ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 60, 61, and 63

[EPA–HQ–OAR–2006–0640; FRL–8721–4]

RIN 2060–AJ86

Performance Specification and Quality Assurance Requirements for Continuous Parameter Monitoring Systems and Amendments to Standards of Performance for New Stationary Sources; National Emission Standards for Hazardous Air Pollutants; and National Emission Standards for Hazardous Air Pollutants for Source Categories

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: This action proposes Performance Specification 17, ''Specifications and Test Procedures for Continuous Parameter Monitoring Systems at Stationary Sources'' and Procedure 4, ''Quality Assurance Requirements for Continuous Parameter Monitoring Systems at Stationary Sources.'' The proposed performance specification and quality assurance requirements establish procedures and other requirements to ensure that the systems are properly selected, installed, and placed into operation. This action also proposes minor amendments to Procedure 1 of the ''Quality Assurance Requirements for Gas Continuous Emission Monitoring Systems Used for Compliance Determinations'' to address continuous emissions monitoring systems that are used for monitoring multiple pollutants. Minor changes to the General Provisions for the Standards of Performance for New Stationary Sources, the National Emission Standards for Hazardous Air Pollutants, and the National Emission Standards for Hazardous Air Pollutants for Source Categories are also proposed to ensure consistency between the proposed Performance Specification 17, Procedure 4, and the General Provisions and to clarify that Performance Specification 17 and Procedure 4 apply instead of requirements that pertain specifically to continuous parameter monitoring systems. Finally, this action proposes amendments to the current national emission standards for closed vent systems, control devices and recovery systems to ensure consistency with Performance Specification 17 and Procedure 4. These actions are needed to establish consistent requirements for ensuring and assessing the quality of data measured by continuous parameter monitoring systems and to provide quality assurance procedures for continuous emission monitoring systems used to monitor multiple pollutants.

DATES: Comments must be received on or before December 8, 2008. Under the Paperwork Reduction Act, comments on the information collection provisions must be received by the Office of Management and Budget (OMB) on or before November 10, 2008.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA–HQ–OAR–2006–0640, by one of the following methods:

- *http://www.regulations.gov:* Follow the on-line instructions for submitting comments.
- *E-mail: a-and-r-Docket@epa.gov.*
- *Fax:* (202) 566–9744.
- *Mail:* Performance Specification 17 and Procedure 4 for Continuous Parameter Monitoring Systems Docket, Docket No. EPA–HQ–OAR–2006–0640, Environmental Protection Agency, EPA Docket Center, Mailcode: 6102T, 1200 Pennsylvania Ave., NW., Washington, DC 20460. Please include a total of two copies. In addition, please mail a copy of your comments on the information collection provisions to the Office of Information and Regulatory Affairs, Office of Management and Budget (OMB), Attn: Desk Officer for EPA, 725 17th St., NW., Washington, DC 20503.
- *Hand Delivery:* EPA Docket Center, Public Reading Room, EPA West, Room 3334, 1301 Constitution Avenue, NW., Washington, DC 20460. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

Instructions: Direct your comments to Docket ID No. EPA–HQ–OAR–2006–0640. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *http://www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through *http://www.regulations.gov* or e-mail. The *http://www.regulations.gov* Web site is an ''anonymous access'' system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA without going through *http://www.regulations.gov* your e-mail address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD–ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses.

Docket: All documents in the docket are listed in the *http://www.regulations.gov* index. Although listed in the index, some information is not publicly available, e.g., CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in *http://www.regulations.gov* or in hard copy at the EPA Air Docket, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave., NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the Air Docket is (202) 566–1742.

FOR FURTHER INFORMATION CONTACT: Mr. Barrett Parker, Sector Policies and Programs Division, Office of Air Quality Planning and Standards (D243–05), Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone number: (919) 541–5635; e-mail address: *parker.barrett@epa.gov.*

SUPPLEMENTARY INFORMATION:

Outline. The information presented in this preamble is organized as follows:

I. General Information

A. Does this action apply to you?

The proposed Performance Specification 17 (PS–17) and Procedure 4 would apply to any facility that is required to install a new continuous parameter monitoring system (CPMS), relocate an existing CPMS, or replace an existing CPMS under any applicable subpart of 40 CFR parts 60, 61, or 63, with certain exceptions. Moreover, the proposed PS–17 and Procedure 4 would become effective upon permit renewal (or within 5 years for area sources that are exempt from title V permitting) for any affected facility subject to an applicable subpart of 40 CFR parts 60, 61, or 63, with certain exceptions. Table 1 of this preamble lists the applicable rules by subpart and the corresponding source categories to which the proposed PS–17 and Procedure 4 would apply.

TABLE 1—SOURCE CATEGORIES THAT WOULD BE SUBJECT TO PS–17 AND PROCEDURE 4

Subpart(s)	Source category
40 CFR part 63	
O	Commercial Ethylene Oxide Sterilization/Fumigation Facilities.
R	Gasoline Distribution Facilities (Bulk Gasoline Terminals and Pipeline Breakout Stations).
S	Pulp and Paper—Process Operations.
X	Secondary Lead Smelters.
EE	Magnetic Tape Manufacturing Operations.
GG	Aerospace Manufacturing and Rework.
HH	Oil and Natural Gas Production Facilities.
JJ	Wood Furniture Manufacturing Operations.
KK	Printing and Publishing.
MM	Combustion Sources at Kraft, Soda & Sulfite Pulp & Paper Mills.

TABLE 1—SOURCE CATEGORIES THAT WOULD BE SUBJECT TO PS–17 AND PROCEDURE 4—Continued

Subpart(s)	Source category
YY	Spandex.
YY	Cyanide Chemical Manufacture.
YY	Carbon Black Production.
CCC	Steel Pickling—HCl Process Facilities and Hydrochloric Acid Regeneration Plants.
EEE	Hazardous Waste Combustors.
GGG	Pharmaceuticals Production.
HHH	Natural Gas Transmission and Storage Facilities.
MMM	Pesticide Active Ingredient Production.
NNN	Wool Fiberglass Manufacturing.
RRR	Secondary Aluminum Production.
UUU	Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units.
DDDD	Plywood & Composite Wood Products.
EEEE	Organic Liquids Distribution (non-gasoline).
FFFF	Miscellaneous Organic Chemical Manufacturing.
HHHH	Wet-Formed Fiberglass Mat Production.
IIII	Surface Coating of Automobiles and Light Duty Trucks.
JJJJ	Paper & Other Web (surface coating).
KKKK	Surface Coating of Metal Cans.
PPPP	Surface Coating of Plastic Parts & Products.
QQQQ	Surface Coating of Wood Building Products.
RRRR	Surface Coating of Metal Furniture.
SSSS	Surface Coating of Metal Coil.
UUUU	Cellulose Products Manufacturing.
VVVV	Boat Manufacturing.
WWWW	Reinforced Plastics Composites Production.
XXXX	Rubber Tire Manufacturing.
YYYY	Stationary Combustion Turbines.
ZZZZ	Reciprocating Internal Combustion Engines.
CCCCC	Coke Ovens: Pushing, Quenching, & Battery Stacks.
DDDDD	Industrial/Commercial/Institutional Boilers and Process Heaters.
EEEEE	Iron and Steel Foundries.
FFFFF	Integrated Iron and Steel Manufacturing Facilities.
GGGGG	Site Remediation.
HHHHH	Miscellaneous Coating Manufacturing.
MMMMM	Flexible Polyurethane Foam Fabrication Operations.
NNNNN	Hydrochloric Acid Production.
PPPPP	Engine Test Cells/Stands.
QQQQQ	Friction Materials.
RRRRR	Taconite Iron Ore Processing.
TTTTT	Primary Magnesium Refining.
ZZZZZ	Iron and Steel Foundries Area Sources.
LLLLLL	Acrylic and Modacrylic Fibers Production Area Sources.
OOOOOO	Flexible Polyurethane Foam Production and Fabrication Area Sources.
PPPPPP	Lead Acid Battery Manufacturing Area Sources.
SSSSSS	Glass Manufacturing Area Sources.
40 CFR part 60	
Ea	Municipal Waste Combustors after December 20, 1989 and on or before September 20, 1994.
Ec	Hospital, Medical, and Infectious Waste Incinerators.
J	Petroleum Refineries.
O	Sewage Treatment Plants.
T, U, V, W, X	Phosphate Fertilizer Industry.
Y	Coal Preparation Plants (>200 tons per day).
Z	Ferroalloy Production Facilities.
AA	Steel Plants: EAF's and Oxygen Decarburization Vessels after October 21, 1974 and on or before August 17, 1983.
BB	Kraft Pulp Mills.
HH	Lime Manufacturing Plants.
LL	Metallic Mineral Processing Plants.
NN	Phosphate rock plants (with prod. capacity >4 ton/hr).
PP	Ammonium Sulfate Manufacture.
RR	Pressure Sensitive Tape and Label Surface Coating Operations.
FFF	Flexible Vinyl and Urethane Coating and Printing.
LLL	Onshore Natural Gas Processing: SO_2 Emissions.

TABLE 1—SOURCE CATEGORIES THAT WOULD BE SUBJECT TO PS–17 AND PROCEDURE 4—Continued

Subpart(s)	Source category
UUU	Calciners and Dryers in Mineral Industries.
VVV	Polymeric Coating of Supporting Substrates Facilities.
AAAA	Small Municipal Waste Combustion Units Constructed after August 30, 1999.
40 CFR part 61	
K	Radionuclide Emissions from Elemental Phosphorus Plants.
L	Benzene from Coke By-Product Recovery Plants.
BB	Benzene Emissions from Benzene Transfer Operations.

The requirements of the proposed PS–17 and Procedure 4 may also apply to stationary sources located in a State, District, Reservation, or Territory that adopts PS–17 or Procedure 4 in its implementation plan. The exceptions to the applicability criteria for PS–17 and Procedure 4 are those source categories that are subject to part 63 rules that specify that § 63.8(a)(2) of the General Provisions for the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Source Categories in 40 CFR part 63, subpart A does not apply to the source category. Section 63.8(a)(2) specifies that rules promulgated under part 63 are subject to the monitoring provisions of § 63.8 upon promulgation of performance specifications (i.e., the proposed PS–17). Consequently, rules which specify that § 63.8(a)(2) does not apply, are not subject to PS–17 or Procedure 4. Table 2 of this preamble lists the part 63 rules that require CPMS but would not be subject to PS–17 or Procedure 4 for this reason.

TABLE 2—PART 63 RULES NOT SUBJECT TO PS–17 OR PROCEDURE 4

[§ 63.8(a)(2) does not apply]

Subpart(s)	Source category
F, G, H, I	Hazardous Organic NESHAP.
U	Polymers and Resins (Group I).
AA	Phosphoric Acid Plants.
BB	Phosphate Fertilizer Production.
CC	Petroleum Refineries.
DD	Offsite Waste and Recovery Operations.
DDD	Mineral Wool.
III	Flexible Polyurethane Foam Production.
JJJ	Polymers and Resins (Group IV).
LLL	Portland Cement Manufacturing.
OOO	Amino/Phenolic Resins Production.
PPP	Polyether Polyols Production.
AAAA	Municipal Solid Waste Landfills.
TTTT	Leather Tanning and Finishing Operations.
IIIII	Mercury Cell Chlor-Alkali Plants.
LLLLL	Asphalt Roofing and Processing.

The standard industrial classification (SIC) codes and North American Industry Classification System (NAICS) codes that correspond to potentially regulated entities are listed in Tables 3 and 4 of this preamble, respectively. To determine the specific types of industry referenced by the SIC or NAICS codes, go to *http://www.osha.gov/pls/imis/sic_manual.html* or *http://www.osha.gov/oshstats/naics-manual.html*, respectively.

TABLE 3—SIC CODES FOR POTENTIALLY REGULATED ENTITIES

SIC code
12, 42, 44, 47, 109, 279, 281, 282, 283, 284, 285, 286, 287, 289, 386, 1011, 1021, 1031, 1041, 1044, 1051, 1061, 1099, 1311, 1321, 1411, 1422, 1423, 1429, 1442, 1445, 1446, 1454, 1455, 1459, 1474, 1475, 1479, 1492, 1496, 1499, 2034, 2035, 2046, 2099, 2211, 2241, 2295, 2296, 2392, 2394, 2396, 2399, 2421, 2426, 2429, 2431, 2435, 2436, 2439, 2441, 2448, 2449, 2451, 2452, 2491, 2493, 2499, 2514, 2522, 2531, 2542, 2599, 2611, 2621, 2631, 2652, 2653, 2655, 2656, 2657, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2711, 2721, 2741, 2754, 2759, 2761, 2771, 2812, 2813, 2816, 2819, 2821, 2822, 2823, 2824, 2832, 2833, 2834, 2835, 2836, 2841, 2842, 2843, 2844, 2851, 2861, 2865, 2869, 2873, 2874, 2875, 2879, 2891, 2892, 2893, 2895, 2899, 2911, 2951, 2952, 2992, 2999, 3011, 3021, 3052, 3053, 3061, 3069, 3074, 3079, 3081, 3082, 3083, 3084, 3085, 3086, 3087, 3088, 3089, 3111, 3131, 3142, 3143, 3144, 3149, 3161, 3171, 3172, 3199, 3211, 3221, 3229, 3274, 3281, 3291, 3292, 3295, 3296, 3299, 3312, 3313, 3315, 3316, 3317, 3321, 3322, 3324, 3325, 3329, 3331, 3334, 3339, 3341, 3351, 3353, 3354, 3355, 3356, 3357, 3363, 3364, 3365, 3366, 3369, 3398, 3399, 3411, 3412, 3421, 3423, 3425, 3429, 3431, 3432, 3441, 3442, 3443, 3444, 3446, 3448, 3449, 3451, 3452, 3462, 3463, 3465, 3466, 3469, 3471, 3479, 3482, 3483, 3484, 3489, 3491, 3492, 3493, 3494, 3495, 3497, 3499, 3511, 3519, 3523, 3524, 3531, 3537, 3543, 3545, 3559, 3562, 3566, 3568, 3569, 3579, 3585, 3592, 3599, 3621, 3634, 3639, 3644, 3645, 3646, 3647, 3663, 3677, 3691, 3693, 3694, 3695, 3711, 3713, 3714, 3715, 3716, 3720, 3721, 3724, 3726, 3728, 3731, 3732, 3743, 3751, 3760, 3761, 3764, 3765, 3769, 3792, 3795, 3799, 3821, 3829, 3841, 3842, 3843, 3851, 3861, 3911, 3914, 3915, 3931, 3942, 3944, 3949, 3951, 3952, 3953, 3955, 3961, 3965, 3991, 3993, 3995, 3996, 3999, 4225, 4226, 4512, 4581, 4612, 4911, 4922, 4923, 4924, 4925, 4931, 4932, 4939, 4941, 4952, 4953, 4961, 4971, 5086, 5122, 5149, 5169, 5171, 5172, 5541, 5995, 7218, 7231, 7241, 7391, 7397, 7399, 7534, 7538, 7539, 7641, 7699, 7911, 7999, 8062, 8063, 8069, 8071, 8072, 8091, 8211, 8221, 8222, 8231, 8243, 8244, 8249, 8299, 8411, 8711, 8731, 8734, 8741, 8748, 8922, 9511, 9661, 9711

TABLE 4—NAICS CODES FOR POTENTIALLY REGULATED ENTITIES

NAICS code
211, 221, 316, 321, 322, 324, 325, 326, 331, 332, 336, 339, 611, 622, 2123, 2211, 3231, 3241, 3251, 3252, 3253, 3254, 3255, 3256, 3259, 3271, 3273, 3274, 3279, 3327, 3328, 3329, 3332, 3335, 3339, 3341, 3342, 3343, 3344, 3361, 3362, 3363, 4227, 5622, 5629, 21221, 22121, 22132, 31332, 32211, 32222, 32411, 32613, 32614, 32615, 32791, 33422, 33634, 33992, 33995, 42269, 42271, 45431, 48611, 48621, 49311, 49319, 51113, 51114, 51223, 54171, 56220, 56221, 56292, 81142, 92411, 92711, 92811, 111998, 112519, 112910, 112990, 211111, 211112, 212111, 212112, 212113, 212210, 212221, 212222, 212231, 212234, 212299, 212319, 212322, 212324, 212325, 212393, 212399, 213113, 221112, 221320, 238910, 311211, 311212, 311221, 311225, 311340, 311421, 311423, 311823, 311830, 311911, 311920, 311941, 311942, 311991, 311999, 313210, 313320, 314911, 314992, 315299, 315999, 321211, 321212, 321213, 321214, 321219, 321911, 321918, 321999, 322110, 322121, 322122, 322130, 322211, 322212, 322213, 322215, 322221, 322222, 322223, 322224, 322225, 322226, 322231, 322291, 322299, 323111, 323112, 323116, 323119, 324121, 324199, 325131, 325181, 325182, 325188, 325192, 325199, 325211, 325221, 325222, 325311, 325312, 325320, 325411, 325412, 325991, 326111, 326113, 326121, 326122, 326150, 326191, 326192, 326199, 326211, 326212, 326299, 327211, 327212, 327213, 327410, 327991, 327992, 327993, 327999, 331111, 331112, 331210, 331221, 331222, 331312, 331315, 331316, 331319, 331419, 331492, 331511, 331512, 331513, 331521, 331524, 332115, 332116, 332212, 332431, 332612, 332618, 332812, 332912, 332951, 332999, 333111, 333112, 333120, 333313, 333319, 333611, 333612, 333613, 333618, 334613, 335121, 335122, 335312, 335911, 336111, 336112, 336120, 336211, 336213, 336214, 336312, 336350, 336399, 336411, 336412, 336413, 336414, 336415, 336419, 336612, 336992, 336999, 337124, 337127, 337214, 337215, 339111, 339112, 339114, 339911, 339912, 339914, 339999, 424690, 424720, 425110, 425120, 481111, 483111, 483112, 483113, 483114, 483211, 483212, 484110, 484121, 484122, 484210, 484220, 484230, 487210, 488111, 488119, 488190, 488310, 488320, 488330, 488390, 488490, 492110, 492210, 493110, 493120, 493130, 493190, 511199, 531130, 532411, 541380, 541710, 541990, 561720, 562111, 562112, 562119, 562213, 562219, 611310, 611692, 622110, 622310, 713930, 811111, 811118, 811310, 811411, 811420, 924110, 928110

The proposed amendments to Procedure 1 (40 CFR part 60, appendix F) would apply to any facility that operates a continuous emission monitoring system (CEMS) that is subject to PS–9 or PS–15 (40 CFR part 60, appendix B) and also must comply with 40 CFR part 60, appendix F. The proposed amendments to the General Provisions to 40 CFR parts 60, 61, and 63 would apply to the same facilities that the proposed PS–17 and Procedure 4 would apply. The proposed amendments to 40 CFR part 63, subpart SS, would apply to producers and coproducers of hydrogen cyanide; sodium cyanide; carbon black by thermal-oxidative decomposition in a closed system, thermal decomposition in a cyclic process, or thermal decomposition in a continuous process; ethylene from refined petroleum or liquid hydrocarbons; and spandex by reaction spinning.

To determine whether your facility would be regulated by this action, you should examine the applicability criteria in section 1.2 of proposed PS–17 and the applicability criteria in the part 60, 61, or 63 standard to which your facility is subject. If you have any questions regarding the applicability of this action to a particular entity, consult either the air permit authority for the entity or your EPA regional representative as listed in § 63.13 of the General Provisions to part 63 (40 CFR part 63, subpart A).

B. What should you consider as you prepare your comments for EPA?

Do not submit information containing CBI to EPA through *http://www.regulations.gov* or e-mail. Send or deliver information identified as CBI only to the following address: Roberto Morales, OAQPS Document Control Officer (C404–02), U.S. EPA, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina 27711, Attention Docket ID EPA–HQ–OAR–2006–0640. Clearly mark the part or all of the information that you claim to be CBI. For CBI information in a disk or CD–ROM that you mail to EPA, mark the outside of the disk or CD–ROM as CBI and then identify electronically within the disk or CD–ROM the specific information that is claimed as CBI. In addition to one complete version of the comment that includes information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket. Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2.

C. Where can you get a copy of this document and other related information?

In addition to being available in the docket, an electronic copy of these proposed actions will also be available on the Worldwide Web (WWW) through the Technology Transfer Network (TTN). A copy of this proposed action will be posted on the TTN's policy and guidance page for newly proposed or promulgated rules at the following address: *http://www.epa.gov/ttn/oarpg/.* The TTN provides information and technology exchange in various areas of air pollution control.

D. Will there be a public hearing?

The EPA will hold a public hearing on this proposed rule only if requested by November 10, 2008. The request for a public hearing should be made in writing and addressed to Mr. Barrett Parker, Sector Policies and Programs Division, Office of Air Quality Planning and Standards (D243–05), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711. The hearing, if requested, will be held on a date and at a place published in a separate **Federal Register** notice.

II. Background

A. What is the regulatory history of the proposed PS–17 and Procedure 4?

Monitoring of emissions, control device operating parameters, and process operations has been a requirement of many of the emission standards that we have promulgated under the authority of the Clean Air Act (CAA). Recognizing the need for good quality data, we initially developed performance specifications for CEMS. These performance specifications stipulate CEMS equipment design, location, and installation requirements and focus on the initial performance of CEMS. To address the ongoing performance of CEMS, we developed quality assurance (QA) procedures.

The basis for performance specifications for CPMS was initially established by the General Provisions for Standards of Performance for New Stationary Sources in 40 CFR part 60, subpart A. Section 60.13(a), which addresses monitoring requirements, states that ''* * * all continuous monitoring systems required under applicable subparts shall be subject to the provisions of this section upon promulgation of performance specifications for continuous monitoring systems under appendix B to this part * * *'' As defined in § 60.2, these ''continuous monitoring systems'' include those systems that are used to measure and record process parameters. Section 60.13 specifies basic requirements for the installation, validation, and operation of continuous monitoring systems, including CPMS. General recordkeeping requirements for CPMS required under part 60 are specified in § 60.7(f).

Section 61.14 of the NESHAP General Provisions in 40 CFR part 61, subpart A also addresses CPMS, although in less detail than does § 60.13. Included in the requirements for CPMS under part 61 are provisions for the general operation and maintenance of continuous monitoring systems, monitoring system performance evaluations, and recordkeeping.

With the enactment of the Clean Air Act Amendments of 1990 (1990 Amendments), we have placed increased emphasis on the collection and use of monitoring data as a means of ensuring continuous compliance with emission standards. In response to the mandates of the 1990 Amendments, we incorporated into the General Provisions to part 63, basic requirements for all continuous monitoring systems (CMS). Section 63.2 broadly defines CMS to include CPMS, as well as CEMS and other forms of monitoring that are used to demonstrate compliance with applicable regulations. In § 63.8(a)(2), the General Provisions specify that, ''* * * all CMS required under relevant standards shall be subject to the provisions of this section upon promulgation of performance specifications for CMS as specified in the relevant standard or otherwise by the Administrator.'' As is the case for part 60, the General Provisions to part 63 establish the need for performance specifications for CPMS.

Rules promulgated under parts 60, 61, and 63 generally require owners or operators of affected sources to use CPMS to monitor the performance of emission control devices associated with those sources. Although many of these standards specify general design, installation, and calibration requirements for CPMS, these rules do not include specific performance requirements for CPMS. In addition, neither the General Provisions nor the subparts to parts 60, 61, and 63 fully specify procedures and criteria for ensuring that CPMS provide good quality data initially and on an ongoing basis. By proposing a new performance specification and QA procedure specifically for CPMS, we would be establishing standards for the design, installation, operation, and maintenance of CPMS that will help to ensure the generation of good quality data on a consistent basis.

The proposed requirements for CPMS also reflect EPA's commitment to improving the quality of data collected and disseminated by the Agency. Although we have always recognized its importance, there has been increased emphasis on ensuring data quality in response to section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Pub. L. 106–554), which directs the OMB to issue guidelines that ''provide policy and procedural guidance to Federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information * * * disseminated by Federal agencies.'' On September 28, 2001, OMB issued final Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by Federal Agencies (66 FR 49718). These guidelines require Federal agencies to adopt ''* * * a basic standard of quality (including objectivity, utility, and integrity) as a performance goal and should take appropriate steps to incorporate information quality criteria into agency dissemination practices.'' The guidelines also require agencies to ''* * * develop a process for reviewing the quality (including objectivity, utility, and integrity) of information before it is disseminated * * *'' and that the process must ''* * * enable the agency to substantiate the quality of the information it has disseminated through documentation or other means appropriate to the information.''

In response to the OMB guidelines, we developed ''Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by the Environmental Protection Agency'' (EPA/260R–02–008, October 2002). As noted in these guidelines, we are committed to ensuring the quality control of information collected through regulatory requirements, such as this proposed rule, by specifying analytical procedures for data collection and sample analysis that will produce good quality data. We believe the procedures specified in the proposed PS–17 and Procedure 4 will help to ensure the quality of data measured and recorded by affected CPMS, which may subsequently be collected and disseminated by EPA.

This proposed rule also represents an important part of our efforts to implement the recommendations developed by the Air Quality Management Work Group in response to the National Research Council (NRC) report on Air Quality Management in the United States. Specifically, the recommendations developed by the Work Group call for improving emissions factors and other emissions estimation methods and reducing the uncertainty in emissions inventories and air quality modeling applications. When emissions factors and other methods are used to estimate emissions from controlled sources, the assumption is that the control device is operating properly. The improved monitoring of air pollution control device parameters that would be achieved by the proposed PS–17 and Procedure 4 would help to ensure that affected control devices are operated properly, and, when problems arise, corrective action is taken in a timely manner. Furthermore, the improved monitoring will help to reduce the uncertainty and improve the reliability of emission estimates that typically are based on the assumptions that emission controls are being operated properly and are performing as designed.

B. What is the regulatory history of the proposed amendments to Procedure 1?

Quality Assurance Procedure 1 of 40 CFR part 60, appendix F, specifies QA procedures for CEMS. At the time that Procedure 1 was promulgated, affected CEMS were designed to monitor a single gaseous pollutant. Since that time, emission standards have been promulgated under parts 60, 61, and 63 that require the installation and operation of CEMS that monitor multiple pollutants. Although most of the provisions of Procedure 1 can be applied directly to multiple pollutant CEMS, there are differences in how multiple pollutant CEMS operate and how their performance should be assessed. We are proposing amendments to Procedure 1 to address those differences.

C. What is the regulatory history of the proposed amendments to the General Provisions to parts 60, 61, and 63?

The only purpose of these proposed amendments to the General Provisions to parts 60 and 61 is to ensure consistency between those provisions, the applicable subparts to parts 60 and 61 that require the use of CPMS, and the requirements of the proposed PS–17 and Procedure 4. As this is the initial proposal of PS–17 and Procedure 4, there is no regulatory history to these proposed amendments to the General Provisions to parts 60 and 61.

We proposed amendments to the monitoring requirements of the General Provisions to part 63 on March 23, 2001 (66 FR 16318) and promulgated those amendments on April 5, 2002 (67 FR 16582). At the time we proposed those amendments, we had not yet developed PS–17 or Procedure 4. As a result, the amendments to the General Provisions, which were incorporated into § 63.8, are not consistent with the requirements of PS–17 and Procedure 4 that we are now proposing. With this proposal of PS–17 and Procedure 4, we decided that additional amendments to the General Provisions to part 63 were needed to ensure consistency between subpart A of part 63, PS–17, Procedure 4, and the applicable subparts to part 63 that require CPMS.

D. What is the regulatory history of the proposed amendments to 40 CFR part 63, subpart SS?

On June 29, 1999, we promulgated the consolidated rulemaking proposal for the ''generic MACT standards'' program (64 FR 34866). The generic MACT program established an alternative methodology for making maximum achievable control technology (MACT) determinations for appropriate small categories by referring to previous MACT standards that have been promulgated for similar sources in other categories. Initially, the generic MACT standards applied to four source categories: Acetal Resins Production, Acrylic and Modacrylic Fibers Production, Hydrogen Fluoride Production, and Polycarbonate Production. We included in the consolidated rulemaking package general control requirements for certain types of hazardous air pollutant (HAP) emissions from storage vessels containing organic materials, process vents emitting organic vapors, and leaks from equipment components. We also established a separate subpart SS, which specifies requirements for closed vent systems, control devices, recovery devices and routing emissions to fuel gas systems or a process. We included in § 63.996 of subpart SS general monitoring requirements for control and recovery devices. On December 6, 2000, we proposed revisions to the monitoring requirements of subpart SS (65 FR 76444). Those proposed revisions specified in greater detail the requirements for CPMS that are used to monitor temperature, pressure, or pH. At the time these revisions to subpart SS were proposed, we were in the early stages of developing PS–17 and Procedure 4 and had not yet refined many of the requirements for CPMS that we are proposing today. However, with this proposal of PS–17 and Procedure 4, we concluded that it would be appropriate to propose further amendments to subpart SS to ensure consistency with PS–17 and Procedure 4.

III. Summary of Proposed Performance Specification 17

A. What is the purpose of PS–17?

The purpose of PS–17 is to establish the initial installation and performance procedures that are required for evaluating the acceptability of a CPMS that is used to monitor specific process or control device parameters. The specific parameters that would be addressed by the proposed PS–17 are temperature, pressure, liquid flow rate, gas flow rate, mass flow rate, pH, and conductivity. Mass flow rate includes the mass flow of liquids as well as solids, such as the flow of powders or dry solid material into a processing unit. As proposed, the requirements for the selection, installation, and validation of CPMS specified in PS–17 would apply instead of the corresponding requirements in an applicable subpart to parts 60, 61, or 63 that requires the use of CPMS for monitoring temperature, pressure, flow rate, pH, or conductivity.

B. Who must comply with PS–17?

The proposed PS–17 would apply to CPMS that are used to monitor temperature, pressure, liquid flow rate, gas flow rate, mass flow rate, pH, or conductivity as indicators of good control device performance or emission source operation. If adopted as a final rule, owners and operators of emission sources that would be required to install and operate any such CPMS under any subpart of parts 60, 61, or 63 (listed in Table 1 of this preamble) would be required to comply with PS–17, with the exception of facilities that are subject to the part 63 rules that are listed in Table 2 of this preamble. In addition to new CPMS that are installed after the proposed effective date of PS–17, existing CPMS that are required under parts 60, 61, or 63 also would be required to comply with PS–17.

C. When must owners or operators of affected CPMS comply with PS–17?

Owners and operators of affected existing CPMS that were installed prior to the effective date of this rule and are located at facilities that are required to obtain a title V operating permit would be required to comply with PS–17 when they renew their title V permit, or when they replace any key components of an affected CPMS. The key components of a CPMS are the sensors, data recorders, and any other parts of the CPMS that affect overall system accuracy, measurement range, or measurement resolution. Owners and operators of affected existing CPMS that were installed prior to the effective date of this rulemaking and are located at area source facilities that are exempt from obtaining a title V operating permit would be required to comply with PS–17 within 5 years of the effective date of this rule, or when they replace any key components of an affected CPMS. Owners and operators of new affected CPMS would have to comply with the proposed PS–17 when they install and place into operation the affected CPMS.

D. What are the basic requirements of PS–17?

The proposed PS–17 would require owners and operators of affected CPMS to: (1) Select a CPMS that satisfies basic equipment design criteria; (2) install their CPMS according to standard procedures; (3) validate their CPMS prior to placing it into operation; and (4) record and maintain information on their CPMS and its operation. The technical rationales for proposed criteria, specifications, and other related requirements of PS–17 are described in section VIII of this document.

1. Equipment Selection

Two types of equipment would be needed for complying with PS–17: (1) the components that comprise the CPMS, and (2) the equipment that is used to validate the CPMS. For CPMS components, PS–17 would require the selection of equipment that can satisfy basic criteria for measurement range, resolution, and overall system accuracy.

For CPMS components, PS–17 does not specify sensor design criteria, allowing affected owners and operators to select any equipment, provided the CPMS meets the accuracy requirements for the initial validation. However, PS–17 would identify voluntary consensus standards that can be used as guidelines for selecting specific types of sensors.

For a temperature CPMS, PS–17 would require a sensor that is consistent with one of the following standards: (1) ASTM E235–06, ''Specification for Thermocouples, Sheathed, Type K, for Nuclear or Other High-Reliability Applications''; (2) ASTM E585/E585M–04, ''Specification for Compacted Mineral-Insulated, Metal-Sheathed Base Metal Thermocouple Cables''; (3) ASTM E608/E608M–06, ''Specification for Mineral-Insulated, Metal-Sheathed Base Metal Thermocouples''; (4) ASTM E696–07, ''Specification for Tungsten-Rhenium Alloy Thermocouple Wire''; (5) ASTM E1129/E1129M–98 (2002), ''Standard Specification for Thermocouple Connectors''; (6) ASTM E 1159–98 (2003), ''Specification for Thermocouple Materials, Platinum-Rhodium Alloys, and Platinum''; (7) ISA–MC96.1–1982, ''Temperature Measurement Thermocouples''; or (8) ASTM E 1137/E 1137M–04, ''Standard Specification for Industrial Platinum Resistance Thermometers'' (incorporated by reference-see § 60.17)

For a pressure CPMS that uses a pressure gauge as the sensor, PS–17 would require a gauge that conforms to the design requirements of ASME B40.100–2005, ''Pressure Gauges and Gauge Attachments'' (incorporated by reference-see § 60.17).

2. Range

With respect to measurement range, this proposed rule would require that temperature, pressure, flow rate, and conductivity CPMS be capable of measuring the appropriate parameter over a range that extends at least 20 percent beyond the normal expected operating range of values for that parameter. For example, if the pressure drop measurement across a scrubber typically ranges from 5.0 to 7.5 kilopascals (kPa) (20 to 30 inches of water column (in. wc)), the range of the data recorder for a CPMS that monitors that pressure drop would have to extend from at least 4.0 to 9.0 kPa (16 to 36 in. wc). For pH CPMS, the proposed PS–17 would require that the CPMS data recorder range covers the entire pH scale from 0 to 14.

3. Resolution

The data recording system associated with affected CPMS would require a resolution that is equal to or better than one-half of the required system accuracy. For example, if a temperature CPMS is required to have an accuracy of 1 °C, the required resolution for the CPMS would be 0.5 °C, or better.

4. Accuracy

The accuracy criteria for CPMS, which are a function of the parameter that is measured by the CPMS, are described in detail in section II.E of this document.

For devices or instruments that are used to validate or check the initial accuracy of a temperature, pressure, or flow CPMS, PS–17 generally would require an accuracy hierarchy of three. In other words, the ratio of the required accuracy of the CPMS to the accuracy of the calibrated validation device would have to be at least three. For example, if the required accuracy of a temperature CPMS is ±1.0 percent, to satisfy the accuracy hierarchy of three criterion, the calibrated validation device would need an accuracy of ±0.33 percent or better (1.0 ÷ 0.33 = 3). A CPMS with an accuracy of 0.25 percent would satisfy the accuracy hierarchy criterion, but a CPMS with an accuracy of 0.5 percent would not satisfy the accuracy hierarchy criterion in this example. The accuracy of the equipment used to validate the CPMS also would have to be traceable to National Institute of Standards and Technology (NIST) standards. We have incorporated into the proposed PS–17 two exceptions to the accuracy requirements for instruments that are used to validate CPMS. First, a mercury-in-glass or water-in-glass U-tube manometer could be used instead of a calibrated pressure measurement device with NIST-traceable accuracy when validating a pressure CPMS or a flow CPMS that uses a differential pressure flow meter. Secondly, for instruments and reagents that are used to validate a pH CPMS, the performance specification would require NIST-traceable accuracy of 0.02 pH units or better, rather than an accuracy hierarchy of three.

