United States
Environmental Protection
Agency

Response to Comment on Proposed Rule, ‘Performance Specification 18 – Specifications and Test Procedures for Gaseous HCl Continuous Emission Monitoring Systems at Stationary Sources’

U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
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Research Triangle Park, NC

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Foreword

This document provides the EPA's responses to comments on the proposed performance specifications and test procedures for hydrogen chloride continuous emission monitoring systems (*Performance Specification 18-Specifications and Test Procedures for Gaseous HCl Continuous Emission Monitoring Systems at Stationary Sources*) (79 FR 27690; May 14, 2014). This proposed rule is available at **http://www.gpo.gov/fdsys/pkg/FR-2014-05-14/pdf/2014-10824.pdf**. Copies of all comments submitted are available at the EPA Docket Center Public Reading Room and are also available electronically through *http://www.regulations.gov* by searching Docket ID *EPA-HQ-OAR-2013-0696.*

For each comment, the Document Control Number (DCN) is provided along with the comment summary. For purposes of this document, the text within the comment summaries was provided by the commenter(s) and represents their opinion(s), regardless of whether the summary specifically indicates that the statement is from a commenter(s) (e.g., "The commenter states" or "The commenters assert"). The comment summaries do not represent the EPA's opinion unless the response to the comment specifically agrees with all or a portion of the comment.

Several of the EPA's responses to comments are provided immediately following each comment summary. However, in instances where several commenters raised similar or related issues, the EPA has grouped these comments together and provided a single response after the last comment summary in the group. Additionally, the EPA does not individually identify each and every commenter who made a certain point in all instances, particularly in cases where multiple commenters express essentially identical arguments. Although portions of the preamble to the final rule are paraphrased in this document, to the extent any ambiguity is introduced by this paraphrasing, the preamble itself remains the definitive statement of the rationale for the final rule.

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Chapter 1. Introduction

The U.S. Environmental Protection Agency (EPA) proposed performance specifications and test procedures for hydrogen chloride (HCl) continuous emission monitoring systems (CEMS) to provide sources and regulatory agencies with criteria and test procedures for evaluating the acceptability of HCl CEMS. The proposal was published on May 14, 2014 (79 FR 27690). The docket for this rule, which includes supporting documents as well as public comments, is available at the www.regulations.gov website.[1]

The initial public comment period proposed by the EPA was scheduled to end on June 13, 2014. Comments were received (0033, 0035) requesting that the EPA extend the comment period. In response, the EPA extended the comment period by 30 days to July 13, 2014, in order to provide the public additional time to submit comments and supporting information (79 FR 31901; June 3, 2014). “Public Submissions” representing over 14 commenters (some submitting more than one comment letter) were received on the proposal. Table 1 presents a list of public submissions placed into the docket for this rulemaking in response to the proposed rule (including comments that requested an extension to the comment period). Throughout this document, we may refer to either a particular commenter (or a particular document) by reference to a commenter ID (or document ID) that corresponds to the last 4 digits of the associated Document ID in the docket for this rulemaking.

In the remaining sections of this Response to Comment document (RTC), we have summarized the public comments received on the proposed *Performance Specification 18-Specifications and Test Procedures for Gaseous HCl Continuous Emission Monitoring Systems at Stationary Sources*. In addition, a list of frequently used acronyms and abbreviations is provided in Table 2.

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[1] The **Regulations.gov** website, part of an eRulemaking Program created in 2002, is managed by the U.S. Environmental Protection Agency with assistance of partner federal agencies. **Regulations.gov** is a public source of information on the development of federal regulations and other related documents issued by the U.S. government. Through this site, you can find, read, and comment on regulatory issues that are important to you.

Table 1. List of Commenters

EPA-HQ-OAR-2013-0696 Document ID	Date Received	Name and Affiliation
0033	5/22/14	Ralph L. Roberson, RMB Consulting & Research, Inc.
0035	5/29/14	Thomas Harman, Regulatory Affairs, PCA
0037	6/29/14	Lauren E. Freeman, Hunton & Williams on behalf of Utility Air Regulatory Group (UARG)
0038	7/11/14	Gervese Mackey, Unisearch Associates and Ty Smith, Cemtek Environmental
0039	7/15/14	Carl Kamme, Opsis, AB Sweden
0040	7/16/14	Gervese Mackey, Unisearch Associates and Ty Smith, Cemtek Environmental
0041	7/16/14	Stephen Gibbons, ABB, Inc
0042	7/16/14	Thomas Harman, Portland Cement Association (PCA)
0043	7/16/14	Michael Nixon, Holcim (US)
0044	7/16/14	Betsy Natz, Institute of Clean Air Companies (ICAC)
0045	7/16/14	Ronald A. Davis, Spectrum Systems, Inc.
0046	7/16/14	Melvin Keener, Coalition for Responsible Waste Incineration (CRWI)
0047	7/16/14	Lauren E. Freeman, Hunton & Williams on behalf of Utility Air Regulatory Group (UARG)
0048	7/16/14	Jamardhan Madabushi, Servomex Co., Inc.
0049	7/16/14	John F. Downs, Babcock & Wilcox Power Generation Group (B & W)
0050	7/30/14	Lauren E. Freeman, Hunton & Williams on behalf of Utility Air Regulatory Group (UARG) (received after public comment period ended; corrections to comments previously submitted during the public comment period-accounted for under “0047”)
0051	8/1/14	Mark S. Chamberlin, Altech Environment USA (received after public comment period ended)
0052	6/16/14	John F. Buresh, Xcel Energy

Chapter 2. General Comments on Proposed PS-18 and Procedure 6

2.1 Request for Extension of Public Comment Period

Comment:

Commenters (0033, 0035, and 0037) request additional time for review and comment on underlying data on the proposed performance specification and procedures.

Commenter (0033) states that (1) additional time is necessary to review the public record and the proposal to formulate meaningful comments; and (2) they are the principal investigator for a hydrogen chloride (HCl) continuous emission monitoring system (CEMS) field study sponsored by the Electric Power and Research Institute (EPRI) for which the report is currently under review and they would like to be able to benefit from being able to refer to the results of their study in their comments (requests an extension of 60 days).

Commenter (0035) opines that the proposed specification is significantly more complex than that which it is intended to substitute for or replace Performance Specification 15 (PS-15) and will require considerable effort to review (requests an extension of 60 days).

Commenter (0037) supports the EPA’s decision to extend the comment period by 30 days to allow additional time for review of the proposal and underlying data. However, according to the commenter, there is a lack of supporting data available in the docket that has frustrated their review. The commenter requests the addition of supporting documents to the docket for their review. Specifically, the commenter requests that the EPA add referenced test data (i.e., “Pilot Plant Performance Testing” and “ORD Testing” in EPA-HQ-OAR-2013-0696-0027, 0028 and 0029) and other relevant data, and that the EPA provide the public additional time for review and comment of the additional underlying data.

Response:

We extended the comment period from 30 to 60 days, closing on July 13, 2014. All of the data used to develop the performance specification was provided in supporting documents included in the rule docket. The EPA is aware of additional test data generated during the preparation of the proposal but not reported by the stakeholders until they provided public comments to our proposal for PS-18 and Procedure 6.

2.2 General Support and Opposition to the Proposal

Comment:

2.2.1 General Support

Commenter (0052) supports the EPA’s efforts to put forth clear guidelines and procedures to maximize the quality data from hydrogen chloride (HCl) continuous emission monitoring system

(CEMS). Commenter (0052) states that in some cases the procedures and specifications in the proposed rule are problematic and in other cases additional language will improve the rule. Commenter (0049) commends the EPA for proposing performance standards and quality assurance (QA) criteria for the growing number of HCl CEMS installed at various facilities due to promulgation of specific rules and standards. Commenter (0049) notes the importance of having a minimum baseline standard in which installed CEMS are manufactured to and certified against, and ongoing QA standards so that collected data can be verified and used to demonstrate compliance. Commenter (0049) states that the proposed Performance Specification 18 (PS-18) attempts to set a consistent level of requirements for HCl CEMS as well as remain technology neutral to the extent practicable, thus maintaining a level of flexibility in affected source analyzer selection and required impartiality towards HCl CEMS analyzer manufacturers.

In response to an EPA question and request for additional data on procedures to qualify integrated path CEMS (IP-CEMS), commenter (0042) asserted that this open-ended EPA request, together with other EPA requests suggest that the EPA has not settled on the acceptability of IP-CEMS or the certification and QA procedures that are necessary. The possibility that the EPA might include future prohibitive requirements for IP-CEMS will cause potential industrial users to adopt a wait and see attitude. Until the EPA finalizes its requirements, the regulated industry users cannot make informed decisions regarding the selection of monitoring options, technologies, or particular CEMS.

