

COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING

310 CMR 7.00 AIR POLLUTION CONTROL REGULATIONS

310 CMR 7.19 U REASONABLY AVAILABLE CONTROL TECHNOLOGY (RACT)  
FOR SOURCES OF OXIDES OF NITROGEN (NO<sub>x</sub>)

7.19: U Reasonably Available Control Technology (RACT) for Sources of Oxides of Nitrogen (NO<sub>x</sub>)

(1) Applicability.

- (a) 310 CMR 7.19 shall apply in its entirety to any person who owns, leases, operates or controls any facility having potential to emit, before application of air pollution control equipment, greater than or equal to 50 tons per year (TPY) of NO<sub>x</sub>.
- (b) Any person who owns, leases, operates or controls a facility subject to 310 CMR 7.19, which has had actual emissions greater than or equal to 50 TPY in any year after 1989 shall continue to comply with all requirements of 310 CMR 7.19 even if emissions from the subject facility no longer exceed the 50 TPY applicability requirement of 310 CMR 7.19.
- (c) The requirements of 310 CMR 7.19 do not apply to:
  - 1. Any person subject to 310 CMR 7.19 who is able to demonstrate to the Department that, after calendar year 1989, the facility has not emitted 50 TPY or more of NO<sub>x</sub>, provided the person obtains a permit restriction from the Department under 310 CMR 7.02(12) (Restricted Emission Status) by May 31, 1995 which restricts the potential emissions to below 50 TPY and complies with the permit restriction by May 31, 1995. Persons who have obtained an RES prior to May 31, 1995, may notify the Department of their intent to operate in compliance with one of the rolling 12-month emission caps under 310 CMR 7.02(15)(e) or (f) as a means of limiting the facility's potential emissions to 25 TPY or less of NO<sub>x</sub>.
  - 2. Any emissions unit that has a permit restriction prohibiting it from operating between May 1 and September 30 of each year and restricting potential emissions to less than 50 tons per year from the emissions unit.

3. Any boiler having an energy input capacity of less than 20 million Btu per hour provided that potential emissions from the emissions unit are less than 50 TPY of NO<sub>x</sub> .
4. Any stationary combustion turbine having an energy input capacity of less than 25 million Btu per hour.
5. Any stationary reciprocating internal combustion engine having an energy input capacity of less than three million Btu per hour.
6. Any glass melting furnace having a maximum production rate of less than 14 tons of glass removed from the furnace per day.
7. Any other furnace, kiln, dryer or oven having potential emissions less than 25 TPY of NO<sub>x</sub> .
8. Any municipal waste combustor unit having potential emissions of less than 25 TPY of NO<sub>x</sub> .
9. Any person who, since January 1, 1990, obtains a plan approval for an emission unit under 310 CMR 7.02 where said approval establishes BACT or LAER to be no less stringent than RACT for a facility size and type as defined in 310 CMR 7.19. Such person shall comply with the BACT or LAER established in the plan approval, and is not subject to RACT standards of 310 CMR 7.19 as may otherwise be applicable, until the applicable RACT standards of 310 CMR 7.19 become more stringent than the BACT or LAER established in the plan approval, at which point the person shall become subject to the updated RACT standards.

(2) General Provisions.

- (a) After May 31, 1995, any person subject to 310 CMR 7.19 shall achieve and maintain continuous compliance with all requirements of 310 CMR 7.19.
- (b) Any person unable to comply with emission standards under 310 CMR 7.19(4), (5), (7), (8) or (9) may submit an application under 310 CMR 7.19(3) for a source specific alternative RACT; said application to be submitted by April 1, 1994 for 310 CMR 7.19(4), and by June 1, 1994 for 310 CMR 7.19(5), (7) or (8) and by May 1, 1999 for 310 CMR 7.19(9) for Department, and EPA approval. For any person subject to 310 CMR 7.08(2) and is required to submit an Emission Control Plan under 310 CMR 7.08(2), a separate Emission Control Plan to demonstrate compliance with 310 CMR 7.19(9) is not required. On and after May 31, 1995, a person approved under 310 CMR 7.19(2)(b) must comply with the approved source specific alternative RACT. Such application must evaluate each of the following

NO<sub>x</sub> controls, where it may be applied, and its technological and economic feasibility.

1. low-NO<sub>x</sub> burners;
2. close coupled and separated overfire air;
3. flue gas recirculation;
4. burners out of service;
5. steam/water injection;
6. dry low-NO<sub>x</sub> combustors;
7. ignition timing retard;
8. separate circuit after-cooling;
9. fuel emulsification;
10. fuel switching;
11. selective noncatalytic reduction (SNCR);
12. selective catalytic reduction (SCR);
13. nonselective catalytic reduction (NSCR).
14. use of emission reduction credits (ERCs) certified by the Department pursuant to 310 CMR 7.00: *Appendix B(3)*, or pursuant to the interstate trading provisions at 310 CMR 7.00: *Appendix B(3)(f)*.

Any person approved under 310 CMR 7.19(2)(b) must comply with the requirements of 310 CMR 7.19(13).

- (c) An emission unit subject to 310 CMR 7.19 shall be operated under conditions acceptable to the Department and EPA, and consistent with the operational parameters and limits established in the approved emission control plan.
- (d) Any person subject to 310 CMR 7.19 may elect to comply with a more stringent NO<sub>x</sub> limit in order to; create Emission Reduction Credits under 310 CMR 7.00: *Appendix B(3)*; create emissions offsets for use under the provisions of 310 CMR 7.00:

*Appendix A(6)*; reduce the net emissions increase below the significance level under 310 CMR 7.00: *Appendix A(3)*; emissions average under 310 CMR 7.19(14) and 7.00: *Appendix B(4)*.

- (e) Any person subject to a more stringent emission standard either contained in a plan approval (issued pursuant to the Department's regulations) or in a PSD permit or contained in a Department regulation shall remain subject to that more stringent emission standard.
- (f) Seasonal fuel switching. After May 31, 1995, any person owning, leasing, operating or controlling an emissions unit subject to an emissions standard contained in 310 CMR 7.19 may choose to have the emissions unit comply with 310 CMR 7.19(2)(f) instead of an emissions limit contained in 310 CMR 7.19(4) through (11) by fuel switching.
  1. The 12 month rolling average NO<sub>x</sub> emissions standard, in pounds per million Btu, shall be less than or equal to the NO<sub>x</sub> emissions standard calculated in the following manner.
    - a. The annual limit shall be determined according to the following equation:

$$AS_{NO_x} = \frac{(HI_1) \times (ES_1) + (HI_2) \times (ES_2) \dots + (HI_N) \times (ES_N)}{HI_1 + HI_2 \dots + HI_N}$$

AS<sub>NO<sub>x</sub></sub> is the annual standard for nitrogen oxides derived from all fuels fired during the baseyear.

HI<sub>1</sub> is the heat input for fuel 1 in Btu during the baseyear.

ES<sub>1</sub> is the emissions standard for fuel 1 contained in 310 CMR 7.19(4) through (11), except that for tangential oil or oil and gas fired boilers, the emissions standard is 0.2 pounds per million Btu.

