



Federal Register

Monday,
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Part II

Environmental Protection Agency

40 CFR Part 60
Update of Continuous Instrumental Test
Methods; Final Rule



Update of Continuous Instrumental Test Methods

- Method 3A – O₂ & CO₂
- Method 6C – SO₂
- Method 7E – NO_x
- Method 10 – CO
- Method 20 – NO_x/SO₂/Diluent



Update of EPA Continuous Instrumental Test Methods

May 15, 2006 Final Rule

- A Discussion of
 - Selected Amendments to the Test Methods
 - Technical Corrections & Clarifications



Update of Continuous Instrumental Test Methods - History

- 1st Proposed August 27, 1997
 - Reproposal Requested
- Reproposed October 10, 2003
 - Original Updates plus Others
- Final Rule May 15, 2006
- Updates Effective August 15, 2006
- Technical Amendment of Corrections/Clarifications Soon

Rule Clarifications on Website

www.epa.gov/ttn/emc

The screenshot shows a web browser window displaying the EPA website. The address bar shows the URL <http://www.epa.gov/ttn/emc/methods/method7e.html>. The page header includes the U.S. Environmental Protection Agency logo and the text "U.S. Environmental Protection Agency". The main heading is "Technology Transfer Network Emission Measurement Center". Below this, there is a search bar and a "GO" button. The breadcrumb trail reads: "EPA Home > Air & Radiation > TTNWeb - Technology Transfer Network > Emission Measurement Center > Method 7E - NOx - Instrumental". The main content area is titled "Method 7E - NOx - Instrumental" and contains the text "Text of Test Method 7E - NOx - Instrumental" followed by a PDF icon. Below this is a section titled "FREQUENTLY ASKED QUESTIONS (FAQS)" with three bullet points:

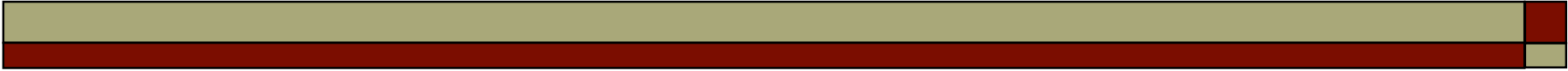
- [Does the new interference test apply to analyzers that have already met the requirements of the old Method 6C, 7E, 10, and 20 interference tests?](#)
- [Section 8.2.7\(2\) implies that the interference test needs to be repeated after replacement of a major piece of equipment. Does this mean a like kind replacement?](#)
- [Specifically, which analyzers are required to conduct the Manufacturer Stability Test \(MST\)?](#)

The left sidebar contains a navigation menu with the following items: Recent Additions, Facts, Methods, Monitoring, Technical Support, Audit Programs, QA/QC, Related Web Sites, Instructional Material, Upcoming Events, Who is EMC?, EMC Contacts, Voluntary Superior Monitoring.



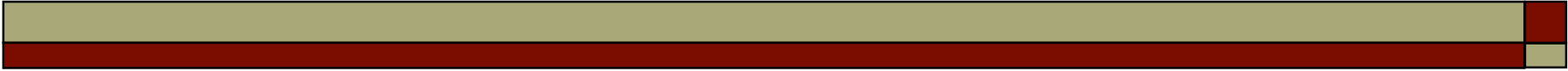
Update of Continuous Instrumental Test Methods

- Purpose
 - Harmonize
 - Simplify
 - Update



Update of Continuous Instrumental Test Methods

- Harmonize
 - General Requirements in Method 7E
 - Consistent Equipment Requirements
 - Consistent Performance Tests
 - Calibration Gases & Ranges



Update of Continuous Instrumental Test Methods

- Simplify & Make Flexible
 - Incorporate Method 20 into Method 7E
 - Make Equipment Performance-Based Instead of Technology-Based
 - Some Tests Can Be Performed by Manufacturer



Update of Continuous Instrumental Test Methods

- Update
 - Relax Outdated Requirements
 - Incorporate Recently Accepted Options & New Techniques
 - Address Dilution Sampling Systems
 - Address Low Measurements Needs