Commenter (0048), in response to the EPA's request for information on other initial or on-going procedures for IP-CEMS, stated that cross-stack measurement of HCl, ammonia (NH_3) and carbon monoxide (CO) as parts per million (ppm) can be conducted with a validation option using a sealed gas cell located inside the receiver unit that contains a fixed quantity of gas to be measured. Commenter states that this feature eliminates the need for reference gas standards for daily validation of the analyzer performance. Commenter states that the IP-CEMS model can be equipped with both internal and external validation cells. Commenter states that the internal sealed cell is moved into the CEMS instrument laser beam path by a compact servomotor. Commenter states that the instrument calculates and stores the absorption signal for the gas concentration in normal mode before span check, and the normal mode absorption signal is continuously subtracted from the measured signal during span check operation (see page 6 of their comment letter for additional information).

2.2.2 <u>General Opposition</u>

Commenters (0042, 0045, and 0051) opine that some of the requirements as proposed are overly complex, restrictive or burdensome. Commenter (0042) acknowledges that the EPA tried to develop a "one size fits all" approach but that, as proposed, the PS is cumbersome and does not fit any technology well. The commenter (0042) requests that the EPA add options and changes to the proposed PS-18 and Procedure 6 that would result in more efficient and effective requirements for initial certification and on-going QA for HCl CEMS.

Commenter (0043) states that the EPA has not included any information in the docket (1) to support or justify the strict performance requirements in PS-18 and Procedure 6, or (2) to allow industry and the public to evaluate so that they can submit informed comments.

Commenter (0042) asserts that the proposed requirements may exclude some viable technologies from use, impose unnecessary QA procedures that would not improve data quality.

Commenters (0041, 0038, 0045, 0039, and 0051) state that the technical difficulty associated with aspects of the proposed regulations may result in properly performing instruments failing to demonstrate conformance with the requirements on a consistent basis.

Response:

We acknowledge the commenters' support for use of both extractive and IP-CEMS to meet PS-18 and Procedure 6 requirements. We disagree with the comment that PS-18 imposes a restriction or burden. To the contrary, it provides flexibility by supplying an additional option for facilities needing to measure HCl on a continuous basis. The facilities already have the option of using PS-15 (which is instrument specific) if they choose, and this rule does not affect the availability of that option. The EPA disagrees with the comment that the materials in the docket were insufficient to allow the public to submit informed comments. All of the information upon which the proposed rule relied was docketed at time of proposal. Performance Specification 18 was written as a performance-based procedure that would allow a variety of technologies, so long as they meet the criteria, to insure that the data provided was adequate. Facilities also continue to have the option of submitting an alternative method under sections 60.8(b)(2), 61.13(h)(1)(ii), and 63.7(e)(2)(ii), or other applicable alternative method approval mechanism if they feel PS-15 and PS-18 are not appropriate for them. Guideline document 22 (GD-022), *Requests For Approval Of Alternatives/Modifications to Test Methods and Testing Procedures*, gives direction to the public in navigating this process. That document can be found at: http://www.epa.gov/ttnemc01/guidlnd/gd22.pdf. The EPA has revised several sections of PS-18 and Procedure 6 in response to public comments and the result is a clearer and better defined standard for continuous HCl emissions measurement. Details on specific changes to PS-18 and Procedure 6 are included in the remainder of this response to comment document.

2.3 Insufficient Time to Implement

Comment:

Commenter (0043) believes that the EPA has failed to propose PS-18 and Procedure 6 in a timely manner which has imposed unfair constraints on cement kiln operators to implement the regulations. The commenter asserts that the EPA has not provided sufficient time to implement an HCl monitoring program under the proposed PS-18 and Procedure 6 requirements prior to the regulatory compliance date in 40 CFR part 63, Subpart LLL (Subpart LLL). The commenter notes that only 14 months remain before the September 9, 2015 Subpart LLL deadline, and that they believe it is unlikely that an HCl CEMS could be successfully installed, operational and certified by the compliance date. The commenter states that the purchase process requires additional time:

- In order to budget capital expenditure funds;
- For purchase activities associated with unique HCl CEMS (including: establishing correct technical specifications and request for proposal (RFP) requirements, soliciting proposals

from multiple providers, performing a legitimate technical and business evaluation of responses considering site-specific conditions at seven affected plants, selection of acceptable proposal, negotiation and issuing contracts);

- For acquisition and installation activities (including supplier fabrication, scheduling and performing factory acceptance tests, site modifications, shipping, delivery, installation, and DAS interface work);
- For start-up and shakedown, debugging and training of technical personnel; and
- For retaining qualified Fourier transform infrared spectroscopy (FTIR) stack test firm, scheduling and conducting certification tests.

According to the commenter, their experience with mercury (Hg) CEMS, the selection, purchase, installation and start-up process may take as long as 2 years. The commenter believes that it is inappropriate to collapse or shortcut this process and risk an unsuccessful outcome.

Commenter (0043) states that it is difficult to predict when the EPA will promulgate PS-18 and Procedure 6 and, therefore, they must plan on selecting another compliance demonstration option.

Commenter (0043) also opines that the current proposal contains numerous errors, contradictions, and omissions, and that it needs significant changes to provide a practical and achievable set of requirements. The commenter believes that, if significant changes are made, re-proposal may be required, further delaying promulgation of final requirements. The commenter asserts that until the EPA promulgates its final regulations, there is no practical basis to pursue any non-FTIR technology such as the tunable diode laser (TDL) CEMS, cavity ring-down spectrometer (CRDS) analyzers as an add on technology for other dilution based CEMS, or the use of PS-18 and Procedure 6 as an alternative to PS-15 and appendix F, Procedure 1 for FTIR-based CEMS.

Response:

The EPA acknowledges that timing is critical for those seeking to comply with 40 CFR part 63, Subpart LLL using PS-18 and we are committed to providing this PS to the public in a timely manner. The combination of PS-18/Procedure 6 is not the only avenue available for compliance demonstration, but will offer a set of technology-neutral performance specifications and QA procedures should a facility choose a compliance option that requires continuous HCl monitoring. In addition, facilities always have the option to petition for an alternative test method approval under sections 60.8(b)(2), 61.13(h)(1)(ii), 63.7(e)(2)(ii), or other applicable alternative method approval mechanism as found in GD-022 (http://www.epa.gov/ttnemc01/guidlnd/gd22.pdf).

To the end that the timing of PS-18 promulgation affects a facilities ability to comply with Subpart LLL in a timely fashion, we also point owners and operators to alternatives in that subpart that allow for use of CEMS certified by PS-15, as well as optional quarterly Method 321 compliance testing until PS-18 is promulgated.

The EPA disagrees that any of the changes made to PS-18/Procedure 6 since proposal warrant re-proposal. Each post-proposal change to PS-18/Procedure 6 was a logical outgrowth of comments received on the proposal. The EPA notes that it did not propose to amend the Subpart LLL deadline, and that comments requesting such amendment are beyond the scope of this action.

2.4 Previous Comments on Pre-Proposal Drafts

Comment:

Commenter (0042) states that they had previously submitted comments to the EPA on pre-proposal drafts of the proposed PS-18 and Procedure 6 and met with the EPA (May 7, 2012) to discuss their comments. The commenter is concerned that their comments on pre-proposal drafts are not included in the docket but that similar comments from others on pre-proposal drafts are included in the docket. The commenter asserts that, in addition to not being included in the docket, their comments as well as other comments received on pre-proposal drafts did not appear to result in any revisions to the EPA’s proposed procedures. The commenter resubmits their pre-proposal comments on previous drafts of PS-18 and Procedure 6 in appendices to their comment letter.

Commenter (0043) believes that the EPA has not adequately considered the results and conclusions from their HCl CEMS field evaluation projects that were submitted to the EPA previously (pre-proposal) in December 2012. The commenter includes the evaluations of the HCl CEMS that were sent previously to the EPA with their comments (see Attachments A and B of their comment letter).

Response:

The EPA acknowledges the contributions from multiple stakeholders in the development of PS-18 and Procedure 6. We thank you for public distribution of your Field Evaluation results and technical comments. All of the information upon which the proposed rule relied was docketed at time of proposal. The EPA has discretion whether to docket additional information beyond the information relied on for proposal. While commenters express concerns that the EPA should have used different or additional information to shape its proposal, the record of this final action reflects that the EPA has fully considered the information submitted by the commenters.

2.5 Use of Other Alternatives

Comment:

Commenter (0042) believes that the costs and risks associated with PS-18 and Procedure 6, as proposed, will cause many cement kiln operators to choose other available alternatives under Subpart LLL such as employing dry scrubbing/sorbent for HCl control and conducting an HCl compliance test every 30 months in conjunction with continuous monitoring of sorbent injection rates, monitoring sulfur dioxide (SO_2) as a surrogate for scrubber control performance, or use of FTIR CEMS meeting PS-15 and Appendix F, Procedure 1 (with or without approved alternatives).