N is the number of fuels burned during the baseyear.

- b. The baseyear shall be 1990. 1991 or 1992 may be used instead if the Department determines 1991 or 1992 is more representative of normal operation.

- 2. The maximum daily NO<sub>x</sub> emissions standard from May 1 through September 30 shall be the emissions standard allowed under 310 CMR 7.19(4) through

(11) for the fuel burned in the largest amount, on a Btu basis, during the baseyear. However, for tangential oil or oil and gas fired boilers, the emissions standard is 0.2 pounds per million Btu.

3. the emission unit(s) must burn only the fuel, of the fuels it is approved to burn, that has the lowest NO<sub>x</sub> emissions rate, between May 1 and September 30 of each year unless the fuel is not available.

(g) Emission Reduction Credits. Any facility may comply, either in part, or entirely, with the applicable emissions standard requirement contained in 310 CMR 7.19 through the use of emissions reduction credits (ERCs) certified by the Department pursuant to 310 CMR 7.00: *Appendix B(3)*.

(3) Emission Control Plans for Implementation of RACT.

(a) General Applicability. Any person subject to 310 CMR 7.19(2)(b), (4), (11) or (12) shall submit an emission control plan by April 1, 1994, any person subject to 310 CMR 7.19(5), (7) or (8) shall submit an ECP by June 1, 1994 for Department approval prior to implementation of RACT, and any person subject to 310 CMR 7.19(9) shall submit an ECP by May 1, 1999 for Department approval. Any person submitting an Emission Control Plan to satisfy 310 CMR 7.08(2) is not required to submit a separate Emission Control Plan to demonstrate compliance with 310 CMR 7.19. Any person who has received a plan approval under 310 CMR 7.02(2)(a) or (b) since January 1, 1990 is exempt from submitting an emission control plan, if that approval requires compliance with 310 CMR 7.19 for the entire facility. A plan application under 310 CMR 7.02(2) is not required in order to implement NO<sub>x</sub> RACT, in order to implement NO<sub>x</sub> RACT, except for boilers complying with the repowering provision under 310 CMR 7.19(4)(b).

Any person subject to 310 CMR 7.19 who is required to submit an emissions control plan by April 1, 1994 or June 1, 1994 as applicable pursuant to 310 CMR 7.19(2), who applies to the Department for restricted emission status (RES) pursuant to 310 CMR 7.02(12)(a)(4), is not required to submit an emission control plan until the Department has acted on the RES application, and has determined whether the facility is subject to 310 CMR 7.19.

(b) Notification. Any person subject to 310 CMR 7.19(6) shall provide written notification to the Department by January 1, 1995 that the facility is subject to, and will comply with 310 CMR 7.19(6).

(c) Emission Control Plan Requirements. The emission control plan under 310 CMR 7.19(3) shall be submitted on a Department approved form and shall include, at a minimum, the following:

1. a list and description of all the exempt and non-exempt emission units at the facility having potential to emit NO<sub>x</sub> including:
  - a. any associated plan approvals, dates of installation, any subsequent alterations, *etc.*;
  - b. the maximum energy input capacity, in millions of Btu per hour, of each emission unit;
  - c. for fuel utilization facilities, the type of fuel(s) permitted to be burned in each emission unit;
  - d. the maximum NO<sub>x</sub> emissions rate of each unit, in pounds per million Btu, for each fuel burned before and after the application of NO<sub>x</sub> RACT;
  - e. the total actual fuel usage and energy input in million Btu for each fuel for each of the last two years for each emission unit;
  - f. the energy conversion efficiency (in million Btu (HHV) per brake horse power hour) for each reciprocating internal combustion engine;
  - g. the O<sub>2</sub> exhaust gas concentration and the dry standard cubic feet per million Btu of energy input for each stationary combustion turbine; and
  - h. the energy input, million Btu, per ton of glass produced for glass manufacturing furnaces.
2. a demonstration that the provisions of 310 CMR 7.19 can be met by each emission unit included in the emission control plan, including the potential emissions after implementation of RACT of all emission units emitting NO<sub>x</sub> for which the emission control plan is being submitted. A demonstration that combustion conditions will not significantly deteriorate shall be included for any emission unit for which a higher CO emission standard is being applied pursuant to 310 CMR 7.19(4)(f), (5)(d) or (7)(a)4.
3. if applicable, the control efficiency, design, specifications, and standard operating and maintenance procedures for any control equipment used to reduce NO<sub>x</sub> emissions to implement RACT;
4. the testing, monitoring, recordkeeping and reporting procedures, as contained in 310 CMR 7.19(13), used to demonstrate compliance with 310 CMR 7.19;

5. a schedule for the implementation of RACT at the facility, including provisions for demonstrating periodic increments of progress and demonstrating compliance;
  6. any other information required by the Department; and
  7. the signature of a responsible official.
- (d) Additional Requirements for Demonstration of RACT. An emission control plan submitted by any person who owns, leases operates or controls a facility or part of a facility subject to 310 CMR 7.19(2)(b), 7.19(4)(b) or 7.19(12), must meet the following requirements in addition to the requirements under 310 CMR 7.19(3)(c). For any person applying under 310 CMR 7.19(4)(b), these additional requirements are only for determining RACT for the period from May 31, 1995 until May 1, 1999. After April 30, 1999, 310 CMR 7.19(4)(b)3, will apply.
1. The plan must demonstrate the emission limits reflecting the application of RACT for that facility or part thereof; and
  2. pertinent information supporting the demonstration made under 310 CMR 7.19(3)(d)1., including technical and economic considerations.
- (e) Approval of an Emission Control Plan. For persons applying under 310 CMR 7.19(2)(b) or (4)(b) or 7.19(12) or 7.19(14), where the information submitted in the emission control plan is sufficient to support the emissions limits and the proposed schedule, the Department will publish a notice of public hearing in accordance with M.G.L. c. 30A. The Department shall allow for a 30 day public comment period following the published notice. After the public hearing and the close of the public comment period, the Department will issue a final approval or disapproval of the emission control plan.
- (f) Prohibition. Except as provided for in 310 CMR 7.19(3)(a), no emission reductions or any other actions taken at any facility or part of a facility will constitute implementation of RACT at that facility unless those emission reductions or other actions are part of an emission control plan approved by the Department.
- (g) Additional requirements may be included in the emission control plan approval to assure that emissions from the unit(s) subject to RACT will not cause or contribute to a condition of air pollution or a violation of any other regulation. Such requirements include but are not limited to emissions limits on other air contaminants, and additional stack testing or emissions monitoring requirements.

(4) Large Boilers.

(a) Applicability and NO<sub>x</sub> RACT. After May 31, 1995, any person owning, leasing, operating or controlling a boiler having an energy input capacity of 100 million Btu per hour or greater, at a facility subject to 310 CMR 7.19, shall comply with the following NO<sub>x</sub> emission standard, except as provided in 310 CMR 7.19(2)(b), 7.19(2)(e), 7.19(2)(f), 7.19(4)(b) and 7.19(4)(c).

