New Jersey Department of Environmental Protection
Division of Air Quality, Bureau of Stationary Sources

State of the Art (SOTA) Manual for Boilers and Process Heaters

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Section 3.12 - State of the Art (SOTA)
Manual for Boilers and Process Heaters

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3.12 SOTA MANUAL FOR BOILERS AND PROCESS HEATERS

3.12.0 Definitions

All terms used in this SOTA Manual are defined in N.J.A.C. 7:27-19.1, N.J.A.C. 7:27F-1.3, Title 40 of the Code of Federal Regulations (40 CFR), Part 63, Subparts DDDDD and JJJJJJ. Additional definitions used in this SOTA Manual are as follows:

"Biogas" means a gas produced by anaerobic digestion or fermentation of organic matter, including landfill gas and digester gas.

"Higher Heating Value (HHV)" means the heat content of a fuel in units of energy per mass or volume.

"Light Liquid Fuel" means any liquid fuel sold and suitable for use in furnaces, heaters, or boilers that is a distillate oil, biodiesel, or vegetable oil and is not a residual oil, jet fuel, kerosene, or gasoline. Fuel oil is categorized by grades:

1. No. 1 and No. 2 fuel oil is a distillate oil;
2. No. 4 fuel oil is a mixture of distillate and residual oils; and
3. No. 5 and No. 6 fuel oil are residual oils.

This SOTA Manual only applies to No. 1 and No. 2 distillate oils and non-distillate fuels other than residual fuel with comparable physical and chemical properties (e.g., biodiesel fuel) to distillate oils or a mixture of these types of distillate oil and non-distillate fuels with comparable physical and chemical properties.

"Natural Gas" means a fluid mixture of hydrocarbons composed of at least 70 percent methane by volume that is merchantable and marketable that meets an interstate or intrastate transmission company's minimum specifications with respect to:

(i) delivery pressure;
(ii) delivery temperature;
(iii) heat content between 950 and 1,100 British Thermal Units (BTU) per dry standard cubic foot;
(iv) mercaptan sulfur;
(v) total sulfur less than 20.0 grains per 100 standard cubic feet;
(vi) moisture and/or water content;
(vii) CO_2;
(viii) oxygen (O_2);
(ix) total inerts (the total combined CO_2, helium, nitrogen, O_2, and any other inert compound percentage by volume);
(x) hydrocarbon dew point limits;
(xi) merchantability;
(xii) content of any liquids at or immediately downstream of the delivery point into a pipeline; and
(xiii) interchangeability with the typical composition of the gas in the pipeline with respect to the following indices: Wobbe Number, Lifting Index, Flashback Index, and Yellow Tip Index per AGA Bulletin No. 36.

Natural gas can include renewable natural gas that meets the requirements for natural gas but does not include the following gaseous fuels: Landfill gas, digester gas, refinery gas, sour gas, blast furnace gas, coal-derived gas, producer gas, coke oven gas, or any gaseous fuel produced in a process which might result in highly variable sulfur content or heating value.

"Renewable Natural Gas (RNG)" means biogas that has been processed to remove impurities and increase the methane concentration to meet interstate or intrastate transmission company's minimum specifications for natural gas.

"Steady state" means all operations except for startup, shutdown, and fuel type switching.

3.12.1 Scope

This State-of-the-Art (SOTA) manual establishes emissions performance levels and control technologies for the best performing sources within the U.S. Conformance to the requirements established in this manual by a permit applicant alleviates the need for the applicant to review and establish a case-by-case SOTA for any air contaminant source included in this manual.

These SOTA performance levels apply to boilers and process heaters with a maximum heat input capacity of 10 million British thermal units (MMBtu) per hour or more, based on the higher heating value (HHV) of the natural gas or light liquid fuel (e.g., No. 1/2 fuel oil or similar) combusted. This SOTA Manual does not apply to boilers or process heaters firing any other type of fuel, including residual oils or residual oil blends (e.g., No. 4/6 fuel oil or similar), which are prohibited from being combusted after January 31, 2025.[1]

The SOTA thresholds for source operations, which must obtain a Preconstruction Permit pursuant to N.J.A.C. 7:27-8, can be found in:

1. N.J.A.C. 7:27-8, Appendix 1, Table A for criteria pollutants; and
2. N.J.A.C. 7:27-17.9, Tables 3A and 3B for hazardous air pollutants (HAP) and toxic substances (TXS) regulated by the New Jersey Department of Environmental Protection (the Department).