5. Installation

The PS–17 would require each CPMS sensor to be located so as to provide representative measurements of the appropriate parameter. The proposed PS–17 also lists voluntary consensus standards that could serve as guidelines for installing specific types of sensors. Voluntary consensus standards are technical standards that are developed or adopted by one or more voluntary consensus standards bodies, such as the American Society for Testing and Materials (ASTM) or the American Society of Mechanical Engineers (ASME).

If required to install a flow CPMS and the sensor of the flow CPMS is a differential pressure device, turbine flow meter, rotameter, vortex formation flow meter or Coriolis mass flow meter, PS–17 would allow one of the following standards to be used as guidance: (1) ASME MFC–3M–2004, ''Measurement of Fluid Flow in Pipes Using Orifice, Nozzle, and Venturi''; (2) ANSI/ASME MFC–7M–1987 (R2001), ''Measurement of Gas Flow by Means of Critical Flow Venturi Nozzles''; (3) ANSI/ISA RP 31.1–1977, ''Recommended Practice: Specification, Installation, and Calibration of Turbine Flowmeters''; (4) ANSI/ASME MFC 4M–1986 (R2003), ''Measurement of Gas Flow by Turbine Meters'' (if used for gas flow measurement); (5) ISA RP 16.5–1961, ''Installation, Operation, and Maintenance Instructions for Glass Tube Variable Area Meters (Rotameters)''; (6) ISO 10790:1999(E), ''Measurement of Fluid Flow in Closed Conduits-Guidance to the Selection, Installation and Use of Coriolis Meters (Mass Flow, Density and Volume Flow Measurements); or (7) ANSI/ASME MFC–6M–1998 (R2005) ''Measurement of Fluid Flow in Pipes Using Vortex Flow Meters'' (incorporated by reference—see § 60.17).

There are also several voluntary consensus standards that can be used as alternative methods for checking the accuracy of specific types of CPMS sensors. Prior to validating the performance of a CPMS, owners and operators would be required to install work platforms, test ports, taps, valves, or any other equipment needed to perform the initial validation check.

6. CPMS Validation

Under this proposed rule, we would require owners and operators of affected CPMS to demonstrate that affected CPMS meet a minimum overall system accuracy. Several methods are specified for checking CPMS accuracy, and owners and operators of affected CPMS could choose among the methods specified for each type of CPMS. These validation methods generally would involve either: (1) Comparing measurements made by the affected CPMS to measurements made by a calibrated measurement device, or (2) simulating the signal generated by the CPMS sensor using a calibrated simulation device. Table 5 of this preamble lists the CPMS validation methods specified in the proposed PS–17 and their applicability. As part of specific validation methods, the proposed PS–17 specifies several voluntary consensus standards as alternative methods for checking sensor accuracy.

TABLE 5—CPMS INITIAL VALIDATION METHODS

If your CPMS measures . . .	You can validate your CPMS by . . .	If the sensor of your CPMS is . . .
1. Temperature	a. Comparison to a calibrated temperature measurement device.	Thermocouple, RTD, or any other type of temperature sensor.
	b. Temperature simulation	Thermocouple, RTD, or any other type of sensor that generates an electronic signal that can be related to temperature magnitude.
2. Pressure	a. Comparison to a calibrated pressure measurement device.	Pressure transducer, pressure gauge, or any other type of pressure sensor.
	b. Pressure simulation procedure using a calibrated pressure source.	Pressure transducer, pressure gauge, or any other type of pressure sensor.
	c. Pressure simulation using a pressure source and a calibrated pressure measurement device.	Pressure transducer, pressure gauge, or any other type of pressure sensor.
3. Liquid flow rate	a. Volumetric method	Any type of liquid flow meter.
	b. Gravimetric method	Any type of liquid flow meter.
	c. Differential pressure measurement method	Orifice plate, flow nozzle, or other type of differential pressure liquid flow meter.
	d. Pressure source flow simulation method	Orifice plate, flow nozzle, or other type of differential pressure liquid flow meter.
	e. Electronic signal simulation method	Turbine flow meter, vortex shedding flow meter, or any other type of liquid flow meter that generates an electronic signal that can be related to flow rate magnitude.
4. Gas flow rate	a. Differential pressure measurement method	Orifice plate, flow nozzle, or any other type of differential pressure gas flow meter other than a differential pressure tube.
	b. Pressure source flow simulation method	Orifice plate, flow nozzle, or any other type of differential pressure gas flow meter other than a differential pressure tube.
	c. Electronic signal simulation method	Any type of gas flow meter that generates an electronic signal that can be related to flow rate magnitude.
	d. Relative accuracy test	Any type of gas flow meter.
5. Liquid mass flow rate	Gravimetric method	Any type of liquid flow meter.
6. Solid mass flow rate	a. Gravimetric method	Any type of solid mass flow meter.
	b. Material weight comparison method	Belt conveyor with weigh scale, equipped with a totalizer.
7. pH	a. Comparison to calibrated pH meter	Any type of pH meter.
	b. Single point calibration	Any type of pH meter.
8. Conductivity	a. Comparison to calibrated conductivity meter.	Any type of conductivity meter.
	b. Single point calibration	Any type of conductivity meter.

7. Temperature CPMS Validation

Under this proposed rule, the performance of a temperature CPMS could be validated by comparing measured values to a calibrated temperature measurement device or by simulating a typical operating temperature using a calibrated temperature simulation device. When the calibrated temperature measurement device method is used, the sensor of the calibrated device would have to be located adjacent to the CPMS sensor and must be subjected to the same environmental conditions as the CPMS sensor. In addition, the measurements made using the CPMS and calibrated temperature measurement device would have to be concurrent. The method is based on ASTM E 220–07e1, ''Standard Test Methods for Calibration of Thermocouples by Comparison Techniques'' (incorporated by reference—see § 60.17).

An alternative method for thermocouples is ASTM E 452–02 (2007), ''Standard Test Method for Calibration of Refractory Metal Thermocouples Using an Optical Pyrometer'' and an alternative method for resistance temperature detectors is ASTM E 644–06, ''Standard Test Methods for Testing Industrial Resistance Thermometers'' (incorporated by reference—see § 60.17).

8. Pressure CPMS Validation

To validate the performance of a pressure CPMS, owners and operators could choose from one of three methods: (1) Comparison to a calibrated pressure measurement device, (2) pressure simulation using a calibrated pressure source, or (3) pressure simulation using a pressure source and calibrated pressure measurement device. Prior to performing the initial validation check of a pressure CPMS, PS–17 would require a leak test on all connections between the process line that is monitored, the CPMS, and the calibrated device that is used as the basis for comparison. If the calibrated pressure measurement device comparison were used, the measurements by the CPMS and calibrated device would have to be concurrent.

As an alternative to the initial validation check, PS–17 would allow the user to check the accuracy of the pressure sensor associated with the pressure CPMS using one of the following methods: (1) ASME B40.100–2005, ''Pressure Gauges and Gauge Attachments'' or (2) ASTM E 251–92 (2003), ''Standard Test Methods for Performance Characteristics of Metallic Bonded Resistance Strain Gages'' (incorporated by reference—see § 60.17). Users would also be required to check the accuracy of the overall CPMS.

9. Flow CPMS Validation

Under the proposed PS–17, the performance of a flow CPMS could be validated using one of seven methods. However, none of the methods could be applied universally to all types of flow CPMS; there would be limitations on the use of each specific method. The volumetric method, which could be used to validate any liquid flow rate measurement device, would entail collecting a volume of liquid for a timed period, then calculating the flow rate based on the volume collected and the length of the time period over which the liquid was collected. The gravimetric method is similar to the volumetric method except that the material collected would be weighed. The gravimetric method could be used to validate any liquid flow CPMS, liquid mass flow CPMS, and solid mass flow CPMS. Liquid mass flow rates and solid mass flow rates would be calculated based on the weight of the liquid or solid and the length of the time period over which the liquid or solid was collected. Liquid flow rate would be calculated based on the weight and density of the liquid and the length of the time period over which the liquid was collected.

The volumetric and gravimetric methods are based on voluntary consensus standards and could be used to validate liquid flow CPMS. Both methods are described in the following standards: (1) ISA RP 16.6–1961, ''Methods and Equipment for Calibration of Variable Area Meters (Rotameters)''; (2) ISA RP 31.1–1977, ''Specification, Installation, and Calibration of Turbine Flow Meters''; and (3) ISO 8316:1987, ''Measurement of Liquid Flow in Closed Conduits-Method by Collection of Liquid in a Volumetric Tank'' (incorporated by reference-see § 60.17). The gravimetric method also is described in the following standards: (1) ANSI/ASME MFC–9M–1988, ''Measurement of Liquid Flow in Closed Conduits by Weighing Method''; and (2) ASHRAE 41.8–1989, ''Standard Methods of Measurement of Flow of Liquids in Pipes Using Orifice Flow Meters'' (incorporated by reference-see § 60.17). The gravimetric method also could be used to validate liquid mass flow or solid mass flow CPMS.

The differential pressure measurement method and the pressure source flow simulation method could be used to validate any flow CPMS that uses a differential pressure measurement flow device, such as an orifice plate, flow nozzle, or venturi tube. Both methods would entail measuring the differential pressure across a flow constriction, then calculating the corresponding flow rate based on the measured differential pressure using the manufacturer's literature or the procedures specified in ASME MFC–3M–2004, ''Measurement of Fluid Flow in Pipes Using Orifice, Nozzle, and Venturi'' (incorporated by reference—see § 60.17), the characteristics of the liquid, and the dimensions and design of the flow constriction. For CPMS that use an orifice flow meter, the flow rate can be calculated using procedures specified in ASHRAE 41.8–1989, ''Standard Methods of Measurement of Flow of Liquids in Pipes Using Orifice Flowmeters'' (incorporated by reference—see § 60.17).

In addition, prior to the validation check, both methods would require a leak test on all connections associated with the process line, CPMS, and pressure connections. Neither the differential pressure measurement method nor the pressure source flow simulation method could be used to validate a gas flow CPMS that uses one or more differential pressure tubes as the flow sensor. A differential pressure tube is defined as a device, such as a pitot tube, that consists of one or more pairs of tubes that are oriented to measure the velocity pressure and static pressure at one of more fixed points within a duct for the purpose of determining gas velocity.

The electronic signal simulation method could be used to validate any flow CPMS that operates with a sensor that generates an electronic signal, provided the electronic signal can be simulated and is related to the magnitude of the flow rate. Examples of this type of flow sensor are turbine meters and vortex shedding flow meters. The electronic signal simulation method would entail simulating an electronic signal using a calibrated signal simulator, then calculating the flow rate that corresponds to the value of the simulated signal.

Owners or operators of flow CPMS that are used for monitoring gas flow rate could validate their CPMS by performing a relative accuracy (RA) test using Reference Methods 2, 2A, 2B, 2C, 2D, or 2F (40 CFR part 60, appendix A–1), or 2G (40 CFR part 60, appendix A–2). The RA test is the only method specified in the proposed PS–17 for validating a gas flow CPMS that incorporates a differential pressure tube.

Finally, the material weight comparison method could be used to validate a solid mass flow CPMS that uses a combination belt conveyor and weigh scale equipped with a totalizer. The method is based on the Belt-Conveyor Scale Systems Method, which is described in NIST Handbook 44—2002 Edition, ''Specifications, Tolerances, And Other Technical Requirements for Weighing and Measuring Devices'' (incorporated by reference—see § 60.17) as adopted by the 86th National Conference on Weights and Measures in 2001.

10. pH CPMS Validation

To validate the performance of a pH CPMS, two methods are specified in the proposed PS–17. In the first method, the pH measured by the CPMS would be compared to the pH measured by a calibrated pH meter. In the second method, the single point calibration method, the value measured by the CPMS would be compared to the pH measurement of a certified buffer solution. If the CPMS did not satisfy the accuracy requirement, a two-point calibration method, based on ASTM D 1293–99 (2005), ''Standard Test Methods for pH of Water'' (incorporated by reference—see § 60.17), would be suggested.

11. Conductivity CPMS Validation

The proposed PS–17 would specify two methods for validating conductivity CPMS. The two methods parallel the methods for validating pH CPMS: comparison to a calibrated conductivity meter and the single point calibration method using a standard conductivity solution.

If the conductivity CPMS did not satisfy the accuracy requirement, calibration based on the procedures specified in the manufacturer's owner's manual would be suggested. If the manufacturer's owner's manual does not specify a calibration procedure, calibration should be performed based on one of the following standards: (1) ASTM D 1125–95 (2005), ''Standard Test Methods for Electrical Conductivity and Resistivity of Water''; or (2) ASTM D 5391–99 (2005), ''Standard Test Method for Electrical conductivity and Resistivity of a Flowing High Purity Water Sample'' (incorporated by reference—see § 60.17).

12. Alternative Methods of CPMS Validation

Owners and operators of affected CPMS could have the option of using alternative methods for validating their CPMS, provided the alternative method has been approved by us or by a delegated authority. In all cases, owners and operators of affected CPMS would be required to take corrective action if the initial validation check indicates that the CPMS does not satisfy the accuracy requirement. Alternative monitoring methods are addressed under the General Provisions to parts 60, 61, and 63 in §§ 60.13(i), 61.14(g), and 63.8(f), respectively. Alternative monitoring methods also are addressed in the applicable subparts for each rule.

E. What initial performance criteria must be demonstrated to comply with PS–17?

Owners or operators of affected CPMS would be required to demonstrate that their CPMS meet a minimum system accuracy. Table 6 of this preamble summarizes the required accuracies. These minimum accuracies would pertain to the overall CPMS and not simply the sensor.

TABLE 6—ACCURACY CRITERIA FOR INITIAL VALIDATION CHECK

If the CPMS measures . . .	The accuracy criteria for the initial validation check are . . .
1. Temperature (in a non-cryogenic environment).	System accuracy of ±1.0 percent of the temperature or 2.8 °C (5 °F), whichever is greater.
2. Temperature (in a cryogenic environment)	System accuracy of ±2.5 percent of the temperature or 2.8 °C (5 °F), whichever is greater.
3. Pressure	System accuracy of ±5 percent or 0.12 kPa (0.5 in. wc), whichever is greater.
4. Liquid flow rate	System accuracy of ±5 percent or 1.9 L/min (0.5 gal/min), whichever is greater.
5. Gas flow rate	a. Relative accuracy of ±20 percent, if the relative accuracy test is used to demonstrate compliance, OR. b. System accuracy of ±10 percent, if the CPMS measures steam flow rate, OR. c. System accuracy of ±5 percent or 280 L/min (10 ft^3/min), whichever is greater, for all other gases and validation test methods.
6. Mass flow rate	System accuracy of ±5 percent.
7. pH	System accuracy of 0.2 pH units.
8. Conductivity	System accuracy percentage of ±5 percent.

In most cases, the required accuracies are expressed both as accuracy percentages and as accuracy values; for a specific parameter value, the accuracy criterion that results in the greater value would apply (i.e., the less stringent criterion would apply). For example, for liquid flow rate, the accuracy percentage would be ±5 percent, and the accuracy value would be 1.9 liters per minute (L/min) (0.5 gallons per minute (gal/min)). If the actual flow rate were 30 L/min (7.9 gal/min), the accuracy percentage criterion would result in a value of 1.5 L/min (0.4 gal/min). Therefore, the accuracy value criterion of 1.9 L/min (0.5 gal/min) would apply because 1.9 L/min is greater than 1.5 L/min.

For temperature CPMS, the proposed PS–17 would make a distinction between cryogenic and non-cryogenic environments; cryogenic environments are those characterized by a temperature less than 0 °C (32 °F), and non-cryogenic environments are those with a temperature of at least 0 °C (32 °F). The minimum accuracy for a temperature CPMS used in a non-cryogenic application would be the greater of ±1.0 percent of the temperature measured on the Celsius scale (°C) and ±2.8 °C (5 °F). For example, for a temperature CPMS that is used to monitor a thermal oxidizer operating at 760 °C (1400 °F), the 1 percent accuracy criterion would require the CPMS to be accurate to within ±7.6 °C (±14 °F). Because 7.6 °C (±14 °F) is greater than 2.8 °C (5 °F), the 1 percent accuracy criterion would apply. The minimum accuracy of a temperature CPMS used in a cryogenic application would be ±2.8 °C (5 °F) or ±2.5 percent of the temperature measured on the Celsius scale, whichever is greater. For a temperature CPMS that is used to monitor a condenser operating with an outlet temperature of −12 °C (10 °F), the temperature value criterion would apply; the CPMS would have to be accurate to ±2.8 °C (±5 °F) because 2.8 °C (5 °F) is greater than 2.5 percent of −12 °C (10 °F), which is ±0.3 °C (±0.5 °F). These criteria translate to the accuracies listed in Table 7 of this preamble.

TABLE 7—SUMMARY OF TEMPERATURE CPMS ACCURACY REQUIREMENTS

For temperatures that are . . .	The required temperature CPMS accuracy is . . .
1. Greater than 280 °C (540 °F)	±1 percent of temperature.
2. Between −112 and 280 °C (−170 and 540 °F)	±2.8 °C (5 °F).
3. Less than −112 °C (−170 °F)	±2.5 percent of temperature.

The proposed PS–17 would require pressure CPMS to be accurate to within ±5 percent or 0.12 kPa (0.5 in. wc), whichever is greater. For example, a CPMS that is used to monitor a venturi scrubber with a pressure drop of 7.5 kPa (30 in. wc) would have to be accurate to 0.37 kPa (1.5 in. wc) or better, based on the ±5 percent criterion because 0.37 kPa (1.5 in. wc) is greater than 0.12 kPa (0.5 in. wc). On the other hand, the required accuracy for a CPMS that monitored a pressure drop of 1.0 kPa (4 in. wc) across a fabric filter would be 0.12 kPa (0.5 in. wc), or better, because the ±5 percent criterion would result in an accuracy of 0.05 kPa (0.2 in. wc).

The required accuracy for flow CPMS would depend on the material that is being monitored. For liquid flow rate CPMS, the minimum accuracy would be 1.9 L/min (0.5 gal/min) or ±5 percent, whichever is greater. For example, to monitor a scrubber liquid flow rate of 300 L/min (80 gal/min), the required CPMS accuracy would be 15 L/min (4 gal/min) or better. For gas flow rate CPMS, PS–17 would require a minimum accuracy of 280 L/min (10 cubic feet per minute (ft^3/min)) or ±5 percent, whichever is greater. Therefore, a fuel flow meter on a natural gas-fired 8 MMBtu/hr incinerator with a gas flow rate of 3,700 L/min (130 ft^3/min) would have to be accurate to 280 L/min (10 ft^3/min) or better. An exception to these accuracy requirements for flow meters would apply if an RA test is used to validate a gas flow CPMS. In such cases, the required RA would be 20 percent of the mean value of the reference method test data, or better. An exception to the gas flow CPMS accuracy requirements would also apply for steam flow rate CPMS. The proposed PS–17 stipulates the minimum accuracy for a CPMS that is used for monitoring steam flow rate would have to be ±10 percent or better. The minimum accuracy specified in the proposed PS–17 for mass flow CPMS would be ±5 percent. We would require pH CPMS to be accurate to within ±0.2 pH units. Finally, conductivity CPMS would have to be accurate to ±5 percent.

F. What are the reporting and recordkeeping requirements for PS–17?

The proposed PS–17 does not specify reporting requirements but would require owners and operators of affected CPMS to record and maintain information that identifies the CPMS, including the location of the CPMS, identification number assigned by the owner or operator, the manufacturer's name and model number, and the typical operating range for each parameter that is monitored. In addition, owners and operators of affected CPMS would be required to document performance demonstrations.

IV. Summary of Proposed Procedure 4

A. What is the purpose of Procedure 4?

The proposed Procedure 4 would have two primary purposes. First, the procedure would be used for evaluating the quality of data produced by CPMS on an ongoing basis. Second, the procedure would help evaluate the effectiveness of the QA and quality control (QC) programs that owners and operators develop for CPMS. As proposed, Procedure 4 would apply instead of the requirements for evaluating the operation and quality of the data produced by CPMS specified in an applicable subpart to parts 60, 61, or 63 that requires the use of CPMS for monitoring temperature, pressure, flow rate, pH, or conductivity.

B. Who must comply with Procedure 4?

This procedure would apply to any CPMS that is subject to PS–17. That is, any owner or operator who would be required under an applicable subpart to parts 60, 61, or 63 to install and operate a CPMS that is used to monitor temperature, pressure, flow rate, pH, or conductivity would be subject to both PS–17 and Procedure 4.

C. When must owners or operators of affected CPMS comply with Procedure 4?

Owners and operators of affected CPMS would have to comply with Procedure 4 when they install and place into operation a CPMS that is subject to PS–17 or when an existing CPMS becomes subject to PS–17.

D. What are the basic requirements of Procedure 4?

The proposed Procedure 4 would require owners or operators to perform periodic accuracy audits, perform visual inspections and other operational checks, and develop and implement a QA/QC program for each affected CPMS. The technical rationales for specific proposed requirements of Procedure 4 are described in section IX of this document.

1. Accuracy Audits

The requirements for periodic accuracy audits would consist of equipment requirements and procedural requirements. As is the case for equipment used to perform initial validations under the proposed PS–17, the specific equipment required to perform an accuracy audit would depend on the type of CPMS and the method selected for evaluating the accuracy of the CPMS. However, all such equipment would have to be calibrated and would have to meet the same two general requirements for accuracy: (1) An accuracy hierarchy of at least three, and (2) an accuracy that is NIST-traceable.

We have incorporated into the proposed Procedure 4 three exceptions to the accuracy requirements for instruments that are used to audit the accuracy of CPMS: (1) When performing an accuracy audit using a redundant sensor, the redundant sensor would have to have an accuracy equal to or better than the accuracy of your primary sensor; (2) a mercury-in-glass or water-in-glass U-tube manometer could be used instead of a calibrated pressure measurement device with NIST-traceable accuracy when auditing the accuracy of a pressure CPMS or a flow CPMS that uses a differential pressure flow meter; and (3) when performing an accuracy audit of a flow CPMS using the volumetric or gravimetric methods, the container that is used to collect the liquid or solid material would not be required to have NIST-traceable accuracy.

The procedural requirements for performing accuracy audits of a CPMS would depend on the type of CPMS. Owners or operators of affected CPMS generally could choose among several methods for performing CPMS accuracy audits. Many of these methods are identical to the methods for performing the initial validation check of CPMS, as specified in the proposed PS–17 and described in section III.D of this document. However, one significant difference between the initial validation methods specified in the proposed PS–17 and the accuracy audit methods specified in the proposed Procedure 4 is that the accuracy audit methods would require you to check the accuracy of each primary sensor, either separately or as part of the overall system accuracy audit. For PS–17, we assumed that newly installed sensors are calibrated, and a separate check of sensor accuracy would be unnecessary. However, for assessing ongoing QA, affected owners and operators would be required to perform accuracy audits on CPMS that have been in service, and the audit procedure would have to verify that the entire system, including the sensor, meets the accuracy criteria. Table 8 of this document lists the CPMS accuracy audit methods specified in the proposed Procedure 4 and the associated applicability.

TABLE 8—ACCURACY AUDIT METHODS

If your CPMS measures . . .	You can perform the accuracy audit of your CPMS by . . .	If the sensor of your CPMS is . . .
1. Temperature	a. Comparison to redundant temperature CPMS.	Any type of temperature sensor.
	b. Comparison to calibrated temperature measurement device.	Thermocouple, RTD, or any other type of temperature sensor.
	c. Separate sensor check and system check by temperature simulation.	Thermocouple or RTD.
2. Pressure	a. Comparison to redundant pressure sensor.	Any type of pressure sensor.
	b. Comparison to calibrated pressure measurement device.	Pressure transducer, pressure gauge, or any other type of pressure sensor.
	c. Separate sensor check and system check by pressure simulation using a calibrated pressure source.	Pressure gauge or metallic-bonded resistance strain gauge.
	d. Separate sensor check and system check by pressure simulation using a pressure source and a calibrated pressure measurement device.	Pressure gauge or metallic-bonded resistance strain gauge.
3. Liquid flow rate	a. Comparison to redundant flow sensor	Any type of liquid flow meter.
	b. Volumetric method	Any type of liquid flow meter.
	c. Gravimetric method	Any type of liquid flow meter.
	d. Separate sensor check and system check by differential pressure measurement method.	Orifice plate, flow nozzle, or other type of differential pressure liquid flow meter.
	e. Separate sensor check and system check by pressure source flow simulation method.	Orifice plate, flow nozzle, or other type of differential pressure liquid flow meter.
4. Gas flow rate	a. Comparison to redundant flow sensor	Any type of gas flow meter.
	b. Separate sensor check and system check by differential pressure measurement method.	Orifice plate, flow nozzle, or any other type of differential pressure gas flow meter other than a differential pressure tube.
	c. Separate sensor check and system check by pressure source flow simulation method.	Orifice plate, flow nozzle, or any other type of differential pressure gas flow meter.
	d. Relative accuracy test	Any type of gas flow meter.
5. Liquid mass flow rate	a. Comparison to redundant flow sensor	Any type of liquid mass flow meter.
	b. Gravimetric method	Any type of liquid mass flow meter.
6. Solid mass flow rate	a. Comparison to redundant flow sensor	Any type of liquid mass flow meter.
	b. Gravimetric method	Any type of solid mass flow meter.
	c. Material weight comparison method	Combination belt conveyor, weigh scale, and totalizer.
7. pH	a. Comparison to redundant pH meter	Any type of pH meter.
	b. Comparison to calibrated pH meter	Any type of pH meter.
	c. Single point calibration	Any type of pH meter.
8. Conductivity	a. Comparison to redundant conductivity meter.	Any type of conductivity meter.
	b. Comparison to calibrated conductivity meter.	Any type of conductivity meter.
	c. Single point calibration	Any type of conductivity meter.

2. Temperature CPMS Accuracy Audit Methods

To perform an accuracy audit of a temperature CPMS, owners and operators of affected CPMS could choose from three methods. The first method would apply to CPMS with redundant temperature sensors and would entail comparing the temperature measured by the primary sensor of your CPMS to that of the redundant temperature sensor. The second method would consist of comparing the temperature measured by the CPMS to a separate calibrated temperature measurement device. The third method would require checking the temperature sensor independent of the other components of the CPMS. The temperature sensor could be checked using methods specified in any of the following voluntary consensus standards: (1) ASTM E 220–07e1, ''Standard Test Methods for Calibration of Thermocouples by Comparison Techniques'' (for thermocouples); (2) ASTM E 452–02 (2007), ''Standard Test Method for Calibration of Refractory Metal Thermocouples Using an Optical Pyrometer'' (for thermocouples); or (3) ASTM E 644–06, ''Standard Test Methods for Testing Industrial Resistance Thermometers'' (for resistance temperature detectors) (incorporated by reference—see § 60.17). The other components of the CPMS could be checked by simulating a temperature, then comparing the temperature recorded by the CPMS to the simulated temperature. Because the voluntary consensus standards specified in the proposed Procedure 4 would apply only to thermocouples and resistance temperature detectors (RTDs), this accuracy audit method would apply only to CPMS that use those types of temperature sensors.

3. Pressure CPMS Accuracy Audit Methods

For an accuracy audit of a pressure CPMS, the proposed Procedure 4 would specify four methods. The first method would apply to CPMS with redundant pressure sensors and would entail comparing the pressure measured by the primary pressure sensor of your CPMS to the pressure measured by the redundant pressure sensor. The second method would consist of comparing the pressure measured by your CPMS to the pressure measured by a separate calibrated pressure measurement device. The other two methods would involve checking the accuracies of the pressure sensor independent of the other components of the CPMS. For checking sensor accuracy, the proposed Procedure 4 would reference voluntary consensus standards. Because we were able to identify voluntary consensus standards only for pressure gauges (ASME B40.100–2005, ''Pressure Gauges and Gauge Attachments'') and metallic-bonded resistance strain gauges (ASTM E 251–92 (2003), ''Standard Test Methods for Performance Characteristics of Metallic Bonded Resistance Strain Gages'') (incorporated by reference—see § 60.17), these other two pressure CPMS accuracy audit methods would apply only to CPMS that use pressure gauge or metallic-bonded resistance strain gauge sensors.

After checking sensor accuracy, the accuracy of the other components of the CPMS could be checked by either: (1) Pressure simulation using a calibrated pressure source, or (2) pressure simulation using a pressure source and a calibrated pressure measurement device. In either method, a simulated pressure would be compared to a calibrated pressure to determine accuracy.

4. Liquid Flow CPMS Accuracy Audit Methods

To perform an accuracy audit of a liquid flow CPMS, five methods are specified in the proposed Procedure 4. As is the case with other types of CPMS, owners and operators of affected CPMS could choose among the methods specified. The first method would apply to CPMS with redundant flow sensors and would entail comparing the flow rate measured by the primary flow sensor of your CPMS to the flow rate measured by the redundant flow sensor. The next two methods—the volumetric and gravimetric methods—are the same methods as specified for the initial CPMS validation in the proposed PS–17 and described in section III.D of this document. The volumetric and gravimetric methods are based on voluntary consensus standards and could be used to validate liquid flow CPMS. Both methods are described in the following standards: (1) ISA RP 16.6–1961, ''Methods and Equipment for Calibration of Variable Area Meters (Rotameters)''; (2) ISA RP 31.1–1977, ''Specification, Installation, and Calibration of Turbine Flow Meters''; (3) ISO 10790:1999, ''Measurement of Fluid Flow in Closed Conduits—Guidance to the Selection, Installation and Use of Coriolis Meters (Mass Flow, Density and Volume Flow Measurements)''; and (4) ISO 8316:1987, ''Measurement of Liquid Flow in Closed Conduits—Method by Collection of Liquid in a Volumetric Tank'' (incorporated by reference—see § 60.17). The gravimetric method also is described in the following standards: (1) ANSI/ASME MFC–9M–1988, ''Measurement of Liquid Flow in Closed Conduits by Weighing Method''; and (2) ASHRAE 41.8–1989, ''Standard Methods of Measurement of Flow of Liquids in Pipes Using Orifice Flowmeters'' (incorporated by reference—see § 60.17). The gravimetric method also could be used to validate liquid mass flow or solid mass flow CPMS.

For liquid flow CPMS that use a differential pressure meter, such as an orifice plate, venturi tube, or flow nozzle, two accuracy audit methods are specified in the proposed Procedure 4. Both of these methods would require a separate visual inspection of the flow constriction and a check of the accuracy of the other components of the system. The accuracy of the other components would have to be checked by pressure simulation, using either a calibrated differential pressure source or a differential pressure source in combination with a calibrated differential pressure measurement device. The required pressure drop that corresponds to the normal operating flow rate expected for the flow CPMS can be calculated using ASME MFC–3M–2004, ''Measurement of Fluid Flow in Pipes Using Orifice, Nozzle, and Venturi'' (incorporated by reference, see § 60.17). For CPMS that use an orifice flow meter, the pressure drop can be calculated using ASHRAE 41.8–1989, ''Standard Methods of Measurement of Flow of Liquids in Pipes Using Orifice Flowmeters'' (incorporated by reference—see § 60.17).

5. Gas Flow CPMS Accuracy Audit Methods

The proposed Procedure 4 specifies four methods for checking the accuracy of a gas flow CPMS. One method would entail comparison to a redundant flow sensor and could be used with any gas flow CPMS. Two methods would apply only to gas flow CPMS that incorporate differential pressure meters. These are the same two methods that would apply to differential pressure liquid flow meter systems described in the previous paragraph. The final method specified in the proposed Procedure 4 for checking the accuracy of a gas flow CPMS is the RA test using Reference Methods 2, 2A, 2B, 2C, 2D, or 2F (40 CFR part 60, appendix A–1), or 2G (40 CFR part 60, appendix A–2). This is the only method specified in Procedure 4 that could be used to check the accuracy of gas flow CPMS that use differential flow tubes.

6. Mass Flow CPMS Accuracy Audit Methods

The accuracy of CPMS that measure either liquid mass flow or solid mass flow could be checked using the redundant sensor method and the gravimetric method, both of which are described in the previous section for liquid flow CPMS. The same two methods could be used for checking the accuracy of solid mass flow CPMS. The accuracy of solid mass flow CPMS also could be evaluated using the material weight comparison method, which is based on the Belt-Conveyor Scale Systems Method, described in NIST

Handbook 44—2002 Edition, ''Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices'' (incorporated by reference—see § 60.17), as adopted by the 86th National Conference on Weights and Measures in 2001.

7. pH CPMS Accuracy Audit Methods

To check the accuracy of pH CPMS, owners and operators of affected CPMS could choose between three methods: (1) Comparison to a redundant pH sensor, (2) comparison to a calibrated pH meter calibrated according to ASTM D1293–99 (2005), ''Standard Test Methods for pH of Water'' (incorporated by reference—see § 60.17), and (3) single point calibration. The redundant sensor method would require you to compare the pH measured by the primary pH sensor of your pH CPMS to that of a redundant pH sensor. The other two methods are the same as specified in the proposed PS–17 for the initial validation check.

8. Conductivity CPMS Accuracy Audit Methods

The proposed Procedure 4 specifies three methods for checking the accuracy of a conductivity CPMS. These methods (comparison to redundant conductivity sensor, comparison to calibrated conductivity meter, and single point calibration) are based on the same principles as the methods specified for pH CPMS accuracy audits in this proposed rule.

Calibration of the conductivity CPMS should be performed according to the manufacturer's owner's manual. If not specified, calibration must be performed based on one of the following standards: (1) ASTM D 1125–95 (2005), ''Standard Test Methods for Electrical Conductivity and Resistivity of Water''; or (2) ASTM D 5391–99 (2005), ''Standard Test Method for Electrical Conductivity and Resistivity of a Flowing High Purity Water Sample'' (incorporated by reference—see § 60.17).

9. Other Operational Checks

In addition to accuracy audits, owners or operators of affected CPMS that do not use redundant sensors would be required to perform visual inspections and other checks of the operation of each affected CPMS. These checks would include such activities as inspecting the physical appearance of the CPMS for damage or wear and checking the electrical components for corrosion.

10. QA/QC Program

The Procedure 4 would require CPMS owners or operators to develop QA/QC programs for each affected CPMS. The QA/QC programs would have to address procedures for accuracy audits, system calibration, preventive maintenance, recordkeeping, and corrective action.

E. How often must accuracy audits and other QA/QC procedures be performed?

Table 9 of this document summarizes the required frequencies for accuracy audits and other QA/QC procedures that would be required under the proposed Procedure 4.

