Diagnostic / Recertification Test Requirements

EPRI CEMUG 2024 Conference

1

Agenda

- Part 75 Diagnostic / Recertification Policy
- Conditionally data procedures
- Reporting requirements
- Common mistakes
- MATS Rule
- COMS Procedure 3
- Key Take Aways

2

2

Why Is This Topic Important?

- Key component of CAMD's Desk Audit (low hanging fruit)
- Requirements are relatively complex
- Insufficient training for plant personnel
- Potential invalidation of large blocks of data
- Often triggers resubmital of multiple EDRs
- May impact allowance trading program compliance
- Potential for monetary fines for allowance trading violation

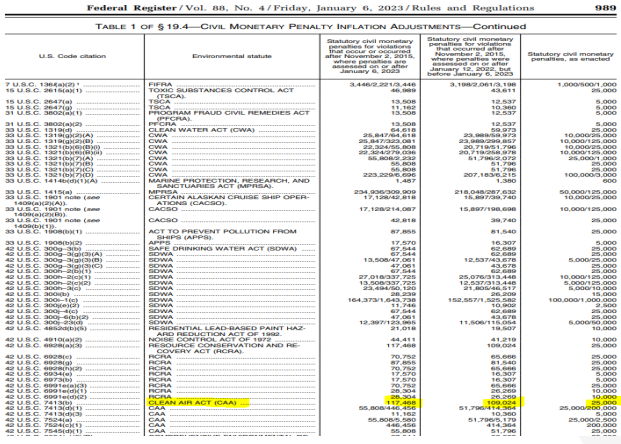
VIM TECHNOLOGIES

3

3

Why Does It Matter?

- 40 CFR Part 19: Civil Monetary Penalty Inflation Adjustment Rule
  - Updated annually



Federal Register / Vol. 88, No. 4 / Friday, January 6, 2023 / Rules and Regulations 989