1. For dry bottom boilers burning coal:
  - a. for tangential fired boilers, 0.38 pounds per million Btu,
  - b. for face fired boiler, 0.45 pounds per million Btu.
2. For stoker-fired boilers burning other solid fuels, 0.33 pounds per million Btu.
3. For boilers with an energy input capacity greater than or equal to 250 million Btu per hour burning either oil or oil and gas (This includes burning the oil and gas simultaneously or at different times. Boilers approved to burn another fuel, such as coal, are subject to this limit only while burning only oil and/or gas and not the other fuel.):
  - a. for tangential oil fired boilers, 0.25 pounds per million Btu;
  - b. for tangential gas fired boilers, 0.20 pounds per million Btu.
4. For boilers with an energy input capacity greater than or equal to 100 million Btu per hour and less than 250 million Btu per hour burning either oil or oil and gas:
  - a. for boilers with a heat release rate less than or equal to 70,000 Btu/hoursft<sup>3</sup>, 0.30 pounds per million Btu, and
  - b. for boilers with a heat release greater than 70,000 Btu/hour-ft<sup>3</sup>, 0.40 pounds per million Btu.
5. For boilers burning only gas, 0.20 pounds per million Btu.
6. The averaging time for determining compliance with 310 CMR 7.19(4)(a) shall be one hour. Except that, for boilers using a continuous emissions monitoring system that satisfies the requirements of 310 CMR 7.19(13)(b) to determine compliance, compliance will be based on a calendar day average.

(b) Repowering. Any person subject to 310 CMR 7.19(4)(a), may choose to repower by December 31, 2003 and comply with 310 CMR 7.19(4)(b) rather than 310 CMR 7.19(4)(a). Such person shall enter into an enforceable agreement with the Department prior to June 1, 1994 agreeing to comply with the requirements of 310 CMR 7.19(4)(b).

1. A boiler to be repowered by December 31, 2003 shall not, after May 31, 1995 and before May 1, 1999, cause, suffer, allow or permit emissions from the facility in excess of an emission rate achievable through the implementation of RACT as required in an emission control plan approved under 310 CMR 7.19(3)
2. The repowered boiler shall be approved under 310 CMR 7.02(2), 310 CMR 7.00: *Appendix A* or 40 CFR 52.21, unless specifically exempted by those regulations.
3. The existing or repowered boiler shall not be operated after April 30, 1999 unless it complies with the most restrictive of the following NO<sub>x</sub> emissions standards (this limit represents RACT):
  - a. For dry bottom, tangential and face fired boilers burning solid fuel, 0.2 pounds per million Btu, based on a one hour average;
  - b. For boilers burning oil or gas, 0.1 pounds per million Btu, based on a one hour average;
  - c. The averaging time for determining compliance with 310 CMR 7.19(4)(b) shall be one hour. Except that, for boilers utilizing a CEMS that satisfies the requirements of 310 CMR 7.19(13)(b) to determine compliance, compliance shall be based on a calendar day average.
  - d. A Best Available Control Technology determination made as part of an approval issued pursuant to 310 CMR 7.02(1) or 40 CFR 52.21 or Lowest Achievable Emission Rate determination made pursuant to 310 CMR 7.00: *Appendix A*, as applicable.
  - e. An applicable New Source Performance Standards (40 CFR 60).

(c) Alternative NO<sub>x</sub> RACT. Any person owning, leasing, operating or controlling a boiler subject to 310 CMR 7.19(4)(a), may choose to have that boiler comply with 310 CMR 7.19(4)(c) instead of 310 CMR 7.19(4)(a).

1. After May 31, 1995, the maximum allowable daily NO<sub>x</sub> emission standard, in pounds per million Btu, shall be equal to 0.6 times the worst NO<sub>x</sub> emission rate. The worst NO<sub>x</sub> emission rate shall be determined in accordance with a methodology specified by the Department for each fuel burned.
  2. The Department will approve the boiler to comply with an alternative emission limitation contained in 310 CMR 7.19(14)(c)1. only if a demonstration is contained in the Emission Control Plan that the boiler can not comply with the emission limitation contained in 310 CMR 7.19(4)(a) through use of available NO<sub>x</sub> controls or NO<sub>x</sub> ERCs. This may be demonstrated either through technical or economic infeasibility.
- (d) Except as provided for under 310 CMR 7.19(2)(f), if more than one fuel is fired simultaneously or during the same hour (or day if an averaging time of 24 hours is used), the allowable NO<sub>x</sub> emission standard shall be calculated according to the procedure contained in 310 CMR 7.19(15) using the emission standard from 310 CMR 7.19(4).
- (e) Testing, Monitoring, Recordkeeping, Reporting and Emission Control Plan. Any facility subject to 310 CMR 7.19(4), shall comply with any applicable testing, monitoring, recordkeeping, and reporting requirements contained in 310 CMR 7.19(13) and shall submit an emission control plan as required by 310 CMR 7.19(3).
- (f) Carbon Monoxide (CO) Limitation. Any facility subject to 310 CMR 7.19(4), shall not exceed a CO exhaust concentration of 200 ppmvd, corrected to 3% oxygen. This shall be based on a one hour averaging time. If a continuous emissions monitoring system is used for determining compliance, the averaging time shall be a calendar day. Notwithstanding this CO emission standard, the Department may approve a higher CO emission standard for a large boiler as part of the emission control plan if the facility demonstrates that combustion conditions will not significantly deteriorate with the higher CO emission standard.
- (5) Medium-size Boilers.
- (a) Applicability and NO<sub>x</sub> RACT. After May 31, 1995, any person owning, leasing, operating or controlling a boiler with an energy input capacity of 50 million Btu per hour or greater and less than 100 million Btu per hour at a facility subject to 310 CMR 7.19, shall comply with the following NO<sub>x</sub> emission standard, except as provided for in 310 CMR 7.19(2)(b), 7.19(2)(e) and 7.19(2)(f).
1. For tangential or face-fired or stoker-fired boilers, burning solid fuel, 0.43 pounds per million Btu, based on a one-hour average.

2. For tangential or face fired boilers, based on a one-hour average.
    - a. burning gas only, 0.1 pounds per million Btu.
    - b. burning distillate oil or oil and gas (This includes burning the oil and gas simultaneously or at different times. Boilers approved to burn another fuel such as coal are subject to this limit while only burning oil and/or gas and not coal.) 0.12 pounds per million Btu.
    - c. burning residual oil,
      - i. 0.3 pounds per million Btu burning residual oil or residual oil and gas (This includes burning the oil and gas simultaneously or at different times. Boilers approved to burn another fuel such as coal are subject to this limit while burning only oil and/or gas and not coal.), or
      - ii. recirculate at least 15% of the flue gas and maintain flue gas oxygen concentration at 3% at the boiler exit. The O<sub>2</sub> level should not be decreased beyond the point that the CO concentration increases beyond 130 ppmvd, corrected to 3% O<sub>2</sub>.
  3. For boilers using a continuous emissions monitoring system that satisfies the requirements of 310 CMR 7.19(13)(b) to determine compliance, compliance will be based on a calendar day average.
- (b) Cofiring fuels. Except as provided for under 310 CMR 7.19(2)(f), if more than one fuel is fired simultaneously or during the same hour (or day if an averaging time of 24 hours is used), the allowable NO<sub>x</sub> emissions standard shall be calculated according to the procedure contained in 310 CMR 7.19(15).
- (c) Testing, Monitoring, Recordkeeping, Reporting and Emission Control Plan. Any facility subject to 310 CMR 7.19(5), shall comply with all applicable testing, monitoring, recordkeeping, and reporting requirements contained in 310 CMR 7.19(13) and shall submit an emission control plan as required by 310 CMR 7.19(3).
- (d) Carbon Monoxide (CO) Limitation. Any facility subject to 310 CMR 7.19(5), shall not exceed a CO exhaust concentration of 200 ppmvd, corrected to 3% oxygen. This shall be based on a one hour averaging time. If a continuous emissions monitoring system is used for determining compliance, the averaging time shall be a calendar day. Notwithstanding this CO emission standard, the Department may approve a higher CO emission standard for a medium-size boiler as part of the emission control

plan if the facility demonstrates that combustion conditions will not significantly deteriorate with the higher CO emission standard.