The SOTA thresholds for source operations which must obtain an Operating Permit, pursuant to N.J.A.C. 7:27-22 can be found in:

1. N.J.A.C. 7:27-22, Appendix, Table A; and
2. N.J.A.C. 7:27-17.9, Tables 3A and 3B for HAP and TXS.

If a source operation was omitted in this manual or a boiler combusts a fuel not included in this manual, the applicant must represent SOTA technology using a case-by-case approach, if applicable, pursuant to N.J.A.C. 7:27-8.12 and N.J.A.C. 7:27-22.35. For air contaminants that may be emitted from the sources described in this manual, but for which a performance level is not specified, SOTA will be done on a case-by-case basis pursuant to N.J.A.C. 7:27-8 and N.J.A.C. 7:27-22.

3.12.1.1 Types of Boilers and Process Heaters

Boilers and process heaters are external combustion sources: a fuel is combusted to generate heat in a fluid (usually water) or gas (usually air). The heated fluid or gas is then used to provide heat or perform work, rather than the combustion process being used to generate motion directly, (i.e., an internal combustion engine). Process heaters heat a liquid or gas (most commonly air) to provide heat only, while boilers heat liquids (most commonly heating water to steam) to provide heat or generate motive power. For example, a water heater warms the water for bathing and cooking and a furnace warms the air during

[1] N.J.A.C. 7:27F-3.2

the winter months, whereas a boiler is used to generate steam for use in an apartment building to warm air via radiators or in an engine to generate motive power.

There are two different methods for combusting fuel in an external combustion source: direct- and indirect-firing. In direct-fired external combustion, air enters the combustion chamber and directly contacts the flame. Since the flame is heating the air directly, it is very efficient; however, the heated exhaust air contains the products of combustion (air pollution). For this reason, direct-fired heaters are uncommon and limited to use in well vented, exterior locations. An example of direct-fired heater is provided in Figure 3.12-1.

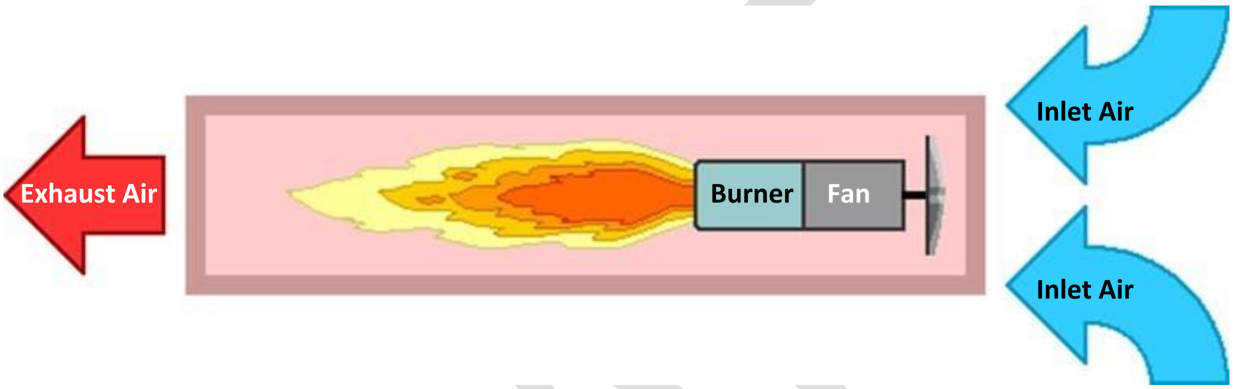

Figure 3.12 – 1: Direct-fired Heater

In an indirect-fired heater or boiler, the combustion process is separated from the liquid or gas being heated. Indirect-fired heaters and boilers are the most common external combustion sources and the only ones that can be used in interior or enclosed spaces. The combustion chamber has its own air source, and the products of combustion are vented through a heat exchanger and then to the atmosphere.[2] A gas or liquid is heated as it moves through the heat exchanger: a series of tubes within the combustion chamber where heat is transferred from the hot exhaust gases to the gas or liquid to be heated.

For indirect-fired boilers, the heat exchanger can operate in one of two different ways:

1. Fire Tube Boiler: The tubes contain exhaust gases and the gas or liquid flows over the tubes; or
2. Water Tube Boiler: The tubes contain the gas or liquid being heated and the exhaust gases flow over the tubes.