Commenter (0045) states that the cost to install and provide ongoing QA and maintenance will lead the majority of electric utility operators subject to 40 CFR part 63, Subpart UUUUU, the Mercury and Air Toxics Standards (MATS) rule, to seek other alternatives such as SO_2 surrogate monitoring or quarterly compliance testing.

Commenter (0043) states that the solicitation of comments in section V. C of the preamble suggests that the EPA has not settled on the acceptability of IP-CEMS or the certification and QA procedures that are necessary. Because of this, the commenter believes that other potential industrial users will plan to adopt a wait and see attitude on this technology. In response to a solicited comment on manufacturer certification, the commenter believes that resolution of issues for IP-CEMS, such as those EPA solicits comments on in the proposal preamble (section V.C), are better resolved through direct discussions of the manufacturers and EPA technical personnel and cannot be effectively resolved during rulemaking. Commenter believes these issues could be resolved through a manufacturer's certification more effectively.

Response:

As two of the commenters pointed out, the EPA has offered facilities a number of HCl emissions compliance demonstration options under both Subpart LLL and the MATS rule. Thus, the combination of PS-18/Procedure 6 is not the only avenue available for compliance demonstration, but will offer a set of technology-neutral performance specifications and QA procedures should a facility choose a compliance option that requires continuous HCl monitoring. Revisions to specific sections of PS-18 and Procedure 6 clarify the appropriate place and balance for manufacturer's certification versus quality control tests performed at the installation site. In addition, facilities always have the option to petition for an alternative test method approval under sections 60.8(b)(2), 61.13(h)(1)(ii), 63.7(e)(2)(ii), or other applicable alternative method approval mechanism as found in GD-022 (http://www.epa.gov/ttnemc01/guidlnd/gd22.pdf).

2.6 Compatibility with Other Requirements

2.6.1 General

Comment:

Commenter (0042) expresses concern that the EPA is proposing changes to recently promulgated requirements affecting kiln systems subject to Subpart LLL which were negotiated with the EPA that cement companies have spent significant resources to meet by a September 2015 deadline.

Response:

The EPA acknowledges that it has proposed technical revisions and changes to the Portland cement rule. (*See*: 79 FR 68821; November 19, 2014). However, that is a separate rulemaking process, beyond the scope of the proposed action to establish PS-18.

2.6.2 Determination of HCl CEMS Span Value

Comment:

Commenter (0042) states that Subpart LLL would apply to HCl CEMS under PS-18 and Procedure 6, including the determination of HCL CEMS span value. The commenter reports that Subpart LLL requires that the HCl CEMS span value be 5 ppm, whereas the span value for EGU's under 40 CFR part 60, Subpart UUUUU (Subpart UUUUU) is lower (likely in the range of 2.5 to 3 ppm). The commenter asserts that the achievability of the proposed specifications must be evaluated using a 5 ppm HCl span value for cement kilns as the promulgated Subpart LLL span requirement is not subject to change under the proposed PS-18.

Response:

When rule-specific requirements for CEMS, such as span, are absent from final source category-specific rules, the applicable PS contains the generic requirements necessary to assess the performance of the measurement system. We acknowledge the commenter's concern and accordingly we have revised several sections of PS-18 and Procedure 6 to clarify how this rule and procedures requirements can be achieved. Section 3.2.1 of PS-18 states that "the span value is an HCl concentration approximately equal to two times the concentration equivalent to the emission standard unless otherwise specified in the applicable regulation, permit or other requirement." Performance Specification 18 also states that "Unless otherwise specified, the span may be rounded up to the nearest multiple of 5." Several requirements based on the applicable span value have been revised in the final rule including, but not limited to, the calibration drift, measurement error and interference test. In each of these cases, the EPA evaluated information provided to the docket including proposed or final span value in Subparts LLL and UUUUU to establish requirements based on the percent of span that were achievable by current technology.

2.6.3 Above Span Calibration Checks

Comment:

Commenter (0042) requests that the EPA remove conflicting requirements in Procedure 6, section 4.1.1, which require a daily check of the "calibration range above span" (CRAS). The commenter asserts that the daily check is inappropriate because emissions will exceed the span value only when mill down operation occurs, which is typically 10-15 percent of source operating hours and often occurs only once each 7 to 10 kiln operating days. The commenter reports that Subpart LLL requires above span calibration checks only when emissions exceed the span value for greater than 2 hours. The commenter complains that the daily CRAS check requirement would likely create 1 hour of CEMS data loss each time it is performed because of the time for the CEMS to reach and stabilize at the high level concentration and recover and stabilize at the normal operating level.

Response:

The EPA agrees that a revision to the proposed rule is appropriate. CEMS data must be of a sufficient quality to determine if a source meets compliance limits. Procedure 6, section 4.1 has been revised to remove its independent requirement for routine generation of calibration data above span. The requirement to do these additional calibration points arises in particular instances under the particular regulation that establishes the monitoring requirement (e.g., Subpart LLL). Section 4.1 now contains an optional procedure that may be used by source owner/operators to qualify data above span.

2.6.4 Adjustment of the CEMS When a Difference from the Target Value of 0.05 ppm HCl is Observed for the CRAS Check

Comment:

Commenter (0042) reports that the proposed requirements in Procedure 6 apply stricter tolerances and potentially invalidate data that is acceptable under the Subpart LLL requirements. The commenter states that Subpart LLL requires only mathematical "normalization" of the CEMS data in accordance with section 63.1350(l)(1)(ii)(C) (Equation 20) when above span checks are performed and the results differ by more than 20 percent from the target value (e.g., > ± 4.0 ppm at 20 ppm target), and that, under the span requirements of Subpart LLL, the CEMS data are valid whether or not a mathematical normalization is applied.

Response:

As noted in the previous response, Procedure 6, section 4.1.5 has been amended to remove the requirement for calibration when measured values are above span. Section 4.1 now contains an optional calibration procedure. The optional calibration procedure may be used to qualify data significantly above the span value and must be used when it is required by an applicable rule or regulation.

2.6.5 QA/QC Procedures

Comment:

Commenter (0049) states that Appendix B to the MATS and any other regulations that require HCl monitoring need to be updated to remove any existing reference to technology specific performance specifications. Commenter (0049) states that section 5.1 in appendix B of the MATS rule requires the subject facility to implement the QA and quality control (QC) procedures from Part 60, Appendix B of PS-15; however, PS-15 is specific to the use of FTIR CEMS and has other issues that the EPA is aware of.

Response:

The EPA sees no need to remove the option of using PS-15 for the MATS or any other rules, but it does intend to add the option of using PS-18. Owners or operators who choose to use the FTIR approach in PS-15 will continue to be able to so do. Use of PS-18 to monitor HCl from MATS facilities is a topic for the MATS rule and, if allowed, will be part of a MATS rule technical correction package. In the event that neither today's rule nor a MATS technical corrections package is completed before MATS implementation, owners or operators may choose to use PS-15 and they remain able to petition the Administrator for alternative monitoring approaches, including that contained, but perhaps not yet finalized, in PS-18. (*See* the MATS rule preamble at 77 FR 9372; February 16, 2012) and 40 CFR 63.7. The EPA believes that an alternative monitoring approach containing the elements and features of PS-18 should have little difficulty being approved. Finally, the EPA expects that the MATS and other rules relying on PS-18 will be updated in a timely fashion as part of their ongoing review, once PS-18 is finalized.

2.7 Single Set of Requirements Applicable for both Sources with Low and High Emissions/Near Level of the Standard

Comment:

Commenter (0042) opines that the central idea of basing everything on the emission limit and span value is not appropriate for sources with low and high emissions, but never appropriate near the level of the standard. The commenter reports that for many kilns with in-line raw mills, unabated HCl emissions during "mill off operation" may range from 10-25 ppm. To maintain compliance with the 30-day rolling average, it will be necessary to achieve and measure HCl concentrations below 0.4 ppm during "mill on operation."

Commenter (0042) asserts that the proposed PS-18 and Procedure 6 requirements do not account for unique cement kiln measurement challenges and conditions:

a. The specification of multi-point linearity tests for initial certification between zero and the span value and requirements for quarterly audits at 20-30 percent of span value is unnecessary and poses risks for the CEMS operator and provider with little impact on the accuracy of reliability of 30-day rolling averages provided by the CEMS. Commenter provides a detailed analysis to support their position as an attachment to their comment letter (see Attachment 3 of their comment letter for their analysis).

Response:

The EPA acknowledges that while candidate HCl monitoring technologies are likely very linear, the performance of the measurement error test is more than just a linearity test. It is a critical and integral component of the overall CEMS certification process which serves to ensure the integrity of monitoring data at each installation. The measurement of multiple upscale gas concentrations are used to accomplish this objective. The three upscale calibration gas concentration ranges serve to assess the HCl CEMS' overall measurement quality at three different HCl levels. Based on defined criteria for establishing the CEMS' span, these HCl levels are: at a level above the emission limit; at a level approximately equal to the emission limit; and at a level near the mid-point of the emission limit. These points serve to bracket, as best as possible, actual and potential measurement levels. This approach is consistent with the MATS rule mercury (Hg) CEMS certification requirements where three upscale Hg calibration gases at the same levels are required for the same purpose.