TABLE 1 OF § 19.4—CIVIL MONETARY PENALTY INFLATION ADJUSTMENTS—Continued

U.S. Code citation	Environmental statute	Statutory civil monetary penalties for violations that occurred after November 2, 2015, where penalties are assessed on or after January 6, 2023	Statutory civil monetary penalties for violations that occurred after November 2, 2015, where penalties were assessed on or after January 12, 2022, but before January 6, 2023	Statutory civil monetary penalties, as enacted
7 U.S.C. 136l(a)(2) *	FIFRA	3,446/2,221/3,446	3,198/2,061/3,198	1,000/500/1,000
15 U.S.C. 2615(a)(1)	TOXIC SUBSTANCES CONTROL ACT (TSCA).	46,989	43,611	25,000
15 U.S.C. 2647(a)	TSCA	13,508	12,537	5,000
15 U.S.C. 2647(g)	TSCA	13,508	12,537	5,000
31 U.S.C. 3802(a)(1)	PROGRAM FRAUD CIVIL REMEDIES ACT (PFCRA).	13,508	12,537	5,000
31 U.S.C. 3802(a)(2)	PFCRA	13,508	12,537	5,000
33 U.S.C. 1319(d)	CLEAN WATER ACT (CWA)	54,618	59,973	25,000
33 U.S.C. 1319(g)(2)(A)	CWA	25,847/323,081	23,989/299,857	10,000/125,000
33 U.S.C. 1319(g)(2)(B)	CWA	25,847/323,081	23,989/299,857	10,000/125,000
33 U.S.C. 1321(b)(6)(B)(i)	CWA	22,324/55,808	20,719/51,796	10,000/25,000
33 U.S.C. 1321(b)(6)(B)(ii)	CWA	22,324/279,036	20,719/258,979	10,000/125,000
33 U.S.C. 1321(b)(7)(A)	CWA	55,808/2,232	51,796/2,072	25,000/1,000
33 U.S.C. 1321(b)(7)(B)	CWA	55,808	51,796	25,000
33 U.S.C. 1321(b)(7)(C)	CWA	55,808	51,796	25,000
33 U.S.C. 1321(b)(7)(D)	CWA	223,229/6,696	207,183/6,215	100,000/3,000
33 U.S.C. 1414c(d)(1)(A)	MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT (MPRSA).	1,487	1,380	500
33 U.S.C. 1415(a)	MPRSA	234,936/309,909	218,048/287,632	50,000/125,000
33 U.S.C. 1901 note (see 1409(a)(2)(A)).	CERTAIN ALASKAN CRUISE SHIP OPERATIONS (CACSO).	17,196/42,918	15,897/39,740	10,000/25,000
33 U.S.C. 1901 note (see 1409(a)(2)(B)).	CACSO	17,128/214,087	15,897/198,698	10,000/125,000
33 U.S.C. 1901 note (see 1409(b)(1)).	CACSO	42,818	39,740	25,000
33 U.S.C. 1908(b)(1)	ACT TO PREVENT POLLUTION FROM SHIPS (APPS).	87,855	81,540	25,000
33 U.S.C. 1908(b)(2)	APPS	17,570	16,307	5,000
42 U.S.C. 300g–3(b)	SAFE DRINKING WATER ACT (SDWA)	67,544	62,689	25,000
42 U.S.C. 300g–3(g)(3)(A)	SDWA	67,544	62,689	25,000
42 U.S.C. 300g–3(g)(3)(B)	SDWA	13,508/47,061	12,537/43,678	5,000/25,000
42 U.S.C. 300g–3(g)(3)(C)	SDWA	47,061	43,678	25,000
42 U.S.C. 300f–2(b)(1)	SDWA	67,544	62,689	25,000
42 U.S.C. 300h–2(c)(1)	SDWA	27,018/337,725	25,076/313,448	10,000/125,000
42 U.S.C. 300h–2(c)(2)	SDWA	13,508/337,725	12,537/313,448	5,000/125,000
42 U.S.C. 300h–3(c)	SDWA	23,464/58,659	21,805/54,506	5,000/15,000
42 U.S.C. 300i(b)	SDWA	58,239	26,209	15,000
42 U.S.C. 300i–1(c)	SDWA	164,373/1,643,738	152,557/1,525,582	100,000/1,000,000
42 U.S.C. 300j(e)(2)	SDWA	11,748	10,902	2,500
42 U.S.C. 300j–4(c)	SDWA	67,544	62,689	25,000
42 U.S.C. 300j–6(b)(2)	SDWA	67,544	62,689	25,000
42 U.S.C. 300j–23(d)	SDWA	12,397/123,965	11,506/115,054	5,000/50,000
42 U.S.C. 4852d(b)(5)	RESIDENTIAL LEAD-BASED PAINT HAZARD REDUCTION ACT OF 1992.	21,018	19,507	10,000
42 U.S.C. 4910(a)(2)	NOISE CONTROL ACT OF 1972.	44,411	41,219	10,000
42 U.S.C. 6928(a)(3)	RESOURCE CONSERVATION AND RECOVERY ACT (RCRA).	117,468	109,024	25,000
42 U.S.C. 6928(c)	RCRA	70,752	65,666	25,000
42 U.S.C. 6928(g)	RCRA	67,855	61,540	25,000
42 U.S.C. 6928(h)(2)	RCRA	70,752	65,666	25,000
42 U.S.C. 6928(i)	RCRA	17,570	16,307	5,000
42 U.S.C. 6973(b)	RCRA	17,570	16,307	5,000
42 U.S.C. 6991e(a)(3)	RCRA	70,752	65,666	25,000
42 U.S.C. 6991e(d)(1)	RCRA	28,304	26,269	10,000
42 U.S.C. 6991e(d)(2)	RCRA	28,304	26,269	10,000
42 U.S.C. 7413(b)	CLEAN AIR ACT (CAA)	117,468	109,024	25,000
42 U.S.C. 7413(d)(1)	CAA	55,808/117,468	51,796/109,024	25,000/25,000
42 U.S.C. 7413(d)(3)	CAA	11,162	10,360	5,000
42 U.S.C. 7524(a)	CAA	55,808/5,580	51,796/5,179	25,000/2,500
42 U.S.C. 7524(c)(1)	CAA	446,456	414,364	200,000
42 U.S.C. 7545(d)(1)	CAA	55,808	51,796	25,000

The 2015 Act prescribes a formula for annually adjusting the statutory maximum (and minimum) amount of civil monetary penalties to reflect inflation, maintain the deterrent effect of statutory civil monetary penalties, and promote compliance with the law. The rule does not establish specific civil monetary penalty amounts the EPA may seek in particular cases, as appropriate given the facts of particular cases and applicable agency penalty policies. The EPA's civil penalty policies, which guide enforcement personnel on how to exercise the EPA's discretion within statutory penalty authorities, take into account a number of fact-specific considerations, *e.g.*, the seriousness of the violation, the violator's good faith efforts to comply, any economic benefit gained by the violator as a result of its noncompliance, and a violator's ability to pay.

