Texas Chapter 117 - Control of Air Pollution From Nitrogen Compounds

SUBCHAPTER G: GENERAL MONITORING AND TESTING REQUIREMENTS

DIVISION 2: EMISSION MONITORING
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Outline:

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SUBCHAPTER G: GENERAL MONITORING AND TESTING REQUIREMENTS
DIVISION 2: EMISSION MONITORING
§§117.8100, 117.8110, 117.8120, 117.8130, 117.8140

STATUTORY AUTHORITY

The new sections are adopted under Texas Water Code, §5.102, concerning General Powers, §5.103, concerning Rules, and §5.105, concerning General Policy, which authorize the commission to adopt rules necessary to carry out its powers and duties under the Texas Water Code. In addition, the sections are adopted under Texas Health and Safety Code, §382.002, concerning Policy and Purpose, which states the policy and purpose of the State of Texas and the Texas Clean Air Act; §382.011, concerning General Powers and Duties, which provides the commission with the authority to establish the level of quality to be maintained in the state's air and the authority to control the quality of the state's air; §382.012, concerning State Air Control Plan, which requires the commission to develop plans for protection of the state's air; §382.014, concerning Emission Inventory, which authorizes the commission to require submission information relating to emissions of air contaminants; §382.016, concerning Monitoring Requirements; Examination of Records, which authorizes the commission to prescribe requirements for owners or operators of sources to make and maintain records of emissions measurements; §382.017, concerning Rules, which provides the commission the authority to adopt rules consistent with the policy and purposes of the Texas Clean Air Act; §382.021, concerning Sampling Methods and Procedures, which authorizes the commission to prescribe the sampling methods and procedures; and §382.051(d), concerning Permitting Authority of Commission Rules, which authorizes the commission to adopt rules as necessary to comply with changes in federal law or regulations applicable to permits under Chapter 382. In addition, the new sections are adopted under federal mandates contained in 42 United States Code, §§7401 *et seq.*, which require states to adopt pollution control measures in order to reach specific air quality standards in particular areas of the state.

The adopted sections implement Texas Health and Safety Code, §§382.002, 382.011, 382.012, 382.014, 382.016, 382.017, 382.021, and 382.051(d).

§117.8100. Emission Monitoring System Requirements for Industrial, Commercial, and Institutional Sources.

(a) Continuous emissions monitoring system (CEMS) requirements. When required by this chapter, the owner or operator of any CEMS shall comply with the following.

(1) Except as specified in paragraph (5) of this subsection, the CEMS must meet the requirements of 40 Code of Federal Regulations (CFR) Part 60 as follows:

(A) §60.13;

(B) Appendix B:

(i) Performance Specification 2, for nitrogen oxides (NO_x) in terms of the applicable standard (in parts per million by volume (ppmv), pounds per million British thermal units (lb/MMBtu), or grams per horsepower-hour (g/hp-hr)). An alternative relative accuracy requirement of $\pm$ 2.0 ppmv from the reference method mean value is allowed;

(ii) Performance Specification 3, for diluent; and

(iii) Performance Specification 4, for carbon monoxide (CO), for owners or operators electing to use a CO CEMS; and

(C) after the final applicable compliance date or date of required submittal of CEMS performance evaluation, conduct audits in accordance with §5.1 of Appendix F, quality assurance procedures for NO_x, CO, and diluent analyzers, except that a cylinder gas audit or relative accuracy audit may be performed in lieu of the annual relative accuracy test audit (RATA) required in §5.1.1. If the optional alternative relative accuracy requirement of subparagraph (B)(i) of this paragraph (or equivalent) from the reference method mean value is used, then an annual RATA must be performed.

(2) The owner or operator shall monitor diluent, either oxygen (O_2) or carbon dioxide (CO_2), unless using an exhaust flow meter that meets the flow monitoring specifications of 40 CFR Part 60, Appendix B, Performance Specification 6 or 40 CFR Part 75, Appendix A.

(3) One CEMS may be shared among units or among multiple exhaust stacks on a single unit, provided:

(A) the exhaust stream of each stack is analyzed separately; and

(B) the CEMS meets the certification requirements of paragraph (1) of this subsection for each stack while the CEMS is operating in the time-shared mode.

(4) Each individual stack must be analyzed separately for units with multiple exhaust stacks.

