

AIR POLLUTION CONTROL DISTRICT  
REGULATORY COMPLIANCE DIVISION

POLICIES AND PROCEDURES

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Topic: Compressors

Distribution: All Policy Holders

This policy and procedures document provides guidance for inspectors and engineers when inspecting compressors. Compressors are essentially motor-driven pumps used to move gases and light-end liquids (e.g., petroleum condensates, low molecular weight hydrocarbons). The motor may be electric or internal combustion engines (piston or turbine), while the pump may be gear, piston, sliding vane, propeller or suction driven. Compressors are rated based on the engine horsepower and the inlet/outlet pressure range.

Compressors have a wide range of application, ranging from refrigerators to sandblasting and painting to moving large volumes of natural gas. Emissions are primarily combustion products (except from electric engines). If the compressor is used to move a hydrocarbon gas, fugitive hydrocarbons may be released from the pump portion of the compressor seals. Control devices for compressor IC engines include water/steam injection (turbines) and catalytic muffler systems (piston). Controls for the pump portion include venting emissions to a vapor recovery system or waste gas system and a District-approved I&M Program.

District Rule 202.C.2.f exempts all piston IC engines of less than 100 bhp from permit requirements except when the total horsepower of the individual engines less than 100 bhp but greater than 20 bhp at the stationary source exceeds 500 bhp. Additionally, Rule 202.C.3 does not require permits for engines used in construction activities. Compressors with engines that are covered by these rules will not be inspected, except for visible emissions and nuisance.

The following items may require inspection:

1. Internal combustion engines -- please refer to Policy & Procedure II.B.
2. Gas turbine(s)
  - fuel rate (scf/hr)
  - water injection rate (gallons/minute)
  - KWe output
  - water/fuel mass ratio
  - diverter valve status (open/shut)
  - operating limits: number of turbines operating simultaneously, heat input rate/turbine, hours operation/turbine, fuel usage rate (scf/hr)

3. SCR Unit(s)
  - inlet NO<sub>x</sub> (ppm)
  - outlet NH<sub>3</sub> (ppm)
  - outlet O<sub>2</sub> (ppm)
  - ammonia feed rate (scf/hr)
  - inlet temperature
  - outlet temperature
  - burner fuel rate (scf/hr)
  - ammonia/NO<sub>x</sub> ratio
4. Stack data
  - NO<sub>x</sub> (ppm, lb/hr)
  - CO (ppm, lb/hr)
  - O<sub>2</sub> (ppm)
  - flue gas flow rate (scf/hr)
  - temperature
  - visible emissions
5. Operator logs
  - maintenance activities (turbines, CEM)
  - downtime
  - KWe generated
  - total number of cold starts and total hours of operation per turbine
6. Other
  - limitations on standby equipment use
7. Continuous Emission Monitoring - many of the emissions and process parameters listed in Items #1-3 (above) may be continuously monitored at the facility. The inspector should obtain the necessary data from these monitors. If the data are not available, a note should be made of this situation. Additionally, the following CEM logs should be checked:
  - daily and weekly preventative maintenance forms prepared and completed
  - manual calibrations performed and documented
  - record of all down time and reason (maintenance, calibration, repair, power failure)
  - record of alarms (number, date and time, cause and solution)

It should be noted that the averaging time for the data from a given offshore platform may range from minute-to-minute to hourly to a daily basis. The inspector must consult with the project manager to determine which averaging time is needed.

If the pump portion of the compressor is subject to BACT controls, the inspector should verify that the seal emissions are vented to the vapor recovery system or the waste gas system. The seal at the end of the pump which is connected to the turbine/engine must be enclosed in a housing which in turn, is connected via piping to the vapor recovery system or waste gas system. Because the housing and piping system design may vary from compressor to compressor the inspector should check with the project manager about the specific design. Should BACT

controls not be required, the inspector should consult with the project manager to determine what, if any controls are required. If permit conditions require an I&M plan, the specifics of the plan should be examined to determine the items which require inspection. All I&M plans must conform with District Protocol (see Policy and Procedures V.1).

An inspection report will be prepared after the inspection has been conducted. The report should include an explanation of the reason for the inspection, the results of the inspection and recommendations. If violations of permit conditions or District rules are detected, Policy and Procedures VII.A, "Enforcement Actions - The Notice of Violation", will be followed.