There are also tubeless boilers, which are similar to water tube boilers: the hot exhaust gases pass over and heat pressure vessels containing water.[3] Heat exchangers used in heaters can also operate using either method; however, the type of heat exchanger is not commonly used in classifying heaters. An example of an indirect-fired fire tube boiler is provided in Figure 3.12-2 and an indirect-fired water tube boiler is provided in Figure 3.12-3.

[2] *Economic Analysis of Air Pollution Regulations: Boilers and Process Heaters*, EPA, November 2002.
[3] *Compilation of Air Emissions Factors, Volume 1, Chapter 1: External Combustion Sources, Section 1.3: Fuel Oil Combustion,* EPA AP-42, September 1999.

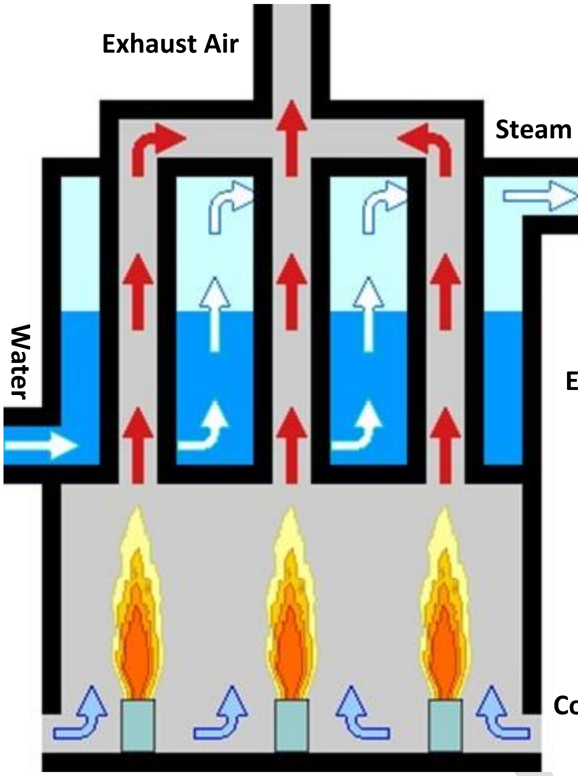

Figure 3.12 – 2: Indirect-fired Fire Tube Boiler

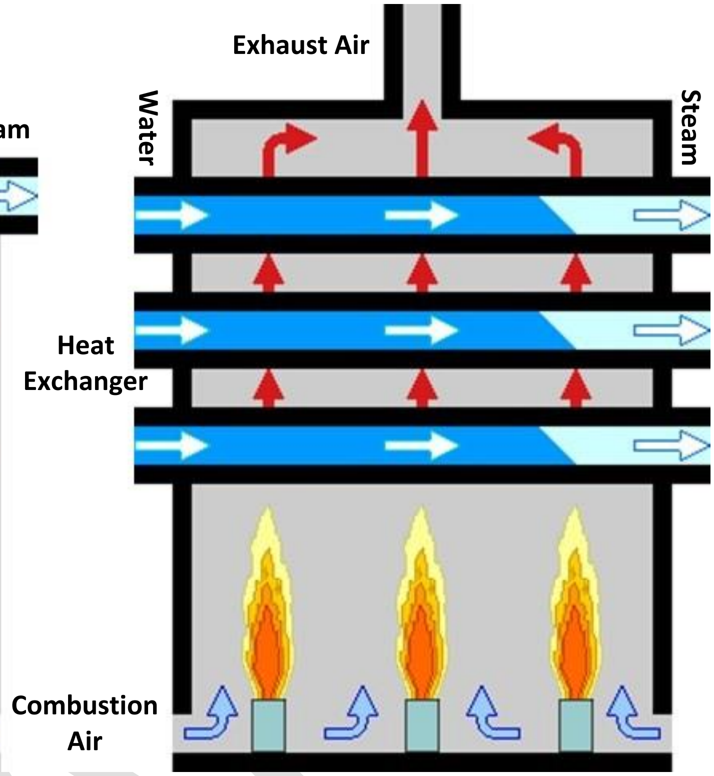

Figure 3.13 – 3: Indirect-fired Water Tube Boiler

3.12.2 SOTA Performance Levels

This SOTA Manual includes operational requirements, emissions limitations, and control efficiency requirements for different air contaminants, depending on the fuel combusted.

