Cutting Rod Weight (lb) = 0.15
Arc-Slicing Weight (lb) = #REF
Arc-Cutting Rod Usage (# rod/hr) = 20
Arc-Slicing Rod Usage (# rod/hr) = #REF
Annual hours of Operation - 8,760 hr

(1) AP-42 Chapter 12.19, Table 12.19-2 "Hazardous Air Pollutant (HAP) Emission Factors for Welding Operations." Arc cutting operations utilize electrode type Eni-Cu.

(2) AP-42 Chapter 12.19, Table 12.19-2 "Hazardous Air Pollutant (HAP) Emission Factors for Welding Operations." Arc cutting operations utilize electrode type E6011.

(3) See Table 4, PM/PM_{10} Emission Estimates for Arc-Cutting found in Permit Application R13-2532F, Attachment 3.

Table 6 shows the uncontrolled and controlled emissions for the recycle scrap metal operation at Huntington Alloys Corportion. The table combines the previous emissions calculated in R13-2532E with the new emissions from R13-2532F.

Table 6: Uncontrolled and Controlled Emissions for Huntington Alloys Corporation's Recycle Scrap Metal Operation.

Pollutant	Before (R13-2532E)				Increase from R13-2532F		Total for Recycle Scap Metal Operation (After R13-2532F)			
	Uncontrolled		Controlled		Uncontrolled [1]		Uncontrolled		Controlled	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
PM	270.55	72.25	2.59	4.41	0.012	0.52	270.562	72.77	2.602	4.93
SO_2	1.60	4.93	Not Controlled (See Uncontrolled)		**No Change in SO_2, NO_x, CO, and VOC Emissions (See R13-2532D)**					
NO_x	1.06	4.62								
CO	0.89	3.88								
VOC	160.1	701	1.65	7.23						
HAP	48.0024	26.11	1.9624	3.45	0.008	0.032	48.0104	26.142	1.9704	3.482

(1) The changes made under R13-2532F are not controlled, i.e., uncontrolled emission equal controlled emissions.

REGULATORY APPLICABILITY

No new regulations are required for this permit update, however the current regulations, both state and federal, are listed below for convenience and reference.

The facility is a major source of criteria pollutants emitting more than 100 ton/yr of PM_{10} (and CO and NO_x). It is also a major source of hazard air pollutants (HAPs) emitting over 10 ton/yr of a single HAP (Nickel and Chromium) and over 25 ton/yr of aggregate HAPs (Nickel and Chromium), i.e., it is a major Title V source (Permit No. R30-01100007-2008).

State Rules

45CSR2 - To Prevent and Control Particulate Air Pollution From Combustion of Fuel in Indirect Heat Exchangers

This rule establishes emission limitations for smoke and particulate matter which are discharged from fuel burning units.

5.1.16. **Fuel Burning Equipment Opacity Limit – NG Burner: Wash Water, Rinse Water, Kiln 1, Kiln 2.** No person shall cause, suffer, allow or permit emission of smoke and/or particulate matter into the open air from any fuel burning unit which is greater than ten (10) percent opacity based on a six minute block average. **[45CSR§2-3.1.]**

5.1.18. **Fuel Burning Unit Emission Rate Limitation – NG Burner Equipment: Wash Water, Rinse Water, Kiln 1, Kiln 2.**

No person shall cause, suffer, allow, or permit the discharge of particulate matter into the open air from all fuel burning units located at one plant, measured in terms of pounds per hour in excess of the amount determined as follows:

For Type 'b' fuel; burning units, the product of 0.09 and the total design heat inputs for such units in millions B.T.U.'s per hour, provided however that no more than six hundred (600) pounds per hour of particulate matter shall be discharged into the open air from all such units. **[45CSR§2-4.1.b]**

[45CSR§2-4.1.]

45CSR7 - To Prevent and Control Particulate Matter Air Pollution From Manufacturing Processes and Associated Operations

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

5.1.19. **Process Opacity Limitation – Plasma Cutter, Arc-Cutting, Arc-Slicing, Crusher, Shot Blaster, Kiln 1, and Kiln 2.**

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.
[45CSR§7-3.1.]

5.1.21. **Process PM Emission Weight Limitation – Plasma Cutter, Arc-Cutting, Arc-Slicing, Crusher, Shot Blaster, Kiln 1, and Kiln 2.**
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. **[45CSR§7-4.1.]**

45CSR10 - To Prevent and Control Air Pollution From Emission of Sulfur Oxides.

The purpose of this rule is to prevent and control air pollution from the emission of sulfur oxides.