(5) As an alternative to paragraph (1) of this subsection, an owner or operator may choose to comply with the CEMS requirements of 40 CFR Part 75 as follows:

(A) general operation requirements in Subpart B, §75.10(a)(2);

(B) certification procedures and test methods in Subpart C, §75.20(c) and §75.22;

(C) recordkeeping requirements of the monitoring plan in Subpart D, §75.53(a) - (c);

(D) appropriate specifications and test procedures in Appendix A, as follows:

(i) §1 (Installation and Measurement Location);

(ii) §2 (Equipment Specifications);

(iii) §3 (Performance Specifications);

(iv) §4 (Data Acquisition and Handling Systems);

(v) §5 (Calibration Gas);

(vi) §6 (Certification Tests and Procedures); and

(vii) meet either the relative accuracy requirement of 40 CFR Part 75 in percentage only, or the alternative relatively accuracy requirement of $\pm$ 2.0 ppmv from the reference method mean value; and

(E) appropriate quality assurance/quality control procedures in Appendix B, as follows:

(i) §1 (Quality Assurance/Quality Control Program); and

(ii) §2 (Frequency of Testing).

(6) The CEMS is subject to the approval of the executive director.

(b) Predictive emissions monitoring system (PEMS) requirements. When required by this chapter, the owner or operator of any PEMS shall comply with the following.

(1) The owner or operator shall monitor diluent, either O_2 or CO_2:

(A) using a CEMS:

(i) in accordance with subsection (a)(1)(B)(ii) of this section; or

(ii) with a similar alternative method approved by the executive director and the United States Environmental Protection Agency; or

(B) using a PEMS.

(2) Any PEMS must meet the requirements of 40 CFR Part 75, Subpart E, except as provided in paragraphs (3) and (4) of this subsection.

(3) The owner or operator may vary from 40 CFR Part 75, Subpart E if the owner or operator:

(A) demonstrates to the satisfaction of the executive director and the United States Environmental Protection Agency that the alternative is substantially equivalent to the requirements of 40 CFR Part 75, Subpart E; or

(B) demonstrates to the satisfaction of the executive director that the requirement is not applicable.

(4) The owner or operator may substitute the following as an alternative to the test procedure of Subpart E for any unit:

(A) perform the following alternative initial certification tests:

(i) conduct initial RATA at low, medium, and high levels of the key operating parameter affecting NOx using 40 CFR Part 60, Appendix B:

(I) Performance Specification 2, subsection 13.2, pertaining to NOx, in terms of the applicable standard (in ppmv, lb/MMBtu, or g/hp-hr). An alternative relative accuracy requirement of $\pm$ 2.0 ppmv from the reference method mean value is allowed;

(II) Performance Specification 3, subsection 13.2, pertaining to O_2 or CO_2; and

(III) Performance Specification 4, subsection 13.2, pertaining to CO, for owners or operators electing to use a CO PEMS; and

(ii) conduct an F-test, a t-test, and a correlation analysis using 40 CFR Part 75, Subpart E at low, medium, and high levels of the key operating parameter affecting NOx:

(I) calculations must be based on a minimum of 30 successive emission data points at each tested level that are either 15-minute, 20-minute, or hourly averages;

(II) the F-test must be performed separately at each tested level;

(III) the t-test and the correlation analysis must be performed using all data collected at the three tested levels;

(IV) waivers from the statistical tests and default reference method standard deviation values for the F-test may be allowed according to the *TNRCC PEMS Protocol Draft*, May 16, 1994;

(V) the correlation analysis may only be temporarily waived following review of the waiver request submittal if:

(-a-) the process design is such that it is technically impossible to vary the process to result in a concentration change sufficient to allow a successful correlation analysis statistical test. Any waiver request must also be accompanied with documentation of the reference method measured concentration, and documentation that it is less than 50% of the emission limit or standard. The waiver must be based on the measured value at the time of the waiver. Should a subsequent RATA effort identify a change in the reference method measured value by more than 30%, the statistical test must be repeated at the next RATA effort to verify the successful compliance with the correlation analysis statistical test requirement; or

(-b-) the data for a measured compound (e.g., NOx, O_2) are determined to be autocorrelated according to the procedures of 40 CFR §75.41(b)(2). A complete analysis of autocorrelation with support information must be submitted with the request for waiver. The statistical test must be repeated at the next RATA effort to verify the successful compliance with the correlation analysis statistical test requirement; and

(VI) all requests for waivers must be submitted to the executive director for review. The executive director shall approve or deny each waiver request;

(B) further demonstrate PEMS accuracy and precision for at least one unit of a category of equipment by performing RATA and statistical testing in accordance with subparagraph (A) of this paragraph for each of three successive quarters, beginning:

(i) no sooner than the quarter immediately following initial certification; and

(ii) no later than the first quarter following the final compliance date; and

(C) after the final applicable compliance date, perform RATA for each unit:

(i) at normal load operations;

(ii) using the Performance Specifications of subparagraph (A)(i)(I) - (III) of this paragraph; and

(iii) at the following frequency:

(I) semiannually; or

(II) annually, if following the first semiannual RATA, the relative accuracy during the previous audit for each compound monitored by PEMS is less than or equal to 7.5% (or within $\pm$ 2.0 ppmv) of the mean value of the reference method test data at normal load operation; or alternatively:

(-a-) for diluent, is no greater than 1.0% O_2 or CO_2, for diluent measured by reference method at less than 5% by volume; or

(-b-) for CO, is no greater than 5.0 ppmv.

(5) The owner or operator shall, for each alternative fuel fired in a unit, certify the PEMS in accordance with paragraph (4)(A) of this subsection unless the alternative fuel effects on NO_x, CO, and O_2 (or CO_2) emissions were addressed in the model training process.

(6) The PEMS is subject to the approval of the executive director.

(c) Monitoring system certification reports. Reports of any RATA performed in accordance with this section must comply with §117.8010 of this title (relating to Compliance Stack Test Reports).

§117.8110. Emission Monitoring System Requirements for Utility Electric Generation Sources.

(a) Continuous emissions monitoring system (CEMS) requirements. When required by this chapter, the owner or operator of any CEMS shall comply with the following.

(1) The CEMS must be installed, calibrated, maintained, and operated in accordance with 40 Code of Federal Regulations (CFR) Part 75 or 40 CFR Part 60, as applicable.

(2) One CEMS may be shared among units, provided:

(A) the exhaust stream of each unit is analyzed separately; and

(B) the CEMS meets the applicable certification requirements of paragraph (1) of this subsection for each exhaust stream.

(b) Predictive emissions monitoring system (PEMS) requirements. When required by this chapter, the owner or operator of any PEMS shall comply with the following.

(1) The owner or operator shall monitor diluent, either oxygen or carbon dioxide:

(A) using a CEMS:

(i) in accordance with subsection (a) of this section; or

(ii) with a similar alternative method approved by the executive director and the United States Environmental Protection Agency; or

(B) using a PEMS.

(2) Any PEMS for units subject to the requirements of 40 CFR Part 75 must meet the requirements of 40 CFR Part 75, Subpart E, §§75.40 - 75.48.

(3) Any PEMS for units not subject to the requirements of 40 CFR Part 75 must meet the requirements of either:

(A) 40 CFR Part 75, Subpart E, §§75.40 - 75.48; or

(B) §117.8100(b) of this title (relating to Emission Monitoring System Requirements for Industrial, Commercial, and Institutional Sources).

§117.8120. Carbon Monoxide (CO) Monitoring.

When required by this chapter, the owner or operator shall monitor carbon monoxide (CO) exhaust emissions from an affected unit using one or more of the following methods:

(1) install, calibrate, maintain, and operate a:

(A) continuous emissions monitoring system (CEMS) in accordance with §117.8100(a) or §117.8110(a) of this title (relating to Emission Monitoring System Requirements for Industrial, Commercial, and Institutional Sources; and Emission Monitoring System Requirements for Utility Electric Generation Sources), as applicable; or

(B) predictive emissions monitoring system (PEMS) in accordance with §117.8100(b) or §117.8110(b) of this title, as applicable; or

(2) sample CO as follows:

(A) with a portable analyzer (or 40 Code of Federal Regulations (CFR) Part 60, Appendix A reference method test apparatus) after manual combustion tuning or manual burner adjustments conducted for the purpose of minimizing nitrogen oxides (NOx) emissions whenever, following such manual changes, either of the following occur:

(i) NOx emissions are sampled with a portable analyzer or 40 CFR Part 60, Appendix A reference method test apparatus; or

(ii) the resulting NOx emissions measured by CEMS or predicted by PEMS are lower than levels when CO emissions data was previously gathered; and

(B) sample CO emissions using the test methods and procedures of 40 CFR Part 60 in conjunction with any relative accuracy test audit of the NOx and diluent analyzer.

§117.8130. Ammonia Monitoring.

When required by this chapter, one of the following ammonia monitoring procedures must be used to demonstrate compliance with the applicable ammonia emission specifications of this chapter for gas-fired or liquid-fired units that inject urea or ammonia into the exhaust stream for nitrogen oxides (NOx) control.