Comment:

b. The highly variable HCl concentrations and variable ammonia concentrations affect the formation and equilibrium of ammonium chloride, which results in unique monitoring challenges for HCl CEMS at cement kilns with in-line raw mills. The commenter (0042) states that this results in the extractive CMS exhibiting "hysteresis effects" due to adsorption/desorption of HCl and ammonium chloride during significant effluent concentration changes and calibration checks. The commenter opines that these effects should not be the basis for frequent short-term analyzer adjustments because they would not detract from the accuracy of 30-day rolling averages. The commenter argues that the proposed calibration drift check requirements may result in the prohibited use of all extractive HCl CEMS at cement kilns with in-line raw mills and highly variable emissions. The commenter asserts that, because of the exclusion of extractive HCl CEMS and unresolved issues with the EPA's final requirements for IP-CEMS, many kiln operators will not have a choice but to elect to monitor SO_2 or sorbent injection to avoid HCl CEMS altogether.

Response:

The EPA recognizes the challenges provided by mill on /mill off operation and has provided specific monitoring allowance in recently proposed technical corrections to Subpart LLL at 79FR 68821. The EPA acknowledges that each source must consider a number of options to demonstrate compliance with HCl emissions depending on the source category specific rule requirements. Options may include monitoring HCl, periodic reference method tests for HCl emissions, or SO_2 control and monitoring options all based on what is allowable in specific rule requirements. The requirement for dynamic spiking has been removed from PS-18 and Procedure 6 and is replaced by several options to use dynamic spiking/standard addition procedures that add flexibility to meet performance requirements in these actions. We have revised sections of Procedure 6, described in section 4.2 of this response to comment document, dealing with calibration drift to allow upscale dynamic spiking/standard addition as an option in the suite of challenges to assure the daily performance of HCl CEMS. By offering the dynamic spiking/standard addition option as part of the rule, the EPA addresses commenters' concerns that dry gas calibration drift and audit challenges may take CEMS systems out of steady state equilibrium experienced during emission gas measurements. Potential "hysteresis effects" caused by the higher level calibration or audit gases are mitigated using the dynamic spike/standard addition option because hot, wet emission gases are still part of the measurement process.

2.8 Technology-Neutral Approach

Comment:

Commenter (0042) requests that the EPA replace the proposed "technology neutral" approach with a "technology appropriate" approach to increase effectiveness and promote data quality.

The commenter acknowledges that the technology neutral approach is well-intended but that they believe the approach is impractical. The commenter argues that, because the EPA proposed different test procedures and specifications for extractive CEMS as compared to cross-stack in-situ CEMS, the EPA has actually proposed what they view are technology appropriate requirements for the different sampling trains (sampling systems), and that they combine these technology appropriate sampling system requirements with technology neutral analytical technologies. The commenter opines that this results in unnecessary test requirements that do not yield useful information. As an example, the commenter states that the proposed interference test requires testing each analytical technology for a fixed set of interference gases, where it is well known that most interference gases cannot possibly have an interference effect on the respective HCl analytical techniques and must be determined by manufacturers in the development of their analyzer systems. The commenter reports that all analyzers that operate in the infrared region (including FTIRs) must determine HCl concentrations over the same spectral region, and formaldehyde, methane and water vapor are potentially interfering substances, and that there is no need to test for interference due to oxygen or other gases on the EPA's list unless the instrument designer desires to use a tracer for dynamic spikes. The commenter recommends that the EPA validate FTIR reference spectra from various manufacturers rather than insisting on the conventional approach and attempting to determine the stability and uncertainty of reactive condensable calibration standards stored in compressed gas cylinders and the ability to recover and deliver the standard in a suitable matrix to each analyzer.

Response:

One reason the EPA develops performance-based requirements is to allow advancements in technology without having to rewrite performance specifications or reference methods. Over the years, we have found this approach to ultimately allow much additional flexibility. If a facility has reason to believe that specific performance criteria are not needed under specific conditions, they may petition the Administrator under section 63.7(f). Performance Specification 18 was proposed to establish performance-based requirements that applicable technologies must meet to generate data sufficient to demonstrate compliance with an associated regulatory emission limit. Performance Specification 18 does not specifically target mid infrared optical instruments; rather it proposes specifications that demonstrate the necessary data quality regardless of the analyzer technology. If owners or operators choose to focus on a mid-infrared, full spectrum optical technique to meet HCl monitoring requirements, the EPA has provided PS-15 that may be included as an acceptable alternative measurement approach in specific rules or may be requested under sections 60.8(b)(2), 61.13(h)(1)(ii), 63.7(e)(2)(ii), or other applicable alternative method approval mechanism as an alternative monitoring approach. Guideline document 22 (GD-022) gives direction to the public in navigating this process. That document can be found at: http://www.epa.gov/ttnemc01/guidlnd/gd22.pdf.

The EPA disagrees with the contention that interference from common or prevalent gases in source emissions do not need to be evaluated in every HCl CEMS technology. PS-18 is a technology neutral performance-based specification that includes a reasonable list of typical stack gas components that could act as interferents in one of a number of currently available or future technology developments for continuous HCl monitoring. Comparative field evaluations by owners and operators demonstrated that bias and differences between different technologies were resolved by improving corrections for interferences. Some of these interference biases were not expected (e.g., water as an interferent in IP-CEMS TDL technologies). It is important for this PS that results from different measurement technologies give accurate, precise and comparable results. It is also important that interference checks include gases that may be part of reactions that generate interference as well as gases that directly interfere with the measurement of HCl. The EPA has clarified and revised PS-18 for interference evaluation by removing the requirement for interference testing in the field. Field evaluation of interference is now accomplished through other QC requirements. We have revised the interference test requirement to be done in a controlled environment by the manufacturer or vendor and have added several alternative evaluation criteria based on total concentration HCl, percent of span or level of detection.

By allowing instrument manufacturers or vendors to perform interference tests under controlled laboratory conditions with an example instrument model and a standard list of common interference gases, we have made the process less costly than requiring a full interference test for each instrument at the installation site.

The EPA also acknowledges commenters recommendations for a broader role for dynamic spiking to demonstrate CEMS performance during initial evaluation and ongoing monitoring. We have addressed relevant dynamic spiking issues in other parts of this response to comments.

2.9 Other Approaches for HCl Monitoring Using FTIR-Based CEMS

Comment:

Commenter (0042) recommends that the EPA allow other approaches, such as reference Method 321 for HCl monitoring using FTIR-based CEMS. The commenter asserts that Method 321 is simple and straightforward as specified as a reference method to determine HCl concentrations for HCl compliance tests and RATAs of HCl CEMS at cement kilns. The commenter presents what their recommended approach would entail on pages 11 and 12 of their comment letter. The commenter opines that, if the EPA considers Method 321 sufficient to ensure HCl CEMS are accurate based on conducting RATAs, then it is logical to assume Method 321 is accurate enough to use on a daily basis to measure HCl concentrations on a continuing basis without the burden and costs that would be incurred as a result of the proposed PS-18 and Procedure 6. The commenter asserts that their proposed approach would provide data of the same quality as the data (1) used for area source determinations, (2) used by the EPA to set the Subpart LLL emission limit, (3) that will be used for required HCl compliance determinations for sources with sorbent injection choosing that option, and (4) used for HCl CEMS RATAs at cement kilns.

Response:

The EPA disagrees with the commenter’s request to allow reference Method 321 or Method 320 to be used as a CEMS procedure. The requirements to perform continuous measurements are different from the requirements to perform single event measurements. The commenter reflects on the accuracy of the FTIR-based Method 321 as adequate to conduct RATAs; however accuracy is not the issue that distinguishes reference methods and performance specifications. Rather it is the sequence of procedures for initial evaluation and the ongoing sequence of procedures to qualify the data quality on a continuous basis. Performance Specification 18 and Procedure 6 were written to include the specifications that are typical in other performance specifications. Where the EPA requires continuous measurement in rules, the EPA stipulates promulgated PS for the measurement system, including specifics on determination of RATAs as well as daily, quarterly, and other periodic QA/QC procedures to validate the collected data. Where a source wishes to employ an FTIR monitor for a CEMS installation, we specify in the appropriate subpart that all CEMS must be operated in accordance with a specified PS. In the case of an FTIR CEMS, this would be either PS-15, or this PS-18 when finalized. A comparison between PS-15 and Method 321 or Method 320 illustrates the differences between a promulgated PS and its requirements and a promulgated reference method used for single event compliance testing and its one-time requirements.

The combination of PS-18/Procedure 6 offers a set of technology neutral performance specifications and QA procedures should a facility choose them from the compliance options allowed in a specific rule or regulation that requires continuous HCl monitoring. We note, for example, that Subpart UUUUU allows periodic measurements with the reference method for HCl as an option to continuous monitoring.