5.1.22. **Sulfur Dioxide (SO_2) In-stack Concentration Limitation – Kiln 1 and Kiln 2 Exhausts.**
No person shall cause, suffer, allow or permit the emission into the open air from any source operation an in-stack sulfur dioxide concentration exceeding 2,000 parts per million by volume from existing source operations, except as provide in subdivisions 4.1a. through 4.1.e.

[45CSR§10-4.1.]

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

Chromium and Compounds, Hexavalent Chromium

Hexavalent Chromium was identified as a toxic air contaminant under California's air toxics program (AB 1807) in 1986.

Chromium compounds are federal hazardous air pollutants and were identified as toxic air contaminants in April 1993 under AB 2728.

CAS Registry Number: Chromium = 7440-47-3, Chromium VI = 18540-29-9

Molecular Formula: Chromium: Cr; Chromium VI: Cr^{+6}

Chromium is an odorless, steel-gray, hard metal that is lustrous and takes a high polish. It is extremely resistant to corrosive agents. Chromium can exist in water in several different states but under strongly oxidizing conditions, may be converted to the hexavalent state and occurs as chromate anions. Chromium is soluble in dilute hydrochloric acid and sulfuric acid but not nitric and strong alkalies and alkali carbonates (Merck, 1989).

Chromium metal is not found in nature, but is produced principally from the mineral chromite (chrome ore). Chromite contains chromium in the +3 oxidation state, or chromium (III). Chromium combines with various other elements to produce compounds, the most common of which contain either chromium (III), which is trivalent (the +3 oxidation state) or chromium (VI), which is hexavalent chromium (the +6 oxidation state) (ARB, 1986d). Chromium (III) compounds are sparingly soluble in water, while most chromium (VI) compounds are readily soluble in water (U.S. EPA, 1994a). Chromium forms a number of compounds in other oxidation states, however, those of +2 (chromous), +3 (chromic) and +6 (chromates) are the most important (HSDB, 1995).

Thousands of chromium (III) compounds exist, exhibiting a wide range of colors, structures, and chemical properties. Chromium (VI) compounds are produced industrially by heating chromium (III) compounds in the presence of mineral bases (such as soda ash) and atmospheric oxygen. Most chromium (VI) solutions are powerful oxidizing agents under acidic conditions, but much less oxidizing under basic conditions. Depending on the concentration and acidity, chromium (VI) can exist as either chromate ion (CrO4-2), or as dichromate ion (Cr2O7-2) (ARB, 1986d).

Chromium (III) is the most stable oxidation state, forming coordination complexes which are exclusively octahedral, with ligands such as water, urea, sulfates,

ammonia, and organic acids. Stable complexes can thus be formed with anions, acids, peptides, proteins, nucleic acids, and other macromolecules.

Chromium (VI) is virtually always bound to oxygen in ions such as chromates (CrO4-2) and dichromates (Cr2O7-2). Chromium (VI) ions are strong oxidizing agents and are readily reduced to chromium (III) in acid or by organic matter.

Physical Properties of Chromium

Atomic Weight	51.966
Atomic Number	24
Valences	1-6
Boiling Point	2642 °C
Melting Point	1900 °C
Density/Specific Gravity	7.14
Vapor Pressure	1 mm Hg at 1616 °C

(HSDB, 1995; Merck, 1989; Sax, 1989; U.S. EPA, 1994a)

From Wikipedia: **Chromium**

Water insoluble chromium(III) compounds and chromium metal are not considered a health hazard, while the toxicity and carcinogenic properties of chromium(VI) have been known for a long time.[1] An actual investigation into hexavalent chromium release into drinking water was used as the plot-basis of the motion picture Erin Brockovich.

Because of the specific transport mechanisms, only limited amounts of chromium(III) enter the cells. Several in vitro studies indicated that high concentrations of chromium(III) in the cell can lead to DNA damage.[2] Acute oral toxicity ranges between 1500 and 3300 µg/kg.[3] The proposed beneficial effects of chromium(III) and the use as dietary supplements yielded some controversial results, but recent reviews suggest that moderate uptake of chromium(III) through dietary supplements poses no risk.[2]

World Health Organization recommended maximum allowable concentration in drinking water for chromium (VI) is 0.05 milligrams per liter. [4] Hexavalent chromium is also one of the substances whose use is restricted by the European Restriction of Hazardous Substances Directive.