(6) Small Boilers.

(a) Applicability and NO<sub>x</sub> RACT. After March 15, 1995, any person owning, leasing, operating or controlling a boiler, with an energy input capacity of less than 50 million Btu per hour and equal to or greater than 20 million Btu per hour or with an energy input capacity less than 20 million Btu per hour with potential emissions greater than 50 TPY of NO<sub>x</sub>, at a facility subject to 310 CMR 7.19, shall tune the boiler annually according to the following procedure (tuneup procedure based on *Combustion Efficiency Optimization Manual for Operators of Oil and Gas Fired Boilers* (EPA 340/1-83-023)):

1. Operate the boiler at a firing rate most typical of normal operation. If the boiler experiences significant load variations during normal operation, operate it at its average firing rate.
2. At this firing rate record stack gas temperature, oxygen concentration, and CO concentration (for gaseous fuels) or smoke-spot number (For liquid fuels, the smoke spot number can be determined with ASTM Test Method D-2156 (Bacharach or equivalent) and observe flame conditions after boiler operation stabilizes at the firing rate selected. If the excess oxygen in the stack gas is at the lower end of the range of typical minimum values (typical minimum oxygen levels for boilers at high firing rates are: for natural gas 0.5-3.0%; for liquid fuels 2.0-4.0%. The O<sub>2</sub> level should be reduced below this range with caution). If the CO emissions are low and there is no smoke, the boiler is probably operating at near optimum efficiency at this particular firing rate.

However, complete the remaining portion of this procedure at 310 CMR 7.19(6)(a)3. through 10. to determine whether still lower oxygen levels are practical.

3. Increase combustion air flow to the boiler until stack gas oxygen levels increase by 1 to 2% over the level measured in 310 CMR 7.19(6)(a)2.. As in 310 CMR 7.19(6)(a)2., record the stack gas temperature, CO concentration (for gaseous fuels) and smoke-spot number (for liquid fuels), and observe flame conditions for these higher oxygen levels after boiler operation stabilizes.
4. Decrease combustion air flow until the stack gas oxygen concentration is at the level measured in 310 CMR 7.19(6)(a)2. From this level gradually reduce the combustion air flow, in small increments. After each increment, record the stack gas temperature, oxygen concentration, CO concentration (for gaseous fuels) and

smoke-spot number (for liquid fuels). Also observe the flame and record any changes in its condition.

5. Continue to reduce combustion air flow stepwise, until one of these limits is reached:
  - a. Unacceptable flame conditions - such as flame impingement on furnace walls or burner parts, excessive flame carryover, or flame instability.
  - b. Stack gas CO concentrations greater than 400 ppm for gaseous fuels.
  - c. Smoking at the stack for liquid fuels.
  - d. Equipment-related limitation - such as low windbox/furnace pressure differential, built in air-flow limits, etc.
  
6. Develop an O<sub>2</sub>/CO curve (for gaseous fuels) or O<sub>2</sub>/smoke curve (for liquid fuels) similar to those shown in figures 310 CMR 7.19(6)-1 and 2 using the excess oxygen and CO or smoke-spot number data obtained at each combustion air flow setting.
  
7. From the curves prepared in 310 CMR 7.19(6)(a)6., find the stack gas oxygen levels where the CO emission or smoke spot number equals the following values:

Fuel	<u>Measurement</u>	<u>Value</u>
Gaseous	CO emissions	400 ppm
#1 & #2 oils	smoke-spot number	number 1
#4 oil	smoke-spot number	number 2
#5 oil	smoke-spot number	number 3
#6 oil	smoke-spot number	number 4

The above conditions are referred to as CO or smoke threshold, or as the minimum excess oxygen level. Compare this minimum value of excess oxygen to the expected value provided by the combustion unit manufacturer. If the minimum level found is substantially higher than the value provided by the combustion unit manufacturer, the owner or operator should improve fuel and air mixing, thereby allowing operation with less air.

8. Add 0.5 to 2.0% to the minimum excess oxygen level found in 310 CMR 7.19(6)(a)7. and reset burner controls to operate automatically at this higher stack gas oxygen level. This margin above the minimum oxygen level accounts for fuel variations, variations in atmospheric conditions, load changes, and non-repeatability or play in automatic controls.
9. If the load of the combustion unit varies significantly during normal operation, repeat 310 CMR 7.19(6)(a)1. through 8. for firing rates that represent the upper and lower limits of the range of the load. Because control adjustment at one firing rate may effect conditions at other firing rates, it may not be possible to establish the optimum excess oxygen level at all firing rates. If this is the case, choose the burner control settings that give best performance over the range of firing rates. If one firing rate predominates, settings should optimize conditions at that rate.
10. Verify that the new settings can accommodate the sudden changes that may occur in daily operation without adverse effects. Do this by increasing and decreasing load rapidly while observing the flame and stack. If any of the conditions in 310 CMR 7.19(6)(a)5. result, reset the combustion controls to provide a slightly higher level of excess oxygen at the affected firing rates.

Next, verify these new settings in a similar fashion. Then make sure that the final control settings are recorded at steady-state operating conditions for future reference.

11. Another method may be substituted if it is approved, in writing, by the Department and EPA as equivalent.
  12. Nothing in any tune-up procedure shall be construed to require any act or omission that would result in unsafe conditions or would be in violation of any regulation or requirement established by National Fire Prevention Association, Federal Occupational Safety and Health Administration, or other applicable regulations or requirements.
- (b) Testing, Recordkeeping, and Notification. Any person subject to 310 CMR 7.19(6) shall:
1. provide written notification to the Department by January 1, 1995 that the facility is subject to, and will comply with 310 CMR 7.19(6).
  2. maintain records for five years of the tune-up, including:

- a. date of tune-up;
- b. person(s) conducting tune-up;
- c. O<sub>2</sub>/CO (for gas) or O<sub>2</sub>/smoke spot (for oil) correlations obtained during tune-up;
- d. boiler/burner manufacturer's recommended set-points;
- e. final boiler set-points as result of tune-up;
- f. normal boiler/burner maintenance records.
- g. at least once per month verify that the settings determined during the tuneup have not changed.