VIM TECHNOLOGIES

4

Diagnostic / Recertification

- Question 12.10 of Part 75 Technical Q&As (formerly called the Policy Manual)
- Questions 15.4 and 15.5 for new add-on emission controls
- Question 15.7 for new stack & new add-on emission controls
- Part 75 recertification requirements (§75.20(b))
- Not applicable to Part 60 CEMS
- Not clearly defined for MATS Rule

5

Diagnostic / Recertification

- Question 12.10 establishes diagnostic/recertification tables for:
  - Dilution-extractive CEMS
  - Dry extractive CEMS
  - Insitu CEMS
  - Stack flow monitors
  - Fuel flowmeters
  - DAHS
- Identifies specific repairs & what follow-up tests are required
- Diagnostic tests versus recertification event
- Conditionally valid data procedures in §75.20(b)(3)(iii)

6

Example Question 12.10 table

Recertification and Diagnostic Test Policy for Dilution-Extractive CEMS[1]

Description of Event	Event Status[2]	RATA	7 Day Cal Error[3]	Cycle Time Test	Linearity Check	Calibration Error Test[4]	Submit an Event Record	Comments
Permanently replace NO_x, SO_2, O_2 or CO_2 analyzer with like-kind analyzer as defined in Question 7.13	R	X	X		X	X	X	The rule indicates that the permanent replacement of an analyzer is a recertification event. EPA does not require the cycle time test in this case, since the analyzer is like- kind and the rest of the system is the same. Modify the Monitoring Plan as necessary.
Permanently replace NO_x, SO_2, O_2 or CO_2 analyzer with new analyzer which does not qualify as a like-kind analyzer	R	X	X	X	X	X	X	The rule indicates that the permanent replacement of an analyzer is a recertification event. Thus, all tests are required. Modify the Monitoring Plan as necessary.
Replace or repair any of the following components:								EPA will conditionally allow the abbreviated linearity check and the alternative system response check (see footnotes (5) and (6)). For repair or replacement of other major components that are not listed here (e.g., major components of new monitoring technologies or monitoring technology not addressed in this policy), contact EPA for a case-by case ruling.
Photomultiplier	D				(5)	X	A	
Lamp	D				(5)	X	A	
Internal analyzer particulate filter	D			(6)		X	A	
Analyzer vacuum pump	D			(6)	(5)	X	A	
Capillary tube	D			(6)	(5)	X	A	
Ozone generator	D				(5)	X	A	
Reaction chamber	D				(5)	X	A	
NO_2 converter	D				(5)	X	A	
Ozonator dryer	D				(5)	X	A	
Sample Cell	D				(5)	X	A	

7

Conditionally Valid Data

- Probationary calibration error test
- Test period limits
  - Linearity check, leak check & cycle time test ≤ 168 unit operating hours
  - RATA ≤ 720 unit operating hours
  - 7-day calibration error test ≤ 21 consecutive unit operating days
- Data validity contingent on test results
- A failed test invalidates conditionally valid data back to probationary calibration error test
- After corrective action, may initiate a new diagnostic test period which restarts applicable test period deadlines

VIM TECHNOLOGIES

8

Diagnostic Abbreviated Linearity

- Abbreviated linearity check
  - May only be used following certain maintenance activities
  - Complete “hands-off” calibration error test
    - Calibration error must meet applicable performance specification
  - Complete one injection of each linearity calibration gas concentration
  - Test passed if linearity error is ≤ 5.0% or alternate criteria
  - Important to document this test!

9

Diagnostic Abbreviated Linearity

- Abbreviated linearity check
  - If test is passed, no report required. Maintain records onsite.
  - If test is failed, must consider the test an aborted linearity check and report results.
  - After failed linearity check, must complete a full linearity check to bring analyzer back in control.
    - May utilize conditionally valid data procedures

10

Diagnostic Abbreviated Cycle Time

- Abbreviated cycle time test (Alternate System Response Test)
  - Limited only to certain maintenance activities
  - Start a calibration error test
  - After stable reading using zero-level gas, start timer when upscale-level* gas injection begins
  - Test is passed if response time is ≤ 15 minutes
  - Important to document this test!