TABLE 9—FREQUENCY OF ACCURACY AUDITS AND OTHER QC PROCEDURES

If your CPMS measures . . .	You must perform . . .	At least . . .
1. Temperature	a. Accuracy audits	i. Quarterly; AND ii. Following any period of more than 24 hours throughout which the temperature exceeded the maximum rated temperature of the sensor, or the data recorder was off scale.
	b. Visual inspections and checks of CPMS operation.	Quarterly, unless the CPMS has a redundant temperature sensor.
2. Pressure	a. Accuracy audits	i. Quarterly; AND ii. Following any period of more than 24 hours throughout which the pressure exceeded the maximum rated pressure of the sensor, or the data recorder was off scale.
	b. Checks of all mechanical connections for leakage.	Monthly.
	c. Visual inspections and checks of CPMS operation.	Quarterly, unless the CPMS has a redundant pressure sensor.
3. Flow rate (liquid, gas, mass)	a. Accuracy audits	i. Quarterly; AND ii. Following any period of more than 24 hours throughout which the flow rate exceeded the maximum rated flow rate of the sensor, or the data recorder was off scale.
	b. Checks of all mechanical connections for leakage.	Monthly.
	c. Visual inspections and checks of CPMS operation.	Quarterly, unless the CPMS has a redundant flow sensor.
4. pH	a. Accuracy audits	Weekly.
	b. Visual inspections and checks of CPMS operation.	Monthly, unless the CPMS has a redundant pH sensor.
5. Conductivity	a. Accuracy audits	Quarterly.
	b. Visual inspections and checks of CPMS operation.	Quarterly, unless the CPMS has a redundant conductivity sensor.

For affected CPMS that are used to monitor temperature, pressure, or flow rate, owners and operators would be required to perform accuracy audits on a quarterly basis. For pH CPMS, accuracy audits would have to be performed weekly, and, for conductivity CPMS, monthly accuracy audits would be required. In addition, for temperature, pressure, and flow CPMS, an accuracy audit would be required following any periods of 24 hours or more, throughout which either: (1) The measured value exceeded the operating limit for the sensor, based on the manufacturer's recommendations, or (2) the parameter value remained off the scale of the CPMS data recorder. As an example of the first condition, consider a Type J thermocouple with a rated operating temperature limit of 760 °C (1400 °F). If a temperature CPMS that uses a Type J thermocouple records a temperature in excess of 760 °C (1400 °F) for more than 24 hours, an accuracy audit of the CPMS would have to be performed within 48 hours.

Visual inspections and other operational checks of temperature, pressure, and flow CPMS would be required quarterly, unless the CPMS is equipped with a redundant sensor. In addition, mechanical connections associated with pressure or flow CPMS would have to be checked monthly for leakage. For pH and conductivity CPMS that are not equipped with redundant sensors, owners or operators of affected units would have to visually inspect and perform operational checks of the affected CPMS on a monthly basis.

F. What are the reporting and recordkeeping requirements for Procedure 4?

The proposed Procedure 4 does not specify reporting requirements but would require owners and operators of affected CPMS to maintain records of all accuracy audits and corrective actions taken to return the CPMS to normal operation. These records would have to be maintained for a period of at least 5 years. For the first 2 years, the records would have to be kept onsite.

V. Summary of Proposed Amendments to Procedure 1

A. What is the purpose of the amendments?

The purpose of the amendments to Procedure 1 of 40 CFR part 60, appendix F is to revise the procedure to address CEMS that must comply with PS–9 or PS–15 (40 CFR part 60, appendix B). Procedure 1 was developed for CEMS that are used to monitor a single pollutant or diluent. As a result, there may be some questions on how to apply Procedure 1 to CEMS subject to PS–9 or PS–15 that measure more than one pollutant. In addition, both PS–9 and PS–15 partially specify ongoing QA procedures. By amending the QA procedure, we are clarifying what owners or operators of CEMS subject to PS–9 or PS–15 must do to comply with Procedure 1 to ensure the quality of the data produced by these CEMS. The technical rationale for proposed changes to Procedure 1 is discussed further in section X of this document.

B. To whom do the amendments apply?

The amendments to Procedure 1 (40 CFR part 60, appendix F) would apply to owners or operators of CEMS that are subject to PS–9 or PS–15 (40 CFR part 60, appendix B) and are used to demonstrate compliance on a continuous basis. Several subparts to parts 60, 61, and 63 require that owners and operators of affected sources demonstrate that those sources are in continuous compliance with the applicable emission standard. Any such standard that requires the use of gas chromatographic CEMS subject to PS–9 or extractive Fourier Transfer Infrared (FTIR) CEMS subject to PS–15 would also require compliance with Procedure 1, and these proposed amendments to Procedure 1 would apply specifically to such sources.

C. How do the amendments address CEMS that are subject to PS–9?

These proposed amendments would address CEMS that are subject to PS–9 (40 CFR part 60, appendix B) by clarifying that the procedure can be used for multiple-pollutant CEMS and by modifying the requirements for daily calibration drift (CD) and data accuracy assessments so that the procedure can be applied specifically to CEMS that are subject to PS–9. The proposed amendments to section 4.1.1 of Procedure 1 specify that the daily CD can be performed using any of the target pollutants that are monitored by the CEMS. For example, if a CEMS is subject to PS–9 and is used to monitor benzene and toluene, the CD check could be performed using either benzene or toluene.

The PS–9 requires neither relative accuracy test audits (RATA's) nor relative accuracy assessments (RAA's). Instead, PS–9 requires cylinder gas audits (CGA's) every calendar quarter. To address data accuracy assessments for CEMS subject to PS–9, the amendments would add section 5.1.5 to Procedure 1. The new section would specify that the requirements for RATA's and RAA's do not apply to CEMS subject to PS–9. Instead, quarterly CGA's of each target pollutant would be required. The amendments further would specify that the quarterly CGA's are to be performed according to the procedure described in PS–9, except that the CGA's would have to be performed at two points rather than the single point requirement of PS–9. Finally, the amendments would clarify that the CGA's performed under the revised Procedure 1 satisfy the quarterly performance audit requirement of PS–9.

D. How do the amendments address CEMS that are subject to PS–15?

These proposed amendments would address extractive FTIR CEMS that are subject to PS–15 (40 CFR part 60, appendix B) by modifying the requirements for checking daily CD, data recording, and data accuracy assessments so that the procedure could be applied specifically to CEMS that are subject to PS–15. The amendments also would clarify what constitutes excessive CD for CEMS subject to PS–15 and the criteria for determining when the CEMS is ''out of control.'' These modifications would be addressed in the amendments by adding sections 4.1.2, 4.3.3, 4.4.1, and 5.1.6 to Procedure 1. Proposed section 4.1.2 of Procedure 1 would specify that the daily CD requirement must be satisfied by performing a daily Calibration Transfer Standards (CTS) Check, Analyte Spike Check, and Background Deviation Check. For the specific procedures to be followed, the amendments would reference the appropriate sections of PS–15, which describe how to perform these system assessments.

Proposed section 4.3.3 of Procedure 1 would specify the criteria for determining when a CEMS subject to PS–15 is out of control. The CEMS would be out of control under either of two conditions. The first condition would occur when the CTS Check, Analyte Spike Check, or Background Deviation Check exceeds twice the drift specification of ±5 percent for five consecutive daily periods. The second condition would occur when the CTS Check, Analyte Spike Check, or Background Deviation Check exceeds four times the drift specification of ±5 percent during any daily check.

Proposed section 4.4.1 of Procedure 1 would specify data storage criteria for CEMS subject to PS–15. In addition to the recordkeeping requirements specified in section 4.4 of Procedure 1, the proposed amended procedure would require owners or operators of affected CEMS to satisfy the data storage requirements of section 6.3 of PS–15. That is, the data storage system would have to have capacity sufficient to store all data collected over the course of one week. The data would have to be stored on either a write-protected medium or to a password-protected remote storage location.

Proposed section 5.1.6 of Procedure 1 would specify the criteria for data accuracy assessments of CEMS subject to PS–15. Instead of requiring data accuracy assessments by RATA's, CGA's, or RAA's, as required for other types of CEMS, the amended Procedure 1 would require quarterly data accuracy assessments according to the three audit procedures specified in section 9 of PS–15. The Audit Sample Check, which is specified in section 9.1 of PS–15, would be required at least once every four calendar quarters. The Audit Spectra Check, which is specified in section 9.2 of PS–15, could be used to satisfy the data accuracy assessment requirement no more than once every four calendar quarters. The Submit Audit for Independent Analysis, which is specified in section 9.3 of PS–15, could be used to satisfy the data accuracy assessment in no more than three of every four consecutive calendar quarters. Proposed section 5.1.6(3) of Procedure 1 also would stipulate that the data accuracy audits performed under the QA procedure satisfy the PS–15 requirement for quarterly or semiannual QA/QC checks on the operation of the CEMS.

VI. Summary of Proposed Amendments to the General Provisions to Parts 60, 61, and 63

A. What is the purpose of the amendments to the General Provisions to parts 60, 61, and 63?

The purpose of the proposed amendments to the General Provisions to parts 60, 61, and 63 is to ensure that the monitoring requirements specified in the General Provisions that apply to CPMS are consistent with the requirements in the proposed PS–17 and Procedure 4 and the requirements specified in the applicable subparts that require the use of the CPMS that are affected by this proposed rule.

B. What specific changes are we proposing to the General Provisions to parts 60, 61, and 63?

These proposed amendments to the General Provisions to part 60 would redesignate § 60.13(a) as § 60.13(a)(1) and would add § 60.13(a)(2). The new paragraph would state that performance specifications and QA procedures for CPMS, promulgated under part 60, appendices B and F, respectively, apply instead of requirements for CPMS specified in applicable subparts to part 60.

These proposed amendments to the General Provisions to part 61 would redesignate § 61.14(a) as § 61.14(a)(1) and would add § 61.14(a)(2). The new paragraph would state that performance specifications and QA procedures for CPMS, promulgated under part 60, appendices B and F, respectively, apply instead of requirements for CPMS specified in applicable subparts to part 61.

These proposed amendments to the General Provisions to part 63 would make several changes to § 63.8(c). Section 63.8(a)(2) would be revised to include new paragraph § 63.8(a)(2)(ii). The new paragraph would state that performance specifications and QA procedures for CPMS, promulgated under part 60, appendices B and F, respectively, apply instead of the requirements for CPMS specified in applicable subparts to part 63.

Under these proposed amendments, the installation requirements of § 63.8(c)(2) would apply to all CMS, including CPMS.

Section 63.8(c)(4) addresses continuous operation and cycle time for CEMS and COMS. These proposed amendments would expand the requirement of § 63.8(c)(4) to require that all CPMS also must be in continuous operation. These proposed amendments also would add paragraph § 63.8(c)(4)(iii) to require that all CPMS complete one cycle of operation within the time period specified in the applicable rule.

Section 63.8(c)(6) addresses daily drift checks. In this proposal, we would delete the last three sentences of paragraph (c)(6) that apply specifically to CPMS because the proposed PS–17 and Procedure 4 would specify the applicable criteria.

Section 63.8(c)(7) defines when a CMS is out of control. The proposed amendments would clarify in § 63.8(c)(7)(i)(A) that the term ''out of control'', when defined in terms of excessive calibration drift, applies to CEMS and COMS and not to CPMS. We also would revise § 63.8(c)(7)(i)(B), which relates out of control to failed performance test audits, relative accuracy audits, relative accuracy test audits, and linearity test audits. In these proposed amendments, § 63.8(c)(7)(i)(A) and (B) would apply only to CEMS and COMS. These proposed amendments would add § 63.8(c)(7)(i)(D) to clarify that a CPMS is out of control when the system fails an accuracy audit.

Quality control programs for CMS are addressed in § 63.8(d). We are proposing to revise § 63.8(d)(2)(ii) to clarify that written protocols for calibration drift determinations and adjustments would not necessarily apply to CPMS.

Finally, we are proposing changes to § 63.8(e), which address CMS performance evaluations. We are proposing to amend § 63.8(e)(2) and (3)(i) to clarify that prior written notice of performance evaluations and performance evaluation test plans are required for CEMS or COMS only. In addition, we are proposing to revise § 63.8(e)(4) to clarify that CPMS performance evaluations must be performed in accordance with the applicable QA procedure (i.e., Procedure 4).

VII. Summary of the Proposed Amendments to 40 CFR Part 63, Subpart SS.

A. What is the purpose of the amendments to subpart SS?

We are proposing to amend subpart SS to ensure that the monitoring requirements for CPMS specified in subpart SS are consistent with the proposed PS–17 and Procedure 4.

B. What specific changes are we proposing to subpart SS?

We are proposing several changes to the general monitoring requirements for control and recovery devices specified in § 63.996. The purpose of these changes is to clarify CPMS monitoring requirements and ensure that the requirements of subpart SS are consistent with the proposed PS–17 and Procedure 4.

Under § 63.996(c)(7), we are proposing to require that you satisfy the requirements of applicable performance specifications and QA procedures established under 40 CFR part 60. In addition, the amended subpart SS would require a CPMS cycle time of no longer than 15 minutes and at least four equally-spaced measurements for each valid hour of data for all CPMS. Any device that is used to perform an initial validation or an accuracy audit of a CPMS would have to have NIST-traceable accuracy and an accuracy hierarchy of at least three.

Section 63.996(c)(8), (9), and (10) of the amended subpart SS would specify requirements for temperature, pressure, and pH CPMS, respectively. Specific requirements would include the same minimum accuracies and data recording system resolution specified in the proposed PS–17 for the same type of CPMS. The proposed amendments to subpart SS would require owners or operators of affected CPMS to perform initial calibrations and initial validations of each CPMS. The initial validation of a temperature or pressure CPMS could be performed by comparison to a calibrated measurement device or by any other method specified in applicable performance specifications for CPMS established under 40 CFR part 60, appendix B. The initial validation of a pH CPMS could be performed using a single point calibration or by any other method specified in applicable performance specifications for CPMS established under 40 CFR part 60, appendix B.

The proposed amendments to subpart SS also would require accuracy audits at the same frequencies that would be required by proposed Procedure 4: quarterly for temperature and pressure CPMS, and weekly for pH CPMS. Accuracy audits also would be required for temperature and pressure CPMS following any period of 24 hours throughout which the measured value (temperature or pressure) exceeded the manufacturer's recommended maximum operating value. Owners or operators of affected temperature or pressure CPMS could perform accuracy audits by the redundant sensor method, by comparison to a calibrated measurement device, or by any other accuracy audit method specified in applicable QA procedures established under 40 CFR part 60, appendix F. For pH CPMS, owners or operators could perform accuracy audits by the redundant sensor method, single point calibration method, or by any other accuracy audit method specified in applicable QA procedures established under 40 CFR part 60, appendix F. In addition, quarterly visual inspections would be required for any temperature or pressure CPMS not equipped with a redundant sensor; for pH CPMS not equipped with a redundant sensor, monthly visual inspections would be required.

VIII. Rationale for Selecting the Proposed Requirements of Performance Specification 17

A. What information did we use to develop PS–17?

To develop proposed PS–17, we considered the requirements of emission standards promulgated under 40 CFR parts 60, 61, and 63; State agency requirements for CPMS; manufacturer and vendor recommendations; and current operational and design practices in industry. To the extent possible, we also considered voluntary consensus standards for CPMS specifications and requirements, and this proposed rule lists several voluntary consensus standards that can be used as alternative methods for checking instrument sensor accuracies. Our review of voluntary consensus standards that apply to parameter monitoring devices is summarized in section XV.I of this document.

To obtain information on current practices and recommendations regarding CPMS design, installation and operation, we developed three separate surveys (hereafter referred to as the CPMS surveys). We sent one survey to nine State agencies, one survey to nine CPMS manufacturers and vendors, and the third survey to nine companies with facilities that currently are subject to emission standards. Although the responses to the CPMS survey were far from complete, the surveys did provide useful information on equipment accuracies, operation and maintenance procedures, and calibration frequencies. To the extent possible, we used the information presented in the CPMS survey responses in the selection of the requirements for PS–17.

B. How did we select the applicability criteria for PS–17?

To select the applicability criteria for PS–17, we considered the current parameter monitoring requirements that are now in effect under 40 CFR parts 60, 61, and 63. The General Provisions to parts 60 and 63 clearly establish the need for performance specifications for CPMS. Although the monitoring provisions of the part 61 General Provisions are not as detailed as the General Provisions requirements of parts 60 and 63, we believe that the need for performance specifications for part 61 is also warranted. The need for CPMS performance specifications is most evident for part 63 in that standards promulgated under part 63 establish enforceable operating limits for parameter monitoring systems. As stated in § 63.6(e)(iii), operation and maintenance requirements, which include parameter monitor operating limits, ''* * * are enforceable independent of emissions limitations or other requirements in relevant standards.'' As a result, there is a need for additional QA and QC for part 63 rules to ensure that the equipment used to comply with those operating limits is properly designed, installed, operated, and maintained.

We recognize that parameter monitoring data for sources subject to part 60 and 61 rules are not in themselves the basis for compliance determinations with the applicable rules, as is the case for sources subject to part 63 rules. Despite that, we believe that there still is a strong need for performance specifications to help ensure the quality of those monitoring system data. In addition, many of the sources regulated under parts 60 and 61 are also regulated under part 63. For these reasons, and to achieve consistency among the requirements for all of our emission standards, we have decided to require PS–17 to apply uniformly to all sources for which CPMS are required under parts 60, 61, or 63. It should be noted that the proposed requirements for CPMS would not be retroactive, but would apply only to the operation, use, and maintenance of CPMS following promulgation of the final PS–17 and Procedure 4 for CPMS.

C. How did we select the parameters that are addressed by PS–17?

The parameters that currently are addressed by proposed PS–17 (temperature, pressure, flow rate, pH, and conductivity) were selected primarily for two reasons: (1) These parameters are generally accepted as reliable indicators of the performance of many types of emission control devices, and (2) most part 60, 61, and 63 emission standards require continuous monitoring of one or more of these parameters. Temperature often is monitored as an indicator of the performance of incineration devices, such as thermal oxidizers, catalytic oxidizers, boilers, and process heaters used for the control of organic emissions. In addition, several part 60, 61, and 63 standards require the monitoring of condenser outlet temperature or carbon adsorber bed regeneration temperature. Monitoring of the temperature of scrubber liquid also is required by some part 60, 61, and 63 standards. Several existing standards require monitoring of pressure drop across control devices, such as wet scrubbers, mist eliminators, and baghouses. Several rules also require CPMS for monitoring scrubber liquid supply pressure. A number of part 60, 61, and 63 standards require monitoring of gas or liquid flow rates. Gas flow rate generally is an indicator of residence time in control devices. The gas and liquid flow rates through a wet scrubber are used to determine the liquid-to-gas ratio, and several promulgated rules require wet scrubber liquid flow rate monitoring. Many standards require mass flow CPMS for monitoring process feed or production rates. In addition, some existing standards require monitoring of carbon adsorber regeneration steam flow rate. Scrubber liquid pH is an important indicator of the performance of acid gas control. Finally, monitoring wet scrubber liquid conductivity provides a good indication of the solids content of the scrubber liquid and the need for blowdown. We recognize that other parameters also are used to indicate control device performance or to monitor process operations, but we believed it less critical to address those other parameters at this time. However, we intend to address additional parameters in PS–17 as the need arises and resources permit.

D. Why did we include requirements for flow CPMS in PS–17 if PS–6 already specifies requirements for flow sensors?

The requirements of PS–6 (40 CFR part 60, appendix B) apply specifically to continuous emission rate monitoring systems (CERMS), which generally include one or more sensors to measure exhaust gas flow rate in addition to the sensor for measuring the concentration of the target pollutant. The proposed PS–17 would have much broader application, such as natural gas flow, steam flow through a carbon bed adsorber, and exhaust gas flow through an emission control device. The proposed PS–17 also would apply to liquid flow and mass flow rate monitoring. In addition to applicability, there are other significant differences in the requirements for flow rate sensors under PS–6 and flow CPMS under the proposed PS–17. The PS–6 specifies CD and RA test requirements for the flow sensor component of CERMS and generally references PS–2 for other requirements. Specifying CD requirements for CERMS in PS–6 is appropriate because PS–6 is meant to apply to monitoring systems that are used for calculating emission rates for determining compliance with emission limits or caps. The proposed PS–17 would have no provisions for checking CD because it is intended primarily for monitoring indicators of control device performance and process parameters rather than emission rates. Consequently, we believe that less rigorous performance assessments are appropriate for CPMS that would be subject to PS–17. Finally, unlike PS–6, PS–17 was developed specifically for CPMS. As a result, we were able to incorporate into the proposed PS–17 more specific design, installation, and evaluation criteria than are provided in PS–6.

E. How did we select the equipment requirements?

In selecting the equipment requirements for PS–17, our intent was to specify criteria that would allow flexibility in the equipment that owners and operators of affected CPMS choose, without compromising the quality of data produced by that equipment. The proposed PS–17 would specify two types of equipment: (1) The components that comprise a CPMS, and (2) the equipment needed to validate that CPMS.

1. CPMS Equipment Requirements

For CPMS components, we selected equipment criteria for overall system accuracy and compatibility. The equipment requirements also would address the measurement range and resolution of the data recording system. The criterion for accuracy would simply be that the equipment must have a demonstrable capability of satisfying the accuracy requirement for the initial validation. We considered, but decided against, specifying sensor design criteria. By not specifying design criteria, we incorporated a considerable amount of flexibility into proposed PS–17 by allowing affected owners and operators to select any equipment, provided they can demonstrate that the CPMS meets the accuracy requirements for the initial validation. However, we do identify voluntary consensus standards that can be used as guidelines for selecting specific types of sensors.

The proposed PS–17 would require a resolution of one-half the accuracy requirement or better to ensure that the accuracy of the CPMS can be calculated to at least the minimum number of significant figures for the data accuracy assessment to be meaningful. For example, if the data recorder of a pressure CPMS had a resolution of 0.24 kPa (1.0 in. wc), it would not be possible to determine that the CPMS is satisfying the required accuracy of 0.12 kPa (0.5 in. wc). Selecting a resolution of one-half the required accuracy ensures that measurements made during validation checks can be readily compared to the accuracy requirement. Furthermore, based on our review of equipment vendor catalogues, most CPMS on the market easily satisfy this minimum resolution. The requirements for measurement range were selected to ensure that the CPMS can detect and record measurements beyond the normal operating range. We believe that requiring a range of at least ±20 percent beyond the normal operating range is reasonable and the minimum measurement range needed to encompass most excursions. Owners and operators may want to select equipment with even wider ranges if it is likely that measurements beyond ±20 percent of the normal operating range will occur. We made an exception to the measurement range requirement for pH CPMS by requiring the range of pH CPMS data recorders to cover the entire pH scale of 0 to 14 pH units. Our review of vendor literature indicates that, with few exceptions, pH CPMS are designed to record over the entire pH scale.

Finally, the proposed PS–17 would require the electronic components of any CPMS to be internally compatible. We believe that internal compatibility is essential for ensuring the accuracy and durability of a CPMS.

2. CPMS Validation Equipment Requirements

Two types of equipment would be needed to perform the initial validation check of a CPMS: (1) A device that is used to directly check the accuracy of the CPMS, and (2) work platforms, test ports, fittings, valves, and other equipment that are needed to conduct the initial validation. For the devices used to check CPMS accuracy, we would require NIST-traceable accuracy and an accuracy hierarchy of at least three. We would require that the accuracy of the device be NIST-traceable as a way of ensuring the accuracy of the test device. We incorporated into PS–17 two exceptions to the NIST-traceability requirement. First, a mercury-in-glass or water-in-glass U-tube manometer could be used instead of a calibrated pressure measurement device with NIST-traceable accuracy when validating a pressure CPMS or a flow CPMS that uses a differential pressure flow meter. The reason for making this exception is that the accuracy of such manometers can be confirmed onsite by a simple measurement of the manometer scale. We also included an exception to the NIST-traceable accuracy and accuracy hierarchy for containers used to validate flow CPMS by either the volumetric or gravimetric methods. In such cases, the volume of the container could be determined onsite with sufficient accuracy to provide a reliable assessment of flow CPMS accuracy.

In selecting the accuracy hierarchy for validation devices, we reviewed the requirements for existing standards and manufacturers' recommendations. Several voluntary consensus standards, such as ISA–S37.3–1982 (R1995) and ISA–S37.6–1982 (R1995), which apply to pressure transducers, require that the testing or calibration device have an accuracy at least five times that of the device that is to be tested (i.e., an accuracy hierarchy of five). Other standards developed by the American Society of Mechanical Engineers (ASME) and Military Specifications (MIL–SPEC) require an accuracy of four times that of the equipment being tested, which establishes an accuracy hierarchy of four. At least one equipment owner's manual specifies that testing devices have an accuracy of at least three times that of the equipment being tested. We believe that requiring an accuracy hierarchy of three is adequate for the purposes of PS–17. Furthermore, a review of manufacturers' literature indicates that calibration devices with accuracies that would satisfy the accuracy hierarchy of the proposed PS–17 are readily available at reasonable cost.

We decided to require owners and operators of affected CPMS to install work platforms, test ports, and other equipment needed for the initial validation check to ensure that the validation check and ongoing accuracy audits can be conducted properly. It is not necessary that a permanent work platform be installed.

F. How did we select the installation and location requirements?

In the proposed PS–17, we would require owners and operators of affected CPMS to locate CPMS sensors where they will provide measurements representative of the parameter that is being monitored. The objective of this requirement is to help ensure that affected CPMS produce quality data. The location and installation requirements specified in the proposed PS–17 are generally consistent with the requirements of rules promulgated under parts 60, 61, and 63.

G. How did we select the initial QA measures?

The initial QA measures specified in the proposed PS–17 include an electronic calibration and an initial validation check. The initial calibration generally is included as part of the manufacturer's recommended procedures for the installation and startup of CPMS; we would require these initial calibrations as a means of further ensuring that the CPMS is placed into operation correctly. We consider the initial validation necessary for demonstrating that the CPMS is providing quality data from the outset.

H. How did we select the methods for performing the initial validation check?

In selecting the methods for validating CPMS, we considered existing voluntary consensus standards, State agency requirements, manufacturers' and vendors' recommendations, and practices used by industry. We tried to identify all methods that would provide a reliable measure of CPMS accuracy to allow owners and operators of affected CPMS as much flexibility as possible in choosing how to comply with PS–17. In general, the validation methods specified in the proposed PS–17 involve comparison of measurements made by the subject CPMS to measurements made using a calibrated device that measures or simulates the same parameter that is measured by the subject CPMS. A primary objective in selecting these methods is to identify procedures that assess the overall accuracy of the CPMS while assuring the quality of data that are used to assess compliance. The initial validation methods that rely on simulating sensor output actually measure how well the rest of the system responds to a simulated sensor signal and do not check the accuracy of the sensor itself. However, we believe that these methods are reliable because the sensors used in new CPMS are factory-calibrated and, therefore, should be accurate.

Two general consensus standards were located, but they were rejected for use with the proposed PS–17 because they are general references for safe practices while working with electronics. The two standards are: (1) ANSI/ISA S82.02.01–1999, ''Electric and Electronic Test, Measuring, Controlling, and Related Equipment: General Requirements''; and (2) ANSI/ISA S82.03–1988, ''Safety Standard for Electrical and Electronic Test, Measuring, Controlling, and Related Equipment (Electrical and Electronic Process Measurement and Control Equipment).''

1. Temperature CPMS Validation Methods

For validating temperature CPMS, the proposed PS–17 would specify two methods: (1) Comparison to a calibrated temperature measurement device, and (2) temperature simulation using a calibrated simulation device. The first method is based on ASTM E 220–07e1, ''Standard Test Methods for Calibration of Thermocouples by Comparison Techniques'' (incorporated by reference—see § 60.17). Although the ASTM E220–07e1 was developed for thermocouples, it should be applicable to other types of temperature measurement devices. Handheld and otherwise portable temperature measurement devices with NIST-traceable accuracy are available from many equipment manufacturers and suppliers.

The second validation method for temperature CPMS would involve the use of calibrated temperature simulators. Although this simulation method is not based on an existing standard method, calibrated simulators with NIST-traceable accuracy are readily available and often are used to check the accuracy of thermocouples and RTD's. Therefore, we believe this method is appropriate for the initial validation of thermocouple-based or RTD-based temperature CPMS, as well as for any other type of CPMS for which the sensor response can be simulated.

Two other consensus standards relating to temperature measurement were located, but they were both rejected for use with the proposed PS–17. The first standard, ASTM E839–05, ''Standard Test Methods for Sheathed Thermocouples and Sheathed Thermocouple Material'' specifies tests that pertain to material quality and instrument assembly rather than direct indicators of instrument performance; many of the tests specified are either destructive or impractical to perform at the installation site. The second standard, ASTM E1350–07, ''Standard Guide for Testing Sheathed Thermocouples, Thermocouple assemblies, and Connecting Wires Prior to, and After Installation or Service'' specifies tests to determine if specific components of thermocouple assembly were damaged during storage, shipment, or installation, but the tests specified do not provide a measure of accuracy.

2. Pressure CPMS Validation Methods

For validating pressure CPMS, the proposed PS–17 would specify three methods for performing the initial validation check. The first method would involve comparison to a calibrated pressure measurement device. This method is based on the same principle as is the temperature CPMS comparison method. Handheld and portable pressure measurement devices with NIST-traceable accuracy are available from many equipment suppliers. Therefore, we believe this method is appropriate for validating pressure CPMS. The other two pressure CPMS validation methods in the proposed PS–17 are similar to the simulation method for validating temperature CPMS and are based on the same principle. The difference between the temperature simulation method and the two pressure simulation methods is that the latter generate pressures instead of electronic signals. One pressure simulation method uses a calibrated pressure source with NIST-traceable accuracy. These devices can simulate a range of pressures to high degrees of accuracy. The other pressure simulation method allows the use of any pressure source. The pressure applied by the pressure source is measured concurrently by the subject CPMS and a separate calibrated pressure measurement device. We believe these methods also can provide reliable assessments of pressure CPMS accuracy.

Two other voluntary consensus standards relating to pressure measurement were located, but they were both rejected for use with the proposed PS–17. Both standards (ISA–S37.6–1982 (R1995), ''Specifications and Tests for Potentiometric Pressure Transducers'' and ISA–S37.3–1982 (R1995), ''Specifications and Tests for Strain Gage Pressure Transducers'') provide general calibration procedures, but neither specifies criteria for evaluating performance.

3. Flow CPMS Validation Methods

For validating flow CPMS, the proposed PS–17 would specify seven methods. The volumetric and gravimetric methods are based on voluntary consensus standards and could be used to validate liquid flow CPMS. Both methods are described in ISA RP 16.6–1961, ''Methods and Equipment for Calibration of Variable Area Meters (Rotameters),'' and ISA RP 31.1–1977, ''Specification, Installation, and Calibration of Turbine Flow Meters'' (incorporated by reference—see § 60.17). The gravimetric method also is described in ANSI/ASME MFC–9M–1988, ''Measurement of Liquid Flow in Closed Conduits by Weighing Method,'' and ASHRAE 41.8–1989, ''Standard Methods of Measurement of Flow of Liquids in Pipes Using Orifice Flow Meters'' (incorporated by reference—see § 60.17). These methods are relatively simple to perform provided that the process flow that is monitored can be diverted easily to a suitable container for measurement. The gravimetric method also could be used to validate liquid mass flow or solid mass flow CPMS.

The differential pressure measurement and pressure flow source simulation methods for validating liquid or gas flow CPMS would apply to flow CPMS that use differential pressure meters. These methods would require accurate pressure measurements and are based on the same principles as are the methods used for validating pressure CPMS. The primary difference between the pressure CPMS methods and these flow CPMS methods is that the flow CPMS would require the calculation of flow rates based on the pressure differentials measured. The flow calculation methods are described in ASME MFC–3M–2004, ''Measurement of Fluid Flow in Pipes Using Orifice, Nozzle, and Venturi'' (incorporated by reference—see § 60.17). The calibrated pressure measurement devices and calibrated pressure sources with NIST-traceable accuracy needed for these validation methods are readily available. Therefore, we believe these methods are appropriate for validating flow CPMS accuracy.

The electronic simulation method is identical to the simulation methods described in this section for temperature and pressure CPMS. This method would apply only to flow CPMS that use flow sensors that generate electronic signals, which can be simulated. Examples of flow CPMS that can be validated using this method are CPMS that use turbine meters or vortex shedding flow meters.

To validate flow CPMS that measure gas flow, PS–17 also would specify the RA test using Reference Method 2, 2A, 2B, 2C, 2D, or 2F (40 CFR part 60, appendix A–1), or 2G (40 CFR part 60, appendix A–2), as appropriate. The RA test for flow CPMS is similar to the RA test procedures specified in other performance specifications. We selected this method because it may be the method of choice for facilities that perform their own emissions testing, have the emissions test equipment, and are familiar with the procedures of the reference methods for determining stack gas velocity and volumetric flow rate.

Finally, the proposed PS–17 would specify the material weight comparison method for validating solid mass flow CPMS. This method would apply only to CPMS that incorporate a belt conveyor, weigh scale, and totalizer. The method is based on the Belt-Conveyor Scale Systems Method, which is described in NIST Handbook 44—2002 Edition: Specifications, Tolerances, And Other Technical Requirements for Weighing and Measuring Devices (incorporated by reference—see § 60.17), as adopted by the 86th National Conference on Weights and Measures 2001. We selected this method because it is relatively simple and is the only method we could identify that applies specifically to belt conveyors systems, which are often used to monitor process raw material feed rates and/or production rates.

Five other voluntary consensus standards relating to flow measurement were located, but they were rejected for use with the proposed PS–17. The first standard, ASTM D 3195–90 (2004), ''Standard Practice for Rotameter Calibration,'' specifies calibration procedures for rotameters used to determine air sample volumes, but applies only to air at ambient temperature and pressure. The second standard, ANSI/ASME MFC–8M–2001, ''Fluid Flow in Closed Conduits—Connections for Pressure Signal Transmissions between Primary and Secondary Devices,'' only applies to installations where very high accuracy is required. The third standard, ASTM D 3464–96 (2007), ''Standard Test Method for Average Velocity in a Duct Using a Thermal Anemometer,'' refers to another ASTM standard for calibration procedures. The fourth standard, ASTM D5540–94a (2003), ''Standard Practice for Flow Control and Temperature Control for On-Line Water Sampling and Analysis,'' details the sampling of the stream, but provides no information on the calibration of the flow. The fifth standard, ''Process Monitors in the Portland Cement Industry'' (published by the EPA) notes that nuclear weigh belts have 0.5 percent operational accuracy, while gravimetric and impaction plate weigh belts have 1 percent accuracy; these accuracies may not hold true for all industries or applications.

4. pH CPMS Validation Methods

For validating pH CPMS, the proposed PS–17 would specify two methods. The first method would entail comparison to a calibrated pH meter and is similar to the comparison methods specified for temperature and pressure CPMS. The second method would be a single point calibration method using a standard buffer solution. We selected these methods because they are relatively simple and are in common use by many facilities to calibrate pH meters.