3.12.2.1 Maximum Achievable Control Technology for Boilers and Process Heaters

The U.S. Environmental Protection Agency (EPA) has issued multiple standards for boilers and process heaters. The Maximum Achievable Control Technology (MACT) standard is considered equivalent to SOTA for hazardous air pollutants (HAPs), pursuant to N.J.A.C. 7:27-8.12(e)(3) for preconstruction permits and the MACT and Generally Available Control Technology (GACT) standard are considered equivalent to SOTA for HAPS, pursuant to N.J.A.C. 7:27-22.35(c) for operating permits. Emissions of other air contaminants from boilers or process heaters not subject to a MACT or GACT standard are addressed in other sections of this SOTA manual.

Multiple MACT standards apply to boilers and process heaters located at major sources of hazardous air pollutants (HAP). The primary MACT standard for boilers and process heaters is found in Title 40 of the Code of Federal Regulations (CFR), Part 63, Subpart DDDDD, National Emission Standards for Hazardous Air Pollutants (NESHAP) for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters.[4] Additionally, other NESHAP have specific requirements for boilers or process heaters associated with other equipment regulated by that NESHAP; only the requirements of the Major Source Boiler MACT standard are included in this SOTA manual. Some additional NESHAP that may include requirements for boilers include:

1. Coal- and Oil-Fired Electric Utility Steam Generating Units NESHAP (Subpart UUUUU);

[4] Title 40 of the Code of Federal Regulations, Part 63, Subpart DDDDD.

2. Chemical Recovery Combustion Sources at Kraft, Soda, Sulfite, and Stand-Alone Semichemical Pulp Mills NESHAP (Subpart MM);
3. Secondary Lead Smelting NESHAP (Subpart X);
4. Generic MACT Standards: Ethylene Cracking Furnace (Subpart YY);
5. Hazardous Waste Combustors NESHAP (Subpart EEE); and
6. Boilers and process heaters used as control devices in Group I Polymers and Resins NESHAP (Subpart U), Group IV Polymers and Resins NESHAP (Subpart JJJ), Manufacture of Amino/Phenolic Resins NESHAP (Subpart OOO), and Polyether Polyols Production NESHAP (Subpart PPP).

Major Source Industrial, Commercial, and Institutional Boilers and Process Heaters

The Major Source Boiler MACT standard includes emissions limits for hydrochloric acid, mercury, carbon monoxide (CO), and filterable particulate matter (PM); these emissions limits apply to liquid- or gas-fired boilers and process heaters with a maximum heat input rate of 10 million British Thermal Units per hour (MMBtu/hour) or greater that were constructed or reconstructed on or after January 31, 2016, and located at a major source of HAP emissions. The emissions limits are provided in Table 3.12.2-1. Sources may opt to comply with alternative emissions limitations until October 6, 2025; these alternative emissions limits are provided in Table 3.12.2-2.

TABLE 3.12.2-1
MACT Standards for Boilers and Process Heaters Located at a Major Source of HAP[5]

Pollutant	Fuel	Emissions Limitations	
		Steady State Operation	Startup and Shutdown
Hydrochloric Acid (HCl)	Light Liquid Fuel	1.5×10^{-4} lbs./MMBtu† heat input	1.7×10^{-4} lbs./MMBtu steam output
Mercury	Light Liquid Fuel	4.8×10^{-7} lbs./MMBtu heat input	5.3×10^{-7} lbs./MMBtu steam output
CO	Light Liquid Fuel	130 ppmvd‡ (3% O_2)	0.13 lbs./MMBtu steam output
Filterable PM	Light Liquid Fuel	1.1×10^{-3} lbs./MMBtu heat input	1.2×10^{-3} lbs./MMBtu steam output

†lbs./MMbtu – pounds per million British Thermal Units
‡ppmvd – parts per million by volume, dry basis

TABLE 3.12.2-2
Alternative MACT Standards for Boilers and Process Heaters Located at a Major Source of HAP (Valid through October 6, 2025)[6]

Pollutant	Fuel	Emissions Limitations	
		Steady State Operation	Startup and Shutdown
Hydrochloric Acid (HCl)	Light Liquid Fuel	4.4×10^{-4} lbs./MMBtu heat input	4.8×10^{-4} lbs./MMBtu steam output

[5] Title 40 of the Code of Federal Regulations, Part 63, Subpart DDDDD.
[6] Title 40 of the Code of Federal Regulations, Part 63, Subpart DDDDD.

