TESTING AND MONITORING RECOMMENDATIONS FOR EXISTING STATIONARY COMBUSTION TURBINES [1]

NATURAL GAS, REFINERY GAS, OR LANDFILL GAS [2, 3]

Size (MMBTU/HR)	Monitoring Recommendation [4]	Frequency of Stack Tests
1 ≤ heat input < 20	CEM (SO_2) [5]	
20 ≤ heat input <50	Combustion Process Adjustment [6] & CEM (SO_2) [5] Stack Test (a) (NOx, & CO) [7]	
50 ≤ heat input <100	Combustion Process Adjustment [6], Stack Test (a) (CO, NOx) & CEM (SO_2) [5]	Every 5 years (a)
100 ≤ heat input <250	Combustion Process Adjustment [6], Stack Test (a) (CO, NOx) & CEM (SO_2) [5]	Every 5 years (a)
≥250 heat input	Combustion Process Adjustment [6], Stack Test (a) (CO, NOx & PM-10) [8] & CEM (NOx [9, 10] CO [9, 10], O_2 [9, 10] & SO_2 [5])	Every 5 years [8] (a)

DISTILLATE OIL OR AVIATION KEROSENE [3]

Size (MMBTU/HR)	Monitoring Recommendation [4]	Frequency of Stack Tests
1 ≤ heat input < 20	NONE	
20 ≤ heat input <50	Combustion Process Adjustment [6] & Stack Test (NOx, & CO) [7]	
50 ≤ heat input <100	Combustion Process Adjustment [6] & Stack Test [11, 12] (VOC, CO, NOx & TSP & PM-10) (a) (b)	Every 5 years(a) (b)
100 ≤ heat input <250	Combustion Process Adjustment [6] & Stack Test [11, 12] (VOC, CO, NOx, TSP & PM-10) [13, 14] (a) (b) & COM [15, 9, 10]	Every 5 years(a) (b)
≥250 heat input	Combustion Process Adjustment [6] & Stack Test [11, 12] (VOC, CO, NOx, TSP [13, 14] & PM10 [9]) [13, 14], (a) (b) COM [15, 9, 10] & CEM (NOx [9, 10], CO [9, 10] & O_2 [9, 10]) [15, 16]	Every 5 years(a) [14] (b)

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[1] For each turbines that has HRSG with duct firing capability, the stack emission testing should be for (i) the turbine operation at full load without duct burner and (ii) turbine operation with duct burner at full load. If the duct burner is operating in Fresh Air Fired mode without the turbine in operation, the duct burner should be treated as boiler and Testing and Monitoring Guidance for combustion equipment should be followed. Stack emission testing at all varying load scenarios is not required if the testing is conducted at worst-case operating conditions specified in the BTS approved stack testing protocol and not required by NSPS subpart GG.

[2] If the concentration of H2S in landfill gas is at or above 100 ppm, the combustion unit should be tested in the same manner as refinery gas, i.e., the turbine should have SO2 CEM or sampling of the landfill gas continuously or manually each week for sulfur or H2S.

[3] Most stringent requirements would apply during co-firing of different fuels.

[4] For a particular air contaminant, stack emission testing is not required if CEMs is installed, certified and CEMs can determine permit allowable in units of the permit standard (e.g. stack testing requires 2.5 lb/hr of VOC and CEM also monitors VOC in lb/hr continuously). CEMS can be used in "lieu of" stack testing with BTS approval. CEM may replace subsequent stack testing requirements but cannot nullify the need for the initial stack test. When only stack testing is required, CEMS can replace "subsequent" stack testing if the CEM monitors and records emissions in units identical to those measured during the initial stack test. Use of stack tests, instead of CEMs, is not permitted.

[5] SO2 CEM required for Refinery Gas or Landfill Gas [2]. Facility can sample refinery gas or Landfill Gas [2] continuously or manually each week for sulfur or H2S in lieu of having a SO2 CEM.