5. Conductivity CPMS Validation Methods

The proposed PS–17 would specify two methods for validation conductivity CPMS: Comparison to a calibrated conductivity meter and single point calibration. These methods are essentially the same as those used for validating pH CPMS, the only differences being the types of calibrated instrument and standard solutions used. We selected these methods because both are reliable, yet relatively simple to perform.

Four other voluntary consensus standards relating to conductivity measurement were located, but they were rejected for use with the proposed PS–17. The first and second standards, ASTM E1511–93 (2005), ''Standard Practice for Testing Conductivity Detectors Used in Liquid and Ion Chromatography,'' and ASTM D3370–95a (2003)e1, ''Standard Practices for Sampling Water from Closed Conduits,'' detail the mixing of conductivity standards, so they are good calibration methods, but far more time-consuming than using readily available pre-mixed conductivity standards as specified in PS–17. The third standard, ASTM D6504–07, ''Standard Practice for On-Line Determination of Cation Conductivity in High Purity Water,'' references other standards for calibration procedures. The fourth standard, ASTM D3864–06, ''Standard Guide for Continual On-Line Monitoring Systems for Water Analysis,'' contains statistical methods that are more rigorous than needed.

I. How did we select the performance criteria for the initial validation check?

In selecting the performance criteria for the initial validation checks of CPMS, we considered the accuracies required by existing rules and the capabilities of off-the-shelf equipment available from the manufacturers and vendors of CPMS components. Based on our review of CPMS manufacturer and vendor literature, equipment that satisfies the accuracy requirements specified in this proposed rule is readily available.

Existing rules that require the use of CPMS specify a range of instrument or system accuracies. For some of the affected source categories, the proposed PS–17 would specify a higher minimum accuracy than is specified in the applicable subpart. However, this proposed rule would not increase the stringency of the underlying emission standards in such cases. Instead, the proposed PS–17 would improve the accuracy and reliability of, and reduce the uncertainty in, data used to demonstrate compliance with those emission standards.

1. Temperature CPMS Accuracy

Several rules promulgated under parts 60, 61, and 63 specify an accuracy requirement for temperature CPMS. Most of these rules specify temperature accuracy in units of temperature (°C) and as a percentage of the measured temperature. For example, 40 CFR part 60, subpart EE, requires thermal incinerator temperature CPMS to have an accuracy of 2.5 °C or 0.75 percent. Although there is a wide range of accuracies specified in these rules, the accuracy required for temperature CPMS associated with high temperature applications, such as thermal oxidizers or boilers, generally range from 0.75 to 1.0 percent or from 0.5 °C to 2.5 °C (0.9 °F to 4.5 °F). For lower temperature applications, such as wet scrubbers, the specified percent accuracies often are not as stringent; that is, accuracies are specified as a higher percentage of the measured temperature. This distinction between low and high temperature applications is consistent with ANSI specifications for thermocouples. The minimum standard accuracies for ANSI Type J and K thermocouples in non-cryogenic applications are °0.75 percent or ±2.2 °C (±4 °F), whichever is greater; for cryogenic applications, the minimum standard accuracies are ±2.0 percent or ±2.2 °C (±4 °F), whichever is greater. The reason for specifying a higher percentage accuracy for lower temperature ranges is to offset the fact that the accuracy percentage applies to a lower value. In selecting the temperature accuracy requirements for the proposed PS–17, we decided to incorporate a similar distinction between higher temperatures (non-cryogenic applications) and lower temperatures (cryogenic applications). Our selection of temperature accuracies of 2.8 °C (5 °F) or °1 percent for non-cryogenic applications, and 2.8 °C (5 °F) or ±2.5 percent for cryogenic applications is consistent with the required accuracies for most standards, and we believe that the accuracies specified in proposed PS–17 are adequate for ensuring good quality data. In addition, our review of vendor literature indicates that temperature CPMS that satisfy these accuracy requirements are readily available at reasonable costs.

2. Pressure CPMS Accuracy

Among the part 60, 61, and 63 rules that require pressure monitoring and also specify a minimum accuracy, the accuracy specified generally is either 0.25 to 0.5 kPa (1 to 2 in. wc) or 5 percent for pressure drop, and 5 to 15 percent for liquid supply pressure. These accuracies are easily achievable because most pressure transducers are accurate to 0.25 to 1.0 percent, and all but the lowest grade (Grade D) of ANSI-rated pressure gauges have accuracies better than 5 percent. For the proposed PS–17, we selected an accuracy requirement of 0.12 kPa (0.5 in. wc) or ±5 percent, whichever is greater. The 0.12 kPa criterion would apply only in low pressure applications. Some existing rules require pressure CPMS to have accuracies of 0.24 kPa (1.0 in. wc) or better. However, those accuracies generally do not apply to pressure CPMS in low pressure applications, where the 0.12 kPa accuracy would apply. We believe this level of accuracy specified for pressure CPMS is appropriate, considering that some control devices operate with pressure drops of less than 1.2 kPa (5 in. wc). For applications with pressures in excess of 2.5 kPa (10 in. wc), the 5 percent accuracy criterion would apply. This criterion is consistent with most rules that specify pressure device accuracies, and CPMS that are capable of achieving this accuracy are readily available.

3. Flow CPMS Accuracy

Rules promulgated under parts 60, 61, and 63 that require flow rate monitoring all specify flow rate accuracy in terms of percent. For liquid flow rate measurement, these rules generally require accuracies of ±5 percent, and rules that require steam flow rate monitoring generally require an accuracy of ±10 percent or better. We believe that these accuracies are reasonable, and we have incorporated them into the proposed PS–17. According to our review of vendor literature, flow CPMS that can achieve these accuracies are readily available.

Unlike rules that address temperature and pressure monitoring, most existing rules that require continuous flow rate monitoring do not specify flow rate monitoring device accuracies in units of flow rate. However, there is an advantage to specifying accuracy in units of measurement as well as a percent; in low flow rate applications, an accuracy criterion based solely on percent can result in an unreasonably stringent accuracy requirement. For that reason, we have incorporated into the proposed PS–17 accuracy criteria as a percent of flow rate and in units of flow rate. The exceptions are the accuracy criteria for liquid mass flow rate and solid mass flow rate, both of which would be specified only as a percentage (i.e., ±5 percent). We concluded that it would not be reasonable to specify accuracy criteria for mass flow in units of mass flow because of the wide range of flow rates that could be monitored (e.g., carbon injection rate vs. rotary kiln raw material feed rate). We based the 5 percent accuracy criterion primarily on vendor literature.

Recognizing the differences in the relative magnitudes and the commonly used units of flow rate measurement for liquids and gases, we have specified in the proposed PS–17 separate accuracy criteria for liquid and gas flow rates. For liquid flow rate CPMS, which typically are associated with wet scrubber operation, the minimum accuracy would be 1.9 L/min (0.5 gal/min) or ±5 percent, whichever is greater. For gas flow rate CPMS, which often are used to monitor stack gas flow rate or natural gas fuel flow rate, PS–17 would require a minimum accuracy of 280 L/min (10 ft^3/min) or ±5 percent, whichever is greater.

The proposed PS–17 also would specify a relative accuracy criterion for owners or operators who choose to validate a gas flow rate CPMS using the RA test, which is specified in section 8.6(6) of PS–17. In such cases, owners or operators would have to demonstrate that the affected CPMS achieves a relative accuracy of 20 percent or better. The relative accuracy criterion of 20 percent was selected because that value is consistent with the relative accuracy required by most performance specifications promulgated under 40 CFR part 60.

4. pH CPMS Accuracy

Although several subparts of 40 CFR parts 60, 61, and 63 require pH monitoring, the only rule to specify an accuracy requirement for pH CPMS is 40 CFR part 61, subpart E; the accuracy required by that rule for pH measurement devices is ±10 percent. Our review of manufacturer and vendor literature indicates that pH CPMS generally have accuracies of ±0.01 to ±0.15 pH units. Based largely on the vendor literature, we decided to require pH CPMS to have accuracies of 0.2 pH units or better. An accuracy of ±0.2 pH units should allow most facilities that currently monitor pH to continue using their pH CPMS, provided the CPMS satisfies the other equipment criteria specified in PS–17.

5. Conductivity CPMS Accuracy

Because none of the part 60, 61, or 63 rules specify accuracy requirements for conductivity CPMS, we reviewed manufacturer and vendor literature, which indicates that conductivity CPMS generally have accuracies of ±1 to ±2 percent. Conductivity measurements range from 0.1 to 200,000 micromhos per centimeter (µmhos/cm) (0.1 to 200,000 microsiemens per centimeter (µS/cm)) at 25 °C (77 °F). To account for this large range and the accuracies that can be met by most available instruments, we decided to require conductivity CPMS to have accuracies of ±5 percent. An accuracy requirement of ±5 percent should allow most facilities that currently monitor conductivity to continue using their conductivity CPMS, provided their CPMS satisfies the other equipment criteria specified in PS–17.

J. How did we select the recordkeeping requirements?

The proposed PS–17 would require owners or operators of affected CPMS to maintain records that identify their CPMS and document performance evaluations, and to retain those records for a period of at least 5 years. These requirements are consistent with the recordkeeping requirements specified in § 63.10 of the General Provisions to part 63.

IX. Rationale for Selecting the Proposed Requirements of Procedure 4

A. What information did we use to develop Procedure 4?

The information used to develop Procedure 4 is essentially the same information used to develop PS–17 and includes information from existing standards, manufacturer and vendor recommendations, and current practices in industry. Section VIII.A of this document provides additional details on how this information was obtained.

B. Why did we decide to apply Procedure 4 to all CPMS that are subject to PS–17?

Rules promulgated under part 63 establish enforceable operating limits for parameter monitoring systems. As is the case for CEMS that are used to demonstrate continuous compliance and are subject to Procedure 1 of 40 CFR part 60, appendix F, there is a need for ongoing QA requirements to ensure that the data generated by CPMS are reliable and accurate. Although the data generated by CPMS that are required under parts 60 and 61 are not used directly to demonstrate compliance, we believe there still is a need to ensure the quality of those data is maintained. For that reason, we believe it is warranted to require that all part 60, 61, and 63 sources that are required to install and operate CPMS be subject to PS–17 and Procedure 4.

C. How did we select the accuracy audit procedures?

With the exception of audit procedures for CPMS with redundant sensors, the accuracy audit procedures specified in the proposed Procedure 4 would essentially be the same procedures that could be used to perform the initial validation checks that would be required by PS–17. For CPMS with redundant sensors, we selected the accuracy audit procedure of comparing the values of the parameter measured by the two sensors because that method currently is used by many industrial facilities to ensure the accuracy of their parameter monitoring systems. The most significant distinction between the audit procedures specified in the proposed Procedure 4 and the initial validation procedures specified in the proposed PS–17 is that the accuracy audit procedures address sensor accuracy, whereas some of the initial validation procedures do not address sensor accuracy. When CPMS are first installed, we assume sensors to have been manufactured and factory-calibrated under stringent QC requirements. Consequently, the proposed PS–17 does not require the initial validation check procedures to include sensor accuracy assessments. However, after a CPMS has been placed into operation, and the sensor is subjected to process environments, loss of calibration can occur quickly. Recognizing that possibility, we have incorporated a check of sensor accuracy into the accuracy audit procedures of the proposed Procedure 4. Some audit procedures assess the accuracy of the overall CPMS, including the sensor. For those procedures, a separate accuracy assessment of the sensor would not be necessary. For those audit procedures that do not assess the accuracy of the entire CPMS, we have incorporated into the proposed Procedure 4 a separate accuracy check of the CPMS sensor. These sensor accuracy assessments are based on voluntary consensus standards.

D. How did we select the accuracy audit frequencies?

To determine the appropriate audit frequencies, we reviewed the requirements of existing rules, the procedures practiced by industry, and vendor recommendations. Most of the rules promulgated under 40 CFR parts 60, 61, and 63 do not specify calibration or audit frequencies. Those rules that do specify accuracy audit frequencies usually require annual calibrations; a few rules require semi-annual or quarterly calibrations of CPMS. The information provided by industry in its responses to the CPMS survey indicated that the typical calibration frequency for most CPMS is once per year. Two facilities perform calibrations on thermocouples semiannually. One of those facilities also checks pressure meter calibration semiannually. Another facility reported that it checks and calibrates its pH CPMS on a weekly basis. With the exception of pH CPMS, Procedure 4 would require quarterly accuracy audits. This frequency is comparable to the audit frequencies required for CEMS specified in many part 60, 61, and 63 standards, and we believe that quarterly accuracy assessments are warranted for CPMS to ensure that monitoring data are accurate. The available information indicates that pH sensors require more frequent calibration than do other types of sensors, and weekly calibration of pH CPMS is common. Therefore, we believe that weekly accuracy audits are warranted for pH CPMS.

E. How did we select the performance criteria for accuracy audits?

The performance criteria for the accuracy audits specified in Procedure 4 are identical to those specified for the initial validation check required by PS–17. The rationale for the validation check accuracy requirements is described in section VIII.H of this document.

F. How did we select the recordkeeping requirements?

The proposed Procedure 4 would require owners or operators of affected CPMS to maintain records of all accuracy audits and corrective actions taken to return the CPMS to normal operation and to retain those records for a period of at least 5 years. These requirements are consistent with the recordkeeping requirements specified in § 63.10 of the General Provisions to part 63.

X. Rationale for Selecting the Proposed Amendments to Procedure 1

A. How did we select the amendments to Procedure 1 that apply to PS–9?

Before drafting the proposed amendments to Procedure 1 (40 CFR part 60, appendix F), we reviewed the procedure and PS–9 (40 CFR part 60, appendix B) to identify those sections of Procedure 1 that did not address, or were inconsistent with, the specific requirements of PS–9. We identified three such sections of Procedure 1: section 1, Applicability and Principle; section 4, CD Assessment; and section 5, Data Accuracy Assessment. The applicability section of Procedure 1 applies to CEMS that are used for monitoring a single pollutant or diluent. The section does not address CEMS that can be used for monitoring more than one pollutant, such as those that are subject to PS–9. Therefore, it is necessary to amend section 1 to clarify that Procedure 1 would apply to single and multiple pollutant CEMS.

Section 4.1 of Procedure 1 requires owners or operators of affected CEMS to check the daily CD at two concentration values. In the case of a single pollutant CEMS, there is no ambiguity in this requirement. However, for multiple pollutant CEMS, Procedure 1 is unclear as to which pollutant can or must be used for the daily CD check. We are proposing to amend Procedure 1 to allow owners and operators of affected CEMS to perform the CD check using any of the target pollutants specified in the applicable subpart.

Section 5 of Procedure 1, which addresses data accuracy audits, is inconsistent with the requirements of PS–9. Procedure 1 requires RATA's at least once every four calendar quarters; the accuracy audit requirement for the other three calendar quarters can be satisfied by performing either RATA's, CGA's, or RAA's. However, PS–9 requires quarterly CGA's and does not address RATA's or RAA's. To resolve this inconsistency in Procedure 1, these proposed amendments would add section 5.1.5, which would clarify that owners and operators of CEMS subject to PS–9 are not required to perform RATA's; the accuracy audit requirement would have to be satisfied by performing quarterly CGA's. The CGA's would have to be conducted at two points for each target pollutant specified in the applicable subpart. Finally, the proposed new section would clarify that these quarterly CGA's satisfy the quarterly CGA requirement of PS–9.

B. How did we select the amendments to Procedure 1 that apply to PS–15?

After reviewing Procedure 1, we identified three sections that either were inconsistent with the requirements of PS–15 (40 CFR part 60, appendix B) or did not address the unique characteristics of CEMS that are subject to PS–15. The sections identified were section 1, Applicability and Principle; section 4, CD Assessment; and section 5, Data Accuracy Assessment. As explained in the section X.A of this document, these proposed amendments to section 1 of Procedure 1 would clarify that the procedure also applies to CEMS that are used for monitoring more than one pollutant or diluent. To address the CD assessment of CEMS subject to PS–15, we are proposing to add three paragraphs to section 4 of Procedure 1. Unlike other types of CEMS, extractive FTIR CEMS are not generally checked for CD. Instead, PS–15 specifies other procedures for checking these instruments on a daily basis. In these proposed amendments we are adding section 4.1.2 to Procedure 1 to specify the proper procedures for checking FTIR CEMS performance that are comparable to the CD checks of other types of CEMS. These daily assessments serve the same purpose as do the daily CD check requirements for other types of CEMS. We also recognize that the term ''excessive CD,'' as defined in section 4.3 of Procedure 1, needs to be clarified for CEMS subject to PS–15. To address this need, we are proposed to add section 4.3.3 to Procedure 1. Section 4.3.3 would clarify how excessive CD is defined for CEMS subject to PS–15 and also would specify when such CEMS are out of control.

Section 4.4 of Procedure 1 addresses CEMS data reporting and recordkeeping. Because of the unique data storage requirements for PS–15, we believe adding another paragraph to section 4.4 of Procedure 1 is warranted. The new paragraph in section 4.4 essentially would reference the data storage requirements specified in PS–15.

The Procedure 1 specifies three methods for assessing data accuracy: RATA's, CGA's, and RAA's. On the other hand, PS–15 specifies a different set of accuracy audit procedures: audit sample checks, audit spectra checks, and an independent accuracy assessment performed by us. Consequently, there is an obvious need to amend Procedure 1 if we were to extend the applicability of Procedure 1 to include CEMS subject to PS–15. To resolve this inconsistency, we would add section 5.1.6 to Procedure 1. We modeled section 5.1.6 after the accuracy audit requirements that were already incorporated in Procedure 1. The most rigorous of the accuracy assessment methods specified in PS–15 is the audit sample check. In this respect, the audit sample check is analogous to the RATA. For consistency with the requirements for other types of CEMS, we would require audit sample checks for CEMS subject to PS–15 to be performed at least once every four calendar quarters, as is the case for RATA's for other types of CEMS. For the other three calendar quarters, we would allow owners and operators of CEMS subject to PS–15 to perform any of the three audit procedures specified in PS–15 (audit sample check, audit spectra check, and submitting spectra for independent analysis), with one exception. The audit spectra check assesses the accuracy of the analytical measurement but not the sampling system measurement. Therefore, we would allow owners and operators of CEMS subject to PS–15 to use the audit spectra check only once every four quarters to satisfy the accuracy audit requirement of Procedure 1. Finally, proposed section 5.1.6 of Procedure 1 would clarify that the quarterly accuracy assessments required by Procedure 1 satisfy the quarterly or semiannual QA/QC checks required by PS–15.

XI. Rationale for Selecting the Proposed Amendments to the General Provisions to Parts 60, 61, and 63

A. How did we select the amendments to the General Provisions to parts 60, 61, and 63?

The proposed PS–17 and Procedure 4 would specify CPMS accuracies, audit frequencies, and other requirements that differ from some of the requirements for CPMS specified in applicable subparts to parts 60, 61, and 63. Eliminating the resulting discrepancies would require either amending each of the applicable subparts or amending the General Provisions to those parts. We concluded that amending the General Provisions would be the preferred approach for avoiding such conflicts or discrepancies.

After reviewing the General Provisions to parts 60 and 61 that apply specifically to monitoring (i.e., §§ 60.13 and 61.14), we decided to amend only the applicability sections of those parts. By stating that, upon promulgation, performance specifications and QA procedures for CPMS (i.e., the proposed PS–17 and Procedure 4) apply to CPMS instead of requirements in the applicable subparts to parts 60 and 61, we believe we can eliminate any discrepancies between the applicable subparts and the proposed PS–17 and Procedure 4. We concluded that this proposed rule would not conflict with the monitoring requirements specified in subsequent sections of the General Provisions to parts 60 and 61, and further amendments to those General Provisions were unnecessary.

With respect to the General Provisions to part 63, we identified several inconsistencies between the requirements specified in § 63.8 and the requirements in the proposed PS–17 and Procedure 4. In this action, we are proposing several changes to § 63.8 to eliminate those inconsistencies.

We believe that the installation requirement of § 63.8(c)(2) should apply to all CMS, and not simply CEMS; we are proposing to amend § 63.8(c)(2) accordingly. We believe that the requirement for continuous operation specified in § 63.8(c)(4) should apply to all CMS, and not just CEMS and COMS as now specified in the General Provisions.

Section 63.8(c)(4) addresses cycle time for CEMS and COMS, but not for CPMS. We believe it is necessary to address CPMS cycle time also. Consequently, we are proposing to add § 63.8(c)(4)(iii) for that purpose.

The last three sentences of § 63.8(c)(6) address calibration and daily checks of CPMS. We are proposing to delete these provisions because the proposed PS–17 and Procedure 4 would address CPMS operation and maintenance more thoroughly.

Section 63.8(c)(7) of the General Provisions defines CMS that are out of control in terms of excessive calibration drift checks and periodic audits that apply to CEMS and COMS, but not to CPMS. Consequently, we are proposing to amend § 63.8(c)(7) to clarify that, for CPMS, out of control is defined in terms of failed accuracy audits only. The proposed amendments would clarify in § 63.8(c)(7)(i)(A) that out of control, when defined in terms of excessive calibration drift, applies to CEMS and COMS and not CPMS. We also would revise § 63.8(c)(7)(i)(B), which relates out of control to failed performance test audits, relative accuracy audits, relative accuracy test audits, and linearity test audits that apply to CEMS and COMS, but not to CPMS. We propose adding § 63.8(c)(7)(i)(D) to clarify that a CPMS is out of control when it fails an accuracy audit.

Quality control programs for CMS are addressed in § 63.8(d). We are proposing to revise § 63.8(d)(2)(ii) to clarify that the requirement for written protocols for calibration drift determinations and adjustments would apply only to applicable CMS; that is, the requirement would apply to CEMS and COMS, but not to CPMS because calibration drift is not relevant to many CPMS.

Finally, we are proposing changes to § 63.8(e), which address CMS performance evaluations. We are proposing to amend § 63.8(e)(2) and (3)(i) to clarify that prior written notice of performance evaluations and performance evaluation test plans are required for CEMS or COMS only. Under the proposed PS–17 and Procedure 4, CPMS initial validations and/or accuracy audits would be required at least quarterly using procedures that are much simpler than those required for CEMS or COMS performance tests. Consequently, we believe that requiring written notifications and test plans is unnecessary for CPMS performance evaluations. We also are proposing to revise § 63.8(e)(4), which addresses conducting CMS performance evaluations during any required performance test. Currently, § 63.8(e)(4) states that CMS performance evaluations must be conducted in accordance to the applicable performance specification. We are proposing to clarify paragraph (e)(4) to state that such evaluations of CMS performance should be conducted in accordance with the applicable performance specification or QA procedure because procedures for performing CPMS accuracy audits would be specified in the proposed Procedure 4.

XII. Rationale for Selecting the Proposed Amendments to 40 CFR Part 63, Subpart SS

Our proposed amendments to subpart SS (65 FR 76444, December 6, 2000) included revisions to the general monitoring requirements specified in § 63.996. At that time, we had not completed our development of performance specifications and QA procedures for CPMS, which we are now proposing as PS–17 and Procedure 4, respectively. After reviewing the public comments on the December 6, 2000 proposal and comparing the requirements of PS–17 and Procedure 4 to the proposed changes to § 63.996, we decided that further revisions to § 63.996 are warranted to ensure consistency between the monitoring requirements of subpart SS, PS–17, and Procedure 4. We identified the requirements of the proposed PS–17 and Procedure 4 that were most relevant to the generic MACT source categories and incorporated those requirements into the amendments that we are proposing for subpart SS. We believe that these proposed amendments would ensure consistency with PS–17, Procedure 4, and subpart SS.

XIII. Summary of Environmental, Energy, and Economic Impacts

A. What are the impacts of PS–17 and Procedure 4?

The proposed PS–17 and Procedure 4 would apply only to CPMS that are required under an applicable subpart to 40 CFR parts 60, 61, or 63; that is, this proposed rulemaking would not require the installation or operation of CPMS, other than those already required by rule. The cost and economic impact analyses that are completed as part of the rulemaking process for any part 60, 61, or 63 rule account for the costs associated with any required CPMS that would be subject to PS–17 and Procedure 4. Those costs, which are not attributable to this proposed rulemaking, include the capital costs for equipment, installation costs, the costs for operating and maintaining the CPMS, and the costs for maintaining records and reporting CPMS data. However, in some cases, the proposed PS–17 and Procedure 4 would require more accurate sensors and more frequent accuracy audits and inspections than would be required otherwise for some source categories. Therefore, the incremental costs associated with replacing those sensors and conducting additional audits and inspections can be attributed to the proposed PS–17 and Procedure 4. Because the applicability of the proposed PS–17 and Procedure 4 will be phased in over a 5-year period, we estimated the costs for each of those initial 5 years. Based on those estimates, the nationwide additional annualized costs to implement the proposed PS–17 and Procedure 4 amount to $17.7 million for the first year, $26.4 million for the second, $35.0 million for the third year, $43.7 million for the fourth year, and $52.3 million for the fifth year of this proposed rule. The average annualized cost per source is estimated to be $320, $470, $610, $740, and $870 for the first through fifth years, respectively. These costs are based on the assumption that affected facilities would not choose to use redundant sensors. If facilities elected to use redundant sensors, the estimated compliance costs for the proposed PS–17 and Procedure 4 would be reduced.

The proposed PS–17 and Procedure 4 would improve the quality of the data measured and recorded by CPMS and thereby would also reduce the uncertainty in those data. However, this proposed rulemaking would not require the installation or operation of additional CPMS. Therefore, with respect to other potential impacts associated with this proposed rulemaking, we have concluded that PS–17 and Procedure 4, as proposed, would have no energy or environmental impacts beyond those that have already been attributed by to the various part 60, 61, and 63 rules that require the use of CPMS.

B. What are the impacts of the amendments to Procedure 1?

The proposed amendments to Procedure 1 clarify how owners and operators of CEMS subject to PS–9 or PS–15 must satisfy the requirements already established by Procedure 1. Therefore, we have determined that there are no additional impacts that should be attributed to these proposed amendments to Procedure 1.

C. What are the impacts of the amendments to the General Provisions to parts 60, 61, and 63?

The proposed amendments to 40 CFR 60.13 and 40 CFR 61.14 would eliminate any discrepancies between the requirements for CPMS specified in an applicable subpart to parts 60 or 61 and requirements for CPMS specified in the proposed PS–17 and Procedure 4. The amendments to 40 CFR 63.8 that we are proposing clarify how the monitoring requirements of the General Provisions to part 63 apply to CPMS. These proposed amendments do not add any additional requirements to what is already required by the General Provisions to parts 60, 61, and 63. Consequently, we have concluded that the proposed amendments do not have any significant environmental, energy, or economic impacts on the affected source categories.

D. What are the impacts of the amendments to subpart SS?

The proposed amendments to 40 CFR part 63, subpart SS clarify the monitoring requirements for CPMS that are required under subpart SS and the General Provisions to part 63. Furthermore, these proposed amendments provide consistency between those monitoring requirements and the proposed requirements of PS–17 and Procedure 4. For these reasons, we have concluded that there are no significant environmental, energy, or economic impacts associated with the proposed amendments.

XIV. Solicitation of Comments and Public Participation

We want to have full public participation in arriving at our final decisions, and we encourage comment on all aspects of this proposal from all interested parties. Interested parties should submit supporting data and detailed analyses with their comments so we can make maximum use of them. Information on where and when to submit comments is listed in ''Comments'' under the **DATES** and **ADDRESSES** sections.

XV. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review

This action is not a ''significant regulatory action'' under the terms of Executive Order 12866 (58 FR 51735, October 4, 1993) and is therefore not subject to review under the Executive Order.

B. Paperwork Reduction Act

The information collection requirements in this proposed rule have been submitted for approval to the Office of Management and Budget (OMB) under the *Paperwork Reduction Act,* 44 U.S.C. 3501 *et seq.* The Information Collection Request (ICR) document prepared by EPA has been assigned EPA ICR number 2269.01.

The information collection requirements for the proposed PS–17 and Procedure 4 are based on the requirements in the General Provisions to parts 60, 61, and 63, which are mandatory for all operators subject to NSPS or NESHAP. These recordkeeping and reporting requirements are specifically authorized by section 114 of the CAA (42 U.S.C. 7414). All information submitted to EPA pursuant to the recordkeeping and reporting requirements for which a claim of confidentiality is made is safeguarded according to EPA's policies set forth in 40 CFR 2, subpart B.

This proposed rule would not require any notifications or reports beyond those required by the General Provisions to parts 60, 61, and 63. The recordkeeping requirements require only the specific information needed to determine compliance.

The annual monitoring, reporting, and recordkeeping burden for this collection of information (averaged over the first 3 years after the effective date of the rule) is estimated to be 318,662 labor hours per year at a total annual cost of $23.3 million. This burden estimate includes time for the maintenance and evaluation of monitoring system operation. Total capital costs associated with the monitoring requirements over the 3-year period of the ICR are estimated at $18.2 million. Burden is defined at 5 CFR 1320.3(b).

An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR part 9.

To comment on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, EPA has established a public docket for this rule, which includes this ICR, under Docket ID No. EPA–HQ–OAR–2006–0640. Submit any comments related to the ICR to EPA and OMB. See **ADDRESSES** section at the beginning of this notice for where to submit comments to EPA. Send comments to OMB at the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th Street, NW., Washington, DC 20503, Attention: Desk Office for EPA. Since OMB is required to make a decision concerning the ICR between 30 and 60 days after October 9, 2008, a comment to OMB is best assured of having its full effect if OMB receives it by November 10, 2008. The final rule will respond to any OMB or public comments on the information collection requirements contained in this proposal.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of this proposed rule on small entities, small entity is defined as: (1) a small business as defined by the Small Business Administration's (SBA) regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of this proposed rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. Because of the number of different source categories involved and the small cost per facility, a case study approach was used to assess the likelihood of significant impact on small entities. A subset of source categories that most likely would be the most impacted was chosen by two criteria. The first criterion was whether or not the underlying regulation was expected to have adverse small business impacts at the time of promulgation. The second criterion was the relative magnitude of the estimated costs for complying with the CPMS Rule on a per-plant basis. In none of the case studies were costs likely to approach 1 percent of sales because the average per facility costs were always less than 3 percent of the compliance costs of underlying regulation.

We continue to be interested in the potential impacts of this proposed rule on small entities and welcome comments on issues related to such impacts.

D. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Pub. L. 104–4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under section 202 of the UMRA, we generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with ''Federal mandates'' that may result in expenditures to State, local, and tribal governments, in the aggregate, or to the private sector, of $100 million or more in any one year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires us to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows us to adopt an alternative other than the least costly, most cost-effective or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before we establish any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of our regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

EPA has determined that this proposed rule does not contain a Federal mandate that may result in expenditures of $100 million or more for State, local, and tribal governments, in the aggregate, or the private sector in any one year. The nationwide additional annualized costs to implement the proposed rule are estimated to be $52.3 million in the fifth year of this proposed rule. Thus, this proposed rule is not subject to the requirements of sections 202 and 205 of the UMRA.

EPA has determined that this proposed rule contains no regulatory requirements that might significantly or uniquely affect small governments. The requirements of PS–17 and Procedure 4 have already been addressed under the General Provisions to parts 60, 61, and 63, and in the applicable subparts that require the installation and operation of CPMS. Furthermore, the amendments to Procedure 1 merely clarify the applicability and requirements of the procedure. Finally, these proposed amendments to the monitoring requirements in the General Provisions to parts 60, 61, and 63, as well as to subpart SS are made to ensure consistency with PS–17 and Procedure 4.

E. Executive Order 13132: Federalism

Executive Order 13132, entitled ''Federalism'' (64 FR 43255, August 10, 1999), requires us to develop an accountable process to ensure ''meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.'' ''Policies that have federalism implications'' is defined in the Executive Order to include regulations that have ''substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.''

This proposed rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. The requirements of PS–17 and Procedure 4 have already been addressed under the General Provisions to parts 60, 61, and 63, and in the applicable subparts that require the installation and operation of CPMS. Furthermore, these proposed amendments to Procedure 1 merely clarify the applicability and requirements of the procedure. Finally, these proposed amendments to the monitoring requirements specified in the General Provisions to parts 60, 61, and 63, as well as to subpart SS are made to ensure consistency with PS–17 and Procedure 4. Thus, Executive Order 13132 does not apply to this rule.

In the spirit of Executive Order 13132, and consistent with our policy to promote communications between us and State and local governments, we specifically solicit comment on this proposed rule from State and local officials.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

Executive Order 13175, entitled ''Consultation and Coordination with Indian Tribal Governments'' (65 FR 67249, November 9, 2000), requires EPA to develop an accountable process to ensure ''meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications.'' This proposed rule does not have tribal implications, as specified in Executive Order 13175. The requirements of PS–17 and Procedure 4 have already been addressed under the General Provisions to parts 60, 61, and 63, and in the applicable subparts that require the installation and operation of CPMS. Furthermore, these proposed amendments to Procedure 1 merely clarify the applicability and requirements of the procedure. Finally, these proposed amendments to the monitoring requirements specified in the General Provisions to parts 60, 61, and 63, as well as to subpart SS are made to ensure consistency with PS–17 and Procedure 4. Thus, Executive Order 13175 does not apply to this proposed rule. EPA specifically solicits additional comment on this proposed rule from tribal officials.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

Executive Order 13045, ''Protection of Children from Environmental Health

Risks and Safety Risks'' (62 FR 19885, April 23, 1997) applies to any rule that: (1) Is determined to be ''economically significant'' as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

EPA interprets EO 13045 as applying only to those regulatory actions that concern health or safety risks, such that the analysis required under section 5–501 of the Order has the potential to influence the regulation. This proposed rule is not subject to Executive Order 13045 because it does not establish an environmental standard intended to mitigate health or safety risks.

H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use

This proposed rule is not subject to Executive Order 13211, ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use'' (66 FR 28355 (May 22, 2001)) because it is not a significant regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (''NTTAA''), Pub. L. No. 104–113, 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards (VCS).

This proposed rulemaking involves technical standards. EPA proposes to use the following VCS: American Society for Testing and Materials (ASTM) E220–07e1, ASTM D1293–99 (2005), ASTM D1125–95 (2005), ASTM D5391–99 (2005), ASTM E251–92 (2003), ASTM E452–02 (2007), ASTM E585/E 585M–04, ASTM E644–06, ASTM E235–06, ASTM E608/E 608M–06, ASTM E696–07, ASTM E1129/E1129M–98 (2002), ASTM E1137/E1137M–04, and ASTM E1159–98 (2003); International Organization for Standardization (ISO) MC96.1–1982 and ISO 10790:1999; American Society of Mechanical Engineers (ASME) B40.100–2005 and ASME MFC–3M–2004; American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) 41.8–1989; American National Standards Institute (ANSI)/ASME MFC–4M–1986 (R2003), ANSI/ASME MFC–6M–1998 (R2005), ANSI/ASME MFC–7M–1987 (R2001), ANSI/ASME MFC–9M–1988; ANSI/Instrumentation, Systems, and Automation Society (ISA) RP 31.1–1977, ISA RP 16.6–1961, ISA RP 16.5–1961, and ISA 8316:1987; and National Institute of Standards and Technology (NIST) Handbook 44—2002 Edition (incorporated by reference—see 40 CFR 60.17). The Agency conducted a search to identify potentially applicable voluntary consensus standards. While the Agency identified 15 VCS as being potentially applicable to PS–17 and Procedure 4, we do not propose to use these standards in this proposed rulemaking. The use of these VCS would be impractical for the purposes of this proposed rule. See the docket for this proposed rule for the reasons for these determinations for the standards.