(1) Mass balance. Ammonia emissions are calculated as the difference between the input ammonia, measured by the ammonia injection rate, and the ammonia reacted, measured by the differential NOx upstream and downstream of the control device that injects urea or ammonia into the exhaust stream. The ammonia emissions must be calculated using the following equation.

Figure: 30 TAC §117.8130(1)

$$NH_3 @ O_2 = \left[\left(\frac{a}{b} \times 10^6\right) - c\right] \times d$$

Where:

$NH_3@O_2$	=	ammonia parts per million by volume (ppmv) at reference oxygen. Reference oxygen on a dry basis is 3.0% for boilers and process heaters; 0.0% for fluid catalytic cracking units (including carbon monoxide (CO) boilers, CO furnaces, and catalyst regenerator vents); 7.0% for boilers and industrial furnaces that were regulated as existing facilities by the United States Environmental Protection Agency 40 Code of Federal Regulations Part 266, Subpart H (as was in effect on June 9, 1993), wood-fired boilers, and incinerators; 15% for stationary gas turbines (including duct burners used in turbine exhaust ducts), gas-fired lean-burn engines, and lightweight aggregate kilns; and 3.0% for all other units;
a	=	ammonia injection rate (in pounds per hour (lb/hr))/17 pound per pound-mole (lb/lb-mol);
b	=	dry exhaust flow rate (lb/hr)/29 lb/lb-mol;
c	=	change in measured NOx concentration across catalyst (ppmv at reference oxygen); and
d	=	correction factor, the ratio of measured slip to calculated ammonia slip, where the measured slip is obtained from the stack sampling for ammonia during an initial demonstration of compliance required by this chapter and using the methods specified in §117.8000 of this title (relating to Stack Testing Requirements).

(2) Oxidation of ammonia to nitric oxide (NO). Convert ammonia to NO using a molybdenum oxidizer and measure ammonia slip by difference using a NO analyzer. The NO analyzer must be quality assured in accordance with the manufacturer's specifications and with a quarterly cylinder gas audit with a 10 parts per million by volume (ppmv) reference sample of ammonia passed through the probe and confirming monitor response to within $\pm$ 2.0 ppmv.

(3) Stain tubes. Measure ammonia using a sorbent or stain tube device specific for ammonia measurement in the 5.0 to 10.0 ppmv range. The frequency of sorbent/stain tube testing must be daily for the first 60 days of operation. After the first 60 days of operation, the frequency may be reduced to weekly testing if operating procedures have been developed to prevent excess amounts of

ammonia from being introduced in the control device and when operation of the control device has been proven successful with regard to controlling ammonia slip. Daily sorbent or stain tube testing must resume when the catalyst is within 30 days of its useful life expectancy. Every effort must be made to take at least one weekly sample near the normal highest ammonia injection rate.

(4) Other methods. Monitor ammonia using another continuous emissions monitoring system or predictive emissions monitoring system procedure subject to prior approval of the executive director.

§117.8140. Emission Monitoring for Engines.

(a) Periodic testing. When required by this chapter, the owner or operator of any stationary internal combustion engine shall test engine nitrogen oxides (NO_x) and carbon monoxide (CO) emissions as follows.

(1) The methods specified in §117.8000 of this title (relating to Stack Testing Requirements) must be used.

(2) The owner or operators shall sample:

(A) on a biennial calendar basis; or

(B) within 15,000 hours of engine operation after the previous emission test, under the following conditions:

(i) install and operate an elapsed operating time meter; and

(ii) submit, in writing, to the executive director and any local air pollution agency having jurisdiction, biennially after the initial demonstration of compliance:

(I) documentation of the actual recorded hours of engine operation since the previous emission test; and

(II) an estimate of the date of the next required sampling.

(3) Engines used exclusively in emergency situations are not required to conduct the testing specified in paragraph (2) of this subsection.

(b) Proper operation. When required by this chapter, the owner or operator of any stationary internal combustion engine shall check the engine for proper operation by recorded measurements of engine NOx and CO emissions at least quarterly and as soon as practicable within two weeks after each occurrence of engine maintenance that may reasonably be expected to increase emissions, oxygen sensor replacement, or catalyst cleaning or catalyst replacement. Stain tube indicators specifically designed to measure NOx concentrations may be acceptable for this documentation, provided a hot air probe or equivalent device is used to prevent error due to high stack temperature, and three sets of concentration measurements are made and averaged. Portable NOx analyzers are also acceptable for this documentation. Quarterly emission testing is not required for those engines whose monthly run time does not exceed ten hours. This exemption does not diminish the requirement to test emissions after the installation of controls, major repair work, and any time the owner or operator believes emissions may have changed.