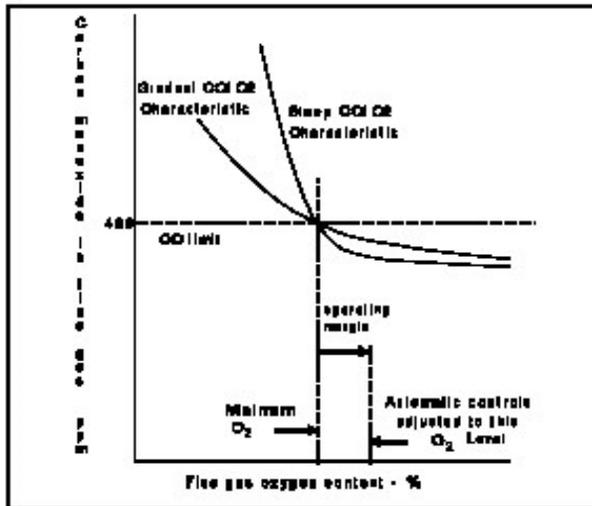


Figure 310 CMR 7.19(6) - 1

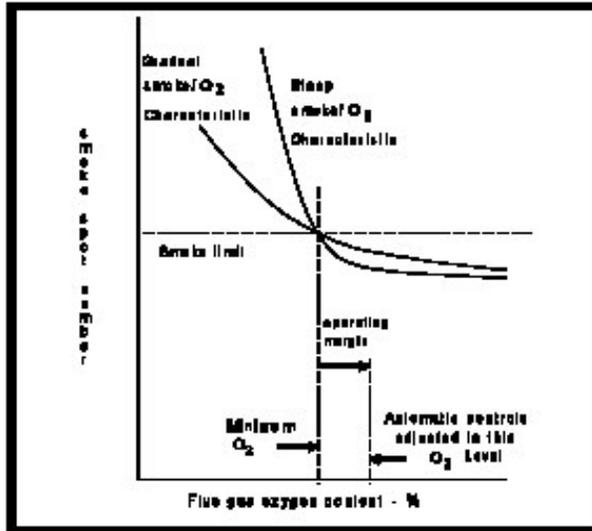


Figure 7.19(6) – 2

(7) Stationary Combustion Turbines.

(a) Applicability and NO<sub>x</sub> RACT. After May 31, 1995, any person owning, leasing, operating or controlling any stationary combustion turbine having an energy input capacity of 25 million Btu per hour or greater at a facility subject to 310 CMR 7.19, shall comply with the following NO<sub>x</sub> and CO emission standard, except as provided for in 310 CMR 7.19(2)(b), 7.19(2)(e) and 7.19(2)(f).

1. For combined cycle stationary combustion turbines, based on a one-hour average:
  - a. 42 ppmvd NO<sub>x</sub>, corrected to 15% O<sub>2</sub>, when firing gas, and
  - b. 65 ppmvd NO<sub>x</sub>, corrected to 15% O<sub>2</sub>, when firing oil, and
  - c. 50 ppmvd CO, corrected to 15% O<sub>2</sub>, when firing oil and/or gas.
2. For simple cycle stationary combustion turbines, based on a one hour average:
  - a. 65 ppmvd NO<sub>x</sub>, corrected to 15% O<sub>2</sub>, when firing gas, and
  - b. 100 ppmvd NO<sub>x</sub>, corrected to 15% O<sub>2</sub>, when firing oil, and
  - c. 100 ppmvd CO, corrected to 15% O<sub>2</sub>, when firing oil and/or gas.

3. For stationary combustion turbines using a monitoring system that satisfies the requirements of 310 CMR 7.19(13)(b) to determine compliance, compliance will be based on a calendar day average.
4. Notwithstanding the CO emission standard stated in 310 CMR 7.19(7)(a)1.c. and 2.c., the Department may approve a higher CO emission standard for a stationary combustion turbine if it is demonstrated that combustion conditions will not significantly deteriorate with a higher CO emission standard.

(b) Testing, Monitoring, Recordkeeping, Reporting and Emission Control Plan. Any facility subject to 310 CMR 7.19(7), shall comply with all applicable testing, monitoring, recordkeeping, and reporting requirements contained in 310 CMR 7.19(13) and shall submit an emission control plan as required by 310 CMR 7.19(3).

(8) Stationary Reciprocating Internal Combustion Engines.

(a) Applicability and NO<sub>x</sub> RACT. After May 31, 1995, any person owning, leasing, operating or controlling a reciprocating internal combustion engine having energy input capacity of three million Btu per hour or greater at a facility subject to 310 CMR 7.19, is subject to 310 CMR 7.19(8) and shall comply with NO<sub>x</sub> RACT as defined in 310 CMR 7.19(8)(c) or (d) as applicable, except as provided for in 310 CMR 7.19(2)(b), 7.19(2)(e) and 7.19(2)(f).

(b) Exemption. Emergency standby engines are exempted from the requirements of 310 CMR 7.19(8) provided:

- 1.the engine is not operated more than 300 hours per year, and
- 2.the engine is not operated as a load shaving unit, peaking power production unit, or standby engine in an energy assistance program.

(c) For a stationary reciprocating internal combustion engine that has operated 1000 hours or more during any consecutive 12 month period since January 1, 1990, the NO<sub>x</sub> emission standard shall be:

1. For rich burn, gas-fired reciprocating internal combustion engines, 1.5 grams per bhp- hr, based on a one-hour average.
2. For lean burn, gas-fired reciprocating internal combustion engines, 3.0 grams per bhp-hr, based on a one hour average.
3. For lean burn, oil-fired or dual fuel reciprocating internal combustion engines, 9.0

grams per bhp-hr, based on a one-hour average.

4. For stationary reciprocating internal combustion engine using a monitoring system that satisfies the requirements of 310 CMR 7.19(13)(b) to determine compliance, compliance will be based on a calendar day average.
- (d) For a stationary reciprocating internal combustion engine that has not operated 1000 hours or more during any consecutive 12 month period since January 1, 1990, the NO<sub>x</sub> emission standard shall be:
1. the emission standard in 310 CMR 7.19(8)(c); or, set and maintain the ignition timing of the engine four degrees retarded relative to standard timing; provided the ignition timing shall not be retarded beyond the point that:
    - a. the CO emission concentration increases by 100 ppmvd, corrected to 15% O<sub>2</sub>, or
    - b. the turbocharger speed is increased beyond the maximum operating speed recommended by the manufacturer, or
    - c. the exhaust port temperature increases beyond the manufacturer's recommended maximum operating temperature.
  2. install and maintain an elapsed time meter to indicate, in cumulative hours, the elapsed engine operating time for previous 12 months;
  3. determine the hours of operation for each engine for the previous 12 month period on a monthly basis;
  4. notify the Department if the operation exceeds 1000 hours for any consecutive 12 month period, and the facility is subject to the emission standard in 310 CMR 7.19(8)(c).
  5. maintain records to certify that the ignition timing of the engine has been inspected and adjusted at least once every three years.
- (e) Testing Monitoring, Recordkeeping, Reporting and Emission Control Plan. Any facility subject to 310 CMR 7.19(8), shall comply with all applicable testing, monitoring, recordkeeping, and reporting requirements contained in 310 CMR 7.19(13) and shall submit an emission control plan as required by 310 CMR 7.19(3).