EPA welcomes comments on this aspect of this proposed rulemaking and, specifically, invites the public to identify potentially-applicable voluntary consensus standards and to explain why such standards should be used in this regulation.

J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 (59 FR 7629, February 16, 1994) establishes Federal executive policy on environmental justice. Its main provision directs Federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

EPA has determined that this proposed rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it increases the level of environmental protection for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income population. The proposed rule will help to ensure that emission control devices are operated properly and maintained as needed, thereby helping to ensure compliance with emission standards, which benefit all affected populations.

List of Subjects

40 CFR Part 60

Environmental protection, Administrative Practice and Procedure, Air pollution control, Incorporation by reference, Reporting and recordkeeping requirements.

40 CFR Part 61

Environmental protection, Air pollution control, Hazardous substances, Reporting and recordkeeping requirements.

40 CFR Part 63

Environmental protection, Air pollution control, Hazardous substances, Reporting and recordkeeping requirements.

Dated: September 22, 2008.

Stephen L. Johnson,

Administrator.

For the reasons stated in the preamble, title 40, chapter I of the Code of the Federal Regulations is proposed to be amended as follows:

PART 60—[AMENDED]

1. The authority citation for part 60 continues to read as follows:

Authority: 42 U.S.C. 7401, *et seq.*

Subpart A—[Amended]

2. Section 60.13 is amended by redesignating paragraph (a) as paragraph (a)(1) and adding paragraph (a)(2) to read as follows:

§ 60.13 Monitoring requirements.

(a)(1) * * *

(2) Performance specifications for continuous parameter monitoring systems (CPMS) promulgated under 40 CFR part 60, appendix B and quality assurance procedures for CPMS promulgated under 40 CFR part 60, appendix F apply instead of the requirements for CPMS specified in an applicable subpart upon promulgation of the performance specifications and quality assurance procedures for CPMS.

* * * * *

3. Section 60.17 is amended by:

a. Adding paragraphs (a)(93) through (a)(106);

b. Adding paragraphs (h)(5) through (h)(10); and

c. Adding paragraphs (o), (p) and (q) to read as follows:

§ 60.17 Incorporations by reference.

* * * * *

(a) * * *

(93) ASTM E220–07e1, ''Standard Test Methods for Calibration of Thermocouples by Comparison Techniques,'' IBR approved for Table 6 to Performance Standard 17 of appendix B to this part and Table 2 to Procedure 4 of appendix F to this part.

(94) ASTM E452–02 (2007), ''Standard Test Method for Calibration of Refractory Metal Thermocouples Using an Optical Pyrometer,'' IBR approved for Table 6 to Performance Standard 17 of appendix B to this part and Table 2 to Procedure 4 to appendix F of this part.

(95) ASTM E585/E 585M–04, ''Specification for Compacted Mineral-Insulated, Metal-Sheathed, Base Metal Thermocouple Cables,'' IBR approved for Table 2 to Performance Standard 17 of appendix B to this part.

(96) ASTM E644–06, ''Standard Test Methods for Testing Industrial Resistance Thermometers,'' IBR approved for Table 6 to Performance Standard 17 of appendix B to this part and Table 2 to Procedure 4 of appendix F to this part.

(97) ASTM E235–06, ''Specification for Thermocouples, Sheathed, Type K, for Nuclear or for Other High-Reliability Applications,'' IBR approved for Table 2 to Performance Standard 17 of appendix B to this part.

(98) ASTM E608/E 608M–06, ''Specification for Mineral-Insulated, Metal-Sheathed Base Metal Thermocouples,'' IBR approved for Table 2 to Performance Standard 17 of appendix B to this part.

(99) ASTM E696–07, ''Specification for Tungsten-Rhenium Alloy Thermocouple Wire,'' IBR approved for Table 2 to Performance Standard 17 of appendix B to this part.

(100) ASTM E1129/E 1129M–98 (2002), ''Standard Specification for Thermocouple Connectors,'' IBR approved for Table 2 to Performance Standard 17 of appendix B to this part.

(101) ASTM E1137/E 1137M–04, ''Standard Specification for Industrial Platinum Resistance Thermometers,'' IBR approved for Table 2 to Performance Standard 17 of appendix B to this part.

(102) ASTM E1159–98 (2003), ''Specification for Thermocouple Materials, Platinum-Rhodium Alloys, and Platinum,'' IBR approved for Table 2 to Performance Standard 17 of appendix B to this part.

(103) ASTM E251–92 (2003), ''Standard Test Methods for Performance Characteristics of Metallic Bonded Resistance Strain Gages,'' IBR approved for Table 7 to Performance Standard 17 of appendix B to this part and Table 3 to Procedure 4 of appendix F to this part.

(104) ASTM D1293–99 (2005), ''Standard Test Methods for pH of Water,'' IBR approved for section 8.7 of Performance Standard 17 of appendix B to this part and section 8.4 of Procedure 4 of appendix F to this part.

(105) ASTM D1125–95 (2005), ''Standard Test Methods for Electrical Conductivity and Resistivity of Water,'' IBR approved for section 8.8 of Performance Standard 17 of appendix B to this part and section 8.5 of Procedure 4 of appendix F to this part.

(106) ASTM D5391–99 (2005), ''Standard Test Method for Electrical Conductivity and Resistivity of a Flowing High Purity Water Sample,'' IBR approved for section 8.8 of Performance Standard 17 of appendix B to this part and section 8.5 of Procedure 4 of appendix F to this part.

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(5) ASME B 40.100–2005, ''Pressure Gauges and Gauge Attachments,'' IBR approved for section 6.3 and Table 7 to Performance Standard 17 of appendix B to this part and Table 3 to Procedure 4 of appendix F to this part.

(6) ASME MFC–3M–2004, ''Measurement of Fluid Flow in Pipes Using Orifice, Nozzle, and Venturi,'' IBR approved for Table 3 to Performance Standard 17 of appendix B to this part and section 8.3 of Procedure 4 to appendix F of this part.

(7) ANSI/ASME MFC–4M–1986 (R2003), ''Measurement of Gas Flow by Turbine Meters,'' IBR approved for Table 3 to Performance Standard 17 of appendix B to this part.

(8) ANSI/ASME MFC–6M–1998 (R2005), ''Measurement of Fluid Flow in Pipes Using Vortex Flow Meters,'' IBR approved for Table 3 to Performance Standard 17 of appendix B to this part.

(9) ANSI/ASME MFC–7M–1987 (R2001), ''Measurement of Gas Flow by Means of Critical Flow Venturi Nozzles,'' IBR approved for Table 3 to Performance Standard 17 of appendix B to this part.

(10) ANSI/ASME MFC–9M–1988, ''Measurement of Liquid Flow in Closed Conduits by Weighing Method,'' IBR approved for Table 5 to Performance Standard 17 of appendix B to this part and Table 5 to Procedure 4 of appendix F to this part.

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(o) The following material is available for purchase from the American National Standards Institute (ANSI), 25 West 43rd Street, 4th Floor, New York, NY, 10036.

(1) ISA–MC96.1–1982, ''Temperature Measurement Thermocouples,'' IBR approved for Table 2 to Performance Standard 17 of appendix B to this part and Table 5 to Procedure 4 of appendix F to this part.

(2) ASHRAE 41.8–1989, ''Standard Methods of Measurement of Flow of Liquids in Pipes Using Orifice Flowmeters,'' IBR approved for Table 5 to Performance Standard 17 of appendix B to this part and Table 5 to Procedure 4 of appendix F to this part.

(3) ANSI/ISA RP 31.1–1977, ''Recommended Practice: Specification, Installation, and Calibration of Turbine Flow Meters,'' IBR approved for Table 3 to Performance Standard 17 of appendix B to this part and Table 5 to Procedure 4 of appendix F to this part.

(p) The following material is available for purchase from the Instrumentation, Systems, and Automation Society (ISA), 67 Alexander Drive, Research Triangle Park, NC 27709.

(1) ISA RP 16.6–1961, ''Methods and Equipment for Calibration of Variable Area Meters (Rotameters),'' IBR approved for Tables 4 and 5 to Performance Standard 17 of appendix B to this part and Tables 4 and 5 to Procedure 4 of appendix F to this part.

(2) ISA RP 16.5–1961, ''Installation, Operation, and Maintenance Instructions for Glass Tube Variable Area Meters (Rotameters),'' IBR approved for Table 3 to Performance Standard 17 of appendix B to this part.

(q) The following material is available for purchase from the International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse, CH–1211 Geneva 20, Switzerland.

(1) ISO 8316:1987, ''Measurement of Liquid Flow in Closed Conduits—Method by Collection of Liquid in a Volumetric Tank,'' IBR approved for Table 4 to Performance Standard 17 of appendix B to this part and Table 4 to Procedure 4 of appendix F to this part.

(2) ISO 10790:1999, ''Measurement of Fluid Flow in Closed Conduits—Guidance to the Selection, Installation, and Use of Coriolis Meters (Mass Flow, Density and Volume Flow Measurements),'' IBR approved for Table 3 to Performance Standard 17 of appendix B to this part and Table 4 to Procedure 4 of appendix F to this part.

4. Appendix B to part 60 is amended by adding Performance Specification 17 in numerical order to read as follows:

Appendix B to Part 60—Performance Specifications

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Performance Specification 17—Specifications and Test Procedures for Continuous Parameter Monitoring Systems at Stationary Sources

1.0 *What is the purpose of Performance Specification 17?*

The purpose of Performance Specification 17 (PS–17) is to establish the initial installation and performance procedures that are required for evaluating the acceptability of a continuous parameter monitoring system (CPMS). This performance specification applies instead of the requirements for applicable CPMS specified in any applicable subpart to 40 CFR part 60, 61, or 63, unless otherwise specified in the applicable subpart. This performance specification does not establish procedures or criteria for evaluating the ongoing performance of an installed CPMS over an extended period of time. Procedures for evaluating the ongoing performance of a CPMS are described in Procedure 4 of appendix F to 40 CFR part 40, Quality Assurance Procedures.

1.1 Under what circumstances does PS–17 apply to my CPMS? This performance specification applies to your CPMS if your CPMS meets the conditions specified in section 1.2 of this specification and you meet either conditions (1) or (2) of this section:

(1) You are required by any applicable subpart of 40 CFR parts 60 or 61 to install and operate the CPMS, or

(2) You are required by any applicable subpart of 40 CFR part 63 to install and operate the CPMS, and § 63.8(a)(2) of the General Provisions applies to the applicable subpart.

1.2 To what types of devices does PS–17 apply? This performance specification applies if your total equipment meets the conditions of (1) and (2) of this section:

(1) You are required by an applicable subpart to install and operate the total equipment on a continuous basis, and

(2) You, as owner or operator, use the total equipment to monitor the parameters (currently temperature, pressure, liquid flow rate, gas flow rate, mass flow rate, pH, and conductivity) associated with the operation of an emission control device or process unit.

1.3 When must I comply with PS–17? You must comply with PS–17 when any of conditions (1) through (5) of this section occur:

(1) At the time you install and place into operation a CPMS that is required by the applicable subpart after 90 days following the date of publication of the final rule in the **Federal Register**, or

(2) At the time you replace or relocate the sensor of an affected CPMS after 90 days following the date of publication of the final rule in the **Federal Register**, or

(3) At the time you replace the electronic signal modifier or conditioner, transmitter, external power supply, data acquisition system, data recording system, or any other mechanical or electrical component of your CPMS that affects the accuracy, range, or resolution of your CPMS after 90 days following the date of publication of the final rule in the **Federal Register**, or

(4) For CPMS located at facilities that are required to obtain a title V permit, at the time of your title V permit renewal.

(i) Prior to submitting your title V permit renewal, you must comply with the basic requirements of this performance specification.

(5) For CPMS located at area source facilities that are exempt from obtaining a title V permit, 5 years after the date of publication of the final rule in the **Federal Register**.

2.0 *What are the basic requirements of PS–17?*

This performance specification requires you, as an owner or operator of an applicable CPMS, to perform and record initial installation and calibration procedures to confirm the acceptability of the CPMS when it is installed and placed into operation.

2.1 How does PS–17 address the installation and equipment requirements for my CPMS? This specification stipulates basic installation, location, and equipment requirements for CPMS and identifies applicable voluntary consensus standards that provide additional guidance on the selection and installation of specific types of sensors associated with CPMS. This specification also identifies the types of equipment needed to check the accuracy of your CPMS. General equipment requirements are identified in section 6 of this specification. Location and installation requirements are addressed in sections 8.1 and 8.2 of this specification.

2.2 What types of procedures must I perform to demonstrate compliance with PS–17? This specification requires you, as owner or operator of a CPMS, to demonstrate that your CPMS satisfies minimum requirements for accuracy. For each of the monitoring parameters addressed (currently temperature, pressure, liquid flow rate, gas flow rate, mass flow rate, pH, and conductivity), this specification offers you the choice of two or more methods that you can use to demonstrate that your CPMS meets the specified accuracy requirements. For accuracy demonstrations that involve measurement of gas or liquid pressures, this specification also requires you to perform a leak test on any pressure connections. Accuracy demonstration methods are described in sections 8.4 through 8.8 of this specification; section 8.9 addresses alternative procedures for demonstrating compliance with this specification; and leak test procedures are described in section 8.10 of this specification.

2.3 What does PS–17 require me to do if my CPMS does not meet the specified accuracy requirements? If your CPMS does not meet the accuracy requirements, section 8 of this specification requires you to take corrective action until you can demonstrate that your CPMS meets the accuracy requirement.

2.4 What types of recordkeeping and reporting activities does PS–17 require? This specification does not have any reporting requirements but does require you to record and maintain data that identify your CPMS and show the results of any performance demonstrations of your CPMS. Recordkeeping requirements are described in section 14 of this specification.

3.0 *What special definitions apply to PS–17?*

3.1 Accuracy. A measure of the closeness of a measurement to the true or actual value.

3.2 Accuracy hierarchy. The ratio of the accuracy of a measurement instrument to the accuracy of a calibrated instrument or standard that is used to measure the accuracy of the measurement instrument. For example, if the accuracy of a calibrated temperature measurement device is 0.2 percent, and the accuracy of a thermocouple is 1.0 percent, the accuracy hierarchy is 5.0 ($1.0 \div 0.2 = 5.0$).

3.3 Conductivity CPMS. The total equipment that is used to measure and record the conductivity of a liquid on a continuous basis.

3.4 Continuous Parameter Monitoring System (CPMS). The total equipment that is used to measure and record a parameter (currently temperature, pressure, liquid flow rate, gas flow rate, mass flow rate, pH, and conductivity) on a continuous basis in one or more locations.

3.5 Cryogenic Application. An application of a temperature CPMS in which the sensor is subjected to a temperature of zero degrees Celsius (32 degrees Fahrenheit) or less.

3.6 Differential pressure tube. A device, such as a pitot tube, that consists of one or more pairs of tubes that are oriented to measure the velocity pressure and static pressure at one or more fixed points within a duct for the purpose of determining gas velocity.

3.7 Electronic Components. The electronic signal modifier or conditioner, transmitter, and power supply associated with a CPMS.

3.8 Flow CPMS. The total equipment that is used to measure and record liquid flow rate, gas flow rate, or mass flow rate on a continuous basis.

3.9 Integrator. The equipment that is used to calculate the material feed rate using two inputs: weight of the load on the material transfer system (e.g. belt conveyor) and the speed of the system.

3.10 Mass flow rate. The measurement of solid, liquid, or gas flow in units of mass per time, such as kilograms per minute or tons per hour.

3.11 Mechanical Component. Any component of a CPMS that consists of or includes moving parts or that is used to apply or transfer force to another component or part of the CPMS.

3.12 pH CPMS. The total equipment that is used to measure and record the pH of a liquid on a continuous basis.

3.13 Pressure CPMS. The total equipment that is used to measure and record the pressure of a liquid or gas at any location, or the differential pressure of a liquid or gas between any two locations, on a continuous basis.

3.14 Resolution. The smallest detectable or legible increment of measurement.

3.15 Sensor. The component or set of components of a CPMS that reacts to changes in the magnitude of the parameter that is measured by the CPMS (currently temperature, pressure, liquid flow rate, gas flow rate, mass flow rate, pH, or conductivity) and generates an output signal. Table 1 identifies the sensor components of some commonly used CPMS.

3.16 Solid mass flow rate. The measurement of the rate at which a solid material is processed or transferred (in units of mass per time). Examples of solid mass flow rate are the rate at which ore is fed to a material dryer or the rate at which powdered lime is injected into an exhaust duct.

3.17 Temperature CPMS. The total equipment that is used to measure and record the temperature of a liquid or gas at any location, or the differential temperature of a liquid or gas between any two locations, on a continuous basis.

3.18 Total Equipment. The sensor, mechanical components, electronic components, data acquisition system, data recording system, electrical wiring, and other components of a CPMS.

4.0 *Interferences* [Reserved]

5.0 *What do I need to know to ensure the safety of persons who perform the procedures specified in PS–17?*

The procedures required under this specification may involve hazardous materials, operations, site conditions, and equipment. This performance specification does not purport to address all of the safety issues associated with these procedures. It is the responsibility of the user to establish appropriate safety and health practices and determine the applicable regulatory limitations prior to performing these procedures.

6.0 *What equipment and supplies do I need?*

The types of equipment that you need to comply with this specification depend upon the parameter that is measured by your CPMS and upon site-specific conditions. You must select the appropriate equipment based on manufacturer's recommendations, your site-specific conditions, the parameter that your CPMS measures, and the method that you choose for demonstrating compliance with this specification. For most CPMS, you will need the two types of equipment described in paragraphs (1) and (2) of this section.

(1) The total equipment that is used to monitor and record the appropriate parameter, as defined in section 3.17 of this specification, and

(2) The equipment needed to perform the initial validation check of your CPMS, as specified in sections 8.4 through 8.8 of this specification.

6.1 What design criteria must my CPMS satisfy? You must select a CPMS that meets the design specifications in paragraphs (1) through (5) of this section.

(1) Your CPMS must satisfy the accuracy requirements of Table 8 of this specification.

(2) Your CPMS must be capable of measuring the appropriate parameter (currently temperature, pressure, liquid flow rate, gas flow rate, mass flow rate, pH, or conductivity) over a range that extends from a value that is at least 20 percent less than the lowest value that you expect your CPMS to measure, to a value that is at least 20 percent greater than the highest value that you expect your CPMS to measure.

(3) The signal conditioner, wiring, power supply, and data acquisition and recording system of your CPMS must be compatible with the output signal of the sensors used in your CPMS.

(4) The data acquisition and recording system of your CPMS must be able to record values over the entire range specified in paragraph (2) of this section.

(5) The data recording system associated with your CPMS must have a resolution of one-half of the required overall accuracy of your CPMS, as specified in Table 8 of this specification, or better.

6.2 Are there any exceptions to the range requirements specified in section 6.1 of PS–17? A pH CPMS must be capable of measuring pH over the entire range of pH values from 0 to 14.

6.3 What additional guidelines should I use for selecting the sensor of my CPMS? Additional guidelines for selecting temperature and pressure sensors are listed in paragraphs (1) and (2) of this section.

(1) For a temperature CPMS, you should select a sensor that is consistent with the standards listed in Table 2 of this specification.

(2) If your pressure CPMS uses a pressure gauge as the sensor, you should select a gauge that conforms to the design requirements of ASME B40.100–2005, ''Pressure Gauges and Gauge Attachments'' (incorporated by reference—see § 60.17).

6.4 What types of equipment do I need for checking the accuracy of my CPMS? The specific types of equipment that you need for checking the accuracy of your CPMS depend on the type of CPMS and the method that you choose for conducting the initial validation check of your CPMS, as specified in sections 8.4 through 8.8 of this specification. In most cases, you will need the equipment specified in paragraphs (1) and (2) of this section.

(1) A separate device that either measures the same parameter as your CPMS, or that simulates the same electronic signal or response that your CPMS generates, and

(2) Any work platform, test ports, pressure taps, valves, fittings, or other equipment required to perform the specific procedures of the validation check method that you choose, as specified in sections 8.4 through 8.8 of this specification.

6.5 What are the accuracy requirements for the equipment that I use for checking the accuracy of my CPMS? Any measurement instrument or device that is used to conduct the initial validation check of your CPMS must have an accuracy that is traceable to National Institute of Standards and Technology (NIST) standards and must have an accuracy hierarchy of at least three. To determine if a measurement instrument or device satisfies this accuracy hierarchy requirement, follow the procedure described in section 12.1 of this specification.

6.6 Are there any exceptions to the accuracy requirement of section 6.5 of PS–17? There are two exceptions to the NIST-traceable accuracy requirement specified in section 6.5 of this specification, as described in paragraphs (1) and (2) of this section.

(1) As an alternative for a calibrated pressure measurement device with NIST-traceable accuracy specified in paragraphs (1) and (3) of section 8.5 and in paragraph (3) of section 8.6 of this specification, you can use a mercury-in-glass or water-in-glass U-tube manometer to validate your pressure CPMS.

(2) When validating a flow rate CPMS using the methods specified in paragraphs (1), (2), or (7) of section 8.6 of this specification, the container used to collect or weigh the liquid or solid is not required to have NIST-traceable accuracy.

7.0 *What reagents or standards do I need to comply with PS–17?*

The specific reagents and standards needed to demonstrate compliance with this specification depend upon the parameter that your CPMS measures and the method that you choose to check the accuracy of your CPMS. Section 8.3 of this specification identifies the specific reagents and standards needed for each initial validation check of CPMS accuracy.

8.0 *What performance demonstrations must I conduct?*

You must satisfy the installation requirements, perform an initial calibration, and perform an initial validation check of your CPMS using the procedures specified in sections 8.1 through 8.8 of this specification.

8.1 How must I install my CPMS? The installation of your CPMS must satisfy the requirements specified in paragraphs (1) and (2) of this section.

(1) You must install each sensor of your CPMS in a location that provides representative measurement of the applicable parameter over all operating conditions, taking into account the manufacturer's guidelines and any location specified in the applicable requirement.

(2) You must also install any work platforms, test ports, pressure taps, valves, fittings, or other equipment needed to perform the initial validation check, as specified in sections 8.4 through 8.8 of this specification.

8.2 What additional guidelines can I use for installing my CPMS? If you are required to install a flow CPMS and the sensor of your flow CPMS is a differential pressure device, turbine flow meter, rotameter, vortex formation flow meter or Coriolis mass flow meter, you can use the standards listed in Table 3 of this specification as guidelines for installation.

8.3 What initial quality assurance measures are required by PS–17 for my CPMS? You must perform an initial calibration of your CPMS based on the procedures specified in the manufacturer's owner's manual. You also must perform an initial validation check of the operation of your CPMS using the methods described in sections 8.4 through 8.8 of this specification.

8.4 How do I perform the initial validation check of my temperature CPMS? To perform the initial validation check of a temperature CPMS, you can choose one of the methods described in paragraphs (1) and (2) of this section.

(1) Comparison to Calibrated Temperature Measurement Device. Place the sensor of a calibrated temperature measurement device adjacent to the sensor of your temperature CPMS so that the sensor of the calibrated test device is subjected to the same environment as the sensor of your temperature CPMS. The calibrated temperature measurement device must satisfy the accuracy requirements specified in section 6.5 of this specification. The calibrated temperature measurement device must also have a range equal to or greater than the range of your temperature CPMS. Allow sufficient time for the response of the calibrated temperature measurement device to reach equilibrium. With the process or control device that is monitored by your CPMS operating under normal conditions, concurrently record the temperatures measured by your temperature CPMS and the calibrated temperature measurement device. Using the temperature measured by the calibrated measurement device as the value for V_c, follow the procedure specified in section 12.2 to determine if your CPMS satisfies the accuracy requirement of Table 8 of this specification. If you determine that your CPMS satisfies the accuracy requirement of Table 8, the validation check is complete. If your CPMS does not satisfy the accuracy requirement of Table 8 of this specification, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this validation check procedure until the accuracy requirement of Table 8 of this specification is satisfied. If you are required to measure and record temperatures at multiple locations, repeat this procedure for each location.

(2) Temperature Simulation Procedure. Disconnect the sensor from your temperature CPMS and connect to your CPMS a calibrated simulation device that is designed to simulate the same type of response as the sensor of your CPMS. The calibrated simulation device must satisfy the accuracy requirements specified in section 6.5 of this specification. Simulate a typical temperature that is measured by your temperature CPMS under normal operating conditions. Allow sufficient time for the response of the calibrated simulation device to reach equilibrium. Record the temperature that is indicated by your temperature CPMS. Using the temperature simulated by the calibrated simulation device as the value for V_c, follow the procedure specified in section 12.2 of this specification to determine if your CPMS satisfies the accuracy requirement of Table 8 of this specification. If you determine that your CPMS satisfies the accuracy requirement of Table 8, the validation check is complete. If the calculated accuracy does not meet the accuracy requirement of Table 8 of this specification, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this validation check procedure until the accuracy requirement of Table 8 of this specification is satisfied. If you are required to measure and record temperatures at multiple locations, repeat this procedure for each location.

8.5 How do I perform an initial validation check of my pressure CPMS? To perform the initial validation check of your pressure CPMS, you can choose one of the methods described in paragraphs (1) through (3) of this section.

(1) Comparison to Calibrated Pressure Measurement Device. Connect a mercury-in-glass U-tube manometer, a water-in-glass U-tube manometer, or calibrated pressure measurement device to operate in parallel with your pressure CPMS so that the manometer or sensor of the calibrated pressure measurement device is subjected to the same pressure as the sensor of your pressure CPMS. If a calibrated pressure measurement device is used, the device must satisfy the accuracy requirements of section 6.5 of this specification. The calibrated pressure measurement device also must have a range equal to or greater than the range of your pressure CPMS. Perform a leak test on all manometer or calibrated pressure measurement device connections using the procedure specified in section 8.10 of this specification. Allow sufficient time for the response of the manometer or calibrated pressure measurement device to reach equilibrium. With the process or control device that is monitored by your pressure CPMS operating under normal conditions, concurrently record the pressures that are measured by your pressure CPMS and by the calibrated pressure measurement device. Using the pressure measured by the calibrated pressure measurement device as the value for V_c, follow the procedure specified in section 12.2 of this specification to determine if your CPMS satisfies the accuracy requirement of Table 8 of this specification. If you determine that your CPMS satisfies the accuracy requirement of Table 8 of this specification, the validation check is complete. If your CPMS does not meet the accuracy requirement of Table 8 of this specification, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this validation check procedure until the accuracy requirement of Table 8 of this specification is satisfied. If you are required to measure and record pressure at multiple locations, repeat this procedure for each location.

(2) Pressure Simulation Procedure Using a Calibrated Pressure Source. Disconnect or close off the process line or lines to your pressure CPMS. Connect an adjustable calibrated pressure source to your CPMS so that the pressure source applies a pressure to the sensor of your pressure CPMS. The calibrated pressure source must satisfy the accuracy requirements of section 6.5 of this specification. The calibrated pressure source also must be adjustable, either continuously or incrementally over the pressure range of your pressure CPMS. Perform a leak test on all calibrated pressure source connections using the procedure specified in section 8.10 of this specification. Using the calibrated pressure source, apply a pressure that is within ±10 percent of the normal operating pressure of your pressure CPMS. Allow sufficient time for the response of the calibrated pressure source to reach equilibrium. Record the pressure applied by the calibrated pressure source and the pressure measured by your pressure CPMS. Using the pressure applied by the calibrated pressure source as the value for V_c, follow the procedure specified in section 12.2 of this specification to determine if your CPMS satisfies the accuracy requirement of Table 8 of this specification. If you determine that your CPMS satisfies the accuracy requirement of Table 8 of this specification, the validation check is complete. If your CPMS does not meet the accuracy requirement of Table 8 of this specification, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this validation check procedure until the accuracy requirement of Table 8 of this specification is satisfied. If you are required to measure and record pressure at multiple locations, repeat this procedure for each location.

(3) Pressure Simulation Procedure Using a Pressure Source and Calibrated Pressure Measurement Device. Disconnect or close off the process line or lines to your pressure CPMS. Attach a mercury-in-glass U-tube manometer, a water-in-glass U-tube manometer, or a calibrated pressure measurement device (the reference pressure measurement device) in parallel to your pressure CPMS. If a calibrated pressure measurement device is used, the device must satisfy the accuracy requirements of section 6.5 of this specification. Connect a pressure source to your pressure CPMS and the parallel reference pressure measurement device. Perform a leak test on all pressure source and parallel reference pressure measurement device connections using the procedure specified in section 8.10 of this specification. Apply pressure to your CPMS and the parallel reference pressure measurement device. Allow sufficient time for the response of your CPMS and the parallel reference pressure measurement device to reach equilibrium. Record the pressure measured by your pressure CPMS and the reference pressure measurement device. Using the pressure measured by the parallel reference pressure measurement device as the value for V_c, follow the procedure specified in section 12.2 of this specification to determine if your CPMS satisfies the accuracy requirement of Table 8 of this specification. If you determine that your CPMS satisfies the accuracy requirement of Table 8 of this specification, the validation check is complete. If your CPMS does not meet the accuracy requirement of Table 8 of this specification, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this validation check procedure until the accuracy requirement of Table 8 of this specification is satisfied. If you are required to measure and record pressure at multiple locations, repeat this procedure for each location.

8.6 How do I perform an initial validation check of my flow CPMS? To perform the initial validation check of your flow CPMS, you can choose any one of the methods described in paragraphs (1) through (7) of this section that is applicable to the type of material measured by your flow CPMS and the type of sensor used in your flow CPMS.

(1) Volumetric Method. This method applies to any CPMS that is designed to measure liquid flow rate. With the process or control device that is monitored by your flow CPMS operating under normal conditions, record the flow rate measured by your flow CPMS for the subject process line. At the same time, collect the liquid that is flowing through the same process line for a measured length of time using the Volumetric Method specified in one of the standards listed in Table 4 of this specification. Using the flow rate measured by the Volumetric Method as the value for V_c, follow the procedure specified in section 12.2 of this specification to determine if your CPMS satisfies the accuracy requirement of Table 8 of this specification. If you determine that your CPMS satisfies the accuracy requirement of Table 8 of this specification, the validation check is complete. If your CPMS does not satisfy the accuracy requirement of Table 8 of this specification, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this validation check until the accuracy requirement of Table 8 of this specification is satisfied. If you are required to measure and record flow rate at multiple locations, repeat this procedure for each location.

(2) Gravimetric Method. This method applies to any CPMS that is designed to measure liquid flow rate, liquid mass flow rate, or solid mass flow rate. With the process or control device that is monitored by your flow CPMS operating under normal conditions, record the flow rate measured by your flow CPMS for the subject process line. At the same time, collect the material (liquid or solid) that is flowing or being transferred through the same process line for a measured length of time using the Weighing, Weigh Tank, or Gravimetric Methods specified in the standards listed in Table 5. Using the flow rate measured by the Weighing, Weigh Tank, or Gravimetric Methods as the value for V_c, follow the procedure specified in section 12.2 of this specification to determine if your CPMS satisfies the accuracy requirement of Table 8 of this specification. If you determine that your CPMS satisfies the accuracy requirement of Table 8 of this specification, the validation check is complete. If your CPMS does not satisfy the accuracy requirement of Table 8 of this specification, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this validation check until the accuracy requirement of Table 8 of this specification is satisfied. If you are required to measure and record flow rate at multiple locations, repeat this procedure for each location.

(3) Differential Pressure Measurement Method. This method applies only to flow CPMS that use a differential pressure measurement flow device, such as an orifice plate, flow nozzle, or venturi tube. This method may not be used to validate a flow CPMS that measures gas flow by means of one or more differential pressure tubes. With the process or control device that is monitored by your CPMS operating under normal conditions, record the flow rate measured by your flow CPMS. Under the same operating conditions, disconnect the pressure taps from your flow CPMS and connect the pressure taps to a mercury-in-glass U-tube manometer, a water-in-glass U-tube manometer, or calibrated differential pressure measurement device. If a calibrated pressure measurement device is used, the device must satisfy the accuracy requirements of section 6.5 of this specification. Perform a leak test on all manometer or calibrated differential pressure measurement device connections using the procedure specified in section 8.10 of this specification. Allow sufficient time for the response of the calibrated differential pressure measurement device to reach equilibrium. Within 30 minutes of measuring and recording the flow rate using your CPMS, record the pressure drop measured by the calibrated differential pressure measurement device. Using the manufacturer's literature or the procedures specified in ASME MFC–3M–2004 (incorporated by reference—see § 60.17), calculate the flow rate that corresponds to the differential pressure measured by the calibrated differential pressure measurement device. For CPMS that use an orifice flow meter, the procedures specified in ASHRAE 41.8–1989 (incorporated by reference—see § 60.17) also can be used to calculate the flow rate. Using the calculated flow rate as the value for V_c, follow the procedure specified in section 12.2 of this specification to determine if your CPMS satisfies the accuracy requirement of Table 8 of this specification. If you determine that your CPMS satisfies the accuracy requirement of Table 8 of this specification, the validation check is complete. If your CPMS does not satisfy the accuracy requirement of Table 8 of this specification, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this procedure until the accuracy requirement of Table 8 of this specification is satisfied. If you are required to measure and record flow rate at multiple locations, repeat this procedure for each location.

(4) Pressure Source Flow Simulation Method. This method applies only to flow CPMS that use a differential pressure measurement flow device, such as an orifice plate, flow nozzle, or venturi tube. This method may not be used to validate a flow CPMS that measures gas flow by means of one or more differential pressure tubes. Disconnect your flow CPMS from the pressure taps. Connect separate pressure sources to the upstream and downstream sides of your pressure CPMS, where the pressure taps are normally connected. The pressure sources must satisfy the accuracy requirements of section 6.5 of this specification. The pressure sources also must be adjustable, either continuously or incrementally over the pressure range that corresponds to the range of your flow CPMS. Perform a leak test on all connections between the calibrated pressure sources and your flow CPMS using the procedure specified in section 8.10 of this specification. Using the manufacturer's literature or the procedures specified in ASME MFC–3M–2004 (incorporated by reference—see § 60.17), calculate the required pressure drop that corresponds to the normal operating flow rate expected for your flow CPMS. For CPMS that use an orifice flow meter, the procedures specified in ASHRAE 41.8–1989 (incorporated by reference—see § 60.17) also can be used to calculate the pressure drop. Use the calibrated pressure sources to apply the calculated pressure drop to your flow CPMS. Allow sufficient time for the responses of the calibrated pressure sources to reach equilibrium. Record the flow rate measured by your flow CPMS. Using the flow rate measured by your CPMS when the calculated pressure drop was applied as the value for V_c, follow the procedure specified in section 12.2 of this specification to determine if your CPMS satisfies the accuracy requirement of Table 8 of this specification. If you determine that your CPMS satisfies the accuracy requirement of Table 8 of this specification, the validation check is complete. If your CPMS does not satisfy the accuracy requirement of Table 8 of this specification, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this procedure until the accuracy requirement of Table 8 of this specification is satisfied. If you are required to measure and record flow rate at multiple locations, repeat this procedure for each location.

