for the NO NDIR analyzer shall be 5,000:1 (see § 86.321).

(6) The minimum CO_2 rejection ratio (maximum CO_2 interference) for the NO NDIR analyzer shall be 30,000:1 (see § 86.322).

§ 86.319–79 Analyzer checks and calibrations; frequency and overview.

(a) Prior to initial use and after major repairs, bench check each analyzer (see § 86.320).

(b) At least monthly during testing, check the NO_X converter efficiency, as described in § 86.332.

(c) At least once every 30 days during testing, perform the following:

(1) Leak check the pressure side of the system (see § 86.328). If the option described in § 86.328(b)(2) is used, a pressure leak check is not required.

(2) Calibrate all analyzers (see §§ 86.330 through 86.332).

(3) Check the analysis system response time (see § 86.329). If the option described in § 86.329(b) is used, a response time check is not required.

(4) Verify that the automatic data collection system (if used) meets the chart reading requirements found in § 86.343.

(5) Check the fuel flow measurement instrument to insure that the specifications in § 86.314 are met. Flow meters of the tapered tube and float design (rotometers) or the balance beam principle need be checked only every 90 days.

(d) At least once every 90 days during testing check the water rejection ratio and the CO_2 rejection ratio on all NDIR analyzers (see §§ 86.321 and 86.322).

(e) At least once every 180 days during testing check the dynamometer test stand and power output instrumentation (see § 86.333).

[42 FR 45154, Sept. 8, 1977, as amended at 58 FR 58422, Nov. 1, 1993]

§ 86.320–79 Analyzer bench check.

(a) Prior to initial use and after major repairs verify that each analyzer complies with the following specifications:

(1) Response time (see § 86.315(a)).

(2) Precision (see § 86.315(b)).

(3) Noise (see § 86.315(c)).

(4) Zero drift (see § 86.315(d)).

(5) Span drift (see § 86.315(e)).

(6) Water rejection ratio, NDIR analyzers only (see §§ 86.316(c) and 86.318 (b)(5).

(7) CO_2 rejection ratio, NDIR analyzers only (see §§ 86.316(d) and 86.318(b)(6)).

(8) Quench check, CL analyzers only (see § 86.327).

(b) If a stainless steel NO_2 to NO converter is used, condition all new or replacement converters. The conditioning consists of either purging the converter with air for a minimum of 4 hours or until the converter efficiency is greater than 90 percent. The converter must be at operational temperature while purging. Do not use this procedure prior to checking converter efficiency on in-use converters.

§ 86.321–79 NDIR water rejection ratio check.

(a) Zero and span the analyzer on the lowest range that will be used.

(b) Introduce a saturated mixture of water and zero gas at room temperature directly to the analyzer.

(c) Determine and record the analyzer operating pressure (GP) in absolute units in pascals. Gauges G3 and G4 may be used if the values are converted to the correct units.

(d) Determine and record the temperature of the zero-gas mixture.

(e) Record the analyzers' response (AR) in ppm to the saturated zero-gas mixture.

(f) For the temperature recorded in step (d), determine the saturation vapor presssure (P_{WB}) from § 86.344(d).

(g) Calculate the water concentration (Z) in the mixture from:

$$Z = (P_{WB}/GP)(10^6)$$

(h) Calculate the water rejection ratio (WRR) from:

$$WRR = (Z/AR)$$

§ 86.322–79 NDIR CO_2 rejection ratio check.

(a) Zero and span the analyzer on the lowest range that will be used.

(b) Introduce a CO_2 calibration gas of at least 10 percent CO_2 or greater to the analyzer.

(c) Record the CO_2 calibration gas concentration in *ppm*.

(d) Record the analyzers' response (AR) in *ppm* to the CO_2 calibration gas.

(e) Calculate the CO_2 rejection ratio (CO_2RR) from:

$CO_2RR = (ppm\ CO_2)/AR$

§ 86.327–79 Quench checks; NO_X analyzer.

(a) Perform the reaction chamber quench check for each model of high vacuum reaction chamber analyzer prior to initial use.

(b) Perform the reaction chamber quench check for each new analyzer that has an ambient pressure or "soft vacuum" reaction chamber prior to initial use. Additionally, perform this check prior to reusing an analyzer of this type any time any repairs could potentially alter any flow rate into the reaction chamber. This includes, but is not limited to, sample capillary, ozone capillary, and if used, dilution capillary.

(c) Quench check as follows:

(1) Calibrate the NO_X analyzer on the lowest range that will be used for testing.

(2) Introduce a mixture of CO_2 calibration gas and NO_X calibration gas to the CL analyzer. Dynamic blending may be used to provide this mixture. Dynamic blending may be accomplished by analyzing the CO_2 in the mixture. The change in the CO_2 value due to blending may then be used to determine the true concentration of the NO_X in the mixture. The CO_2 concentration of the mixture shall be approximately equal to the highest concentration experienced during testing. Record the response.

(3) *Recheck the calibration.* If it has changed more than ±1 percent of full scale, recalibrate and repeat the quench check.

(4) Prior to testing, the difference between the calculated NO_X response and the response of NO_X in the presence of CO_2 (step 2) must not be greater than 3.0 percent of full-scale. The calculated NO_X response is based on the calibration performed in step (1).

(Secs. 206, 301(a), Clean Air Act as amended (42 U.S.C. 7525, 7601(a)))

[42 FR 45154, Sept. 8, 1977, as amended at 44 FR 16917, Mar. 20, 1979]

§ 86.328–79 Leak checks.

(a) *Vacuum side leak check.* (1) Any location within the analysis system where a vacuum leak could affect the test results must be checked.

(2) The maximum allowable leakage rate on the vacuum side is 0.5 percent of the in-use flow rate for the portion of the system being checked. the analyzer flows and bypass flows may be used to estimate the in-use flow rates.

(3) The sample probe and the connection between the sample probe and valve V2 (Figure D79–1) may be excluded from the leak check.

(b) *Pressure side leak check.* (1) The maximum allowable leakage rate on the pressure side in 5 percent of the in-use flow rate.

(2) Option: If the flow rate for each flow meter is equal to or greater than the flow rate recorded in §86.329(b)(1)(ii), then a pressure side leak check is not required.

§ 86.329–79 System response time; check procedure.

(a) Check the system response time by the following procedure:

(1) Stabilize the operating temperature of the sample line, sample pump, and heated filters.

(2) Introduce an HC span gas into the sampling system at the sample probe or valve V2 at atmospheric pressure. Simultaneously, start the time measurement.

(3) When the HC instrument response is 95 percent of the span gas concentration used, stop the time measurement.

(4) If the elapsed time is more than 20.0 seconds, make necessary adjustments.

(5) Repeat with the CO, CO_2, and NO_X instruments and span gases.

(b) *Option.* If the following parameters are determined, the initial system response time may be generally applied to future checks.

(1) *Analyzer and bypass flow rates.* (i) Determine by experimentation the minimum analyzer and bypass flow rates individually and in combination that will produce a response time as close as possible to 20.0 seconds per paragraph (a) of this section.

(ii) Record the highest minimum flow rate for each flow meter as determined in step (i).