We have chosen to specify HCl monitoring requirements in a construct (via performance specification and QA procedure) similar to that for all our other gaseous monitoring requirements. We will also consider petitions for an alternative test method approval under sections 60.8(b)(2), 61.13(h)(1)(ii), 63.7(e)(2)(ii), or other applicable alternative method approval mechanism if owner or operators provide rationale and justification for meeting the HCl measurement requirements in applicable federal rules and regulations. Guideline document 22 (GD-022) gives direction to the public in navigating this process. That document can be found at: http://www.epa.gov/ttnemc01/guidlnd/gd22.pdf.

2.10 Compliance Date

Comment:

Commenter (0049) requests that the compliance date for HCl CEMS required under MATS be extended by at least 6 months from the date when the PS-18 standards are finalized and published in the *Federal Register*. The commenter states that due to delays in finalizing PS-18 and the lack of NIST traceable calibration gases, it will be impossible for MATS-affected units that plan to install HCl CEMS to have them certified by the compliance date of April 16, 2015. Commenter further states that after PS-18 becomes final, some HCl CEMS may need to be returned to the supplier and/or a unit outage for modification or redesign, which could take 3 to 6 months to complete.

Commenter (0052) requests that the EPA include a grace period in the final rule for cases where the affected facility cannot be operated to meet the testing deadlines (i.e., CGA or RATA) due to circumstances such as plant outages, both scheduled and unscheduled. Commenter states that other regulations have allowances for these situations and the grace periods should be consistent with those defined in 40 CFR parts 75 and 63.

Response:

The comment concerning extending the compliance dates of other rules is beyond the scope of this action. In this action, the EPA did not propose to reconsider MATS deadlines. Concerns about other rules should be addressed in those individual rulemakings. For example, the MATS rule proposed changes regarding the use of PS-18 and Procedure 6 on February 17, 2015 (see 80 FR 8448, 8483, and 8484).

Owners or operators subject to the MATS proposal are reminded that one option for facilities who seek to use HCl CEMS in advance of the promulgation of PS-18 and Procedure 6 has been the submission of an alternative monitoring request in accordance with the requirements of section 63.8(f). Such a request could include the use of proposed PS-18 and Procedure 6 (see 80 FR 8448). Electrical generating units (EGU) owners or operators could have used one of the approved alternatives, such as quarterly stack testing, to demonstrate compliance with MATS HCl emission limits until PS-18 and Procedure 6 are promulgated.

2.11 Optical Measurement Path Length Determination

Comment:

In response to an EPA-solicited comment on path length measurement, Commenter (0042) responded that the EPA need not specify additional requirements. CEMS suppliers must accurately determine the measurement path length at the time of installation. Successful demonstration of conformance with PS-18 RATA or dynamic spike accuracy requirements is sufficient proof that the measurement path length is accurate.

Commenter (0048) provides information on stack and sampling system components that are used to determine the optical path length, including the optical path through gas, the optical path through flanges, and the optical path through the transmitter and receiver units (see page 3 of their comment letter). To determine the optical path length, the commenter recommends that a physical measurement be taken of the stack diameter and flange nozzles using a laser tape measure, measurement tape, or similar device instead of relying on engineering drawings.

Commenter (0048) states that in the determination of the optical path length, the effect of window/flange nozzle purge gas in IP-CEMS is not addressed in the proposed requirements and should be as it can be a significant source of uncertainty for short path lengths and/or high purge flows. Commenter provides detailed information on procedures for optimizing the flange purge flow (see pages 4 to 5 of their comment letter).

Commenter (0040) asks the EPA why the path length cannot be determined by engineering drawings. Commenter states that if the path length cannot be determined by engineering drawings, then it must be measured, either mechanically (a type of ruler) or possibly by laser radiometer.

Response:

The EPA agrees that the optical path length should be considered for integrated Path CEMS measurement. Path length cannot be determined from engineering drawings because our experience is the practical construction and flange/insertion depth of the sampling port are often not the same as those on the engineering and construction drawings. Furthermore, technologies may choose to restrict the path length of their equipment to a specific dimension different from the stack construction. The EPA also agrees that purge gas flow rate has an effect on the apparent optical path length through the measured gas. We have revised PS-18 in section 8.2.3.2 to take into account purge gas flow and in section 8.2.3.1 to note that laser based tape measure or mechanical tape measure are used to determine the true distance available for integrated path CEMS measurement.

2.12 Information on Critical Parameters that can Affect CEMS Performance

Comment:

Commenter (0041) is a manufacturer of FTIR HCl CEMS and provided detailed information on critical parameters that can influence extractive CEMS performance after initial acceptance of the system, including strategies to avoid negative influence on CEMS quality (see pages 13 to 15 of their comment letter). These parameters include: interference testing, estimating the limit of detection, temperature drop in the sampling system and the analyzer below the HCl dew point, probe filter cake build-up, HCl adsorption at probe filter build-up, leakage of the sampling system and the analyzer, aging of the continuous gas analyzer, and emergency purge.

Response:

The EPA acknowledges the commenter’s support for analyzer interference testing and limit of detection tests performed by the manufacturer as an option to testing the effect of interferences in field tests. EPA also acknowledges this commenter’s suggestions for best practices to promote ways to meet the performance-based requirements in PS-18 and Procedure 6. Other responses from this commenter are grouped with similar responses from other commenters.

The EPA continues to include measurement error checks performed in the field to account for instrument performance under the potentially harsh conditions of field measurements including the effect of site-specific sample matrix on sampling and analysis system performance.

The EPA understands that the commenter’s request to substitute the interference test, linearity demonstration, and field verification of calibration accuracy and drift stabilty at zero and one upscale level together and dynamic spikes as an alternative to RATA testing with a specified reference method. We have revised Procedure 6 to include dynamic spiking as an alternative measure of measurement error and calibration drift stability for extractive CEMS. We have revised PS-18 calibration drift requirements to include only a mid-level check. However, the EPA disagrees with the request to eliminate the RATA because it does not resolve the question about the representativeness of the sample demonstrated by comparing reference method results that include a traversing procedure to CEMS single point monitoring.

Chapter 3.0 Comments Received on the Proposed Performance Specification-18

3.1 Applicability

<u>3.1.1 Section 1.2.3</u>

<u>Comment</u>:

Commenter (0047) believes that the following sentence in section 1.2.3 of PS-18 is unnecessary and suggests that a source could not use a HCl CEMS for any purpose without meeting PS-18.

> *A source that demonstrates their CEMS meets the criteria of this PS may use the system to continuously monitor gaseous HCl.*

Commenter (0043) recommends that the EPA delete the sentence or add to the end of the sentence the following: "…under any regulation or permit that requires compliance with this PS."

<u>Response</u>:

The EPA acknowledges the comment and we have revised the PS-18 text to provide this clarification.

<u>3.1.2 Cement Kilns</u>

<u>Comment</u>:

Commenter (0043) states that the EPA has not performed under conditions representative of the effluent conditions encountered at cement kilns. The commenter notes that tests conducted over short pilot plant operating conditions are not representative of the performance that can be achieved under actual conditions at cement kilns. The commenter believes that establishing requirements that are too strict or too burdensome discourages use of CEMS intended to meet PS-18 and Procedure 6.

<u>Response</u>:

Performance Specification 18 was developed to evaluate data generated under the specification to determine if it is adequate to meet the compliance data needs for stationary sources in general. We recognize that each source will experience their own particular learning curve as with any new instrument, but if the source should experience an apparently insurmountable problem with a particular installation, they still have the option to either petition the Administrator for consideration of an alternative testing approach under section 63.7(f).

We disagree with the comment that PS-18 requires further demonstration. The same applicable technology (Method 321, 40 CFR part 60, Appendix A) is the reference test method successfully used on all cement kilns for compliance demonstration and was instrumental in collecting data to establish the emission limits the Portland Cement rule with good precision and accuracy. Promulgation of PS-18 will allow the application of monitoring technologies in addition to FTIR which offers facilities (e.g., cement and power industries) additional flexibility to meet HCl monitoring requirements. We have also taken other specific comments about the adequacy of requirements and revised PS-18 and Procedure 6 to be consistent with other existing performance specifications. In some cases those revisions, described elsewhere in this response to comments, have provided additional flexibility in meeting the requirements to demonstrate adequate measurement and monitoring quality for HCl CEMS covered under this action.

3.2 Definitions

3.2.1 Calibration Drift (CD)

Comment:

Commenter (0047) believes that the sentence "[a] separate CD determination must be performed for pollutant and diluent analyzers." in the calibration drift definition is unnecessary because PS-18 only applies to HCl CEMS and not diluent analyzers. The commenter also believes that this sentence in the definition could cause confusion by suggesting that diluent analyzers are required to meet the CD requirement and recommends that the EPA delete the sentence from the definition.