Area Source Industrial, Commercial, and Institutional Boilers and Process Heaters

The GACT standard applies to boilers located at area sources of HAP; this standard is found in 40 CFR, Part 63, Subpart JJJJJJ, NESHAP for Area Sources: Industrial, Commercial, and Institutional Boilers applies.[7] The GACT standard includes emissions limits for filterable particulate matter (PM); these emissions limits apply to boilers and process heaters firing a liquid fuel with a maximum heat input capacity of 10 MMBtu/hour or greater that were constructed or reconstructed after May 20, 2011. The emissions limits are provided in Table 3.12.2-3.

TABLE 3.12.2-3
GACT Standards for Boilers and Process Heaters Located at an Area Source of HAP[8]

Pollutant	Fuel	Emissions Limitations	
		Steady State Operation	Startup and Shutdown
Filterable PM	Light Liquid Fuel	3.0×10^{-2} lbs./MMBtu heat input	None specified.

3.12.2.2 New Source Performance Standards for Steam Generators

EPA has developed new source performance standards (NSPS) in 40 CFR, Part 60, Subpart Db[9] and Dc[10] for steam generating units (boilers); process heaters are not included in these standards. Subpart Db applies to steam generating units that were constructed, modified, or reconstructed after June 19, 1984, with a maximum heat input capacity of 100 MMBtu/hour or greater. It includes emissions limits for PM, nitrogen dioxide (NO_2), and sulfur dioxide (SO_2). Subpart Dc applies to steam generating units that were constructed, modified, or reconstructed after June 9, 1989, with a maximum heat input capacity of 10 MMBtu/hour or greater and less than 100 MMBtu/hour. It includes emissions limits for PM and SO_2. Since the emissions limits for PM, NO_2, and SO_2 are equivalent or less stringent than the emissions limits determined to be SOTA in Section 3.12.2.3, they are not included in this manual.

3.12.2.3 Other SOTA Performance Levels for Boilers and Process Heaters

The SOTA performance level for SO_2 applicable during steady state operations while combusting natural gas is 0.056 lbs./MMBtu;[11] the sulfur fuel content for light liquid fuels with a Saybolt Seconds, Universal (SSU) viscosity of no more than 45 is 15.0 parts per million by weight (ppmw).[12]

The SOTA performance levels for TSP and opacity applicable during steady state operations while combusting gaseous fuels or liquid fuels are provided below:

1. Total suspended particulate (TSP) emissions limits:
   A. 0.0075 lbs./MMBtu for boilers and process heaters firing natural gas;
   B. 0.015 lbs./MMBtu for boilers and process heaters firing light liquid fuel <50 MMBtu/hour;
   C. 0.020 lbs./MMBtu for boilers and process heaters firing light liquid fuel ≥50 MMBtu/hour;[13]

[7] Title 40 of the Code of Federal Regulations, Part 63, Subpart JJJJJJ.
[8] Title 40 of the Code of Federal Regulations, Part 63, Subpart JJJJJJ.
[9] Title 40 of the Code of Federal Regulations, Part 60, Subpart Db
[10] Title 40 of the Code of Federal Regulations, Part 60, Subpart Dc.
[11] Converted from 20.0 grains total sulfur per 100 standard cubic feet (scf) at a heating value of 1,026 Btu/scf.
[12] N.J.A.C. 7:27-9.2
[13] SC&A, Inc. *Analysis of Boiler / Heater Permits Emissions Limits and Control Requirements*, August 2023.

2. An opacity limit of 10% for all operations when firing gaseous fuels and for all operations EXCEPT startup, shutdown, and fuel switching for liquid fuels. For startup, shutdown, and fuel switching of liquid fuels, the opacity limit is 20%.[14]

Additional requirements for steady state operation of boilers and process heaters are included in Tables 3.12.2-4 through 3.12.2-6. These include control equipment and emissions limits for carbon monoxide (CO), nitrogen oxides (NO_X), and volatile organic compounds (VOC).