(5) Electronic Signal Simulation Method. This method applies to any flow CPMS that uses a flow sensor that generates an electronic signal. Disconnect the sensor from your flow CPMS and connect to your CPMS a calibrated simulation device that is designed to simulate the same type of electrical response as the sensor of your CPMS. The calibrated simulation device must satisfy the accuracy requirements of section 6.5 of this specification. Perform a leak test on all connections between the calibrated simulation device and your flow CPMS using the procedure specified in section 8.10 of this specification. Simulate a typical flow rate that is monitored by your flow CPMS under normal operating conditions. Allow sufficient time for the response of the calibrated simulation device to reach equilibrium. Record the flow rate measured by your flow CPMS. Using the flow rate simulated by the calibrated simulation device as the value for V_c, follow the procedure specified in section 12.2 of this specification to determine if your CPMS satisfies the accuracy requirement of Table 8 of this specification. If you determine that your CPMS satisfies the accuracy requirement of Table 8 of this specification, the validation check is complete. If the calculated accuracy does not meet the accuracy requirement of Table 8 of this specification, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this validation check until the accuracy requirement of Table 8 of this specification is satisfied. If you are required to measure and record flow rate at multiple locations, repeat this procedure for each location.

(6) Relative Accuracy (RA) Test. This method applies to any flow CPMS that measures gas flow rate. If your flow CPMS uses a differential flow tube as the flow sensor, you must use this method to validate your flow CPMS. The reference methods (RM's) applicable to this test are Methods 2, 2A, 2B, 2C, 2D, 2F of 40 CFR part 60, appendix A–1 and Method 2G of 40 CFR part 60, appendix A–2. Conduct three sets of RM tests. Mark the beginning and end of each RM test period on the flow CPMS chart recordings or other permanent record of output. Determine the integrated flow rate for each RM test period. Perform the same calculations specified by section 7.5 in PS–2 of this appendix. If the RA is no greater than 20 percent of the mean value of the RM test data, the RA test is complete. If the RA is greater than 20 percent of the mean value of the RM test data, check all system components and take any corrective action that is necessary to achieve the required RA. Repeat this RA test until the RA requirement of this section is satisfied. If you are required to measure and record flow rate at multiple locations, repeat this procedure for each location.

(7) Material Weight Comparison Method. This method applies to any solid mass flow CPMS that uses a combination of a belt conveyor and scale and is equipped with a totalizer. To conduct this test, pass a quantity of pre-weighed material over the belt conveyor in a manner consistent with actual loading conditions. To weigh the test quantity of material that is to be used during the initial validation, you must use a scale that satisfies the accuracy requirements of section 6.5 of this specification. The test quantity must be sufficient to challenge the conveyor belt-scale system for at least three revolutions of the belt. Record the length of the test. Calculate the mass flow rate using the measured weight and the recorded time. Using this mass flow rate as the value for V_c, follow the procedure specified in section 12.2 of this specification to determine if your CPMS satisfies the accuracy requirement of Table 8 of this specification. If you determine that your CPMS satisfies the accuracy requirement of Table 8 of this specification, the validation check is complete. If your CPMS does not satisfy the accuracy requirement of Table 8 of this specification, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this validation check until the accuracy requirement of Table 8 of this specification is satisfied. If you are required to measure and record flow rate at multiple locations, repeat this procedure for each location. In addition, you must perform an initial validation check on the integrator used by your material feed CPMS according to the manufacturer's specifications.

8.7 How do I perform an initial validation check of my pH CPMS? You must perform an initial validation check of your pH CPMS using either of the methods described in paragraphs (1) and (2) of this section.

(1) Comparison to Calibrated pH Measurement Device. Place a calibrated pH measurement device adjacent to your pH CPMS so that the calibrated test device is subjected to the same environment as your pH CPMS. The calibrated pH measurement device must satisfy the accuracy requirements specified in section 6.5 of this specification. Allow sufficient time for the response of the calibrated pH measurement device to reach equilibrium. With the process or control device that is monitored by your CPMS operating under normal conditions, concurrently record the pH measured by your pH CPMS and the calibrated pH measurement device. If concurrent readings are not possible, extract a sufficiently large sample from the process stream and perform measurements using a portion of the sample for each meter. Using the pH measured by the calibrated pH measurement device as the value for V_c, follow the procedure specified in section 12.2 of this specification to determine if your CPMS satisfies the accuracy requirement of Table 8 of this specification. If you determine that your CPMS satisfies the accuracy requirement of Table 8 of this specification, the validation check is complete. If your CPMS does not satisfy the accuracy requirement of Table 8 of this specification, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this validation check procedure until the accuracy requirement of Table 8 of this specification is satisfied. If you are required to measure and record pH at multiple locations, repeat this procedure for each location.

(2) Single Point Calibration. This method requires the use of a certified buffer solution. All buffer solutions used must be certified by NIST and accurate to ±0.02 pH units at 25 °C (77 °F). Set the temperature on your pH meter to the temperature of the buffer solution, typically room temperature or 25 °C (77 °F). If your pH meter is equipped with automatic temperature compensation, activate this feature before calibrating. Set your pH meter to measurement mode. Place the clean electrodes into the container of fresh buffer solution. If the expected pH of the process fluid lies in the acidic range (less than 7 pH), use a buffer solution with a pH value of 4.00. If the expected pH of the process fluid lies in the basic range (greater than 7 pH), use a buffer solution with a pH value of 10.00. Allow sufficient time for the response of your pH CPMS to reach equilibrium. Record the pH measured by your CPMS. Using the buffer solution pH as the value for V_c, follow the procedure specified in section 12.2 of this specification to determine if your CPMS satisfies the accuracy requirement of Table 8 of this specification. If you determine that your CPMS satisfies the accuracy requirement of Table 8 of this specification, the validation check is complete. If your CPMS does not satisfy the accuracy requirement of Table 8 of this procedure, calibrate your pH CPMS using the procedures specified in the manufacturer's owner's manual. If the manufacturer's owner's manual does not specify a two-point calibration procedure, you must perform a two-point calibration procedure based on ASTM D1293–99 (2005) (incorporated by reference—see § 60.17). If you are required to measure and record pH at multiple locations, repeat this procedure for each location.

8.8 How do I perform an initial validation check of my conductivity CPMS? You must perform an initial validation check of your conductivity CPMS using either of the methods described in paragraphs (1) and (2) of this section.

(1) Comparison to Calibrated Conductivity Measurement Device. Place a calibrated conductivity measurement device adjacent to your conductivity CPMS so that the calibrated measurement device is subjected to the same environment as your conductivity CPMS. The calibrated conductivity measurement device must satisfy the accuracy requirements specified in section 6.5 of this specification. Allow sufficient time for the response of the calibrated conductivity measurement device to reach equilibrium. With the process or control device that is monitored by your CPMS operating under normal conditions, concurrently record the conductivity measured by your conductivity CPMS and the calibrated conductivity measurement device. If concurrent readings are not possible, extract a sufficiently large sample from the process stream and perform measurements using a portion of the sample for each meter. Using the conductivity measured by the calibrated conductivity measurement device as the value for V_c, follow the procedure specified in section 12.2 of this specification to determine if your CPMS satisfies the accuracy requirement of Table 8 of this specification. If you determine that your CPMS satisfies the accuracy requirement of Table 8 of this specification, the validation check is complete. If your CPMS does not satisfy the accuracy requirement of Table 8 of this specification, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this validation check procedure until the accuracy requirement of Table 8 of this specification is satisfied. If you are required to measure and record conductivity at multiple locations, repeat this procedure for each location.

(2) Single Point Calibration. This method requires the use of a certified conductivity standard solution. All solutions used must be certified by NIST and accurate to ±2 percent micromhos per centimeter (μmhos/cm) (±2 percent microsiemens per centimeter (μS/cm)) at 25 °C (77 °F). Choose a conductivity standard solution that is close to the measuring range for best results. Since conductivity is dependent on temperature, the conductivity tester should have an integral temperature sensor that adjusts the reading to a standard temperature, usually 25 °C (77 °F). If the conductivity meter allows for manual temperature compensation, set this value to 25 °C (77 °F). Place the clean electrodes into the container of fresh conductivity standard solution. Allow sufficient time for the response of your CPMS to reach equilibrium. Record the conductivity measured by your CPMS. Using the conductivity standard solution as the value for V_c, follow the procedure specified in section 12.2 of this specification to determine if your CPMS satisfies the accuracy requirement of Table 8 of this specification. If you determine that your CPMS satisfies the

accuracy requirement of Table 8, the validation check is complete. If your CPMS does not satisfy the accuracy requirement of Table 8 of this procedure, calibrate your conductivity CPMS using the procedures specified in the manufacturer's owner's manual. If the manufacturer's owner's manual does not specify a calibration procedure, you must perform a calibration procedure based on ASTM D 1125–95 (2005) or ASTM D 5391–99 (2005) (incorporated by reference—see § 60.17). If you are required to measure and record conductivity at multiple locations, repeat this procedure for each location.

8.9 Are there any acceptable alternative procedures for installing and verifying my CPMS? You may use alternative procedures for installing and verifying the operation of your CPMS if the alternative procedures are approved by the Administrator. In addition, for temperature and pressure CPMS, you can use the methods specified in paragraphs (1) and (2) of this section, respectively, to satisfy the initial validation check.

(1) Alternative Temperature CPMS Validation Check. As an alternative to the procedures for the temperature CPMS initial validation check in this specification, you may use the methods listed in Table 6 of this specification to determine the accuracy of thermocouples or resistance temperature detectors. However, you also must check the accuracy of the overall CPMS system using the methods specified in section 8.4 of this specification or an alternative method that has been approved by the Administrator.

(2) Alternative Pressure CPMS Validation Check. As an alternative to the procedure for the pressure CPMS initial validation check in this specification, you may use the methods listed in Table 7 of this specification to check the accuracy of the pressure sensor associated with your pressure CPMS. However, you also must check the accuracy of the overall CPMS using the methods in section 8.5 of this specification or an alternative method that has been approved by the Administrator.

8.10 How do I perform a leak test on pressure connections, as required by this specification? You can satisfy the leak test requirements of sections 8.5 and 8.6 of this specification by following the procedures described in paragraphs (1) through (3) of this section.

(1) For each pressure connection, apply a pressure that is equal to the highest pressure the connection is likely to be subjected to or 0.24 kilopascals (1.0 inch of water column), whichever is greater.

(2) Close off the connection between the applied pressure source and the connection that is being leak-tested.

(3) If the applied pressure remains stable for at least 15 seconds, the connection is considered to be leak tight. If the applied pressure does not remain stable for at least 15 seconds, take any corrective action necessary to make the connection leak tight and repeat this leak test procedure.

9.0 *What ongoing quality control measures are required?*

Ongoing quality control procedures for CPMS are specified in Procedure 4 of appendix F of this part.

10.0 *Calibration and Standardization* [Reserved]

11.0 *Analytical Procedure* [Reserved]

12.0 *What calculations are needed?*

The calculations needed to comply with this performance specification are described in sections 12.1 and 12.2 of this specification.

12.1 How do I determine if a calibrated measurement device satisfies the accuracy hierarchy specified in section 6.5 of this specification. To determine if a calibrated measurement device satisfies the accuracy hierarchy requirement, follow the procedure described in paragraphs (1) and (2) of this section.

(1) Calculate the accuracy hierarchy (A_h) using Equation 17–1.

$$A_h = \frac{A_r}{A_c} \qquad \text{(Eq. 17-1)}$$

Where:

A_h = Accuracy hierarchy, dimensionless.

A_r = Required accuracy (A_p or A_v) specified in Table 8 of this specification, percent or units of parameter value (e.g., degrees Celsius, kilopascals, liters per minute).

A_c= Accuracy of calibrated measurement device, same units as A_r.

(2) If the accuracy hierarchy (A_h) is equal to or greater than 3.0, the calibrated measurement device satisfies the accuracy hierarchy of Section 6.5 of this specification.

12.2 How do I determine if my CPMS satisfies the accuracy requirement of PS–17? To determine if your CPMS satisfies the accuracy requirement of PS–17, follow the procedure described in paragraphs (1) through (4) of this section.

(1) If your CPMS measures temperature, pressure, or flow rate, calculate the accuracy percent value (A_{pv}) using Equation 17–2. If your CPMS measures pH, proceed to paragraph (2) of this section.

$$A_{pv} = V_c \quad \frac{A_p}{100} \qquad \text{(Eq. 17-2)}$$

Where:

A_{pv} = Accuracy percent value, units of parameter measured (e.g., degrees Celsius, kilopascals, liters per minute).

V_c = Parameter value measured by the calibrated measurement device or measured by your CPMS when a calibrated signal simulator is applied to your CPMS during the initial validation check, units of parameter measured (e.g., degrees Celsius, kilopascals, liters per minute).

A_p = Accuracy percentage specified in Table 8 of this specification that corresponds to your CPMS, percent.

(2) If your CPMS measures temperature, pressure, or flow rate other than mass flow rate or steam flow rate, compare the accuracy percent value (A_{pv}) to the accuracy value (A_v) in Table 8 of this specification and select the greater of the two values. Use this greater value as the allowable deviation (d_a) in paragraph (4) of this section. If your CPMS measures pH, use the accuracy value (A_v) specified in Table 8 of this specification as the allowable deviation (d_a). If your CPMS measures steam flow rate, mass flow rate, or conductivity, use the accuracy percent value (A_{pv}) calculated using Equation 17–2 as the allowable deviation (d_a).

(3) Using Equation 17–3, calculate the measured deviation (d_m), which is the absolute value of the difference between the parameter value measured by the calibrated device (V_c) and the value measured by your CPMS (V_m).

$$d_m = |V_c - V_m| \qquad \text{(Eq. 17-3)}$$

Where:

d_m = Measured deviation, units of the parameter measured (e.g., degrees Celsius, kilopascals, liters per minute).

V_c = Parameter value measured by the calibrated measurement device or measured by your CPMS when a calibrated signal simulator is applied to your CPMS during the initial validation check, units of parameter measured (e.g., degrees Celsius, kilopascals, liters per minute).

V_m = Parameter value measured by your CPMS during the initial validation check, units of parameter measured (e.g., degrees Celsius, kilopascals, liters per minute).

(4) Compare the measured deviation (d_m) to the allowable deviation (d_a). If the measured deviation is less than or equal to the allowable deviation, your CPMS satisfies the accuracy requirement of this specification.

13.0 *What initial performance criteria must I demonstrate for my CPMS to comply with PS–17?*

You must demonstrate that your CPMS meets the accuracy requirements specified in Table 8 of this specification.

14.0 *What are the recordkeeping requirements for PS–17?*

You must satisfy the recordkeeping requirements specified in Sections 14.1 and 14.2 of this specification.

14.1 What data does PS–17 require me to record for my CPMS? For each affected CPMS that you operate, you must record the information listed in paragraphs (1) through (6) of this section.

(1) Identification and location of the CPMS;

(2) Manufacturer's name and model number of the CPMS;

(3) Range of parameter values you expect your CPMS to measure and record;

(4) Date of the initial calibration and system validation check;

(5) Results of the initial calibration and system validation check; and

(6) Name of the person(s) who performed the initial calibration and system validation check.

14.2 For how long must I maintain the data that PS–17 requires me to record for my CPMS? You are required to keep the records required by this specification for your CPMS for a period of 5 years. At a minimum, you must maintain the most recent 2 years of data onsite and available for inspection by the enforcement agency.

15.0 *Pollution Prevention* [Reserved]

16.0 *Waste Management* [Reserved]

17.0 *Which references are relevant to PS–17?*

1. Technical Guidance Document: Compliance Assurance Monitoring. U.S. Environmental Protection Agency Office of Air Quality Planning and Standards Emission Measurement Center. August 1998. (*http://www.epa.gov/ttn/emc/cam.html*).

2. NEMA Standard Publication 250. ''Enclosures for Electrical Equipment (1000 Volts Maximum)''. National Electrical Manufacturers Association. 1997.

3. ASTM E–220–86 (1996): Standard Test Methods for Calibration of Thermocouples by Comparison Techniques. American Society for Testing and Materials. May 1986.

4. MC96–1–1982: Temperature Measurement Thermocouples. American National Standards Institute. August 1982.

5. The pH and Conductivity Handbook. Omega Engineering, Inc. 1995.

6. ASTM E–452–89: ''Standard Test Method for Calibration of Refractory Metal Thermocouples Using an Optical Pyrometer''. American Society of Testing and Materials. April 1989.

7. ASTM E 644–06: ''Standard Test Methods for Testing Industrial Resistance Thermometers''. American Society of Testing and Materials. 2006.

8. ASME B 40.100–2005: ''Pressure Gauges and Gauge Attachments''. American Society of Mechanical Engineers. 2005.

9. ASTM E 251–92 (2003): ''Standard Test Methods for Performance Characteristics of Metallic Bonded Resistance Strain Gages''. American Society for Testing and Materials. 2003.

10. ASHRAE 41.8–1989: ''Standard Methods of Measurement of Flow of Liquids in Pipes Using Orifice Flow Meters''. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. 1989.

11. ISA RP 16.6–1961: ''Methods and Equipment for Calibration of Variable Area Meters (Rotameters)''. Instrumentation, Systems, and Automation Society. 1961.

12. ANSI/ISA–RP31.1–1977: ''Specification, Installation, and Calibration of Turbine Flow Meters''. Instrumentation, Systems, and Automation Society. 1977.

13. ASTM E 1–95: ''Standard Specifications for ASTM Thermometers''. American Society for Testing and Materials. 1995.

14. ANSI/ASHRAE 41.1–1986: ''Standard Method for Temperature Measurement'' American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. February 1987.

15. ANSI/ASHRAE 41.3–1989: ''Standard Method for Pressure Measurement''. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. 1989.

16. ISA RP 16.5–1961: ''Installation, Operation, and Maintenance Instructions for Glass Tube Variable Area Meters (Rotameters)''. Instrumentation, Systems, and Automation Society. 1961.

17. ASME MFC–3M–2004: ''Measurement of Fluid Flow in Pipes Using Orifice, Nozzle, and Venturi''. American Society of Mechanical Engineers. 1989.

18. ASTM E–1137–97: ''Standard Specification for Industrial Platinum Resistance Thermometers''. American Society for Testing and Materials. 1997.

19. The Temperature Handbook. Omega Engineering, Inc. 2000.

20. The Pressure, Strain and Force Handbook. Omega Engineering, Inc. 1999.

21. The Flow and Level Handbook. Omega Engineering, Inc. 2000.

22. ASTM D–5464–93 (1997): ''Standard Test Methods for pH Measurement of Water of Low Conductivity''. American Society for Testing and Materials. 1993.

23. ASTM D–1293–99: ''Standard Test Methods for pH of Water''. American Society for Testing and Materials. 1999.

24. ANSI/ASME MFC–4M–1986 (R2003): ''Measurement of Gas Flow by Turbine Meters''. American Society of Mechanical Engineers. 2003.

25. ASME/ANSI MFC–6M–1987: ''Measurement of Fluid Flow in Pipes Using Vortex Flow Meters''. American Society of Mechanical Engineers. 1987.

26. ASME/ANSI MFC–7M–1987: ''Measurement of Gas Flow by Means of Critical Flow Venturi Nozzles''. American Society of Mechanical Engineers. 1987.

27. ASME/ANSI MFC–9M–1988: ''Measurement of Liquid Flow in Closed Conduits by Weighing Method''. American Society of Mechanical Engineers. 1989.

28. ASME/ANSI MFC–10M–1994: ''Measurement of Liquid Flow in Closed Conduits by Volumetric Method''. American Society of Mechanical Engineers. 1994.

29. ISO 8316:1987: ''Measurement of Liquid Flow in Closed Conduits-Method by Collection of Liquid in a Volumetric Tank''. International Organization for Standardization. 1987.

30. NIST Handbook 44—2002 Edition: ''Specifications, Tolerances, And Other Technical Requirements for Weighing and Measuring Devices, as adopted by the 86th National Conference on Weights and Measures 2001'', Section 2.21: ''Belt-Conveyor Scale Systems''.

31. ISO 10790:1999: ''Measurement of Fluid Flow in Closed Conduits-Guidance to the Selection, Installation, and Use of Coriolis Meters (Mass Flow, Density and Volume Flow Measurements''. International Organization for Standardization. 1999.

32. ASTM D 1125–95 (2005): ''Standard Test Methods for Electrical Conductivity and Resistivity of Water''. American Society for Testing and Materials. 2005.

33. ASTM D 5391–99 (2005): ''Standard Test Method for Electrical Conductivity and Resistivity of a Flowing High Purity Water Sample''. American Society for Testing and Materials. 2005.

18.0 *What tables are relevant to PS–17?*

TABLE 1—SENSOR COMPONENTS OF COMMONLY USED CPMS

For a CPMS that measures . . .	Using a . . .	The sensor component consists of the . . .
1. Temperature	a. Thermocouple	Thermocouple.
	b. Resistance temperature detector (RTD)	RTD.
	c. Optical pyrometer	Optical assembly and detector.
	d. Thermistor	Thermistor.
	e. Temperature transducer	Integrated circuit sensor?
2. Pressure	a. Pressure gauge	Gauge assembly, including bourdon element, bellows element, or diaphragm.
	b. Pressure transducer	Strain gauge assembly, capacitance assembly, linear variable differential transformer, force balance assembly, potentiometer, variable reluctance assembly, piezoelectric assembly, or piezoresistive assembly.
	c. Manometer	U-tube or differential manometer.
3. Flow rate	a. Differential pressure device	Flow constricting element (nozzle, Venturi, or orifice plate) and differential pressure sensor.
	b. Differential pressure tube	Pitot tube, or other array of tubes that measure velocity pressure and static pressure, and differential pressure sensor.
	c. Magnetic flow meter	Magnetic coil assembly.

TABLE 1—SENSOR COMPONENTS OF COMMONLY USED CPMS—Continued

For a CPMS that measures . . .	Using a . . .	The sensor component consists of the . . .
	d. Positive displacement flow meter	Piston, blade, vane, propeller, disk, or gear assembly.
	e. Turbine flow meter	Rotor or turbine assembly.
	f. Vortex formation flow meter	Vortex generating and sensing elements.
	g. Fluidic oscillating flow meter	Feedback passage, side wall, control port, and thermal sensor.
	h. Ultrasonic flow meter	Sonic transducers, receivers, timer, and temperature sensor.
	i. Thermal flow meter	Thermal element and temperature sensors.
	j. Coriolis mass flow meter	U-tube and magnetic sensing elements.
	k. Rotameter	Float assembly.
	l. Solids flow meter	Sensing plate.
	m. Belt conveyor	Scale.
4. pH	pH meter	Electrode.
5. Conductivity	Conductivity meter	Electrode.

TABLE 2—DESIGN STANDARDS FOR TEMPERATURE SENSORS

If the sensor is a . . .	You can use the following design standards as guidance in selecting a sensor for your CPMS . . .
1. Thermocouple	a. ASTM E235–88 (1996), "Specification for Thermocouples, Sheathed, Type K, for Nuclear or Other High-Reliability Applications."
	b. ASTM E585/E 585M–04, "Specification for Compacted Mineral-Insulated, Metal-Sheathed, Base Metal Thermocouple Cables."
	c. ASTM E608/E 608M–06, "Specification for Mineral-Insulated, Metal-Sheathed Base Metal Thermocouples."
	d. ASTM E696–07, "Specification for Tungsten-Rhenium Alloy Thermocouple Wire."
	e. ASTM E1129/E 1129M–98 (2002), "Standard Specification for Thermocouple Connectors."
	f. ASTM E1159–98 (2003), "Specification for Thermocouple Materials, Platinum-Rhodium Alloys, and Platinum."
	g. ISA–MC96.1–1982, "Temperature Measurement Thermocouples."
2. Resistance temperature detector	ASTM E1137/E1137M–04, "Standard Specification for Industrial Platinum Resistance Thermometers."

TABLE 3—STANDARDS FOR THE INSTALLATION OF FLOW SENSORS

If the sensor of your flow CPMS is a . . .	You should install the flow sensor according to . . .
1. Differential pressure device	ASME MFC–3M–2004, "Measurement of Fluid Flow in Pipes Using Orifice, Nozzle, and Venturi".
2. Critical flow venturi flow meter used to measure gas flow rate.	ASME/ANSI MFC–7M–1987 (R2001), "Measurement of Gas Flow by Means of Critical Flow Venturi Nozzles".
3. Turbine flow meter	ANSI/ISA RP 31.1–1977, "Recommended Practice: Specification, Installation, and Calibration of Turbine Flowmeters", or, if used for gas flow measurement, ANSI/ASME MFC–4M–1986 (R2003), "Measurement of Gas Flow by Turbine Meters".
4. Rotameter	ISA RP 16.5–1961, "Installation, Operation, and Maintenance Instructions for Glass Tube Variable Area Meters (Rotameters)".
5. Coriolis mass flow meter	ISO 10790:1999, "Measurement of fluid flow in closed conduits—Guidance to the selection, installation and use of Coriolis meters (mass flow, density and volume flow measurements).
6. Vortex formation flow meter	ASME/ANSI MFC–6M–1998 (R2005), "Measurement of Fluid Flow in Pipes Using Vortex Flow Meters".

TABLE 4—VOLUMETRIC METHODS FOR INITIAL VALIDATION CHECK OF FLOW METERS

Designation	Title
1. ISA RP 16.6–1961	"Methods and Equipment for Calibration of Variable Area Meters (Rotameters)".
2. ANSI/ISA RP 31.1–1977	"Specification, Installation, and Calibration of Turbine Flow Meters".
3. ISO 8316:1987	"Measurement of Liquid Flow in Closed Conduits—Method by Collection of Liquid in a Volumetric Tank".

TABLE 5—WEIGHING METHODS FOR INITIAL VALIDATION CHECK OF FLOW METERS

Designation	Title
1. ASHRAE 41.8–1989	"Standard Methods of Measurement of Flow of Liquids in Pipes Using Orifice Flow Meters".
2. ISA RP 16.6–1961	"Methods and Equipment for Calibration of Variable Area Meters (Rotameters)".
3. ANSI/ISA RP 31.1–1977	"Specification, Installation, and Calibration of Turbine Flow Meters".

TABLE 5—WEIGHING METHODS FOR INITIAL VALIDATION CHECK OF FLOW METERS—Continued

Designation	Title
4. ANSI/ASME MFC–9M–1988	"Measurement of Liquid Flow in Closed Conduits by Weighing Method".

TABLE 6—ALTERNATE METHODS FOR INITIAL VALIDATION CHECK OF TEMPERATURE SENSORS

If the temperature sensor in your CPMS is a . . .	And is used in . . .	You can perform the initial validation check of the sensor using . . .
1. Thermocouple	Any application	ASTM E220–07e1.
2. Thermocouple	A reducing environment	ASTM E452–02 (2007).
3. Resistance temperature detector	Any application	ASTM E644–06.

TABLE 7—ALTERNATE METHODS FOR INITIAL VALIDATION CHECK OF PRESSURE SENSORS

If the pressure sensor in your CPMS is a . . .	You can perform the initial validation check of the sensor using . . .
1. Pressure gauge	ASME B40.100–2005.
2. Metallic bonded resistance strain gauge	ASTM E251–92 (2003).

TABLE 8—CPMS ACCURACY REQUIREMENTS

If your CPMS measures . . .	You must demonstrate that your CPMS operates within . . .
1. Temperature, in a non-cryogenic application.	An accuracy percentage (A_p) of ±1.0 percent of the temperature measured in degrees Celsius or within an accuracy value (A_v) of 2.8 degrees Celsius (5 degrees Fahrenheit), whichever is greater.
2. Temperature, in a cryogenic application.	An accuracy percentage (A_p) of ±2.5 percent of the temperature measured in degrees Celsius or within an accuracy value (A_v) of 2.8 degrees Celsius (5 degrees Fahrenheit), whichever is greater.
3. Pressure	An accuracy percentage (A_p) of ±5 percent or an accuracy value (A_v) of 0.12 kilopascals (0.5 inches of water column), whichever is greater.
4. Liquid flow rate	An accuracy percentage (A_p) of ±5 percent or an accuracy value (A_v) of 1.9 liters per minute (0.5 gallons per minute), whichever is greater.
5. Gas flow rate	a. A relative accuracy of ±20 percent, if you demonstrate compliance using the relative accuracy test, or b. An accuracy percentage (A_p) of ±10 percent, if your CPMS measures steam flow rate, or c. An accuracy percentage (A_p) of ±5 percent or an accuracy value (A_v) of 280 liters per minute (10 cubic feet per minute), whichever is greater, for all other gases and accuracy audit methods.
6. Mass flow rate	An accuracy percentage (A_p) of ±5 percent.
7. pH	An accuracy value (A_v) of ±0.2 pH units.
8. Conductivity	An accuracy percentage (A_p) of ±5 percent.

5. Appendix F to part 60 is amended as follows:

a. In Procedure 1, by:

i. Revising the second (last) sentence in the first paragraph of section 1.1; and

ii. Adding sections 4.1.1, 4.1.2, 4.3.3, 4.4.1, 5.5.5, and 5.1.7.

b. Adding Procedure 4 in numerical order to read as follows:

Appendix F to Part 60—Quality Assurance Procedures

Procedure 1. Quality Assurance Requirements for Gas Continuous Emission Monitoring Systems Used for Compliance Determination

1. Applicability and Principle

1.1 * * * The CEMS may include systems that monitor one pollutant (e.g., SO_2 or NO_X), a combination of pollutants (e.g., benzene and hexane), or diluents (e.g., O_2 or CO_2).

* * * * *

4. CD Assessment

* * * * *

4.1.1 Multiple Organic Pollutant CEMS. Source owners and operators of gas chromatographic CEMS that are subject to PS 9 and are used to monitor multiple organic pollutants must perform the daily CD requirement specified in section 4.1 of this procedure using any one of the target pollutants specified in the applicable regulation.

4.1.2 CEMS Subject to PS 15. To satisfy the daily CD requirement of this procedure, source owners and operators of extractive Fourier Transfer Infrared (FTIR) CEMS that are subject to PS 15 must perform at least once daily the calibration transfer standards check, analyte spike check, and background deviation check specified in PS–15 (40 CFR part 60, appendix B), sections 10.1, 10.4, and 10.6, respectively. The analyte spike check can be performed using any of the target analytes.

* * * * *

4.3.3 Out-of-Control Definition for CEMS Subject to PS 15. If the calibration transfer standards check, analyte spike check, or background deviation check exceeds twice the accuracy criterion of ±5 percent for five, consecutive daily periods, the CEMS is out of control. If the calibration transfer standards check, analyte spike check, or background deviation check exceeds four times the accuracy criterion of ±5 percent during any daily calibration check, the CEMS is out of control. If the CEMS is out of control, take necessary corrective action. Following corrective action, repeat the calibration checks specified in this section.

* * * * *

4.4.1 Data Storage Requirements for CEMS Subject to PS 15. In addition to the requirements of section 4.4 of this procedure, source owners and operators of CEMS subject to PS–15 (40 CFR part 60, appendix B) must satisfy the data storage requirements of section 6.3 of PS–15.

* * * * *

5. Data Accuracy Assessment

* * * * *

5.1.5 Audits for CEMS Subject to PS 9. For CEMS that are subject to PS 9, the requirements of section 5.1 of this procedure apply, with the following exceptions:

(1) The RATA specified in sections 5.1.1 and 5.1.4 of this procedure does not apply.

(2) The CGA must be conducted every calendar quarter.

(3) The CGA must be conducted according to the procedures specified in section 5.3 of PS–9 (40 CFR part 60, appendix B), except that the audit must be performed at two points as specified in section 5.1.2 of this procedure.

(4) The CGA must be conducted for each target pollutant specified in the applicable regulation.

(5) The RAA specified in section 5.1.3 of this procedure does not apply.

(6) Audits conducted under this procedure fulfill the requirement of section 5.3 of PS–9 (40 CFR part 60, appendix B) for quarterly performance audits.

5.1.6 Audits for CEMS Subject to PS–15. For CEMS that are subject to PS–15 (40 CFR part 60, appendix B), the requirements of section 5.1 of this procedure apply, with the following exceptions:

(1) The RATA specified in sections 5.1.1 and 5.1.4, the CGA specified in section 5.1.2, and the RAA specified in section 5.1.3 of this procedure do not apply.

(2) To satisfy the quarterly accuracy audit requirement of this procedure, one of the accuracy checks specified in PS–15 (40 CFR part 60, appendix B), sections 9.1 (Audit Sample), 9.2 (Audit Spectra), and 9.3 (Submit Spectra for Independent Analysis) must be performed at least once each calendar quarter, consistent with the following additional criteria:

(i) The audit sample check, specified in section 9.1 of PS–15 (40 CFR part 60, appendix B), must be conducted at least once every four calendar quarters.

(ii) The audit spectra check, specified in section 9.2 of PS–15 (40 CFR part 60, appendix B), can be used to satisfy the quarterly accuracy audit requirement only once every four calendar quarters.

(3) Audits conducted under this procedure fulfill the requirement of section 9 of PS–15 (40 CFR part 60, appendix B) for quarterly or semiannual QA/QC checks on the operation of extractive FTIR CEMS.

* * * * *

Procedure 4. Quality Assurance Requirements for Continuous Parameter Monitoring Systems at Stationary Sources

1.0 *What is the purpose of this procedure?*

The purpose of this procedure is to establish the minimum requirements for evaluating on an ongoing basis the quality of data produced by your continuous parameter monitoring system (CPMS), and the effectiveness of quality assurance (QA) and quality control (QC) procedures that you have developed for your CPMS. This procedure applies instead of the QA and QC requirements for applicable CPMS specified in any applicable subpart to parts 60, 61, or 63, unless otherwise specified in the applicable subpart. This procedure presents requirements in general terms to allow you to develop a QC program that is most effective for your circumstances. This procedure does not restrict your current QA/QC procedures to ensure compliance with applicable regulations. Instead, you are encouraged to develop and implement a more extensive QA/QC program or to continue such programs where they already exist.

1.1 To what types of devices does Procedure 4 apply? This procedure applies to any CPMS that is subject to Performance Specification 17 (PS–17).

1.2 When must I comply with Procedure 4? You must comply with this procedure when conditions (1) or (2) of this section occur.

(1) At the time you install and place into operation a CPMS that is subject to PS–17.

(2) At the time any of your existing CPMS become subject to PS–17.

1.3 How does Procedure 4 affect me if I am also subject to QA procedures under another applicable subpart? This procedure does not apply if any more stringent QA requirements apply to you under an applicable requirement. You are required to comply with the more stringent of the applicable QA requirements.

2.0 *What are the basic requirements of Procedure 4?*

This procedure requires all owners and operators of a CPMS to perform periodic QA evaluations of CPMS performance and to develop and implement QC programs to ensure that CPMS data quality is maintained.