The acute oral toxicity for chromium(VI) ranges between 50 and 150 µg/kg.[3] In the body, chromium(VI) is reduced by several mechanisms to chromium(III) already in the blood before it enters the cells. The chromium(III) is excreted from the body, whereas the chromate ion is transferred into the cell by a transport

mechanism, by which also sulfate and phosphate ions enter the cell. The acute toxicity of chromium(VI) is due to its strong oxidational properties. After it reaches the blood stream, it damages the kidneys, the liver and blood cells through oxidation reactions. Hemolysis, renal and liver failure are the results of these damages. Aggressive dialysis can improve the situation.[5]

The carcinogenity of chromate dust is known for a long time, and in 1890 the first publication described the elevated cancer risk of workers in a chromate dye company.[6][7] Three mechanisms have been proposed to describe the genotoxicity of chromium(VI). The first mechanism includes highly reactive hydroxyl radicals and other reactive radicals which are byproducts of the reduction of chromium(VI) to chromium(III). The second process includes the direct binding of chromium(V), produced by reduction in the cell, and chromium(IV) compounds to the DNA. The last mechanism attributed the genotoxicity to the binding to the DNA of the end product of the chromium(III) reduction.[8]

Chromium salts (chromates) are also the cause of allergic reactions in some people. Chromates are often used to manufacture, amongst other things, leather products, paints, cement, mortar and anti-corrosives. Contact with products containing chromates can lead to allergic contact dermatitis and irritant dermatitis, resulting in ulceration of the skin, sometimes referred to as "chrome ulcers". This condition is often found in workers that have been exposed to strong chromate solutions in electroplating, tanning and chrome-producing manufacturers.[9][10][10]

In some parts of Russia, pentavalent chromium was reported as one of the causes of premature dementia.[11]

Nickel

Web address http://www.autismtoday.com/articles/heavymetals.html

Website Name:	Autism Today
Title:	Heavy Metals: What you can do to protect your child with Autism
Author of Article:	Linda G. Shepard

Nickel; Symbol: Ni
Nickel is widely used in consumer products including buttons, zippers, coins, dental braces, orthodontic appliances, household appliances, tools, artificial joints, jewelry, faucets, batteries, hairspray, cold-wave permanent solutions, shampoos, paint, spray paint, varnish, pipes, and many products made of stainless steel. Nickel occurs naturally in some foods and manufacturers use it

in the hydrogenation process. Nickel exposure also occurs from both first and second-hand tobacco smoke. The Food and Drug Administration (FDA) considers nickel safe as a direct human food ingredient. Nickel co ntact dermatitis affects an estimated 2.5 to 5% of the population, with women more affected than men. A family sensitivity to nickel raises one's risk factor.

Cancers of the lung, nasal passage, and possibly the larynx may occur from occupational exposure. Metal refineries and municipal solid waste incinerators release nickel into the air, soil, and water. The U.S. has not had any active nickel-producers since 1985 but soil from or near the former sites may continue to pose a source of exposure. Nickel accumulates in aquatic food chains with freshwater organisms more sensitive than ones from saltwater. The 1990 Clean Air Act lists nickel as a hazardous air pollutant. (21)

(21) John Harte, Cheryl Holdren, Richard Schneider, Christine Shirley, (1991). Toxics A to Z: A Guide to Everyday Pollution Hazards.

From Wikipedia - **Nickel Toxcity**

Exposure to nickel metal and soluble compounds should not exceed 0.05 mg/cm³ in nickel equivalents per 40-hour work week. Nickel sulfide fume and dust is believed to be carcinogenic, and various other nickel compounds may be as well.[47][48] Nickel carbonyl, $[Ni(CO)_4]$, is an extremely toxic gas. The toxicity of metal carbonyls is a function of both the toxicity of the metal as well as the carbonyl's ability to give off highly toxic carbon monoxide gas, and this one is no exception. It is explosive in air.[49][50] Sensitized individuals may show an allergy to nickel affecting their skin, also known as dermatitis. Sensitivity to nickel may also be present in patients with pompholyx. Nickel is an important cause of contact allergy, partly due to its use in jewellery intended for pierced ears.[51] Nickel allergies affecting pierced ears are often marked by itchy, red skin. Many earrings are now made nickel-free due to this problem. The amount of nickel which is allowed in products which come into contact with human skin is regulated by the European Union. In 2002 researchers found amounts of nickel being emitted by 1 and 2 Euro coins far in excess of those standards. This is believed to be due to a galvanic reaction.[52]

It was voted Allergen of the Year in 2008 by the American Contact Dermatitis Society.[53]

AIR QUALITY IMPACT ANALYSIS

No modeling study was performed for the proposed updates.

CHANGES TO PERMIT R13-2532E

A wordperfect file compare comparing R13-2532F to R13-2532E was run as is given in Attachment 1 to this evaluation.

RECOMMENDATION TO DIRECTOR

Permit application R13-2532F submitted by Huntington Alloy Corporation has been reviewed and determined to meet all applicable requirements. It is therefore recommended that the resulting permit be approved.

Caraline Griffith
Permit Writer

7/10/15
DATE

Attachment 1

Wordperfect File Comparison
Comparing R13-2532F to R13-2532E