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MEMORANDUM

To: Beverly McKeone, P.E. – New Source Review Program Manager

From: Ed Andrews, Engineer 

Date: November 20, 2015

Subject: Class I Administrative Update of R13-1772H (R13-1772I) for Charleston Area Medical Center – General Division (039-00057)

On July 31, 2015, the DAQ received a request from Charleston Area Medical Center (CAMC) to update Permit R13-1772I. The existing four boilers permitted under Permit R13-1772I will be replaced with three new 400 boiler horsepower (bhp) boilers.

The new boilers are Hurst 500 Series Boilers with Riello RLS650 burners. Each of these units are rated to generate 13,850 pounds of 80 psig steam per hour with a maximum design heat input of 16.3 MMBtu/hr either using natural gas or fuel oil. The specified Riello burner will be configured using 15% of the flue gas with LO NO_x burner design to minimize oxides of nitrogen formation to 30 ppm or less.

The applicant used manufacturer's data to determine the potential from the boiler for particulate matter (PM), sulfur dioxide (SO₂), oxides of nitrogen (NO_x), carbon monoxide (CO), and volatile organic compounds (VOCs) for when firing on natural gas and SO₂, NO_x, and CO for when firing on fuel oil. Annual potential emissions for the boilers were based on an operating schedule of 8,260 hours per year on natural gas and 500 hours per year on fuel oil. These emissions are presented in the following table.

Pollutant	Hourly Rate (lb/hr)	Annual Rate (TPY)	Hourly Rate on #2 Distillate oil (lb/hr)	Annual Rate on #2 Distillate oil (TPY)
Particulate Matter (PM)	0.01	0.04	0.50	0.13
Particulate Matter Less Than 10 microns (PM ₁₀)	0.01	0.39	0.27	0.07
Particulate Matter less than 2.5 microns (PM _{2.5})	0.01	0.39	0.18	0.05
Sulfur Dioxide (SO ₂)	0.01	0.04	0.03	0.01
Oxides of Nitrogen (NO _x)	0.59	2.44	1.77	0.44
Carbon Monoxide (CO)	0.44	1.82	0.64	0.16
Volatile Organic Compounds (VOCs)	0.09	0.26	0.04	0.01
Total Hazardous Air Pollutants (HAPs)	0.03	0.12	0.005	0.001
Carbon Dioxide Equivalent (CO _{2e})	1,908.70	7,882.93	2,660.53	665.13

The following the table is summary of the emissions changes for this project.

Pollutant	CO	NO_x	VOC	PM	SO₂
Boilers under R13-1772H	18.78	29.78	1.26	2.88	89.68
Total 3 New Boilers	5.94	8.64	0.81	0.51	0.15
Net Difference	-12.84	-21.14	-0.45	-2.37	-89.53

NSPS

The new boilers have a maximum design heat input of greater than 10 MMBtu per hour with a manufactured date after June 9, 1989. Thus, the new boilers are subject to the requirements of Subpart Dc of Part 60 (40 CFR§60.40c(a)). These new boilers are subject to the SO₂ of 40 CFR §60.42c(d), which limits either SO₂ emissions to 0.50 lb/MMBtu or 0.5 % sulfur by weight in the fuel oil. CAMC has elected to meet the 0.5% of sulfur by weight standard by using ultra-low sulfur diesel as the fuel oil for this boilers.

NESHAP

General Division is classified as an area source of HAPs. Subpart JJJJJJ to Part 63 establishes emission standards for boiler and process heaters located at an area source of HAPs. Gas fired boilers are excluded from the subpart regardless of the size of the unit and date manufactured. The proposed units are capable of using fuel oil. Under the definition of gas boilers, gas fired boiler can mean gas fired boilers that use oil as a back-up source of fuel and for 48 hours per year to test or conduct readiness checks. CAMC has elect to only use the oil delivery system on these new units when there is an interruption of the facility's natural gas supply and no more than 48 hours per year to conduct readiness checks. Therefore, the new boilers are classified as gas fired boilers and not subject to any requirements under of Subpart JJJJJJ other than documenting when and what reason the oil delivery system was used for these boilers.

State Rules 2 &10

The boilers are subject to Rules 2 & 10, which regulates particulate matter and sulfur dioxide emissions. The allowable PM rate for each of the new boilers is 1.48 pounds per hour regardless of fuel used. The worst case potential from these units is during oil firing at a rate of 0.50 pounds of PM per hour, which is nearly 34% of the allowable without controls. In addition, the boilers would be subject to a visible emission standard of 10% opacity, which the units should meet without any add-on control device.

Rule 10 establishes a SO₂ allowable of 26.08 pounds per hour. The worst case potential from these units is during oil firing at a rate of 0.02 pounds of PM per hour, which is less than 1 % of the allowable without controls. Thus, these new units will meet the requirements of these rules without use any add-on control device.

Changes to R13-1772H

Changes that this writer recommends to Permit R13-1772H is to establish restriction based on the natural of the operation of the emission source. For the boilers, restrict the operation for natural gas boilers with fuel oil back as such using the definition of gas fired boiler from 40 CFR §63.11237. This would only allow CAMC to operate the dual fuel boilers on diesel when there is a gas supply interruption and for 48 hours per year for readiness checks. This writer believes that this requirement would be more stringent than the 6,820 hours of operation that the on diesel per year that the fuel usage restriction in Condition 5.1.2.allows for each of the four boilers.

Permit R13-1772H set annual fuel limits for natural gas and fuel oil in Condition 5.1.2. for the boilers. This writer does not agree with this approach for limiting annual emissions from duel fuel units because the unit could be in compliance with the fuel limit while exceeding the annual emission limit. A better approach is to limit the total heat input from the boiler, which would require the fuel monitoring.

As part of this project, CAMC is centralizing the steam plant for General Division next to the medical waste incinerator, which has a waste heater boiler. This incinerator uses a small amount of natural gas for start-up and as needed to maintain secondary chamber temperature. All for of these emission units will be consuming natural gas from a common meter. To account for the usage from the incinerator, CAMC provide fuel usage records from 2014 operating year. The heat input limit for the boilers in Condition 5.1.1.j. is just the heat input for the boilers. This writer established a secondary limit as means to satisfy compliance in Condition 5.2.1. which includes the additional gas consumed by the incinerator. Other recordkeeping that is required is to record when and reason the boilers were fired with fuel oil. The Boiler GACT indirectly requires sources to prove the gas-fired boiler is still operated as a gas-fired boiler.

Permit R13-1772H required the applicant to conduct visible emission checks when using diesel or fuel oil for thirty consecutive days and obtain records to demonstrate compliance with the certified fuel supplier records for Subpart Dc.

The proposed changes do not increase any emissions from the boilers and does not trigger any new or additional requirements that the existing units were already subject to. The facility is subject to Rule 30 due to the medical waste incinerator. Under Rule 30, these changes do not affect the facility's status under the Title V program. These changes clearly fall within the criteria of a Class I Administrative Update either in 45CSR§13-4.2.a.4. or a.5.. Thus, the writer recommends to the Director to issue Permit R13-1772I to the Charleston Area Medical Center as the response for their Class I Administrative Update request.