Response:

The EPA agrees with the commenter that this sentence may cause confusion as PS-18 only applies to HCl CEMS and, thus, we have removed it from section 3.2 of PS-18.

3.2.2 Calibration Range Above Span (CRAS)

Comment:

Commenter (0047) notes that PS-18 proposes a new term, CRAS, which is defined as the upper limit of the measurement range based on a conservatively high estimate of the range of HCl measurements expected from the source category. The commenter states that this term is not adequately explained in the preamble or the docket, and notes that the definition conflicts with other performance specifications. As an example, the commenter points out that CRAS conflicts with the definition of "span" in both 40 CFR part 60, Subpart UUUUU (Subpart UUUUU), Appendix A, and in 40 CFR 72.2. The commenter believes that the EPA should explain what it is attempting to accomplish with the CRAS requirements, and why the conventional definition of span is not appropriate or sufficient to ensure that HCL CEMS are calibrated over the range they are intended to measure. The commenter also opines that if the EPA intends to impose a daily or weekly above span calibration requirement, they should issue a proposal that includes such a test and provide data to support any proposed specifications.

Another commenter (0043) states that the EPA should not propose new requirements in PS-18 and Procedure 6 such as daily CRAS checks and criteria that conflict with the recently promulgated 40 CFR part 63, Subpart LLL (Subpart LLL) requirements. The commenter believes that the EPA should remove conflicting requirements from the proposed PS-18 and Procedure 6 and re-propose requirements compatible with promulgated Subpart LLL requirements. The commenter believes that the proposed daily CRAS check requirement and adjustment criteria are unacceptable for the following reasons:

- It would likely create one hour of unnecessary CEMS data loss each time it is performed in view of the time required for the CEMS to achieve and stabilize at the high concentration level and subsequently recover to the normal operating level.
- The requirement to “adjust the HCl CEMS” when the calibration drift exceeds 0.5 ppm at the zero, upscale or CRAS levels would impose arbitrary adjustments simply chasing noise. It should be changed to a requirement to inspect the CEMS and determine the proper corrective action.
- The new requirement to adjust the HCl CEMS based on the CRAS check if drift exceeds 0.5 parts performed at 15-20 ppm levels.

Response:

The EPA acknowledges the commenters request for elaboration, clarification and justification for the inclusion of calibration range above span in PS-18 and Procedure 6. The EPA has revised PS-18 and Procedure 6 to remove calibration range above span requirements since these are best handled on a rule-specific basis through specific compliance rule text.

3.2.3 Continuous Operation

Comment:

Commenter (0047) believes that the term “Continuous Operation” is not appropriate for inclusion in a performance specification or a QA procedure and should be removed. The commenter notes that the term is not used in proposed PS-18 or Procedure 6.

Response:

The EPA’s intent in using continuous operation in this performance specification was to define a term that describes ongoing operation of the CEMS after initial installation and calibration. Calibration drift should be performed after the CEMS is ready for continuous operation. The EPA has revised PS-18 Section 11.8.3 to clarify this intent.

3.2.4 Point CEMS

Comment:

Commenter (0047) states that the term “Point CEMS” is not used in proposed PS-18 or Procedure 6.

Response:

The commenter is correct that references to single measurement points or paths, formerly in section 8.2, have been removed from PS-18. The relevant text in section 8.2 (describing locating the HCl CEMS where pollutant concentration measurements are representative of HCl emissions) has been revised to remove stratification requirements and include requirements to ensure the installation point will meet RATA requirements. Section 8.2 has also been revised to clarify that CEMS installation locations need not be installed at the same location as the relative accuracy test location.

3.2.5 Span Value

Comment:

Commenter (0047) states that the definition of the term “Span Value” should be consistent with the EPA’s treatment of span for Hg CEMS and particulate matter (PM) CEMS. The commenter notes that span is measured as a concentration, but the limits in Subpart UUUUU are expressed as emission rates. The commenter suggests this issue can be avoided by allowing for the rounding up of the resulting value to the next highest multiple of 5 or 10 ppm, or make it clear that the span may have to set at a concentration corresponding to the emission standard.

Response:

The definition in section 3.22 of the proposed PS-18 clearly states that the span value is typically established based on the relevant regulatory requirement. In the absence of a specific regulatory requirement, performance specifications typically require that the span is set at approximately twice the emission limit. The definition of “Span Value” was revised the final PS-18 language, now found in section 3.21 to offer additional flexibility, by allowing rounding up of the span concentration to the nearest multiple of 5.

3.3 Equipment and Supplies

3.3.1 Diluent Analyzer

Comment:

Commenter (0047) notes that the EPA proposes to define a diluent analyzer as equipment that may be part of an HCl CEMS. The commenter believes this provision is at odds with the remainder of PS-18, which does not establish any requirements or specifications for diluent analyzers. The commenter also states that the provision conflict with Subpart UUUUU, which treats diluent analyzers as a system separate from the HCl CEMS and requires that it be certified and quality assured under Part 75. The commenter suggests that the EPA remove this paragraph and all other references to diluent analyzers or limit the references to those regulations that consider the diluent analyzer to be part of the HCl CEMS.

Response:

The EPA recognizes that including the definition for diluent analyzer may cause confusion and we have removed it from section 6 of PS-18.

3.3.2 Moisture Measurement System

Comment:

To the EPA-solicited question on the need for continuous moisture measurements, commenter (0042) indicated that this issue has already been resolved during the 2010 Part 98 rulemaking for Green House Gas Emissions. In response to proposed moisture monitoring requirements that would affect cement kilns under Part 98, the cement industry provided extensive comments and supporting data as to why requiring moisture monitors was not appropriate. In short, the EPA has not developed performance specifications or QA procedures for moisture monitors and calibration standards are not practical. The use of wet and dry oxygen measurements and determination of water vapor was shown to be subject to unacceptable measurement error both by analysis of analyzer drift and supported by actual data. The EPA agreed in the promulgated regulations that periodic moisture tests during annual CO_2 CEMS RATAs was sufficient and that sources could establish a fixed moisture content (or multiple values for cement kilns representing mill on and mill off operating conditions) to correct data to an appropriate moisture basis. Commenter refers to Attachment D of their comment letter which they report includes highlighted sections of the preamble discussion and regulation text. Some cement kilns using FTIRs or other multi-parameter monitoring systems capable of monitoring moisture concentrations may elect to use that data. FTIR-based CEMS and other infrared based analyzers must accurately measure water concentrations in order to perform the necessary spectral subtractions or other water vapor compensation. Successful RATAs and DS are sufficient proof to verify that this is done correctly.

Commenter (0047) believes that Method 4 or other moisture measurement methods approved by the Administrator are sufficient and there is no need for continuous moisture measurements. The commenter notes that that there is little variation in stack gas moisture at coal-fired electric generating units (EGUs) and that corrections to hourly HCl CEMS measurements under Subpart UUUUU will be made using moisture monitoring systems meeting the requirements of part 75, which does not require continuous measurements. However, the commenter requests that, if the EPA receives data that shows that continuous moisture measurements are warranted, that the EPA make this data available for review and comment.

Commenters (0041, 0044) support the simultaneous measurement of moisture with HCl pollutant measurement. Commenter (0041) states that many extractive instruments, such as non-dispersive infrared (NDIR) and FTIR, can measure moisture accurately to within plus or minus 2 percent relative accuracy to an EPA Method 4 reference method moisture train. Commenter (0041) provides additional data to support the accuracy of extractive instruments in measuring moisture content (see page 6 of their comment letter). Commenter (0041) suggests that the calibration and accuracy of the moisture measurement on the CEM instrument may be compared with information from a periodic HCl RATA using the approved EPA Method 4 or American Society for Testing and Materials (ASTM) D6348-12.

Commenter (0044) states that simultaneous measurement of moisture with HCl greatly increases the accuracy of the emission measurement when converted to a dry basis. Commenter asserts that EPA Method 4 does not adequately represent the moisture content of the gas stream matrix when measured within an hour period in a Portland cement kiln due to possible variations in raw feed and fuel materials, wet scrubber upsets, or ambient temperature conditions (which cause moisture content variations). Commenter states that moisture content variation was not considered when the EPA determined the relative accuracy validation test requirements. Commenter provides data from two Portland cement kilns to support their conclusion on the variation of moisture content in their comment letter (see pages 4 and 5 of their comment letter). Commenter presents further information on factors that can affect the moisture content of the emission stream in their comment letter (see page 7 of their comment letter).