*** Remember high-level (80.0 – 100.0% of span) gas required for cycle time tests.**

11

Diagnostic Abbreviated Cycle Time

- Abbreviated cycle time test
  - If test is passed, an XML record is not reported. Maintain records onsite.
  - After a failed abbreviated cycle time test, must complete a full cycle time test to bring analyzer back in control.
    - May utilize conditionally valid data procedures

12

Reporting These Events

- Recertification application due 45 days after last test (§75.63)
- *ECMPS QA and Certification Reporting Instructions*
- QA Certification Event Record
  - "Event" Codes
  - "Required Test" Codes
  - Conditionally valid data flag

Table 46: QA or Certification Event Codes and Descriptions

Code	Description
1	DAHS Vendor Change
2	DAHS Software Version Upgrade
3	DAHS Failure
5	Change or Insert New Temperature, Pressure, or Molecular Weight Correction Algorithms in the DAHS for a Dilution-Type Monitoring System
10	Change or Insert New Mathematical Algorithms in the DAHS to Convert NO Concentration to Total NO_X
15	Change Missing Data Algorithms
20	Installation of Add-on SO_2 Emission Controls

Table 47: Required Test Codes and Descriptions

Code	Description
1	3-Load RATA, 7-Day Calibration Error Test
2	Normal Load RATA, 7-Day Calibration Error Test, Linearity Check, Cycle Time Test
3	3-Load RATA, 7-Day Calibration Error Test, DAHS Verification
4	Normal Load RATA, 7-Day Calibration Error Test, Linearity Checks, Cycle Time Test, DAHS Verification
5	Normal Load RATA
6	3-Load Flow RATA

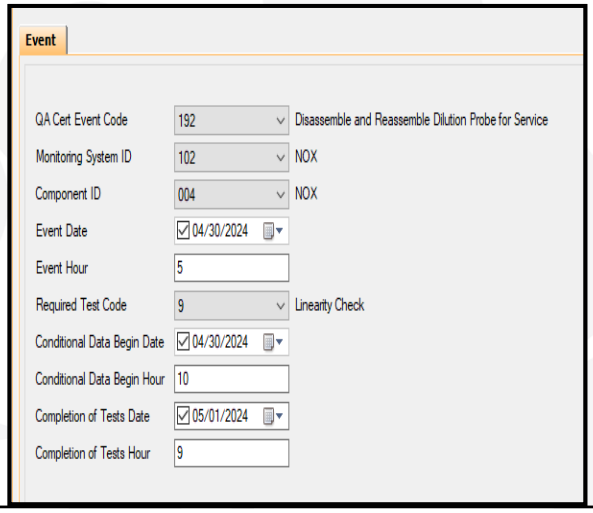
VIM TECHNOLOGIES

13

Reporting These Events

- Example QA Certification Event Record

```
<ORISCode>61000</ORISCode>
  <Version>1.2</Version>
  <QACertificationEventData>
  <UnitID>1</UnitID>
  <MonitoringSystemID>102</MonitoringSystemID>
  <ComponentID>004</ComponentID>
  <QACertEventCode>192</QACertEventCode>
  <QACertEventDate>2024-04-30</QACertEventDate>
  <QACertEventHour>5</QACertEventHour>
  <RequiredTestCode>9</RequiredTestCode>
  <ConditionalBeginDate>2024-04-30</ConditionalBeginDate>
  <ConditionalBeginHour>10</ConditionalBeginHour>
  <CompletionTestDate>2024-05-01</CompletionTestDate>
  <CompletionTestHour>9</CompletionTestHour>
  </QACertificationEventData>
<QACertificationEventData>
```



14

Common Mistakes

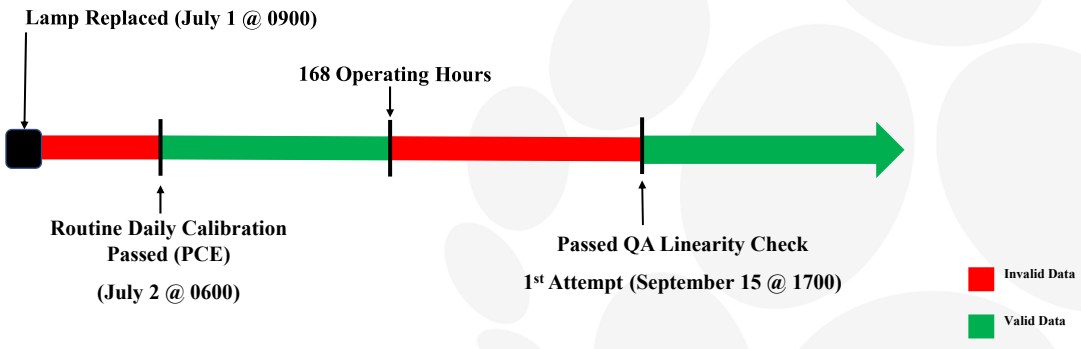
- Not conducting probationary calibration ASAP
- Not clearly documenting event in logbook
- Contractor maintenance issues
  - Diagnostic tests conducted offline or not at all
  - Conduct exit interview
- Like-kind analyzer replacement issues
- Diagnostic tests not conducted on primary analyzer after repairs
- Not reporting events when required