[6] The adjustment of the combustion process should be carried out according to the manufacturer's recommended procedures and maintenance schedule pursuant to N.J.A.C. 7:27-19.5(e) and 19.16.

[7] Initial stack emission testing for NOx, and CO is required for combustion turbines > 25 MMBTU/hr capacity in accordance with RACT rules.

[8] Initial PM-10 (including condensible) testing is required for all combustion units greater than 250 MMBTU/Hr capacity combusting gaseous fuel. Subsequent PM-10 stack testing requirements will be determined on a case-by-case basis considering results of the initial stack tests.

[9] COM: Installation and operation of a continuous opacity monitor is required if distillate oil operation exceeds 500 hours in a calendar year. See “Opacity Monitoring For Combustion Equipment”.

[10] For Simple Cycle Turbines that are Peaking Units a minimum of two turbines consisting of those units with the most cumulative operating hours, can be tested each calendar year if there are at least ten Peaking Unit turbines at the facility.

[11] Stack testing for any operating scenario with N.J.A.C. 7:27-19.25, “Exemption for emergency use of fuel oil” is required when testing was not otherwise conducted for fuel oil OR when the fuel oil is used only under the “exemption for emergency use”.

[12] A modified stack testing schedule may be written in the permit for #2 fuel oil for an operating scenario for N.J.A.C. 7:27-19.25, “Exemption for emergency use of fuel oil” ONLY if no other operating scenario for fuel oil exists and if testing was not otherwise required by Federal regulations.

[13] Initial and once every 5 year stack emission testing for TSP and PM10 (including condensible) are required for combustion turbines > 100 MMBtu/hr capacity combusting oil and that operate less than 500 hours per year on oil, See footnote (a) and (b) below for an exemption from this requirement.

[14] Initial and Annual stack emission testing for TSP and PM10 (including condensible) are required for combustion turbines > 100 MMBtu/hr capacity combusting oil that operate more than 500 hours per year on oil, See footnote (a) and (b) below for an exemption from this requirement.

[15] COM is not required if distillate oil is used as backup fuel for less than 500 hours of operation per year.

[16] SO2 CEM is not required for oil fired operations. The calculations of SO2 emissions are required monthly based on fuel oil usage records and percent sulfur as specified by the fuel supplier.

(a): For simple cycle turbines combusting natural gas or distillate oil, stack emission testing is not required if the capacity factor (in terms of operating hours) of the unit is no more than average 10% during the previous 3 calendar years and no more than 20% in each of those calendar years. However, periodic testing (using such instrument as a portable monitor) in accordance with Technical Manual 1005 must be conducted for NOx and CO every year. Periodic testing is not required if CEMs for NOx and CO are installed. Stack testing of VOC is not required. Annual tune-ups must be performed in accordance with manufacturer’s recommendations. The periodic testing for NOx and CO will be for just one fuel the unit is burning at the time of the test.

If the average capacity factor of the unit (in terms of operating hours) exceeds 10% during the previous 3 calendar years or exceeds 20% in each of those calendar years, NOx and CO must be stack tested once per permit term (if natural gas is combusted) and NOX, CO, VOC, TSP & PM-10 must be stack tested once per permit term (if distillate oil is combusted). Stack emission test protocol must be submitted within 6 months of exceeding 10% capacity factor.

(b): For combined cycle turbines combusting distillate oil, no subsequent stack testing is required for any pollutant if (i) the total actual amount of distillate oil fired is less than 100 hours in a calendar year, and (ii) the distillate oil fired for less than 100 hours in a calendar year is Ultra Low Sulfur Distillate Oil (ULSD).

However, when distillate oil is fired more than 100 hours in a calendar year, stack emission tests must be performed for VOC, CO, NOx, TSP and PM-10. This applies to all combined cycle turbines > 50 MMBTU/Hr. Stack test protocol must be submitted in 30 days of reaching 100 hours of distillate oil usage and stack emission tests must be conducted within 180 days of reaching the 100-hour mark.