The Department also requires an annual combustion adjustment for any indirect-fired boiler or heat input of 5 MMBtu/hour or greater. The annual combustion adjustment includes an inspection and repair, cleaning, or replacement of the burner, flame pattern, air-to-fuel ratio controllers, and a measurement of the CO, NO_X, and oxygen concentrations before and after the adjustment.[15]

The emissions limits specified in this SOTA manual do not apply outside of steady state operating conditions. SOTA technology for startup, shutdown, and fuel switching is determined using the case-by-case approach, pursuant to N.J.A.C. 7:27-8.12 and N.J.A.C. 7:27-22.35.

TABLE 3.12.2-4
CO SOTA Steady State Performance Levels for Boilers and Process Heaters[16]

Pollutant	Size	Fuel	Control Technology	Emissions Limitations
CO	≥10 MMBtu/hr and <75 MMBtu/hr	Light Liquid Fuel	Good Combustion Control	0.036 lbs./MMBtu heat input
CO	≥75 MMBtu/hr	Light Liquid Fuel	Good Combustion Control	0.039 lbs./MMBtu heat input
CO	≥10 MMBtu/hr and <75 MMBtu/hr	Natural Gas	Good Combustion Control	0.05 lbs./MMBtu heat input
CO	≥75 MMBtu/hr	Natural Gas	Good Combustion Control	0.037 lbs./MMBtu heat input

TABLE 3.12.2-5
NO_X SOTA Steady State Performance Levels for Boilers and Process Heaters[17]

Pollutant	Size	Fuel	Control Technology	Emissions Limitations
NO_X	≥10 MMBtu/hr and <75 MMBtu/hr	Light Liquid Fuel	Low NO_X Burners (LNB) with Flue Gas Recirculation (FGR)	0.06 lbs./MMBtu heat input
NO_X	≥75 MMBtu/hr	Light Liquid Fuel	LNB with FGR AND Selective Catalytic Reduction (SCR)	0.03 lbs./MMBtu heat input
NO_X	≥10 MMBtu/hr and <50 MMBtu/hr	Natural Gas	LNB with FGR OR Ultra Low NO_X Burners (ULNB)	0.035 lbs./MMBtu heat input
NO_X	≥50 MMBtu/hr	Natural Gas	ULNB with FGR AND/OR SCR	0.01 lbs./MMBtu heat input

[14] SC&A, Inc. *Analysis of Boiler / Heater Permits Emissions Limits and Control Requirements*, August 2023.
[15] N.J.A.C. 7:27-19.16
[16] SC&A, Inc. *Analysis of Boiler / Heater Permits Emissions Limits and Control Requirements*, August 2023.
[17] SC&A, Inc. *Analysis of Boiler / Heater Permits Emissions Limits and Control Requirements*, August 2023.

TABLE 3.12.2-6
VOC SOTA Steady State Performance Levels for Boilers and Process Heaters[18]

Pollutant	Size	Fuel	Control Technology	Emissions Limitations
VOC	≥10 MMBtu/hr and <75 MMBtu/hr	Light Liquid Fuel	Good Combustion Control	0.004 lbs./MMBtu heat input
VOC	≥75 MMBtu/hr	Light Liquid Fuel	Good Combustion Control	0.008 lbs./MMBtu heat input
VOC	≥10 MMBtu/hr	Natural Gas	Good Combustion Control	0.005 lbs./MMBtu heat input

3.12.3 Control Technologies

Reductions in CO, NO_X, and VOC emissions can be achieved using combustion control technologies or flue gas treatment (post-combustion control technologies). SO_2 is primarily controlled by regulating the fuel sulfur content.

3.12.3.1 Combustion Control Technologies for NO_X

NO_X controls alter the combustion parameters by changing the combustion chemistry (lower temperature, excess oxygen, and reduced residence time). NO_X is formed from nitrogen in the fuel (Fuel NO_X) and atmosphere (thermal NO_X) combining with excess oxygen in the combustor section.

Low NO_X Burners (LNB) / Ultra Low NO_X Burners (ULNB)

Low NO_X Burners (LNB) and Ultra Low NO_X Burners (ULNB) reduce thermal NO_X formation by reducing flame temperature. This lowers the energy available to convert atmospheric nitrogen and oxygen to NO_X. LNB and ULNB create a reduced oxygen level in the combustion zone, also limiting fuel NO_X formation. ULNB uses fuel staging and internal flue gas recirculation within the burner to lower NO_X even further. For fuel staging, fuel gas is injected into the combustion chamber in two stages, creating an ignitable fuel-rich zone surrounded by a fuel-lean zone, delaying combustion and reducing temperature. LNB can reduce NO_X emissions by 35-55%, whereas ULNB can reduce NO_X emissions by up to 75%.