Sampling Traverse Points

- Number Determined by Stratification Test
 - 12- Point (per Method 1) *or*
 - 3-Point @ 16.7, 50.0, 83.3%
 - Methods 6C, 7E, 10 – Pollutant Stratification Test
 - Method 20 – Diluent-Corrected Pollutant Stratification Test
 - Rake Probes OK Except for *CAMD Tests
- Clarification
 - Perform Stratification Test at Each Site



Sampling Traverse Points

- **>10%:** 12-Point Sampling
- **>5% but $\leq 10\%$:** 3-Points @ 16.7, 50.0, & 83.3%
- **$\leq 5\%$:** Single-Point Sampling
- **“Clarification:**
 - Min. Test Run Time = 21 Min.
 - Single-Point OK for IC Engines or Stacks < 4 ”



Dilution Sampling Systems

- ❑ 3-Point System Calibration Error in Place of Analyzer Calibration Error Test
- ❑ 2-Point System Calibration Error in Place of Bias Test Between Runs
- ❑ 3-Point System Calibration Error Test Serves As Initial 2-Point Calibration Error Test for a Run



General Equipment Specifications

- Performance Based - OK If Can Pass
Interference Check, CE, System Bias Tests
- Components Maintained Above Gas Dew
Point Before Sample Conditioning
- Components Not In System Bias Check Must
Be SS, Teflon, or Glass



Zero Gas Quality

- Traceability Protocol Not Applicable
- Part 72.2 Provisions for Zero Air Material
 - $\text{SO}_x/\text{NO}_x/\text{VOC} < 0.1 \text{ ppm}$
 - $\text{CO} < 1 \text{ ppm}$
 - $\text{CO}_2 < 400 \text{ ppm}$



Instrumental Test Methods

- Calibration Span (CS)
- Equal to High Calibration Gas Value
- Chosen Such That $20\% \geq \text{Emissions} \leq 100\%$ of Calibration Span, as Practicable
- Mid-Level Gas: 40-60% of CS
- Low-Level Gas: 0-20% of CS
- Method 205 Allowed (Special Approval for CAMD)



Interference Test - Clarifications

- ❑ Table 7E-3 Lists Example Test Gases
- ❑ Address All Potential Interferences
- ❑ May Be Performed by Manufacturer
- ❑ Test Gases Manufacturer-Certified
- ❑ One Initial Test Per Make & Model
- ❑ Repeat for Non-model Replacement Parts
- ❑ Current Analyzers Grandfathered

Table 7E-3. Example Interference Check Gas Concentrations

Potential Interferent Gas ¹	Concentrations ²	
	Hot Wet	Dried
CO ₂	5 and 15%	5 and 15%
H ₂ O	25%	1 %
NO	15 ppmv	15 ppmv
NO ₂	15 ppmv	15 ppmv
N ₂ O	10 ppmv	10 ppmv
CO	50 ppmv	50 ppmv
NH ₃	10 ppmv	10 ppmv
CH ₄	50 ppmv	50 ppmv
SO ₂	20 ppmv	20 ppmv
H ₂	50 ppmv	50 ppmv
HCl	10 ppmv	10 ppmv

- 1) Any applicable gas may be eliminated or tested at a reduced level if the manufacturer has provided reliable means for limiting or scrubbing that gas to a specified level.
- 2) As Practicable, gas concentrations should be the highest expected at test sites.