Response:

The EPA acknowledges the commenters concern that some sources may have constant moisture content in stack emissions while other sources experience shifts in moisture content depending on raw materials or fuel. The EPA also acknowledges the request for flexibility with moisture measurement and the support of allowing continuous moisture measurement. The EPA's proposed PS-18 identified either Method 4 or other moisture measurement method approved by the Administrator as appropriate measurement methods when correction of the measured HCl emissions is required (e.g., to get RM and CEMS measurements on a consistent basis). Though potentially advantageous for this use, continuous measurement of moisture is not needed to comply with PS-18. The EPA agrees that the requirements for the Moisture Measurement System in section 6 of PS-18 could be clarified and we have revised the section to include additional detail on the use of Method 4 and continuous measurement techniques necessary to generate data acceptable for compliance decisions. We have revised section 6.7 in PS-18 (formerly section 6.8 in proposed PS-18) to include an alternative that allows owners or operators to determine an appropriate site-specific default moisture value (or values), using measurements made with Method 4, *Determination of Moisture Content In Stack Gases*, in Appendix A-3 of this part. If this option is selected, the site-specific moisture default value(s) must represent the fuel(s) or fuel blends that are combusted in the unit during normal, stable operation, and must account for any distinct difference(s) in the stack gas moisture content associated with different process operating conditions. If a facility believes that alternative procedures are appropriate, that facility can request consideration for an alternative measurement method under sections 60.8(b)(2), 61.13(h)(1)(ii), 63.7(e)(2)(ii), or other applicable alternative method approval mechanism. Guideline document 22 (GD-022) gives direction to the public in navigating this process, and can be found at: http://www.epa.gov/ttnemc01/guidlnd/gd22.pdf.

3.4 Reagents and Standards

3.4.1 Dilution of High Concentration HCl Standards

Comment:

In response to an EPA solicited question on using Method 205 to dilute high concentration cylinder gas, commenter (0042) responded that the EPA should determine the uncertainty of calibration standards produced by its Method 205. Section 2.1 of Method 205 requires that the calibration gas should produce measured results within 2 percent of the predicted values. The EPA has stated that the uncertainty of calibration standards must be less than 5 percent and strives to achieve 2 percent. Jeff Ryan's May 7, 2014 memo claims uncertainties of about 2 percent for a limited number of compressed gas standards. Based on the above considerations, high level HCl standards diluted by Method 205 should be allowed. It is recognized that any error in the gas dilution will make demonstrating conformance with the QA requirements more difficult. The EPA should allow dilution of high-level HCl compressed gas calibration standards based on measurement of tracers such as sulfur hexafluoride (SF6) included in the high level standard mixture for FTIR-based CEMS for quarterly QA audits. Again, it is recognized that any error in the gas dilution will make demonstrating conformance with the QA requirements more difficult. This is an inherently conservative approach. The EPA should allow dilution of high-level HCl calibration standards for use in performing daily checks. Standards used for daily checks should not be required to be NIST Traceable.

Commenter (0047) supports the option to allow dilution of high concentration HCl standards to generate the required HCl gas standards using Method 205, but notes that this would increase the overall uncertainty of the calibration gas values and could make the CD and calibration error (CE) requirements more difficult to meet adding support for their request that the EPA increase the 5 percent specification.

Response:

The EPA agrees with commenter 0042 that higher concentration cylinder gases diluted by a quality controlled procedure should be allowed. The EPA contends that using the required quality of reference gas and checking the before and after dilution concentration following procedures in Method 205 is sufficient to demonstrate the requirements in PS-18.

The EPA disagrees that using Method 205 to dilute higher concentration HCl reference gas standards will make CD and CE requirements difficult to meet, or that it is a reason for EPA to increase the 5.0 percent specification. The inclusion of Method 205 as a means to dilute gasses to generate HCl standards into a necessary range is an optional procedure with its own associated QC requirements. Method 205, applied to gases prepared using the *EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (http://nepis.epa.gov/Adobe/PDF/P100EKJR.pdf)*, is a performance-based method that considers and limits the additional uncertainty as a result of the dilution technology. Commercial HCl compressed gases will be prepared following the procedures contained in the Green Book. Method 205 requires resulting gases within 2 percent of an independent protocol gas at the midpoint. Assuming an increase in 2 percent uncertainty and knowing protocol HCl gases are already better than 3 percent accuracy, we estimate the added uncertainty from dilutions using Method 205 would be approximately 0.5 percent. We expect the additional uncertainty will still fall within uncertainty requirements in PS-18 and conclude that Method 205 is an acceptable approach to generate HCl gas standards, without any need for a modification to the CD and CE requirements.

3.4.2 Liquid Evaporative Standard

Comment:

Commenter (0047) believes that the EPA should clarify whether the proposed PS-18 section 7.3 refers to the creation of a "Liquid Evaporative Standard" as that term is used in PS-18 section 7.2 ("liquid evaporative standards") and defined in PS-18 section 3.15. The commenter notes that the EPA refers to the term "liquid evaporative," but does not use the term "liquid evaporative standard." The commenter points out sections in proposed PS-18 where this occurs (sections 3.24, 7.1, 11.10.1, and appendix A, section 8.1.4).

Response:

The EPA acknowledges the comment and has made the appropriate corrections to the proposed text for PS-18.

3.4.3 Compressed Gas Standards/NIST Traceable HCl Standards

Comment:

Commenter (0042) asserts that daily use of NIST traceable calibration standards for daily calibration drift checks in both PS-18 and Procedure 6 are unnecessary and increase the complexity and cost, and do not enhance accuracy especially for advanced analyzers with fixed calibrations such as cavity ring-down spectrometer (CRDS), cross-stack tunable diode lasers (TDLs), and FTIR-based CEMS with fixed analysis algorithms and reference spectra stored as electronic files that are not subject to change. The commenter reports that Part 60 regulations at section 60.13(d) as well as Performance Specifications 2, 3, and 4, and other requirements allow for the use of manufacturer certified standards and gas cells for routine (daily) calibration drift tests. The commenter states that EPA Protocol Gases (i.e., NIST traceable) are only required for quarterly cylinder gas audits (CGAs) as required by Appendix F, Procedure 1 and in performing certain instrumental reference methods for RATAs such as Methods 6C, 7E and 3A.

Commenter (0042) further states that the limited availability, demonstration, and usefulness of NIST traceable HCl standards justify the use of other means for performing daily calibration drift checks for HCl CEMS. The commenter discusses the EPA supporting memorandum in the docket on progress made on standards development and on-going work by the EPA and other compressed calibration gas analyses (e.g., by Holcim) as support for their position.

Response:

The EPA acknowledges the commenter's observation that, historically, EPA Protocol Gases (NIST traceable using the *EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards*, EPA/600/R-12/531, May 2012) have not been specifically required by certain appendix F procedures for daily calibration drift checks. However, the EPA disagrees with the commenters that NIST-traceable HCl gas standards have limited availability and usefulness. In the proposal docket, the EPA provided evidence that NIST-Traceable HCl compressed gas cylinders and HCl evaporative generators are both viable, and both are currently available options for providing NIST traceable HCl calibration gases and meeting the EPA's NIST traceability requirements to support implementation of PS-18 and associated QA/QC requirements. Each of these approaches are able to provide HCl gas concentrations <1ppm to >10ppm with uncertainties well less than the required 5 percent. The EPA has confirmed that NIST has named the reference materials used by gas vendors and that at least one gas vendor is producing commercially available cylinder gas standards in accordance with the *EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards*, EPA's guidance for establishing NIST Traceability. The EPA believes the use of NIST-traceable gas standards for initial CEM certification and on-going accuracy audits is essential in assessing the measurement performance of CEMS, particularly in light of the low level emissions HCl CEMS. The use of NIST-traceable gas standards is a common and integral requirement of many of EPA's monitoring Performance Specifications. We have clarified in section 4.1.1 of Procedure 6, that either NIST-traceable reference gases as defined in section 7 of PS-18 or gas standards certified by gas vendors to within 5 percent are appropriate for use in conducting ongoing daily calibration drift checks; however, reference standards certified NIST-traceable according to requirements of section 7 of PS-18 will still be required for PS-18 CEMS certification testing and Procedure 6 quarterly audits. Use of quality gases is the most comprehensive check available and provides the foundation for ensuring the acceptable quality of HCl monitoring data.

Comment:

Commenter (0044) questions the accuracy of NIST traceable cylinder gases.

Response:

The EPA disagrees that the NIST traceable cylinder gases are insufficiently accurate. In the proposal docket, (EPA-HQ-OAR-2013-0696-0030, 0031, and 0032), the EPA provided evidence that accurate NIST Traceable HCl compressed gas cylinders are currently available across a range of concentrations needed to support PS-18 and Procedure 6; commercial gas cylinders, traceable to NIST reference materials, resulted in combined uncertainties (a measure of accuracy) of 1.8 to 2.6 percent for 6 gases between nominally 0.5 and 10 ppm.

Comment:

Commenter (0044) states that the requirement in PS-18 section 7.1, that audit gases must be NIST certified or NIST traceable, is clear for cylinder gases but is ambiguous as it relates to evaporating HCl generators.

Response:

The EPA has revised section 7.1 of PS-18 to clarify NIST traceability for liquid evaporative gas standards.

