

# Instrumental Methods Update

Methods

3A, 6C, 7E, 10, & 20

# Purpose

*Harmonize* - Same Performance Tests  
- Same Calibration Gases

*Update* - Address Outdated  
Equipment & Procedures

*Simplify* - Plain English Format  
- Adding Flexibility

# Instrumental Methods Update

- Method 3A: O<sub>2</sub>/CO<sub>2</sub>
- Method 6C SO<sub>2</sub>
- Method 7E NO<sub>x</sub>
- Method 10 CO
- Method 20 NO<sub>x</sub>/SO<sub>2</sub>/Diluent

# Performance Requirements

Existing

Method	Tests				
	Calibration Error	Calibration Drift	Bias Test	Response Time	Interference Test
3A	X	X	X	X	
6C	X	X	X	X	X
7E	X	X	X	X	X
10		X			
20		X		X	X

# Current Cal Gas Requirements

Method	Traceability Protocol	% of Span		
		Zero	Mid-	High-
3A	Yes	< 0.25%	40-60	80-100
6C	Yes	“	“	“
7E	Yes	“	“	“
10	No	N2	30, 60	<1.5 x Std
20	Yes or RM	< 0.25%	20-30, 45-55	80-90

# Instrumental Methods Update

- *Additional Revisions*
  - Cal Error/Bias Calculation - % of Std
  - Dropping Drift Check Between Runs
  - Bias Test Definition, Correction, Reporting
  - M7E Converter Efficiency Test
  - Alternative Interference Test for M6C
  - Frequency of Interference Test
  - Alternative Dynamic Spiking Test
  - M20 Only a Placeholder

# Bias Test Revisions

- *Definition*

Current: Difference between post-run bias test and calibration error test

Proposing: Difference between post-run bias test and cal gas tag value

- Dropping Bias Correction
- Report Bias as Uncertainty

# Interference Check

Interference Gas Challenge to Instrument  
Acceptance: Sum < 2.5% of High Cal Value

Potential NOx Interference	Interference Gas Concentration at Turbine
Water Vapor	$10 \pm 2\%$
Carbon Dioxide	$4 \pm 0.5\%$
Oxygen	$15 \pm 1\%$
Carbon Monoxide	$50 \pm 5 \text{ ppmv}$
Ammonia	$5 \pm 0.5 \text{ ppmv}$



# Frequency of Interference Test

Currently: Once for each source category

Proposing: Once a year for each tested  
source category

Initial test may be manufacturer  
certification

# Alternative Dynamic Spiking Test

- Conducted During Test
  - Min. 5 1-min. Samples
  - Recoveries Must Be  $100 \pm 5\%$
  - Can Be Used in Place of Interference & Bias Tests

# Low Concentrations Provisions

## <10 ppm

- Bias check  $\pm 0.5$  ppm instead of 5% of Emission Std
- Initial Manufacturer type certification

# Schedule

Publication in Federal Register

Proposal	December '02
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Promulgation	December '03
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