Method 7E NO₂ Converter Check

3 Options

1. Conversion of NO₂
2. Old Method 20 NO + O₂ in Bag
3. Procedure in 40 CFR 86.123-78

Clarification

Can Be Performed Before or After a Test



Converter Efficiency Check

Conversion of NO₂ Gas

- Traceability Protocol Gas
 - Unstable Over Long Periods
 - Reference Material May Contain HNO₃
- Amending
 - Changing to Require Manuf-Certified Gas
 - Use Mid- to High-Concentration Range Gas Instead of 40-60 ppm Gas



Converter Efficiency Check

Old Method 20 Bag Procedure

□ Procedure Amendment

- Secondary Steps For Determining Conversion Efficiency Were Confusing - Dropped
- Acceptance Criterion: 2% Drop from NO_x peak
- Requirement to Introduce Test Gas Upstream of Dilution Assembly For Sample Dilution Systems Dropped



Manufacturer Stability Test

- Stability Against Test Site Variations in
 - Temperature
 - Line Voltage
- For Routine Analyses Below 20 ppm
- Clarification/Correction
 - Performed by Tester or Manufacturer
 - Use Procedures Similar to 40 CFR 53.23, not 53.55 or 53.56



Low-Measurements Relief

Alternative Criteria

- **Stratification Test Points**
 - ≤ 0.5 ppm – Single-Point Sampling
 - ≤ 1.0 ppm – 3-Point Sampling
- **Calibration Error** – Pass if ≤ 0.5 ppm
- **Calibration Drift** – Pass if ≤ 0.5 ppm
- **Bias or System Calibration Test** – Pass if ≤ 0.5 ppm
- **Interference Test** – Pass if ≤ 0.5 ppm for CS of 5-10 ppm
Or ≤ 0.2 ppm for CS < 5 ppm
- **Dynamic Spiking** – Pass if ≤ 0.2 ppm



Alternative Dynamic Spike Check

- Optional in place of:
 - Bias Test
 - Interference Check
- 2-Level Spike
 - Approx 50% above & 50% below Emissions
 - Spike Before & After Test
- Best on Steady-State Process
- Approval Required for CAMD Tests

Converter Eff. Calculation Corrections

Old Method 20 Converter Check Calculation

□ Current Equation

$$EffNO_2 = \frac{NO_{xfinal} - NO_{final}}{NO_{xpeak} - NO_{xfinal}} \times 100$$

□ Amended Equation

$$\% \text{ Decrease} = \frac{NO_{xpeak} - NO_{xfinal}}{NO_{xpeak}} \times 100$$



Calculation Corrections/Revisions

System Calibration Error Calculation

Missing DF in Eq. 7E-3

$$SCE = \frac{(C_s - C_v) \times DF}{CS} \times 100 \quad \text{Eq. 7E - 3}$$

Calculations Corrections/Revisions

Dynamic Spike Recovery Calculation

□ Current Equation

$$R = \frac{C_{ss} - C_{avg}}{C_{calc}} \times 100 \quad Eq.7E - 12$$

□ Correct Equation

$$R = \frac{DF(C_{ss} - C_{native}) + C_{native}}{C_{spike}} \times 100$$

Calculations Corrections/Revisions

Missing Sample Concentration Calculation

When Using a Zero Gas

□ Current Equation for Non-Zero Gas

$$C_{gas} = (C_{avg} - C_m) \frac{C_{ma} - C_{oa}}{C_m - C_o} + C_{ma} \quad Eq. 7E - 5a$$

□ New Equation For Zero Gas

$$C_{gas} = (C_{avg} - C_o) \frac{C_{ma}}{C_m - C_o} \quad Eq. 7E - 5b$$

Upcoming Amendments Rule

Projected by End of April '07

DRAFT

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 60

OAR-2002-0071; FRL-]

RIN 2060-AK61

Update of Continuous Instrumental Test Methods:
Technical Amendments

AGENCY: Environmental Protection Agency (EPA).

ACTION: Direct final rule.

SUMMARY: This action makes technical amendments to the final rule to update five instrumental test methods that was published on May 15, 2006. It was brought to our attention by applicable parties that several of the updates need adjustment to make them usable and more clearly understood. We do not anticipate these amendments to raise issues beyond those already addressed in the public comment period. These amendments address unanticipated cases that the final rule created but did not address.

DATES: This direct final rule will be effective on [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL



Update of EPA Continuous Instrumental Test Methods

Questions or Suggestions