VIM TECHNOLOGIES

15

15

Real Life CEMS Example



VIM TECHNOLOGIES

16

MATS Rule Hg Recertification

- Hg CEMS recertification specified in Section 4.2, Appendix A
  - Permanent analyzer replacement
  - Change in unit flue gas handling system
  - Complete CEMS replacement
  - Change probe location or orientation
- Hg CEMS may use Part 75 conditional valid data procedures for "certification, recertification & diagnostic testing" per Section 5.1.5, Appendix A

17

MATS Rule Recertification

- HCl & HF CEMS recertification specified in Section 4, App. B
  - Permanent analyzer replacement
  - Change in unit flue gas handling system
  - Complete CEMS replacement
  - Change probe location or orientation
- PM CEMS recertification specified in Section 4.2, App. C
  - Moved to different stack or duct
  - Moved to new location on same stack or duct
  - Repair or modification that existing correlation is altered or impacted

18

COMS Procedure 3

- Must develop a corrective action program for COMS repairs and maintenance per Section 10.5
  - EPA COMS Diagnostic Test Guidance Document
  - https://www3.epa.gov/ttn/emc/perfspec/suggested_COMS_diagnostic_tests.pdf
- Be Aware of Diagnostic Test Requirements for the Certified COMS After Reinstalled Following Repairs
- No conditionally valid data procedures

19

EPA Suggested COMS Diagnostic Test

Maintenance Event	Optical Alignment	Optical Alignment indicator assessment (Note 1)	Zero calibration check	Clear path (off-stack) zero assessment (Note 2)	Upscale calibration check	Calibration error test	Fault status indicator check	Averaging Period calculation & recording	7-Day zero & upscale drift check (Note 3)
(1) Replace or repair components described as routine and/or preventative maintenance. (Note 4)	x	---	x	---	x	---	x	---	---
(2) Replace or repair primary measurement light. (Note 5)	x	x	x	x	x	x	x	---	---
(3) Replace or repair components which are measurement noncritical. (Note 6)	x	---	x	---	x	---	x	---	---
(4) Replace or repair components which are measurement critical. (Note 6)	x	x	x	x	x	x	x	---	x
(5) Replace or repair components which are measurement critical but do not involve optical or electro-optical components. (Note 7)	---	---	x	---	x	x	x	x	---

Notes:

(1) Optical alignment indicator assessment requires the operator to verify during an off the stack clear path zero assessment that the beam is centered on the reflector/retro reflector when the alignment indicator indicates on-axis centered alignment.
(2) Requires verification of the external zero device response, or recalibration of the same, after the off-stack clear path zero has been re-established.
(3) 7-day zero and upscale drift assessment. Opacity measurement data recorded prior to completion of the 7-day test will be considered as valid provided that the first 7-day drift test is successful, that is completed within 14 days of completion of the repair, and that other QA requirements are met during this time period.
(4) Includes replacement of blower, cleaning optical surfaces, resetting adjustable parameters to maintain normal performance.
(5) Light source uniformity and position are key source to many performance parameters.
(6) See test description above.
(7) Includes changes of components involving data acquisition and recording.

20

EPA Suggested COMS Recertification Test

Event Description	Recertify Per PS-1	New MCOC per ASTM D6216-98, 07	Comments
Rebuild or substantially refurbish the analyzer	X		None specified
Change to, or addition of, analyzer components which may affect MCOC specified performance parameters	X	X	Significant changes which are not part of the MCOC-designated configuration

21

Key Takeaways

- Provide adequate training concerning diagnostic/recertification
- Communication between CEMS technicians and environmental personnel critical to ensure data is reported correctly
- Be aware of primary analyzer repairs & conduct diagnostic tests
- Schedule preventive maintenance prior to QA tests
- Document these tests
- Sound QA/QC Plan
- Potential invalidation of large blocks of CEMS data

22

23