2.1 What types of procedures are required for me to demonstrate compliance? This procedure requires you to meet the requirements of paragraphs (1) and (2) of this section.

(1) Perform periodic accuracy audits of your CPMS; and

(2) Take corrective action when your CPMS fails to meet the accuracy requirements of this procedure.

2.2 What types of recordkeeping and reporting activities are required by Procedure 4? This procedure does not have any reporting requirements but does require you to record and maintain data that identify your CPMS and show the results of any performance demonstrations of your CPMS. Recordkeeping requirements are specified in section 14 of this procedure.

3.0 *What special definitions apply to Procedure 4?*

3.1 Accuracy. A measure of the closeness of a measurement to the true or actual value.

3.2 Accuracy hierarchy. The ratio of the accuracy of a measurement instrument to the accuracy of a calibrated instrument or standard that is used to measure the accuracy of the measurement instrument. For example, if the accuracy of a calibrated temperature measurement device is 0.2 percent, and the accuracy of a thermocouple is 1.0 percent, the accuracy hierarchy is 5.0 ($1.0 \div 0.2 = 5.0$).

3.3 Calibration drift. The difference between a reference value and the output value of a CPMS after a period of operation during which no unscheduled maintenance, repair, or adjustment took place.

3.4 Conductivity CPMS. The total equipment that is used to measure and record liquid conductivity on a continuous basis.

3.5 Continuous parameter monitoring system (CPMS). The total equipment that is used to measure and record parameters, such as temperature, pressure, liquid flow rate, gas flow rate, mass flow rate, pH or conductivity, in one or more locations on a continuous basis.

3.6 Differential pressure tube. A device, such as a pitot tube, that consists of one or more pairs of tubes that are oriented to measure the velocity pressure and static pressure at one of more fixed points within a duct for the purpose of determining gas velocity.

3.7 Electronic components. The electronic signal modifier or conditioner, transmitter, and power supply associated with a CPMS.

3.8 Flow CPMS. The total equipment that is used to measure liquid flow rate, gas flow rate, or mass flow rate on a continuous basis.

3.9 Mass flow rate. The measurement of solid, liquid, or gas flow in units of mass per time, such as kilograms per minute or tons per hour.

3.10 Mechanical component. Any component of a CPMS that consists of or includes moving parts or that is used to apply or transfer force to another component or part of a CPMS.

3.11 pH CPMS. The total equipment that is used to measure and record liquid pH on a continuous basis.

3.12 Pressure CPMS. The total equipment that is used to measure and record the pressure of a liquid or gas at any location or the differential pressure of a gas or liquid at any two locations on a continuous basis.

3.13 Resolution. The smallest detectable or legible increment of measurement.

3.14 Sensor. The component of a CPMS that senses the parameter being measured (currently temperature, pressure, liquid flow rate, gas flow rate, mass flow rate, pH, or conductivity) and generates an output signal. Table 1 identifies the sensor components of some commonly used CPMS.

3.15 Solid mass flow rate. The measurement in units of mass per time of the rate at which a solid material is processed or transferred. Examples of solid mass flow rate are the rate at which ore is fed to a material dryer or the rate at which powdered lime is injected into an exhaust duct.

3.16 Temperature CPMS. The total equipment that is used to measure and record the temperature of a liquid or gas at any location or the differential temperature of a gas or liquid at any two locations on a continuous basis.

3.17 Total equipment. The sensor, mechanical components, electronic components, data recording, electrical wiring, and other components of a CPMS.

4.0 *Interferences* [Reserved]

5.0 *What do I need to know to ensure the safety of persons who perform the accuracy audits specified in Procedure 4?*

The accuracy audits required under Procedure 4 may involve hazardous materials, operations, site conditions, and equipment. This QA procedure does not purport to address all of the safety issues associated with these audits. It is the responsibility of the user to establish appropriate safety and health practices and determine the applicable regulatory limitations prior to performing these audits.

6.0 *What are the equipment requirements for Procedure 4?*

6.1 What types of equipment do I need for performing the accuracy audit of my CPMS? The specific types of equipment that you need for your CPMS accuracy audit depend on the type of CPMS, site-specific conditions, and the method that you choose for conducting the accuracy audit, as specified in sections 8.1 through 8.5 of this procedure. In most cases, you will need the equipment described in paragraphs (1) and (2) of this section.

(1) A separate device that either measures the same parameter that your CPMS measures, or that simulates the same electronic signal or response that your CPMS generates, and

(2) Any test ports, pressure taps, valves, fittings, or other equipment required to perform the specific procedures of the accuracy audit method that you choose, as specified in section 8.1 of this procedure.

6.2 What are the accuracy requirements for the equipment that I use to audit the accuracy of my CPMS? Unless you meet one of the exceptions listed in section 6.3 of this procedure, any measurement instrument or device that you use to conduct an accuracy audit of your CPMS must have an accuracy that is traceable to National Institute of Standards and Technology (NIST) standards and must have an accuracy hierarchy of at least three. To determine if a measurement instrument or device satisfies this accuracy hierarchy requirement, follow the procedure described in section 12.1 of this procedure.

6.3 Are there any exceptions to the accuracy requirement of section 6.2 of this procedure? There are three exceptions to the NIST-traceable accuracy requirement specified in section 6.2, as described in paragraphs (1) through (3) of this section.

(1) If you perform an accuracy audit of your CPMS by comparison to a redundant CPMS, you need not meet the NIST-traceability requirement of section 6.2; however, the redundant CPMS must have an accuracy equal to or better than the corresponding minimum required accuracy specified in Table 6 of this procedure for that specific type of CPMS.

(2) As an alternative for the calibrated pressure measurement device with NIST-traceable accuracy that is required in paragraphs (2) and (4) of section 8.2 and in paragraph (4) of section 8.3 of this specification, you can use a mercury-in-glass or water-in-glass U-tube manometer to check the accuracy of your pressure CPMS.

(3) When validating a flow rate CPMS using the methods specified in paragraphs (2), (3), or (7) of section 8.3 of this specification, the container used to collect or weigh the liquid or solid is not required to have NIST-traceable accuracy.

7.0 *What reagents or standards do I need to comply with Procedure 4?*

The specific reagents and standards needed to demonstrate compliance with this procedure depend upon the parameter that your CPMS measures and the method that you choose to check the accuracy of your CPMS. Sections 8.1 through 8.5 of this procedure identify the specific reagents and standards that you will need to conduct accuracy audits of your CPMS.

8.0 *What quality assurance and quality control measures are required by Procedure 4 for my CPMS?*

You must perform accuracy audits, meet the accuracy requirements of this procedure, and perform any additional checks of the CPMS as specified in sections 8.1 through 8.9 of this procedure.

8.1 How do I perform an accuracy audit for my temperature CPMS? To perform the accuracy audit, you can choose one of the methods described in paragraphs (1) through (3) of this section.

(1) Comparison to Redundant Temperature Sensor. This method requires your CPMS to have a primary temperature sensor and a redundant temperature sensor. The redundant temperature sensor must be installed adjacent to the primary temperature sensor and must be subject to the same environment as the primary temperature sensor. To perform the accuracy audit, record three pairs of concurrent temperature measurements within a 24-hour period. Each pair of concurrent measurements must consist of a temperature measurement by each of the two temperature sensors. The minimum time interval between any two such pairs of consecutive temperature measurements is one hour. You must take these readings during periods when the process or control device that is being monitored by the CPMS is operating normally. Calculate the mean of the three values for each temperature sensor. The mean values must agree within the minimum required accuracy specified in Table 6 of this procedure. If your CPMS satisfies the accuracy requirement of Table 6, the accuracy audit is complete. If your CPMS does not satisfy the accuracy requirement of Table 6 of this procedure, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this accuracy audit procedure until the accuracy requirement of Table 6 of this procedure is satisfied. If you replace any electrical or mechanical components of your temperature CPMS, you must perform the procedures outlined in PS–17. If you are required to measure and record temperatures at multiple locations, repeat this procedure for each location.

(2) Comparison to Calibrated Temperature Measurement Device. Place the sensor of a calibrated temperature measurement device adjacent to the sensor of your temperature CPMS in a location that is subject to the same environment as the sensor of your temperature CPMS. The calibrated temperature measurement device must satisfy the accuracy requirements specified in section 6.2 of this procedure. Allow sufficient time for the response of the calibrated temperature measurement device to reach equilibrium. With the process or control device that is monitored by your CPMS operating under normal conditions, record concurrently the temperatures measured by your temperature CPMS and the calibrated temperature measurement device. Using the temperature measured by the calibrated measurement device as the value for V_c, follow the procedure specified in section 12.2 of this procedure to determine if your CPMS satisfies the accuracy requirement of Table 6 of this procedure. If you determine that your CPMS satisfies the accuracy requirement of Table 6 of this procedure, the accuracy audit is complete. If your CPMS does not satisfy the accuracy requirement of Table 6 of this procedure, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this procedure until the accuracy requirement of Table 6 of this procedure is satisfied. If you replace any electrical or mechanical components of the primary CPMS, you must perform the procedures outlined in PS–17 (40 CFR part 60, appendix B). If you are required to measure and record temperatures at multiple locations, repeat this procedure for each location.

(3) Separate Sensor Check and System Check by Temperature Simulation. This method applies to temperature CPMS that use either a thermocouple or a resistance temperature detector as the temperature sensor. First, perform the temperature sensor check using the appropriate ASTM standard listed in Table 2 of this procedure. To perform the system check, record the temperature using your temperature CPMS with the process or control device that is monitored by your temperature CPMS operating under normal conditions. Under the same operating conditions, disconnect the sensor from the CPMS system and connect a calibrated simulation device that is designed to simulate the same type of response as the CPMS sensor. The simulation device must satisfy the accuracy requirements specified in section 6.2 of this procedure. Within 15 minutes of measuring and recording the temperature using your temperature CPMS, simulate the same temperature recorded for the temperature CPMS. Allow sufficient time for the response of the simulation device to reach equilibrium. Using the temperature simulated by the calibrated simulation device as the value for V_c, follow the procedure specified in section 12.2 of this procedure to determine if your CPMS satisfies the accuracy requirement of Table 6 of this procedure. If you determine that your CPMS satisfies the accuracy requirement of Table 6 of this procedure, the accuracy audit is complete. If the calculated accuracy does not meet the accuracy requirement of Table 6 of this procedure, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this procedure until the accuracy requirement of Table 6 of this procedure is satisfied. If you replace any electrical or mechanical components of your temperature CPMS, you must perform the procedures outlined in PS–17. If you are required to measure and record temperatures at multiple locations, repeat this procedure for each location.

8.2 How do I perform an accuracy audit for my pressure CPMS? To perform the accuracy audit, you can choose one of the methods described in paragraphs (1) through (4) of this section.

(1) Comparison to redundant pressure sensor. This method requires your CPMS to

have a primary pressure sensor and a redundant pressure sensor. The redundant pressure sensor must be installed adjacent to the primary pressure sensor and must be subject to the same environment as the primary pressure sensor. To perform the accuracy audit, record three pairs of concurrent pressure measurements within a 24-hour period. Each pair of concurrent measurements must consist of a pressure measurement by each of the two pressure sensors. The minimum time interval between any two such pairs of consecutive pressure measurements is one hour. You must take these readings during periods when the process or control device that is being monitored by the CPMS is operating normally. Calculate the mean of the three values for each pressure sensor. The mean values must agree within the minimum required accuracy specified in Table 6 of this procedure. If your CPMS satisfies the accuracy requirement of Table 6 of this procedure, the accuracy audit is complete. If your CPMS does not satisfy the accuracy requirement of Table 6 of this procedure, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this accuracy audit procedure until the accuracy requirement of Table 6 of this procedure is satisfied. If you replace any electrical or mechanical components of your pressure CPMS, you must perform the procedures outlined in PS–17 (40 CFR part 60, appendix B). If you are required to measure and record pressure at multiple locations, repeat this procedure for each location.

(2) Comparison to Calibrated Pressure Measurement Device. With the process or control device that is monitored by your pressure CPMS operating under normal conditions, record the pressure at each location that is monitored by your pressure CPMS. For each pressure monitoring location, connect the process lines from the process or emission control device that is monitored by your pressure CPMS to a mercury-in-glass U-tube manometer, a water-in-glass U-tube manometer, or calibrated pressure measurement device. If a calibrated pressure measurement device is used, the device must satisfy the accuracy requirements of section 6.2 of this procedure. The calibrated pressure measurement device must also have a range equal to or greater than the range of your pressure CPMS. Perform a leak test on all manometer or calibrated pressure measurement device connections using the method specified in section 8.9 of this procedure. Allow sufficient time for the response of the calibrated pressure measurement device to reach equilibrium. Within 30 minutes of measuring and recording the corresponding pressure using your CPMS, record the pressure measured by the calibrated pressure measurement device at each location. Using the pressure measured by the calibrated pressure measurement device as the value for V_c, follow the procedure specified in section 12.2 of this procedure to determine if your CPMS satisfies the accuracy requirement of Table 6 of this procedure. If you determine that your CPMS satisfies the accuracy requirement of Table 6 of this procedure, the accuracy audit is complete. If the calculated accuracy does not meet the accuracy requirement of Table 6 of this procedure, check all system components and take any corrective action that is necessary to achieve the accuracy requirements. Repeat this procedure until the accuracy requirement of Table 6 of this procedure is satisfied. If you replace any electrical or mechanical components of your pressure CPMS, you must perform the procedures outlined in PS–17 (40 CFR part 60, appendix B). If you are required to measure and record pressures at multiple locations, repeat this procedure for each location.

(3) Separate Sensor Check and System Check by Pressure Simulation Using a Calibrated Pressure Source. Perform the pressure sensor check using the appropriate ASTM standard listed in Table 3 of this procedure. These sensor check methods apply only to pressure CPMS that use either a pressure gauge or a metallic-bonded resistance strain gauge as the pressure sensor. To perform the system check, begin by disconnecting or closing off the process line or lines to your pressure CPMS. For each location that is monitored by your pressure CPMS, connect a pressure source to your CPMS. The pressure source must be calibrated and must satisfy the accuracy requirements of section 6.2 of this procedure. The pressure source also must be adjustable, either continuously or incrementally over the pressure range of your pressure CPMS. Perform a leak test on the calibrated pressure source using the method specified in section 8.9 of this procedure. Using the calibrated pressure source, apply to each location that is monitored by your CPMS a pressure that is within ±10 percent of the normal operating pressure of your pressure CPMS. Allow sufficient time for the response of the calibrated pressure source to reach equilibrium. Using the pressure applied by the calibrated pressure source as the value for V_c, follow the procedure specified in section 12.2 of this procedure to determine if your CPMS satisfies the accuracy requirement of Table 6 of this procedure. If you determine that your CPMS satisfies the accuracy requirement of Table 6 of this procedure, the accuracy audit is complete. If your CPMS does not meet the accuracy requirement of Table 6 of this procedure, check all system components and take any other corrective action that is necessary to achieve the required minimum accuracy. Repeat this procedure until the accuracy requirement of Table 6 of this procedure is satisfied. If you replace any electrical or mechanical components of your pressure CPMS, you must perform the procedures outlined in PS–17 (40 CFR part 60, appendix B). If you are required to measure and record pressure at multiple locations, repeat this procedure for each location.

(4) Separate Sensor and System Check by Pressure Simulation Procedure Using a Pressure Source and a Calibrated Pressure Measurement Device. Perform the pressure sensor check using the appropriate ASTM standard listed in Table 3 of this procedure. These sensor check methods apply only to pressure CPMS that use either a pressure gauge or a metallic-bonded resistance strain gauge as the pressure sensor. To perform the system check, begin by disconnecting or closing off the process line or lines to your pressure CPMS. Attach a mercury-in-glass U-tube manometer, a water-in-glass U-tube manometer, or a calibrated pressure measurement device (the reference pressure measurement device) in parallel to your pressure CPMS. If a calibrated pressure measurement device is used, the device must satisfy the accuracy requirements of section 6.2 of this procedure. Connect a pressure source to your pressure CPMS and the parallel reference pressure measurement device. Perform a leak test on all connections for the pressure source and calibrated pressure measurement device using the method as specified in section 8.9 of this procedure. Apply pressure to your CPMS and the parallel reference pressure measurement device. Allow sufficient time for the responses of your CPMS and the parallel reference pressure measurement device to reach equilibrium. Record the pressure measured by your pressure CPMS and the reference pressure measurement device. Using the pressure measured by the parallel reference pressure measurement device as the value for V_c, follow the procedure specified in section 12.2 of this procedure to determine if your CPMS satisfies the accuracy requirement of Table 6 of this procedure. If you determine that your CPMS satisfies the accuracy requirement of Table 6 of this procedure, the accuracy audit is complete. If your CPMS does not meet the accuracy requirement of Table 6 of this procedure, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this accuracy audit until the accuracy requirement of Table 6 of this procedure is satisfied. If you replace any electrical or mechanical components of your pressure CPMS, you must perform the procedures outlined in PS–17 (40 CFR part 60, appendix B). If you are required to measure and record pressure at multiple locations, repeat this procedure for each location.

8.3 How do I perform an accuracy audit for my flow CPMS? To perform the accuracy audit on your flow CPMS, you can choose one of the methods described in paragraphs (1) through (7) of this section that is applicable to the type of material measured by your flow CPMS and the type of sensor used in your flow CPMS.

(1) Comparison to redundant flow sensor. This method requires your CPMS to have a primary flow sensor and a redundant flow sensor. The redundant flow sensor must be installed adjacent to the primary flow sensor and must be subject to the same environment as the primary flow sensor. If using two Coriolis mass flow meters, care should be taken to avoid cross-talk, which is interference between the two meters due to mechanical coupling. Consult the manufacturer for specifics. To perform the accuracy audit, record three pairs of concurrent flow measurements within a 24-hour period. Each pair of concurrent measurements must consist of a flow measurement by each of the two flow sensors. The minimum time interval between any two such pairs of consecutive flow

measurements is one hour. You must take these readings during periods when the process or control device that is being monitored by the CPMS is operating normally. Calculate the mean of the three values for each flow sensor. The mean values must agree within the minimum required accuracy specified in Table 6 of this procedure. If your CPMS satisfies the accuracy requirement of Table 6 of this procedure, the accuracy audit is complete. If your CPMS does not satisfy the accuracy requirement of Table 6 of this procedure, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this accuracy audit procedure until the accuracy requirement of Table 6 of this procedure is satisfied. If you replace any electrical or mechanical components of your flow CPMS, you must perform the procedures outlined in PS–17 (40 CFR part 60, appendix B). If you are required to measure and record flow at multiple locations, repeat this procedure for each location.

(2) Volumetric Method. This method applies to any CPMS that is designed to measure liquid flow rate. With the process or control device that is monitored by your flow CPMS operating under normal conditions, record the flow rate measured by your flow CPMS for the subject process line. Collect concurrently the liquid that is flowing through the same process line for a measured length of time using the Volumetric Method specified in one of the standards listed in Table 4 of this procedure. Using the flow rate measured by the Volumetric Method as the value for V_c, follow the procedure specified in section 12.2 of this procedure to determine if your CPMS satisfies the accuracy requirement of Table 6 of this procedure. If you determine that your CPMS satisfies the accuracy requirement of Table 6 of this procedure, the accuracy audit is complete. If your CPMS does not satisfy the accuracy requirement of Table 6 of this procedure, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this procedure until the accuracy requirement of Table 6 of this procedure is satisfied. If you replace any electrical or mechanical components of your flow CPMS, you must perform the procedures outlined in PS–17 (40 CFR part 60, appendix B). If you are required to measure and record flows at multiple locations, repeat this procedure for each location.

(3) Gravimetric Method. This method applies to any CPMS that is designed to measure liquid flow rate, liquid mass flow rate, or solid mass flow rate. With the process or control device that is monitored by your flow CPMS operating under normal conditions, record the flow rate measured by your flow CPMS for the subject process line. At the same time, collect the material (liquid or solid) that is flowing or being transferred through the same process line for a measured length of time using the Weighing, Weigh Tank, or Gravimetric Methods specified in the standards listed in Table 5 of this procedure. Using the flow rate measured by the Weighing, Weigh Tank, or Gravimetric Methods as the value for V_c, follow the procedure specified in section 12.2 of this procedure to determine if your CPMS satisfies the accuracy requirement of Table 6 of this procedure. If you determine that your CPMS satisfies the accuracy requirement of Table 6 of this procedure, the accuracy audit is complete. If your CPMS does not satisfy the accuracy requirement of Table 6 of this procedure, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this procedure until the accuracy requirement of Table 6 of this procedure is satisfied. If you replace any electrical or mechanical components of your flow CPMS, you must perform the procedures outlined in PS–17 (40 CFR part 60, appendix B). If you are required to measure and record flows at multiple locations, repeat this procedure for each location.

(4) Separate Sensor Check and System Check by Differential Pressure Measurement Method. This method applies only to flow CPMS that use a differential pressure measurement flow device, such as an orifice plate, flow nozzle, or venturi tube. This method may not be used to validate a flow CPMS that measures gas flow by means of one or more differential pressure tubes. To perform the sensor check, remove the flow constricting device and perform a visual inspection for wear or other deformities based on manufacturer's recommendations. Take any corrective action that is necessary to ensure its proper operation. To perform the system check, record the flow rate measured by your flow CPMS while the process or control device that is monitored by your CPMS operating under normal conditions. Under the same operating conditions, disconnect the pressure taps from your flow CPMS and connect the pressure taps to a mercury-in-glass U-tube manometer, a water-in-glass U-tube manometer, or calibrated differential pressure measurement device. If a calibrated pressure measurement device is used, the device must satisfy the accuracy requirements of section 6.2 of this procedure. Perform a leak test on all manometer or calibrated differential pressure measurement device connections using the method specified in section 8.9 of this procedure. Allow sufficient time for the response of the calibrated differential pressure measurement device to reach equilibrium. Within 30 minutes of measuring and recording the flow rate using your CPMS, record the pressure drop measured by the calibrated differential pressure measurement device. Using the manufacturer's literature or the procedures specified in ASME MFC–3M–2004 (incorporated by reference—see § 60.17), calculate the flow rate that corresponds to the differential pressure measured by the calibrated differential pressure measurement device. For CPMS that use an orifice flow meter, the procedures specified in ASHRAE 41.8–1989 (incorporated by reference—see § 60.17) also can be used to calculate the flow rate. Using the calculated flow rate as the value for V_c, follow the procedure specified in section 12.2 of this procedure to determine if your CPMS satisfies the accuracy requirement of Table 6 of this procedure. If you determine that your CPMS satisfies the accuracy requirement of Table 6 of this procedure, the accuracy audit is complete. If your CPMS does not satisfy the accuracy requirement of Table 6 of this procedure, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this procedure until the accuracy requirement of Table 6 of this procedure is satisfied. If you replace any electrical or mechanical components of your flow CPMS, you must perform the procedures outlined in PS–17 (40 CFR part 60, appendix B). If you are required to measure and record flows at multiple locations, repeat this procedure for each location.

(5) Separate Sensor Check and System Check by Pressure Source Flow Simulation Method. This method applies only to flow CPMS that use a differential pressure measurement flow device, such as an orifice plate, flow nozzle, or venturi tube. This method may not be used to validate a flow CPMS that measures gas flow by means of one or more differential pressure tubes. To perform the sensor check, remove the flow constricting device and perform a visual inspection for wear or other deformities based on manufacturer's recommendations. Take any corrective action that is necessary to ensure its proper operation. To perform the system check, connect separate pressure sources to the upstream and downstream sides of your pressure CPMS, where the pressure taps are normally connected. The pressure sources must be calibrated and must satisfy the accuracy requirements of section 6.2 of this procedure. The pressure sources also must be adjustable, either continuously or incrementally over the pressure range that corresponds to the range of your flow CPMS. Perform a leak test on all connections between the calibrated pressure sources and your flow CPMS using the method specified in section 8.9 of this procedure. Using the manufacturer's literature or the procedures specified in ASME MFC–3M–2004 (incorporated by reference-see § 60.17), calculate the required pressure drop that corresponds to the normal operating flow rate expected for your flow CPMS. For CPMS that use an orifice flow meter, the procedures specified in ASHRAE 41.8–1989 (incorporated by reference-see § 60.17) also can be used to calculate the pressure drop. Use the calibrated pressure sources to apply the calculated pressure drop to your flow CPMS. Allow sufficient time for the responses of the calibrated pressure sources to reach equilibrium. Record the flow rate measured by your flow CPMS. Using the flow rate measured by your CPMS when the calculated pressure drop was applied as the value for Vc, follow the procedure specified in section 12.2 of this procedure to determine if your CPMS satisfies the accuracy requirement of Table 6 of this procedure. If you determine that your CPMS satisfies the accuracy requirement of Table 6 of this procedure, the accuracy audit is complete. If your CPMS does not satisfy the accuracy requirement of Table 6 of this procedure, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this accuracy audit until the accuracy

requirement of Table 6 of this procedure is satisfied. If you replace any electrical or mechanical components of your flow CPMS, you must perform the procedures outlined in PS–17 (40 CFR part 60, appendix B). If you are required to measure and record flows at multiple locations, repeat this procedure for each location.

(6) Relative Accuracy (RA) Test. This method applies to any flow CPMS that measures gas flow rate. If your flow CPMS uses a differential pressure tube as the flow sensor and does not include redundant sensors, you must use this method to validate your flow CPMS. The reference methods (RM's) applicable to this test are Methods 2, 2A, 2B, 2C, 2D, and 2F in 40 CFR part 60, appendix A–1, and Method 2G in 40 CFR part 60, appendix A–2. Conduct three sets of RM tests. Mark the beginning and end of each RM test period on the flow CPMS chart recordings or other permanent record of output. Determine the integrated flow rate for each RM test period. Perform the same calculations specified by PS–2 (40 CFR part 60, appendix B), section 7.5. If the RA is no greater than 20 percent of the mean value of the RM test data, the RA test is complete. If the RA is greater than 20 percent of the mean value of the RM test data, check all system components and take any corrective action that is necessary to achieve the required RA. Repeat this RA test until the RA requirement of this section is satisfied.

(7) Material Weight Comparison Method. This method applies to any solid mass flow CPMS that uses a combination of a belt conveyor and scale and includes a totalizer. To conduct this test, pass a quantity of pre-weighed material over the belt conveyor in a manner consistent with actual loading conditions. To weigh the test quantity of material that is to be used during the accuracy audit, you must use a scale that satisfies the accuracy requirements of section 6.2 of this procedure. The test quantity must be sufficient to challenge the conveyor belt-scale system for at least three revolutions of the belt. Record the length of the test. Calculate the mass flow rate using the measured weight and the recorded time. Using this mass flow rate as the value for Vc, follow the procedure specified in section 12.2 of this procedure to determine if your CPMS satisfies the accuracy requirement of Table 6 of this procedure. If your CPMS satisfies the accuracy requirement of Table 6 of this procedure, the accuracy audit is complete. If your CPMS does not satisfy the accuracy requirement of Table 6 of this procedure, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this accuracy audit procedure until the accuracy requirement of Table 6 of this procedure is satisfied. If you replace any electrical or mechanical components of your flow CPMS, you must perform the procedures outlined in PS–17 (40 CFR part 60, appendix B). If you are required to measure and record flow at multiple locations, repeat this procedure for each location.

8.4 How do I perform an accuracy audit for my pH CPMS? To perform the accuracy audit, you can choose one of the methods described in paragraphs (1) through (3) of this section.

(1) Comparison to redundant pH sensor. This method requires your CPMS to have a primary pH sensor and a redundant pH sensor. The redundant pH sensor must be installed adjacent to the primary pH sensor and must be subject to the same environment as the primary pH sensor. To perform the accuracy audit, concurrently record the pH measured by the two pH sensors. You must take these readings during periods when the process or control device that is being monitored by the CPMS is operating normally. The two pH values must agree within the minimum required accuracy specified in Table 6 of this procedure. If your CPMS satisfies the accuracy requirement of Table 6 of this procedure, the accuracy audit is complete. If your CPMS does not satisfy the accuracy requirement of Table 6 of this procedure, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this accuracy audit procedure until the accuracy requirement of Table 6 of this procedure is satisfied. If you replace any electrical or mechanical components of your pH CPMS, you must perform the procedures outlined in PS–17 (40 CFR part 60, appendix B). If you are required to measure and record pH at multiple locations, repeat this procedure for each location.

(2) Comparison to Calibrated pH Meter. Place a calibrated pH measurement device adjacent to your pH CPMS so that the calibrated test device is subjected to the same environment as your pH CPMS. The calibrated pH measurement device must satisfy the accuracy requirements specified in section 6.2 of this procedure. Allow sufficient time for the response of the calibrated pH measurement device to reach equilibrium. With the process or control device that is monitored by your CPMS operating under normal conditions, record concurrently the pH measured by your pH CPMS and the calibrated pH measurement device. If concurrent pH readings are not possible, extract a sufficiently large sample from the process stream and perform measurements using a portion of the sample for each meter. Using the pH measured by the calibrated pH measurement device as the value for Vc, follow the procedure specified in section 12.2 of this procedure to determine if your CPMS satisfies the accuracy requirement of Table 6 of this procedure. If you determine that your CPMS satisfies the accuracy requirement of Table 6, the accuracy audit is complete. If your CPMS does not satisfy the accuracy requirement of Table 6 of this procedure, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this procedure until the accuracy requirement of Table 6 of this procedure is satisfied. If you replace any electrical or mechanical components of the primary CPMS, you must perform the procedures outlined in PS–17 (40 CFR part 60, appendix B). If you are required to measure and record pH at multiple locations, repeat this procedure for each location.

(3) Single Point Calibration. This method requires the use of a certified buffer solution. All buffer solutions used must be certified by NIST and accurate to ±0.02 pH units at 25 °C (77 °F). Set the temperature on your pH meter to the temperature of the buffer solution, typically room temperature or 25 °C (77 °F). If your pH meter is equipped with automatic temperature compensation, activate this feature before calibrating. Set your pH meter to measurement mode. Place the clean electrodes into the container of fresh buffer solution. If the expected pH of the process fluid lies in the acidic range (less than 7 pH), use a buffer solution with a pH value of 4.00. If the expected pH of the process fluid lies in the basic range (greater than 7 pH), use a buffer solution with a pH value of 10.00. Allow sufficient time for the response of your CPMS to reach equilibrium. Record the pH measured by your CPMS. Using the buffer solution pH as the value for V_c, follow the procedure specified in section 12.2 of this procedure to determine if your CPMS satisfies the accuracy requirement of Table 6 of this procedure. If you determine that your CPMS satisfies the accuracy requirement of Table 6 of this procedure, the accuracy audit is complete. If your CPMS does not satisfy the accuracy requirement of Table 6 of this procedure, calibrate your pH CPMS using the procedures specified in the manufacturer's owner's manual. If the manufacturer's owner's manual does not specify a two-point calibration procedure, you must perform a two-point calibration procedure based on ASTM D 1293–99 (2005) (incorporated by reference—see § 60.17). If you replace any electrical or mechanical components of your pH CPMS, you must perform the procedures outlined in PS–17 (40 CFR part 60, appendix B). If you are required to measure and record pH at multiple locations, repeat this procedure for each location. If you are required to measure and record pH at multiple locations, repeat this procedure for each location.

8.5 How do I perform an accuracy audit for my conductivity CPMS? To perform the accuracy audit, you can choose one of the methods described in paragraphs (1) through (3) of this section.

(1) Comparison to Redundant Conductivity Sensor. This method requires your CPMS to have a primary conductivity sensor and a redundant conductivity sensor. The redundant conductivity sensor must be installed adjacent to the primary conductivity sensor and must be subject to the same environment as the primary conductivity sensor. To perform the accuracy audit, concurrently record the conductivity measured by the two conductivity sensors. You must take these readings during periods when the process or control device that is being monitored by the CPMS is operating normally. The two conductivity values must agree within the minimum required accuracy specified in Table 6 of this procedure. If your CPMS satisfies the accuracy requirement of Table 6 of this procedure, the accuracy audit is complete. If your CPMS does not satisfy the accuracy requirement of Table 6 of this procedure, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this accuracy audit procedure until the accuracy requirement of Table 6 of this

procedure is satisfied. If you replace any electrical or mechanical components of your conductivity CPMS, you must perform the procedures outlined in PS–17 (40 CFR part 60, appendix B). If you are required to measure and record conductivity at multiple locations, repeat this procedure for each location.

(2) Comparison to Calibrated Conductivity Meter. Place a calibrated conductivity measurement device adjacent to your conductivity CPMS so that the calibrated test device is subjected to the same environment as your conductivity CPMS. The calibrated conductivity measurement device must satisfy the accuracy requirements specified in section 6.2 of this procedure. Allow sufficient time for the response of the calibrated conductivity measurement device to reach equilibrium. With the process or control device that is monitored by your CPMS operating under normal conditions, record concurrently the conductivity measured by your conductivity CPMS and the calibrated conductivity measurement device. If concurrent conductivity readings are not possible, extract a sufficiently large sample from the process stream and perform measurements using a portion of the sample for each meter. Using the conductivity measured by the calibrated conductivity measurement device as the value for V_c, follow the procedure specified in section 12.2 of this procedure to determine if your CPMS satisfies the accuracy requirement of Table 6 of this procedure. If you determine that your CPMS satisfies the accuracy requirement of Table 6 of this procedure, the accuracy audit is complete. If your CPMS does not satisfy the accuracy requirement of Table 6 of this procedure, check all system components and take any corrective action that is necessary to achieve the required minimum accuracy. Repeat this procedure until the accuracy requirement of Table 6 of this procedure is satisfied. If you replace any electrical or mechanical components of the primary CPMS, you must perform the procedures outlined in PS–17 (40 CFR part 60, appendix B). If you are required to measure and record conductivity at multiple locations, repeat this procedure for each location.

(3) Single Point Calibration. This method requires the use of a certified conductivity standard solution. All conductivity standard solutions used must be certified by NIST and accurate within ±2 percent micromhos per centimeter (μmhos/cm) (±2 percent microsiemens per centimeter μS/cm)) at 25 °C (77 °F). Choose a conductivity standard solution that is close to the measuring range for best results. Since conductivity is dependent on temperature, the conductivity tester should have an integral temperature sensor that adjusts the reading to a standard temperature, usually 25 °C (77 °F). If the conductivity meter allows for manual temperature compensation, set this value to 25 °C (77 °F). Place the clean electrodes into the container of fresh conductivity standard solution. Allow sufficient time for the response of your CPMS to reach equilibrium. Record the conductivity measured by your CPMS. Using the conductivity standard solution as the value for V_C, follow the procedure specified in section 12.2 of this procedure to determine if your CPMS satisfies the accuracy requirement of Table 6 of this procedure. If you determine that your CPMS satisfies the accuracy requirement of Table 6 of this procedure, the accuracy audit is complete. If your CPMS does not satisfy the accuracy requirement of Table 6 of this procedure, calibrate your conductivity CPMS using the procedures specified in the manufacturer's owner's manual. If the manufacturer's owner's manual does not specify a calibration procedure, you must perform a calibration procedure based on ASTM D 1125–95 (2005) or ASTM D 5391–99 (2005) (incorporated by reference—see § 60.17). If you replace any electrical or mechanical components of your conductivity CPMS, you must perform the procedures outlined in PS–17 (40 CFR part 60, appendix B). If you are required to measure and record conductivity at multiple locations, repeat this procedure for each location.