Flue Gas Recirculation (FGR)

Exhaust (flue) gases that contain a lower oxygen content are recirculated back into the combustion chamber. These already hot gases lower the combustion temperature required for fuel ignition and reduce the available oxygen content for NO_X formation. FGR is usually used in conjunction with LNB. Sensors monitor the oxygen content of the flue gas and regulate the amount of flue gas that is reintroduced into the combustion chamber. FGR can reduce NO_X emissions by 5-30%.

Selective Catalytic Reduction (SCR)

SCR is an add-on NO_X control technique that is placed in the exhaust stream following the boiler or process heater. SCR is a process in which ammonia is directly injected into the flue gas and then passed over a catalyst to react with NO_X, converting the NO_X, and ammonia to nitrogen and water. The catalyst allows this reaction to take place at a lower temperature than would be required without it. The temperature of the catalyst should be between approximately 570ºF to 750ºF depending on the catalyst used. The catalyst is usually either a noble metal, base metal (titanium or vanadium), or a zeolite-based material.

[18] SC&A, Inc. *Analysis of Boiler / Heater Permits Emissions Limits and Control Requirements*, August 2023.

SCR is a common technique for boilers and process heaters. SCR can reduce NO_X emission by 70-90%; as an add-on control, it can be used in conjunction with LNB / FGR or ULNB.

Selective Non-Catalytic Reduction (SNCR)

SNCR is an add-on NO_X control technique used instead of SCR. Ammonia or urea, (which contains ammonia), is injected into the exhaust, reducing NO_X to nitrogen and water vapor. Rather than using a catalyst to cause the chemical reduction reaction, the exhaust gases are at temperature high enough to cause the chemical reduction reaction. To conduct SNCR, the exhaust gases must be at a temperature greater than 1,550ºF and require a residence time between the ammonia / urea and exhaust gas of at least 1 second. SNCR has been employed in boilers >50 MMBtu/hour. More ammonia / urea is added to the exhaust gas than needed, so some of this ammonia passes is emitted (ammonia slip); ammonia slip of 10 ppm is considered reasonable. SNCR can reduce NO_X emission by 30-50%; as an add-on control, it can be used in conjunction with LNB / FGR or ULNB.

3.12.3.2 CO and VOC Control Technology

Good Combustion Control

To control emissions of CO and VOC, the fuel must be completely combusted, as CO is formed by incomplete oxidation of the carbon within the fuel and VOCs are unburned hydrocarbons. Combustion control is achieved by monitoring the temperature and oxygen, CO, and NO_X content of the exhaust gases, to ensure that the boiler or process heater is operating at an optimal condition. Excess oxygen or higher CO indicates that the fuel is not being fully combusted, and the burners are adjusted to achieve optimal combustion conditions.

3.12.3.3 Alternate Control Technologies - Energy Efficiency

Greater energy efficiency reduces emissions of all air contaminants, including CO_2, a greenhouse gas. The Boiler NESHAP for major sources and the Boiler NESHAP for area sources require an energy assessment conducted by an energy assessor to evaluate the capacity of certain boilers and inventory of major energy use systems. This report identifies ways to improve efficiency from the existing boiler system.

The energy efficiency of the boilers and process heaters are expressed in terms of the efficiency for converting fuel to steam; these values must be reported in the permit application. Higher efficiency systems require less fuel to produce the required energy.

3.12.4 Technical Basis

Information from the following sources were used as the basis for developing this SOTA Manual:

A. Title 40 of the Code of Federal Regulations, Part 60, Subpart Db, "Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units"

B. Title 40 of the Code of Federal Regulations, Part 60, Subpart Dc, "Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units"

C. Title 40 of the Code of Federal Regulations, Part 63, Subpart DDDDD, "National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters"

D. Title 40 of the Code of Federal Regulations, Part 63, Subpart JJJJJJ, "National Emission Standards for

Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources"

E. SC&A, Inc. *Analysis of Boiler Permits Emissions Limits and Control Requirements*, August 21, 2023.

3.12.5 Recommended Review Schedule

This SOTA Manual will be reviewed periodically and revised if new collection and control technologies that minimize emissions become available, and any time a new MACT standard or standard of performance for new or existing sources is published.