(9) Municipal Waste Combustor Units.

(a) Applicability and NO<sub>x</sub> RACT. After May 31, 1995, any person owning, leasing, operating or controlling a municipal waste combustor unit with potential emissions of NO<sub>x</sub> equal to or greater than 25 tons per year at a facility having potential emissions, before application of air pollution control equipment, greater than or equal to 50 tons per year of NO<sub>x</sub> shall comply with 310 CMR 7.19(9). The NO<sub>x</sub> emission standard for a municipal waste combustor unit subject to 310 CMR 7.19(9) is 0.6 pounds per million Btu, based on a one hour average, while burning municipal waste, except as provided for in 310 CMR 7.19(2)(b), (2)(e) and (2)(f). However, for any municipal waste combustor unit equipped with a continuous emissions monitoring system, the averaging time shall be based on a calendar day average.

(b) Testing, Monitoring, Record Keeping, Reporting and Emission Control Plan. Any facility subject to 310 CMR 7.19(9), shall comply with any applicable testing, monitoring, recordkeeping, and reporting requirements contained in 310 CMR 7.19(13) and shall submit an emissions control plan as required by 310 CMR 7.19(3).

[(10) Reserved]

(11) Glass Melting Furnaces.

(a) Applicability and NO<sub>x</sub> RACT. After May 31, 1995, any person owning, leasing, operating or controlling a container glass melting furnace having a maximum production rate of 14 tons of glass removed from the furnace per day or greater, at a facility subject to 310 CMR 7.19, shall comply with an emission standard of 5.3 pounds of NO<sub>x</sub> per ton glass removed from the furnace based on a calendar day average, except as provided for in 310 CMR 7.19(2)(b), 7.19(2)(e) and 7.19(2)(f).

(b) Testing, Monitoring, Recordkeeping, Reporting and Emission Control Plan. Any facility subject to 310 CMR 7.19(11), shall comply with any applicable testing, monitoring, recordkeeping, and reporting requirements contained in 310 CMR 19(13) and shall submit an emission control plan as required by 310 CMR 7.19(3).

(12) Miscellaneous RACT.

(a) Applicability. Any emissions unit with potential emissions of NO<sub>x</sub> equal to or greater than 25 tons per year at a facility having potential emissions, before application of air pollution control equipment, greater than or equal to 50 tons per year of NO<sub>x</sub> is subject to 310 CMR 7.19(12) and shall comply with the source specific RACT for that emissions unit.

(b) Emissions Exemptions.

1. RACT is not required to be defined under 310 CMR 7.19(12) for any emissions

unit that since January 1, 1990 has been approved as Best Available Control Technology or Lowest Achievable Emission Rate in an approval containing specific emission limits or work practice standards issued under a federally enforceable regulation.

2. RACT is not required to be defined under 310 CMR 7.19(12) for any emissions unit either subject to a RACT standard under 310 CMR 7.19(4), (5), (6), (7), (8), or (11) or exempt under 310 CMR 7.19(1)(c)2. through 8.

(c) NO<sub>x</sub> Reasonably Available Control Technology Requirements. After May 31, 1995, no person subject to the requirements of 310 CMR 7.19(12) shall cause, suffer, allow or permit emissions from the facility in excess of an emission rate achievable through the implementation of reasonably available control technology as required in an emission control plan approved under 310 CMR 7.19(3).

(d) Emission control Plan Requirements. Any person subject to 310 CMR 19(12)(a) must submit an emission control plan as required by 310 CMR 7.19(3) by April 1, 1994 to demonstrate how compliance will be achieved. The emission control plan and the plan approval issued by the Department under 310 CMR 7.19(3) must also be approved by the EPA as a Massachusetts SIP revision.

(e) Testing, Monitoring, Recordkeeping, Reporting and Emission Control Plan. Any facility subject to 310 CMR 7.19(12), shall comply with any applicable testing, monitoring, recordkeeping, and reporting requirements contained in 310 CMR 19(13) and shall submit an emission control plan as required by 310 CMR 7.19(3).

(13) Testing, Monitoring, Recordkeeping, and Reporting Requirements.

(a) Applicability. Any person subject to 310 CMR 7.19(2)(b), (4), (5), (7), (8), (9), (10), (11), (12) or (14) shall comply with 310 CMR 7.19(13). If the provisions or requirements from 310 CMR 7.27(11) conflict with a provision of 310 CMR 7.19(13), the more stringent of the provisions will apply unless otherwise determined by the Department in the approved emission control plan. For any variance of a requirement under 310 CMR 7.19(13), the variance must be made federally enforceable. A variance from the requirement will be given only where it will not adversely impact the ability to monitor emissions. Regardless of the Department's determination in the emission control plan, any facility that is subject to 40 CFR Parts 60 and 75 must still comply with those requirements.

1. For boilers with an energy input capacity greater than or equal to 250,000,000 Btu per hour, compliance with the NO<sub>x</sub> and CO emission standards shall be demonstrated with a continuous emissions monitoring system (CEMS) as specified in 310 CMR 7.19(13)(b), and recordkeeping and reporting as specified in 310

CMR 7.19(13)(d). Boilers that will be repowered pursuant to 310 CMR 7.19(4)(b) are not subject to the CEMS requirement until May 1, 1999 unless required as the result of the single source SIP revision approving RACT for the period from May 31, 1995 until May 1, 1999.

2. For boilers with an energy input capacity equal to or greater than 100,000,000 Btu per hour and less than 250,000,000 Btu per hour, compliance with the NO<sub>x</sub> and CO emission standards shall be demonstrated by performing an annual stack test as specified in 310 CMR 7.19(13)(c), and recordkeeping and reporting as specified in 310 CMR 7.19(13)(d). Boilers that will be repowered pursuant to 310 CMR 7.19(4)(b) are not required to stack test until May 1, 1999. The annual stack test requirement is waived for boilers equipped with a CEMS satisfying the requirements of 310 CMR 7.19(13)(b).
3. For multiple emission units that are complying with 310 CMR 7.19(14), compliance with the CO (as applicable) and NO<sub>x</sub> emission standards shall be demonstrated:

- a. with a continuous emissions monitoring system (CEMS) as specified in 310 CMR 7.19(13)(b), or

- b. for emission unit(s) not required by 310 CMR 7.19(13)(a) to use CEMS to determine compliance, by performing an annual stack test as specified in 310 CMR 7.19(13)(c).

The emission rate from the stack tested emission unit shall be adjusted by a compliance assurance multiplier determined by the Department within the range of 1.1-1.25.

- c. for emission unit(s) not generating surplus emission reductions to be used by another emission unit in the average, compliance may alternatively be determined by the procedure contained in 310 CMR 7.19(13)(a) for similar emission units (*e.g.* a stationary combustion turbine burning the same fuel with the same energy input) that are not emissions averaging to determine compliance.