8.6 Are there any acceptable alternative procedures for evaluating my CPMS? You may use alternative procedures for evaluating the operation of your CPMS if the alternative procedures are approved by the Administrator.

8.7 How often must I perform an accuracy audit of my CPMS? Depending on the parameter measured (temperature, pressure, flow, pH, or conductivity), you must perform the accuracy audits according to the frequencies specified in paragraphs (1) and (2) of this section.

(1) Temperature, Pressure, Flow, and Conductivity. If your CPMS measures temperature, pressure, flow rate, or conductivity, you must perform an accuracy audit of your CPMS at least quarterly using the procedures specified in sections 8.1 through 8.3 and 8.5, respectively, of this procedure. You also must perform within 48 hours an accuracy audit of your CPMS following any periods of at least 24 hours in duration throughout which:

(i) The value of the measured parameter exceeded the maximum rated operating limit of the sensor, as specified in the manufacturer's owner's manual, or

(ii) The value of the measured parameter remained off the scale of the CPMS data recording system.

(2) pH. If your CPMS measures pH, you must perform an accuracy audit of your pH CPMS at least weekly using the procedures specified in section 8.4 of this procedure.

8.8 What other checks must I do on my CPMS? According to the parameter being measured (temperature, pressure, flow, pH, or conductivity), you must perform the additional checks specified in paragraphs (1) through (4) of this section.

(1) Temperature. If your temperature CPMS is not equipped with a redundant temperature sensor, at least quarterly, perform a visual inspection of all components of your temperature CPMS for physical and operational integrity and all electrical connections for oxidation and galvanic corrosion. You must take necessary corrective action to replace or repair any damaged components as soon as possible.

(2) Pressure. At least monthly, check all mechanical connections for leakage. If your pressure CPMS is not equipped with a redundant pressure sensor, at least quarterly, perform a visual inspection of all components of the pressure CPMS for physical and operational integrity and all electrical connections for oxidation and galvanic corrosion. You must take necessary corrective action to replace or repair any damaged components as soon as possible.

(3) Flow Rate. At least monthly, check all mechanical connections for leakage. If your flow CPMS is not equipped with a redundant flow sensor, at least quarterly, perform a visual inspection of all components of the flow CPMS for physical and operational integrity and all electrical connections for oxidation and galvanic corrosion. You must take necessary corrective action to replace or repair any damaged components as soon as possible.

(4) pH. If your pH CPMS is not equipped with a redundant sensor, at least monthly, perform a visual inspection of all components of the pH CPMS for physical and operational integrity and all electrical connections for oxidation and galvanic corrosion. You must take necessary corrective action to replace or repair any damaged components as soon as possible.

(5) Conductivity. If your conductivity CPMS is not equipped with a redundant sensor, at least quarterly, perform a visual inspection of all components of the conductivity CPMS for physical and operational integrity and all electrical connections for oxidation and galvanic corrosion. You must take necessary corrective action to replace or repair any damaged components as soon as possible.

8.9 How do I perform a leak test on pressure connections, as required by this procedure? You can satisfy the leak test requirements of sections 8.2 and 8.3 of this procedure by following the procedures specified in paragraphs (1) through (3) of this section.

(1) For each pressure connection, apply a pressure that is equal to the highest pressure the connection is likely to be subjected to or 0.24 kilopascals (1.0 inch of water column), whichever is greater.

(2) Close off the connection between the applied pressure source and the connection that is being leak-tested.

(3) If the applied pressure remains stable for at least 15 seconds, the connection is considered to be leak tight. If the applied pressure does not remain stable for at least 15 seconds, take any corrective action necessary to make the connection leak tight and repeat this leak test procedure.

9.0 *What quality control measures are required by this procedure for my CPMS?*

You must develop and implement a QA/QC program for your CPMS according to section 9.1 of this procedure. You must also maintain written QA/QC procedures for your CPMS.

9.1 What elements must be covered by my QA/QC program? Your QA/QC program must address, at a minimum, the elements listed in paragraphs (1) through (5) of this section.

(1) Accuracy audit procedures for the CPMS sensor;

(2) Calibration procedures, including procedures for assessing and adjusting the calibration drift (CD) of the CPMS;

(3) Preventive maintenance of the CPMS (including a spare parts inventory);

(4) Data recording, calculations, and reporting; and

(5) Corrective action for a malfunctioning CPMS.

9.1 How long must I maintain written QA/QC procedures for my CPMS? You are required to keep written QA/QC procedures on record and available for inspection by the enforcement agency for the life of your CPMS or until you are no longer subject to the requirements of this procedure.

10.0 *Calibration and Standardization* [Reserved]

11.0 *Analytical Procedure* [Reserved]

12.0 *What calculations are needed?*

The calculations needed to comply with this procedure are described in sections 12.1 and 12.2 of this procedure.

12.1 How do I determine if a calibrated measurement device satisfies the accuracy hierarchy specified in section 6.2 of this procedure? To determine if a calibrated measurement device satisfies the accuracy hierarchy requirement, follow the procedure described in paragraphs (1) and (2) of this section.

(1) Calculate the accuracy hierarchy (A_h) using Equation 4–1.

$$A_h = \frac{A_r}{A_c} \qquad \text{(Eq. 4-1)}$$

Where:

A_h = Accuracy hierarchy, dimensionless.

A_r = Required accuracy (A_p or A_v) specified in Table 6 of this procedure, percent or units of parameter value (e.g., degrees Celsius, kilopascals, liters per minute, pH units).

A_c = Accuracy of calibrated measurement device, same units as A_r.

(2) If the accuracy hierarchy (A_h) is equal to or greater than 3.0, the calibrated measurement device satisfies the accuracy hierarchy of section 6.2 of this procedure.

12.2 How do I determine if my CPMS satisfies the accuracy requirement of Procedure 4? To determine if your CPMS satisfies the accuracy requirement of this procedure, follow the procedure described in paragraphs (1) through (4) of this section.

(1) If your CPMS measures temperature, pressure, or flow rate, calculate the accuracy percent value (A_{pv}) using Equation 4–2. If your CPMS measures pH, proceed to paragraph (2) of this section.

$$A_{pv} = V_c \quad \frac{A_p}{100} \qquad \text{(Eq. 4-2)}$$

Where:

A_{pv} = Accuracy percent value, units of parameter measured (e.g., degrees Celsius, kilopascals, liters per minute).

V_c = Parameter value measured by the calibrated measurement device or measured by your CPMS when a calibrated signal simulator is applied to your CPMS during the initial validation check, units of parameter measured (e.g., degrees Celsius, kilopascals, liters per minute).

A_p = Accuracy percentage specified in Table 6 that corresponds to your CPMS, percent.

(2) If your CPMS measures temperature, pressure, conductivity, or flow rate other than mass flow rate or steam flow rate, compare the accuracy percent value (A_{pv}) to the accuracy value (A_v) specified in Table 6 of this procedure and select the greater of the two values. Use this greater value as the allowable deviation (d_a) in paragraph (4) of this section.

(3) If your CPMS measures pH, use the accuracy value (A_v) specified in Table 6 of this procedure as the allowable deviation (d_a).

(4) If your CPMS measures steam flow rate, mass flow rate, or conductivity, use the accuracy percent value (A_{pv}) calculated using Equation 2 as the allowable deviation (d_a).

(5) Using Equation 4–3, calculate the measured deviation (d_m), which is the absolute value of the difference between the parameter value measured by the calibrated device (V_c) and the value measured by your CPMS (V_m).

$$d_m = \left|V_c - V_m\right| \qquad \text{(Eq. 4-3)}$$

Where:

d_m = Measured deviation, units of the parameter measured (e.g., degrees Celsius, kilopascals, liters per minute).

V_c = Parameter value measured by the calibrated measurement device or measured by your CPMS when a calibrated signal simulator is applied to your CPMS during the initial validation check, units of parameter measured (e.g., degrees Celsius, kilopascals, liters per minute).

V_m = Parameter value measured by your CPMS during the initial validation check, units of parameter measured (e.g., degrees Celsius, kilopascals, liters per minute).

(6) Compare the measured deviation (d_m) to the allowable deviation (d_a). If the measured deviation is less than or equal to the allowable deviation, your CPMS satisfies the accuracy requirement of this procedure.

13.0 *What performance criteria must I demonstrate for my CPMS to comply with this quality assurance procedure?*

You must demonstrate that your CPMS meets the applicable accuracy requirements specified in Table 6 of this procedure.

14.0 *What are the recordkeeping requirements for Procedure 4?*

You must satisfy the recordkeeping requirements specified in sections 14.1 and 14.2 of this procedure.

14.1 What data does this procedure require me to record for my CPMS? You must record the results of all CPMS accuracy audits and a summary of all corrective actions taken to return your CPMS to normal operation.

14.2 For how long must I maintain the QA data that this procedure requires me to record for my CPMS? You are required to keep the records required by this procedure for your CPMS for a period of 5 years. At a minimum, you must maintain the most recent 2 years of data onsite and available for inspection by the enforcement agency.

15.0 *Pollution Prevention* [Reserved]

16.0 *Waste Management* [Reserved]

17.0 *Which references are relevant to Procedure 4?*

1. Technical Guidance Document: Compliance Assurance Monitoring. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Emission Measurement Center. August 1998. (http://www.epa.gov/ttn/emc/cam.html).

2. NEMA Standard Publication 250. ''Enclosures for Electrical Equipment, 1000 Volts Maximum''.

3. ASTM E–220–07e1: ''Standard Test Methods for Calibration of Thermocouples by Comparison Techniques''. American Society for Testing and Materials. 2007.

4. ISA–MC96–1–1982: ''Temperature Measurement Thermocouples''. American National Standards Institute. August 1982.

5. The pH and Conductivity Handbook. Omega Engineering, Inc. 1995.

6. ASTM E–452–02 (2007): ''Standard Test Method for Calibration of Refractory Metal Thermocouples Using an Optical Pyrometer''. American Society for Testing and Materials. 2002.

7. ASTM E 644–06: ''Standard Test Methods for Testing Industrial Resistance Thermometers''. American Society for Testing and Materials. 2006.

8. ASME B 40.100–2005: ''Pressure Gauges and Gauge Attachments''. American Society of Mechanical Engineers. February 2005.

9. ASTM E 251–92 (2003): ''Standard Test Methods for Performance Characteristics of Metallic Bonded Resistance Strain Gages''. American Society for Testing and Materials. 2003.

10. ANSI/ASME MFC–3M–2004: ''Measurement of Fluid Flow in Pipes Using Orifice, Nozzle, and Venturi''. American Society of Mechanical Engineers. 1989 (Reaffirmed 1995).

11. ANSI/ASME MFC–9M–1988: ''Measurement of Liquid Flow in Closed Conduits by Weighing Method''. American Society of Mechanical Engineers. 1989.

12. ASHRAE 41.8–1989: ''Standard Methods of Measurement of Flow of Liquids in Pipes Using Orifice Flow Meters''. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. 1989.

13. ISA RP 16.6–1961: ''Methods and Equipment for Calibration of Variable Area Meters (Rotameters)''. Instrumentation, Systems, and Automation Society. 1961.

14. ANSI/ISA–RP31.1–1977: ''Specification, Installation, and Calibration of Turbine Flow Meters''. Instrumentation, Systems, and Automation Society. 1977.

15. ISO 8316:1987: ''Measurement of Liquid Flow in Closed Conduits—Method by Collection of Liquid in a Volumetric Tank''. International Organization for Standardization. 1987.

16. NIST Handbook 44—2002 Edition: ''Specifications, Tolerances, And Other

Technical Requirements for Weighing and Measuring Devices, as adopted by the 86th National Conference on Weights and Measures 2001'', Section 2.21: ''Belt-Conveyor Scale Systems''.

17. ISO 10790:1999: ''Measurement of Fluid Flow in Closed Conduits—Guidance to the Selection, Installation, and Use of Coriolis Meters (Mass Flow, Density and Volume Flow Measurements''. International Organization for Standardization. 1999.

18. ASTM D 1125–95 (2005): ''Standard Test Methods for Electrical Conductivity and Resistivity of Water''. American Society for Testing and Materials. 2005.

19. ASTM D 5391–99 (2005): ''Standard Test Method for Electrical Conductivity and Resistivity of a Flowing High Purity Water Sample''. American Society for Testing and Materials. 2005.

18.0 *What tables are relevant to Procedure 4?*

TABLE 1—SENSOR COMPONENTS OF COMMONLY USED CPMS

For a CPMS that measures . . .	Using a . . .	The sensor component consists of the . . .
1. Temperature	a. Thermocouple	Thermocouple.
	b. Resistance temperature detector	(RTD).
	c. Optical pyrometer	Optical assembly and detector.
	d. Thermistor	Thermistor.
	e. Temperature transducer	Integrated circuit sensor?
2. Pressure	a. Pressure gauge	Gauge assembly, including bourdon element, bellows element, or diaphragm.
	b. Pressure transducer	Strain gauge assembly, capacitance assembly, linear variable differential transformer, force balance assembly, potentiometer, variable reluctance assembly, piezoelectric assembly, or piezoresistive assembly.
	c. Manometer	U-tube or differential manometer.
3. Flow rate	a. Differential pressure device	Flow constricting element (nozzle, Venturi, or orifice plate) and differential pressure sensor.
	b. Differential pressure tube	Pitot tube, or other array of tubes that measure velocity pressure and static pressure, and differential pressure sensor.
	c. Magnetic flow meter	Magnetic coil assembly.
	d. Positive displacement flow meter	Piston, blade, vane, propeller, disk, or gear assembly.
	e. Turbine flow meter	Rotor or turbine assembly.
	f. Vortex formation flow meter	Vortex generating and sensing elements.
	g. Fluidic oscillating flow meter	Feedback passage, side wall, control port, and thermal sensor.
	h. Ultrasonic flow meter	Sonic transducers, receivers, timer, and temperature sensor.
	i. Thermal flow meter	Thermal element and temperature sensors.
	j. Coriolis mass flow meter	U-tube and magnetic sensing elements.
	k. Rotameter	Float assembly.
	l. Solids flow meter	Sensing plate.
	m. Belt conveyor	Scale.
4. pH	pH meter	Electrode.
5. Conductivity	Conductivity meter	Electrode.

TABLE 2—METHODS FOR TEMPERATURE SENSOR CHECK

If the temperature sensor in your CPMS is a . . .	And is used in . . .	You can perform the accuracy audit of the sensor using . . .
1. Thermocouple	Any application	ASTM E220–07e1.
2. Thermocouple	A reducing environment	ASTM E452–02 (2007).
3. Resistance temperature detector	Any application	ASTM E644–06.

TABLE 3—METHODS FOR PRESSURE SENSOR CHECK

If the pressure sensor in your CPMS is a . . .	You can perform the accuracy audit of the sensor using . . .
1. Pressure gauge	ASME B40.100–2005.
2. Metallic bonded resistance strain gauge	ASTM E251–92 (2003).

TABLE 4—VOLUMETRIC METHODS FOR FLOW METER ACCURACY AUDITS

Designation	Title
1. ISA RP 16.6–1961	Methods and Equipment for Calibration of Variable Area Meters (Rotameters).
2. ANSI/ISA RP 31.1–1977	Specification, Installation, and Calibration of Turbine Flow Meters.
3. ISO 10790:1999	Measurement of Fluid Flow in Closed Conduits-Guidance to the Selection, Installation and Use of Coriolis Meters (Mass Flow, Density and Volume Flow Measurements).
4. ISO 8316:1987	Measurement of Liquid Flow in Closed Conduits-Method by Collection of Liquid in a Volumetric Tank.

TABLE 5—WEIGHING METHODS FOR FLOW METER ACCURACY AUDITS

Designation	Title
1. ASHRAE 41.8–1989	Standard Methods of Measurement of Flow of Liquids in Pipes Using Orifice Flow Meters.

TABLE 5—WEIGHING METHODS FOR FLOW METER ACCURACY AUDITS—Continued

Designation	Title
2. ISA RP 16.6–1961	Methods and Equipment for Calibration of Variable Area Meters (Rotameters).
3. ANSI/ISA RP 31.1–1977	Specification, Installation, and Calibration of Turbine Flow Meters.
4. NIST Handbook 44–2002 Edition, Section 2.21.	Specifications, Tolerances, And Other Technical Requirements for Weighing and Measuring Devices, as adopted by the 86th National Conference on Weights and Measures 2001: Belt-Conveyor Scale Systems.
5. ANSI/ASME MFC–9M–1988	Measurement of Liquid Flow in Closed Conduits by Weighing Method.

TABLE 6—CPMS ACCURACY REQUIREMENTS

If your CPMS measures . . .	You must demonstrate that your CPMS operates within . . .
1. Temperature, in a non-cryogenic application.	An accuracy percentage (A_p) of ±1.0 percent of the temperature measured in degrees Celsius or within an accuracy value (A_v) of 2.8 degrees Celsius (5 degrees Fahrenheit), whichever is greater.
2. Temperature, in a cryogenic application.	An accuracy percentage (A_p) of ±2.5 percent of the temperature measured in degrees Celsius or within an accuracy value (A_v) of 2.8 degrees Celsius (5 degrees Fahrenheit), whichever is greater.
3. Pressure	An accuracy percentage (A_p) of ±5 percent or an accuracy value (A_v) of 0.12 kilopascals (0.5 inches of water column), whichever is greater.
4. Liquid flow rate	An accuracy percentage (A_p) of ±5 percent or an accuracy value (A_v) of 1.9 liters per minute (0.5 gallons per minute), whichever is greater.
5. Gas flow rate	a. A relative accuracy of ±20 percent, if you demonstrate compliance using the relative accuracy test, or b. An accuracy percentage (A_p) of ±10 percent, if your CPMS measures steam flow rate, or c. An accuracy percentage (A_p) of ±5 percent or an accuracy value (A_v) of 280 liters per minute (10 cubic feet per minute), whichever is greater, for all other gases and accuracy audit methods.
6. Mass flow rate	An accuracy percentage (A_p) of ±5 percent.
7. pH	An accuracy value (A_v) of ±0.2 pH units.
8. Conductivity	An accuracy percentage (A_p) of ±5 percent.

PART 61—[AMENDED]

6. The authority citation for part 61 continues to read as follows:

Authority: 42 U.S.C. 7401, *et seq.*

Subpart A—[Amended]

7. Section 61.14 is amended by redesignating paragraph (a) as paragraph (a)(1) and adding paragraph (a)(2) to read as follows:

§ 61.14 Monitoring requirements.

(a)(1) * * *

(2) Performance specifications for continuous parameter monitoring systems (CPMS) promulgated under 40 CFR part 60, appendix B and quality assurance procedures for CPMS promulgated under 40 CFR part 60, appendix F apply instead of the requirements for CPMS specified in an applicable subpart upon promulgation of the performance specifications and quality assurance procedures for CPMS.

* * * * *

PART 63—[AMENDED]

8. The authority citation for part 63 continues to read as follows:

Authority: 42 U.S.C. 7401, *et seq.*

Subpart A—[Amended]

9. Section 63.8 is amended by:

a. Revising paragraph (a)(2);

b. Revising paragraph (c)(2)(i);

c. Revising paragraph (c)(4) introductory text and adding paragraph (c)(4)(iii);

d. Revising paragraphs (c)(6) and (c)(7)(i);

e. Revising paragraph (d)(2)(ii); and

f. Revising paragraphs (e)(2), (e)(3)(i), and (e)(4).

The revisions and additions read as follows:

§ 63.8 Monitoring requirements.

(a) * * *

(2)(i) For the purposes of this part, all CMS required under relevant standards shall be subject to the provisions of this section upon promulgation of performance specifications and quality assurance procedures for CMS as specified in the relevant standard or otherwise by the Administrator.

(ii) Performance specifications for CPMS promulgated under 40 CFR part 60, appendix B and quality assurance procedures for CPMS promulgated under 40 CFR part 60, appendix F apply instead of the requirements for CPMS specified in the relevant standard upon promulgation of the performance specifications and quality assurance procedures for CPMS.

* * * * *

(c) * * *

(2)(i) All CMS must be installed such that representative measurements of emissions or process parameters from the affected source are obtained. In addition, CMS shall be located according to procedures contained in the applicable performance specification(s).

* * * * *

(4) Except for system breakdowns, out-of-control periods, repairs, maintenance periods, calibration checks, and zero (low-level) and high-level calibration drift adjustments, all CMS, including COMS, CEMS, and CPMS, shall be in continuous operation and shall meet minimum frequency of operation requirements as follows:

* * * * *

(iii) All CPMS shall complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive time period specified in the relevant standard.

* * * * *

(6) The owner or operator of a CMS that is not a CPMS, which is installed in accordance with the provisions of this part and the applicable CMS performance specification(s) shall check the zero (low-level) and high-level calibration drifts at least once daily in accordance with the written procedure specified in the performance evaluation plan developed under paragraphs (e)(3)(i) and (e)(3)(ii) of this section. The zero (low-level) and high-level calibration drifts shall be adjusted, at a minimum, whenever the 24-hour zero (low-level) drift exceeds two times the limits of the applicable performance specification(s) specified in the relevant standard. The system must allow the amount of excess zero (low-level) and high-level drift measured at the 24-hour interval checks to be recorded and quantified, whenever specified. For

COMS, all optical and instrumental surfaces exposed to the effluent gases shall be cleaned prior to performing the zero (low-level) and high-level drift adjustments; the optical surfaces and instrumental surfaces shall be cleaned when the cumulative automatic zero compensation, if applicable, exceeds 4 percent opacity.

* * * * *

(7)(i) A CMS is out of control if—

(A) The COMS or CEMS zero (low-level), mid-level (if applicable), or high-level calibration drift (CD) exceeds two times the applicable CD specification in the applicable performance specification or in the relevant standard; or

(B) The COMS or CEMS fails a performance test audit (e.g., cylinder gas audit), relative accuracy audit, relative accuracy test audit, or linearity test audit; or

(C) The COMS CD exceeds two times the limit in the applicable performance specification in the relevant standard; or

(D) The CPMS fails an accuracy audit.

* * * * *

(d) * * *

(2) * * *

(ii) Determination and adjustment of the calibration drift of the CMS, where applicable;

* * * * *

(e) * * *

(2) Notification of performance evaluation. The owner or operator shall notify the Administrator in writing of the date of the performance evaluation of a COMS or CEMS simultaneously with the notification of the performance test date required under § 63.7(b) or at least 60 days prior to the date the performance evaluation is scheduled to begin if no performance test is required.

(3)(i) Submission of site-specific performance evaluation test plan. Before conducting a required COMS or CEMS performance evaluation, the owner or operator of an affected source shall develop and submit a site-specific performance evaluation test plan to the Administrator for approval upon request. The performance evaluation test plan shall include the evaluation program objectives, an evaluation program summary, the performance evaluation schedule, data quality objectives, and both an internal and external QA program. Data quality objectives are the pre-evaluation expectations of precision, accuracy, and completeness of data.

* * * * *

(4) Conduct of performance evaluation and performance evaluation dates. The owner or operator of an affected source shall conduct a performance evaluation of a required CMS during any performance test required under § 63.7 in accordance with the applicable performance specification or QA procedure as specified in the relevant standard. Notwithstanding the requirement in the previous sentence, if the owner or operator of an affected source elects to submit COMS data for compliance with a relevant opacity emission standard as provided under § 63.6(h)(7), he/she shall conduct a performance evaluation of the COMS as specified in the relevant standard, before the performance test required under § 63.7 is conducted in time to submit the results of the performance evaluation as specified in paragraph (e)(5)(ii) of this section. If a performance test is not required, or the requirement for a performance test has been waived under § 63.7(h), the owner or operator of an affected source shall conduct the performance evaluation not later than 180 days after the appropriate compliance date for the affected source, as specified in § 63.7(a), or as otherwise specified in the relevant standard.

* * * * *

Subpart SS—[Amended]

10. Section 63.996 is amended by adding paragraphs (c)(7) through (c)(10) to read as follows:

§ 63.996 General monitoring requirements for control and recovery devices.

* * * * *

(c) * * *

(7) For each CPMS, the owner or operator must meet the requirements in paragraphs (c)(7)(i) through (vi) of this section.

(i) Satisfy all requirements of applicable performance specifications for CPMS established under 40 CFR part 60, appendix B.

(ii) Satisfy all requirements of quality assurance (QA) procedures for CPMS established under 40 CFR part 60, appendix F.

(iii) The CPMS must complete a minimum of one cycle of operation for each successive 15-minute period.

(iv) To calculate a valid hourly average, there must be at least four equally spaced values for that hour, excluding data collected during the periods described in paragraph (c)(5) of this section.

(v) Calculate a daily average using all of the valid hourly averages for each day.

(vi) Except for redundant sensors, any device that is used to conduct an initial validation or accuracy audit of a CPMS must meet the accuracy requirements specified in paragraphs (c)(7)(vi)(A) and (B) of this section.

(A) The device must have an accuracy that is traceable to National Institute of Standards and Technology (NIST) standards.

(B) The device must be at least three times as accurate as the required accuracy for the CPMS.

(8) For each temperature CPMS, the owner or operator must meet the requirements in paragraphs (c)(8)(i) through (ix) of this section.

(i) Install each sensor of the temperature CPMS in a location that provides representative temperature measurements over all operating conditions, taking into account the manufacturer's guidelines.

(ii) For a noncryogenic temperature range, use a temperature CPMS with a minimum tolerance of 2.8 deg. C or 1.0 percent of the temperature value, whichever is larger.

(iii) For a cryogenic temperature range, use a temperature CPMS with a minimum tolerance of 2.8 deg. C or 2.5 percent of the temperature value, whichever is larger.

(iv) The data recording system associated with the CPMS must have a resolution of one-half of the applicable required overall accuracy of the CPMS, as specified in paragraph (c)(8)(ii) or (iii) of this section, or better.

(v) Perform an initial calibration of the CPMS according to the procedures in the manufacturer's owner's manual.

(vi) Perform an initial validation of the CPMS according to the requirements in paragraph (c)(8)(vi)(A) or (B) of this section.

(A) Place the sensor of a calibrated temperature measurement device adjacent to the sensor of the temperature CPMS in a location that is subject to the same environment as the sensor of the temperature CPMS. The calibrated temperature measurement device must satisfy the accuracy requirements of (c)(7)(vi) of this section. Allow sufficient time for the response of the calibrated temperature measurement device to reach equilibrium. With the process and control device that is monitored by the CPMS operating normally, record concurrently and compare the temperatures measured by the temperature CPMS and the calibrated temperature measurement device. Using the calibrated temperature measurement device as the reference, the temperature measured by the temperature CPMS must be within the accuracy specified in paragraph (c)(8)(ii) or (iii) of this section, whichever applies.

(B) Perform any of the initial validation methods for temperature CPMS specified in applicable performance specifications established under 40 CFR part 60, appendix B.

(vii) Perform an accuracy audit of the temperature CPMS at least quarterly, according to the requirements in paragraph (c)(8)(vii)(A), (B), or (C) of this section.

(A) If the temperature CPMS includes a redundant temperature sensor, record three pairs of concurrent temperature measurements within a 24-hour period. Each pair of concurrent measurements must consist of a temperature measurement by each of the two temperature sensors. The minimum time interval between any two such pairs of consecutive temperature measurements is one hour. The readings must be taken during periods when the process and control device that is monitored by the CPMS is operating normally. Calculate the mean of the three values for each temperature sensor. The mean values must agree within the required overall accuracy of the CPMS, as specified in paragraph (c)(8)(ii) or (iii) of this section, whichever applies.

(B) If the temperature CPMS does not include a redundant temperature sensor, place the sensor of a calibrated temperature measurement device adjacent to the sensor of the temperature CPMS in a location that is subject to the same environment as the sensor of the temperature CPMS. The calibrated temperature measurement device must satisfy the accuracy requirements of paragraph (c)(7)(vi) of this section. Allow sufficient time for the response of the calibrated temperature measurement device to reach equilibrium. With the process and control device that is monitored by the CPMS operating normally, record concurrently and compare the temperatures measured by the temperature CPMS and the calibrated temperature measurement device. Using the calibrated temperature measurement device as the reference, the temperature measured by the temperature CPMS must be within the accuracy specified in paragraph (c)(8)(ii) or (iii) of this section, whichever applies.

(C) Perform any of the accuracy audit methods for temperature CPMS specified in applicable QA procedures established under 40 CFR part 60, appendix F.

(viii) Conduct an accuracy audit following any 24-hour period throughout which the temperature measured by the CPMS exceeds the manufacturer's specified maximum operating temperature range, or install a new temperature sensor.

(ix) If the CPMS is not equipped with a redundant temperature sensor, at least quarterly, perform a visual inspection of all components for integrity, oxidation, and galvanic corrosion.

(9) For each pressure CPMS, the owner or operator must meet the requirements in paragraph (c)(9)(i) through (ix) of this section.

(i) Install each sensor of the pressure CPMS in a location that provides representative pressure measurements over all operating conditions, taking into account the manufacturer's guidelines.

(ii) Use a pressure CPMS with a minimum tolerance of ±5 percent or 0.12 kilopascals (0.5 inches of water column), whichever is greater.

(iii) The data recording system associated with the pressure CPMS must have a resolution of one-half of the required overall accuracy of the CPMS, as specified in paragraph (c)(9)(ii) of this section.

(iv) Perform an initial calibration of the CPMS according to the procedures in the manufacturer's owner's manual.

(v) Perform an initial validation of the CPMS according to the requirements in paragraph (c)(9)(v)(A) or (B) of this section.

(A) Place the sensor of a calibrated pressure measurement device adjacent to the sensor of the pressure CPMS in a location that is subject to the same environment as the sensor of the pressure CPMS. The calibrated pressure measurement device must satisfy the accuracy requirements of paragraph (c)(7)(vi) of this section. Allow sufficient time for the response of the calibrated pressure measurement device to reach equilibrium. With the process and control device that is monitored by the CPMS operating normally, record concurrently and compare the pressure measured by the pressure CPMS and the calibrated pressure measurement device. Using the calibrated pressure measurement device as the reference, the pressure measured by the pressure CPMS must be within the accuracy specified in paragraph (c)(9)(ii) of this section.

(B) Perform any of the initial validation methods for pressure CPMS specified in applicable performance specifications established under 40 CFR part 60, appendix B.

(vi) Perform an accuracy audit of the pressure CPMS at least quarterly, according to the requirements in paragraph (c)(9)(vi)(A), (B), or (C) of this section.

(A) If the pressure CPMS includes a redundant pressure sensor, record three pairs of concurrent pressure measurements within a 24-hour period. Each pair of concurrent measurements must consist of a pressure measurement by each of the two pressure sensors. The minimum time interval between any two such pairs of consecutive pressure measurements is 1 hour. The readings must be taken during periods when the process and control device that is monitored by the CPMS is operating normally. Calculate the mean of the three pressure measurement values for each pressure sensor. The mean values must agree within the required overall accuracy of the CPMS, as specified in paragraph (c)(9)(ii) of this section.

(B) If the pressure CPMS does not include a redundant pressure sensor, place the sensor of a calibrated pressure measurement device adjacent to the sensor of the pressure CPMS in a location that is subject to the same environment as the sensor of the pressure CPMS. The calibrated pressure measurement device must satisfy the accuracy requirements of paragraph (c)(7)(vi) of this section. Allow sufficient time for the response of the calibrated pressure measurement device to reach equilibrium. With the process and control device that is monitored by the CPMS operating normally, record concurrently and compare the pressure measured by the pressure CPMS and the calibrated pressure measurement device. Using the calibrated pressure measurement device as the reference, the pressure measured by the pressure CPMS must be within the accuracy specified in paragraph (c)(9)(ii) of this section.

(C) Perform any of the accuracy audit methods for pressure CPMS specified in applicable QA procedures established under 40 CFR part 60, appendix F.

(vii) Conduct an accuracy audit following any 24-hour period throughout which the pressure measured by the CPMS exceeds the manufacturer's specified maximum operating pressure range, or install a new pressure sensor.

(viii) At least monthly, check all mechanical connections for leakage.

(ix) If the CPMS is not equipped with a redundant pressure sensor, at least quarterly, perform a visual inspection of all components for integrity, oxidation, and galvanic corrosion.

(10) For each pH CPMS, the owner or operator must meet the requirements in paragraph (c)(10)(i) through (vii) of this section.

(i) Install the pH sensor in a location that provides representative measurement of pH over all operating conditions, taking into account the manufacturer's guidelines.

(ii) Use a pH CPMS with a minimum tolerance of 0.2 pH units.

(iii) The data recording system associated with the CPMS must have a resolution of 0.1 pH units or better and must be capable of measuring pH over the entire range of pH values from 0 to 14.

(iv) Perform an initial calibration of the CPMS according to the procedures in the manufacturer's owner's manual.

(v) Perform an initial validation of the CPMS according to the requirements in paragraph (c)(10)(v)(A) or (B) of this section.

(A) Perform a single point calibration using an NIST-certified buffer solution that is accurate to within ±0.02 pH units at 25 °C (77 °F). If the expected pH of the fluid that is monitored lies in the acidic range (less than 7 pH), use a buffer solution with a pH value of 4.00. If the expected pH of the fluid that is monitored lies in the basic range (greater than 7 pH), use a buffer solution with a pH value of 10.00. Place the electrode of the pH CPMS in the container of buffer solution. Record the pH measured by the CPMS. Using the certified buffer solution as the reference, the pH measured by the pH CPMS must be within the accuracy specified in paragraph (c)(10)(ii) of this section.

(B) Perform any of the initial validation methods for pH CPMS specified in applicable performance specifications established under 40 CFR part 60, appendix B.

(vi) Perform an accuracy audit of the pH CPMS at least weekly, according to the requirements in paragraph (c)(10)(vi)(A), (B), or (C) of this section.

(A) If the pH CPMS includes a redundant pH sensor, record the pH measured by each of the two pH sensors. The readings must be taken during periods when the process and control device that is monitored by the CPMS are operating normally. The two pH values must agree within the required overall accuracy of the CPMS, as specified in paragraph (c)(10)(ii) of this section.

(B) If the pH CPMS does not include a redundant pH sensor, perform a single point calibration using an NIST-certified buffer solution that is accurate to within ±0.02 pH units at 25 °C (77 °F). If the expected pH of the fluid that is monitored lies in the acidic range (less than 7 pH), use a buffer solution with a pH value of 4.00. If the expected pH of the fluid that is monitored lies in the basic range (greater than 7 pH), use a buffer solution with a pH value of 10.00. Place the electrode of the pH CPMS in the container of buffer solution. Record the pH measured by the CPMS. Using the certified buffer solution as the reference, the pH measured by the pH CPMS must be within the accuracy specified in paragraph (c)(10)(ii) of this section.

(C) Perform any of the accuracy audit methods for pH CPMS specified in applicable QA procedures established under 40 CFR part 60, appendix F.

(vii) If the CPMS is not equipped with a redundant pH sensor, at least monthly, perform a visual inspection of all components for integrity, oxidation, and galvanic corrosion.

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