- 4.a. For boilers with an energy input capacity equal to or greater than 50,000,000 Btu per hour and less than 100,000,000 Btu per hour, compliance with the NO<sub>x</sub> and CO emission standards shall be demonstrated by performing an initial stack test as specified in 310 CMR 7.19(13)(c). The recordkeeping in 310 CMR 7.19(13)(d) shall apply.

- b. For boilers complying with the requirement on allowable oxygen level, an oxygen analyzer and recorder shall be utilized. The recordkeeping in 310

CMR 7.19(13)(d) shall apply.

5. For combined cycle combustion turbines with an energy input capacity greater than or equal to 100,000,000 Btu per hour, compliance with the NO<sub>x</sub> and CO emission standards shall be demonstrated with a continuous emission monitoring system (CEMS) as specified in 310 CMR 7.19(13)(b) and recordkeeping as specified in 310 CMR 7.19(13)(d).
6. For combined cycle combustion turbines with an energy input capacity less than 100,000,000 Btu per hour, compliance with the NO<sub>x</sub> and CO emission standards shall be demonstrated by performing an annual stack test as specified in 310 CMR 7.19(13)(c). The annual stack test requirement is waived for combined cycle combustion turbines equipped with a monitoring system satisfying the requirements of 310 CMR 7.19(13)(b).
7. For simple cycle combustion turbines, compliance with the NO<sub>x</sub> and CO emission standards shall be demonstrated by performing an annual stack test as specified in 310 CMR 7.19(13)(c).
8. For stationary reciprocating internal combustion engine with an energy input capacity greater than or equal to 30,000,000 Btu per hour, compliance with the NO<sub>x</sub> emission standards shall be demonstrated with a continuous emissions monitoring system (CEMS) as specified in 310 CMR 7.19(13)(b) and recordkeeping as specified in 310 CMR 7.19(13)(d). For engines operating less than 1000 hours per year in this size range compliance shall be determined by recordkeeping as required in 310 CMR 7.19(8)(d).
9. For stationary reciprocating internal combustion engine with an energy input capacity less than 30,000,000 Btu per hour and operating 1000 hours or more in any consecutive 12 month period, compliance with the applicable emission standard shall be demonstrated by performing an initial stack test as as specified in 310 CMR 7.19(13)(c), and recordkeeping as specified in 310 CMR 7.19(13)(d). For engines operating less than 1000 hours per year in this size range compliance shall be determined by recordkeeping as required in 310 CMR 7.19(8)(d).
10. For glass melting furnaces, compliance with the applicable emission standard shall be demonstrated by performing an annual stack test as specified in 310 CMR 7.19(13)(c), and recordkeeping and reporting as specified in 310 CMR 7.19(13)(d). The annual stack test requirement is waived for glass melting furnaces equipped with a CEMS satisfying the requirements of 310 CMR 7.19(13)(b).
11. For emission units subject to 310 CMR 7.19(2)(b) or 7.19(12), compliance with the applicable emission standard shall be demonstrated through a combination of

continuous emissions monitoring, stack testing and/or recordkeeping specified in the approved emission control plan.

12. The Department or EPA may require compliance stack testing beyond that listed above.

13. For municipal waste combustors with potential emissions greater than 25 tons per year of NO<sub>x</sub>, compliance with the applicable NO<sub>x</sub> emissions standard shall be demonstrated by performing an annual stack test as specified in 310 CMR 7.19(13)(c), and recordkeeping and reporting as specified in 310 CMR 7.19(13)(d). However, for any municipal waste combustor unit that in May 1995 is equipped with a continuous emissions monitoring system (CEMS), compliance shall be demonstrated with a CEMS as specified in 310 CMR 7.19(13)(b) and recordkeeping and reporting as specified in 310 CMR 7.19(13)(d).

(b) Continuous Emissions Monitoring Systems (CEMS). Any person required to monitor NO<sub>x</sub> emissions (*i.e.*, through NO<sub>x</sub> concentrations and the associated diluent concentrations) pursuant to 40 CFR 75, 310 CMR 7.27 or 310 CMR 7.28 shall use the procedures contained either therein or in 310 CMR 7.19(13)(b)1. through (b)12. to gather and analyze data and provide quality assurance and quality control in order to determine compliance with 310 CMR 7.19, except that missing data routines and bias adjustment factors do not need to be applied. The person subject to 40 CFR 75, 310 CMR 7.27, or 310 CMR 7.28 shall monitor for CO as specified in 310 CMR 7.19(13)(b)1. through (b)12. and use the data reduction procedures contained in either 40 CFR 75 or 310 CMR 7.19(13)(b)9. Any person demonstrating compliance with 310 CMR 7.19 for emission units using CEMS who is not subject to 40 CFR 75, 310 CMR 7.27 or 310 CMR 7.28 shall;

1. for any emission unit either already having a CEMS in place or having a CEMS being procured or installed, submit a preliminary CEMS monitoring plan for Department approval as part of the emission control plan required in 310 CMR 7.19(3)(f), unless the CEMS is already certified and approved by the Department of EPA;
2. for any emission unit not covered under 310 CMR 7.19(13)(b)1., submit a preliminary CEMS monitoring plan for Department approval at least 180 days prior to equipment installation;
3. include the following information in the preliminary CEMS monitoring plan: source identification, source description, control technology description, the applicable regulations, the type of monitor, a monitoring system flow diagram, a description of the data handling system, and a sample calculation demonstrating compliance with the emission limits using conversion factors from 40 CFR 60 or approved by the Department and EPA;

4. submit a CEMS certification protocol at least 90 days prior to certification testing for the CEMS, and submit any proposed adjustment to the certification testing at least seven days in advance;
5. include the following information in the certification protocol, which must be found acceptable by the Department: the location of and specifications for each instrument or device, as well as procedures for calibration, operation, data evaluation and data reporting;
6. install, calibrate, maintain and operate a CEMS for measuring NO<sub>x</sub>, and either O<sub>2</sub> or CO<sub>2</sub> at locations approved in the Department's approval of the CEMS certification protocol and record the output of each CEMS;
7. submit a certification report within 60 days of the completion of the certification test for review and written Department approval;
8. certify each CEMS in accordance with the performance specifications contained in 40 CFR 60 Appendix B and quality assurance and quality control procedures contained in 40 CFR 60 Appendix F and continue to comply with the requirements of 40 CFR 60 Appendix F;
9. calculate a calendar day average from a block hourly average for each hour the emissions unit is operating and a block hourly average from at least three data points, generated by a CEMS at 15 minute intervals over each one-hour period.
10. operate each continuous emission monitoring system at all times that the emissions unit(s) is operating except for periods of CEMS calibrations checks, zero span adjustment, and preventive maintenance as described in the preliminary monitoring plan submitted to the Department and as determined during certification. Notwithstanding such exceptions, in all cases obtain valid data for at least 75% of the hours per day, 75% of the day per month, and 90% of the hours per quarter during which the emission unit is operating;
11. use only valid data to calculate the emissions rate averages using conversion factors from 40 CFR 60 or approved by the Department and EPA; and
12. Any person required to utilize a monitoring system to determine compliance of a stationary reciprocating engine or stationary combustion turbine with the applicable NO<sub>x</sub> emissions standard may monitor process or control device parameters provided it is demonstrated to the Department, and the Department approves in writing, that the parametric monitoring system (PMS) provides an equivalent degree assurance of compliance with the emissions standard. The Department may require any conditions it deems necessary to assure continuous compliance. The Department will be required to

bring these PMS requirements into compliance with 40 CFR 64, Enhanced Monitoring Requirements, after EPA has finalized those rules.

(c) Stack testing. Any person required to demonstrate compliance with a NO<sub>x</sub> emission standard contained in 310 CMR 7.19 by stack testing shall comply with 310 CMR 7.19(13)(c). That person shall:

1. submit a pretest protocol for the required emission test for review and Department approval at least 60 days prior to the anticipated date of testing;
2. include in the pretest protocol, a description of sampling point locations, sampling equipment, sampling and analytical procedures, and the operating conditions for the required testing;
3. conduct compliance stack testing in accordance with procedures set forth in Appendix A of 40 CFR Part 60 or another method approved by the Department and EPA;
4. perform the initial compliance stack test on the emission unit before August 1, 1995 for existing emission units, or within 90 days of continuous operation for new emission units to demonstrate compliance;
5. perform the annual compliance test, where annual compliance stack testing is required either by 310 CMR 7.00 or in the approved emission control plan, on the emission unit prior to October 1 of each year beginning 1995;
6. submit the emission test report for the review and written Department approval within 60 days of the completion of the compliance stack testing.

(d) Recordkeeping and reporting. Any person required to demonstrate compliance with 310 CMR 7.19 by recordkeeping and reporting shall comply with 310 CMR 7.19(13)(d). That person:

1. shall maintain a record of all measurements, performance evaluations, calibration checks, and maintenance or adjustments for each continuous emission monitor;
2. shall submit to the Department's regional office by the 30th day of April, July, October, and January of each calendar year, a report showing any excess emissions as measured by a CEMS within the previous calendar quarter (January-March, April-June, *etc.*) and shall include:
  - a. the date and time of commencement and completion of each period of excess emissions and the magnitude of the excess emissions for each hour;

- b. identification of the suspected reason for the excess emissions and any corrective action taken;
- c. the date and time that any CEMS stopped collecting valid data and when it started to collect valid data again, except for zero and span checks; and
- d. the nature and date of system repairs;

In the event none of the above items have occurred such information shall be stated in the report;

3. shall measure and record for each unit on a daily basis: type fuel(s) burned each day, heat content of each fuel, the total heating value of the fuel consumed for each day, the actual emission rate (for emissions units demonstrating compliance with CEMS), and the allowable emission rate. For units complying with 310 CMR 7.19(14), daily records should also include a summation of these values for all units included in the average, as well as any other data needed to demonstrate compliance.

(4. Reserved)

5. shall obtain a certification from the fuel supplier for each shipment of residual oil that includes the following information:

- a. the name of the oil supplier;
- b. the nitrogen content of each oil shipment (acceptable test methods for determining nitrogen content of the oil are ASTM methods D3228 and D4629 or any other method approved by the Department and EPA);
- c. the location where the sample was drawn for analysis to determine the nitrogen content of the oil, specifically including whether the oil was sampled as delivered to the affected facility or whether the sample was drawn from oil in storage at the oil supplier's or oil refiner's facility or another location;

6. may, as an alternative to the fuel supplier certification required in 310 CMR 7.19(13)(d)5., elect to sample and analyze the residual oil immediately after the fuel tank is filled and before any oil is combusted for each new shipment according to methods approved by the Department.

7. shall maintain copies of all fuel supplier certifications or fuel oil analyses on site for a period of five years;

8. shall maintain all records required by 310 CMR 7.19(13)(d) for a period of five years in a permanently bound log book or any other form acceptable to the Department including computer retained and generated data; and

9. shall submit compliance records within ten days of written request by the Department or EPA.

(14) Averaging for Multiple Emission Units to Achieve Compliance.

(a) Applicability and RACT Requirement. After May 31, 1995, any person operating or controlling more than one emission unit subject to a NO<sub>x</sub> emission standard contained in 310 CMR 7.19(4), (5), (7), (8) or (12) may comply with 310 CMR 7.19 by emissions averaging, provided the requirements of 310 CMR 7.19(14) and 7.00 *Appendix B*(4) are met.

(b) Stationary Reciprocating Internal Combustion Engines. For any stationary reciprocating internal combustion engine(s) included in the average with boiler(s), the emissions rate and emissions standard for the stationary reciprocating internal combustion engine(s) shall be converted to pounds per million according to the following equation:

$$ES_{p/mmBtu} = 0.866 \times ES_{gm/bhp-hr} \times Eff$$

Where:

$ES_{p/mmBtu}$  - Emission standard expressed in pounds per million Btu.

$ES_{gm/bhp-hr}$  - Emission standard expressed in grams per brake horse-power hour.

Eff = Thermal efficiency; the ratio of the electrical/mechanical output energy to the energy input.

The thermal efficiency must be demonstrated to the Department's satisfaction. There shall be either a direct or indirect readout of the electrical/mechanical energy output. If a stationary combustion turbine and a stationary reciprocating internal combustion engine are to be averaged, the conversion factors contained in 310 CMR 7.19(14)(b) and (c) shall both be used.

(c) Stationary Combustion Turbines. If stationary combustion turbines are to be averaged with boilers, the emissions rate in ppmvd at 15% O<sub>2</sub> shall be converted to units of pounds per million Btu according to the procedure contained in 40 CFR 60.45.

For natural gas or propane:

$$\text{pounds per million Btu} = (\text{ppmvd@15\%O}_2) \times (0.00315)$$

For oil:

$$\text{pounds per million Btu} = (\text{ppmvd@15\% O}_2) \times (0.00333)$$

If a stationary combustion turbine and a stationary reciprocating internal combustion engine are to be averaged, the conversion factors contained in 310 CMR 7.19(14)(b) and (c) shall both be used.

(d) Testing, Monitoring, Recordkeeping, Reporting and Emission Control Plan. Any facility subject to 310 CMR 7.19(14) shall comply with the applicable testing, monitoring, recordkeeping, and reporting requirements contained in 310 CMR 7.19(13)(b), (c) and (d) and shall submit an emission control plan as required by 310 CMR 7.19(3).

(15) Cofiring fuels. When different fuels are either burned simultaneously in any combination, or during the same hour (or day if a 24 hour averaging time is used), the applicable emission standard (*e.g.* in pounds per million Btu) is determined by proration using the following formula:

$$PS_{NOx} = \frac{(HI_1) \times (ES_1) + (HI_2) \times (ES_2) \dots + (HI_N) \times (ES_N)}{HI_1 + HI_2 \dots + HI_N}$$

$PS_{NOx}$  is the prorated standard for nitrogen oxides when burning different fuels simultaneously, in pounds per million Btu heat input derived from all fuels fired.

$HI_1$  is the heat input for fuel 1

$ES_1$  is the emissions standard for fuel 1

$N$  is the total number of fuels burned either simultaneously or on that day.