Comment:

Commenter (0044) states that liquid evaporative generators are allowed in the performance specification; however, detailed traceability requirements are not included. Commenter recommends that the EPA adopt a strategy of traceability related to determining the accuracy of each individual component, which, for HCl gas generators, would include HCl solution and mass flow controllers for liquid mass flow controllers (LMFS) and gas mass flow controllers (GMFC). Commenter asserts that with this strategy, total accuracies of less than two percent can be obtained without the need for a chain of custody procedure.

Response:

The EPA has revised section 7.1 of PS-18 to clarify NIST traceability requirements for evaporative generators and referred to the ORD document, *DRAFT - EPA Traceability Protocol for Qualification and Certification of Evaporative HCl Gas Standards and Humidification of HCl Gas Standards from Cylinders*, now in the docket. The document includes the strategy recommended by the commenter for determining the uncertainty of the individual components (i.e., HCl feed solution, solution feed rate, and diluent gas flow rate). This document also includes a requirement for confirming the theoretical output through a direct comparison with a NIST traceable reference gas standard.

Comment:

Commenter (0043) objects to the EPA's proposed requirements that necessitate use of NIST traceable external calibration standards for HCl CEMS for daily calibration checks. The commenter reports that these requirements do not apply to the $SO_2/NO_x/CO/CO_2$ CEMS certified for permit compliance monitoring and Part 98 CO_2 monitoring which allow the use of calibration gas cells. The commenter believes that NIST traceable calibration standards should be reserved for quarterly CGAs and instrumental reference testing as required for Part 60 regulations and that nothing in Part 63 warrants a different approach than required for Part 60.

Commenter (0043) notes that the EPA has stated that progress has been made in improving the compressed gas standards and that NIST Traceable HCl standards with uncertainties less than 5 percent will be commercially available in the near future. The commenter states that they did not identify any information in the docket demonstrating successful "calibration error" tests (i.e., linearity tests) for any CEMS, even under laboratory test conditions. The commenter questions the EPA's basis for including field linearity tests requiring multiple certified gases to assess linearity and the EPA's basis for its proposed CE specification of 5 percent of span (i.e., ±0.25 ppm) for HCl CEMS installed at cement kilns.

Response:

As noted in the response for Comment 3.4.3, the EPA acknowledges that, historically, EPA Protocol Gases (NIST traceable using the *EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards*, EPA/600/R-12/531, May 2012) have not been specifically required by certain appendix F procedures for daily calibration drift checks. Our experience monitoring low concentration emissions using difficult to manufacture gas standards (such as Hg under CAMR) demonstrated the need, there, to require high quality gases including NIST traceable for all facets of HCl monitoring including CEMS certification, daily calibrations, and quarterly audits when CEMS were used to demonstrate compliance. The better quality gases are needed for the low level, difficult to transport gases we are measuring. The EPA believes the use of NIST-traceable gas standards for initial CEM certification and on-going accuracy audits is essential in assessing the measurement performance of HCl CEMS. We have clarified in section 4.1.1 of Procedure 6, that either NIST-traceable reference gases as defined in section 7 of PS-18 or gas standards certified by gas vendors to within 5 percent are appropriate for use in conducting ongoing daily calibration drift checks; however, reference standards certified NIST-traceable according to requirements of section 7 of PS-18 will still be required for PS-18 CEMS certification testing and Procedure 6 quarterly audits.

Measurement error assessments are central requirements of a number of the EPA's emissions monitoring Performance Specifications and the inclusion of the PS-18 linearity assessment is wholly consistent with this approach. The measurement error (ME) specification (5 percent of span) applies irrespective of whether successful measurement error test data are present. The ME specification (5 percent of span) is based on the known quality of available NIST traceable HCl gas standards. The EPA's demonstrated approach is to ensure that the ME specification is consistent with and no more stringent than the calibration gas standard uncertainty. The EPA's requirement for NIST traceable HCl gas standard uncertainties ≤ 5 percent is consistent with the measurement error specification of 5 percent of span.

Comment:

Commenter (0043) reports that, in their field evaluations (see Attachments A and B of their comment letter), certified values of compressed gas standards purchased from two independent suppliers having vendor-stated uncertainties of 5 percent, or better, were found to be in error by significant amounts. According to the commenter, on-site re-analysis by Prism Analytical Technologies verified the results of the three extractive CEMS included in their study.

Response:

The EPA acknowledges that, certain previously, available HCl gas standards used in field and laboratory testing were not considered accurate The primary evidence for this was non-agreement between cylinder certified values and FTIR measurements. The EPA points out, however, that these gases were prepared and used over 2 years ago, at which time NIST traceability reference materials were not yet available. While there have been prior instances in which vendor certified standards were found to be inaccurate, certified standards are currently manufactured more carefully and are currently sufficiently accurate for use in PS-18 and Procedure 6 purposes.

Comment:

Commenter (0043) states that their field evaluations of HCl CEMS demonstrate that dry compressed gas standards have limited utility for daily drift checks or calibration adjustments. The commenter asserts that the injection of dry compressed gas standards does not reveal the actual problems that plague extractive HCl CEMS installed to monitor emissions at cement kilns (i.e., cold spots in the sampling system, contamination of the sampling system due to formation of ammonium chloride salts, and interferences).

Commenter (0042) also reports that the daily application of these standards may reduce data quality under real-world conditions and long term CEMS applications for HCl CEMS at cement kilns (e.g., compressed gas mixtures cannot detect the most common problem associated with the formation and disassociation of ammonium chloride in the measurement system). See pages 25 and 26 of the comment letter for additional detail.

Response:

The EPA disagrees that the use of NIST Traceable Gas Standards for initial CEM certification and on-going QA/QC would be insufficient in assessing the measurement performance of CEMS, including HCl CEMS. The use of NIST Traceable Gas Standards is a common and integral requirement of a number of the EPA's monitoring performance specifications. While it is true that quality assurance checks, involving the use of such gas standards, cannot identify all potential scenarios by which the quality of HCl monitoring data could be compromised, such a check is but one of a suite of comprehensive quality checks available. When it is used in combination with other PS-18 and Procedure 6 QA checks, the use of NIST Traceable Gas Standards provides a foundation for determining the acceptable quality of HCl monitoring data

The EPA posted results from evaluation of NIST reference gas standards for HCl that demonstrate the progress NIST has made in preparation and storage of certified gas standards. This data supports the current availability of NIST traceable standards available to gas vendors for preparation and certification of HCl gas standards. As noted in public comments and the EPA's response, we recognize that preparation of reliable HCl cylinder gas materials requires careful attention to detail. Therefore, the EPA agrees to continue to support the need for vendors to certify their commercial HCl gas offerings for use in PS-18 and Procedure 6 against a NIST traceable gas.

3.5 HCl CEMS and Sampling Point Location

Comment:

In response to an EPA solicited comment on alternative probe placement, commenter (0042) opines that confusion about the requirements for stratification test at the monitor installation location versus the RATA test location may lead to confusion about where the effluent handling system monitor may be installed. The commenter requests that the EPA explicitly state that installing the CEMS at a location other than the location where reference method tests are performed for RATAs is acceptable.

Commenter (0042) reports that language in section 8.2 of PS-18 and in section III.D.2 (page 27693) of the preamble includes consistent language regarding where in the effluent system the monitor may be installed. However, according to the commenter, the EPA solicits comment and supporting data on alternative probe placement locations such as the breeching of the stack that pass RATA requirements. The commenter states that it is unnecessary for the EPA to seek information on “alternative locations” given that alternative locations are allowed under the proposed requirements and PSs-2, 3 and 4. The commenter states that there is no requirement in the proposed PS-18 or PS-2 or other gas CEMS performance specifications that the monitor must be installed at the same location used for the RATA testing and the commenter provides a list of reasons why the CEMS monitor would be installed at other locations than the RATA testing location (see pages 14 and 15 of their comment letter). The commenter suggests regulation wording changes to proposed PS-18 sections 8.1.1 and 8.1.2 (CEMS Installation and CEMS Measurement Location) to parallel language that is included in PS-2. Alternatively, the commenter suggests that the EPA could add a statement to language that “the CEMS need not be installed at the same location as the RATA test location” between the second and third sentence of the proposed PS-18 section 8.2.

Similarly, commenter (0047) believes that any location that meets the RATA requirements should be allowed to be used as the HCl CEMS siting location. The commenter notes that the proposed siting criteria are designed to minimize the likelihood that the monitor or probe will be located in an area where emissions are stratified. According to the commenter, if the HCl CEMS passes the relative accuracy test, then it is confirmation that the CEMS measurement is representative. The commenter notes that allowing use of other locations at which the RATA is passed would be consistent with proposed section 8.2, which puts sources on notice that failure to meet the RATA requirements could require relocation of the monitoring system if satisfactory correction techniques cannot be established.

Commenter (0043) requests that the EPA recognize that installing monitors in accessible locations (such as the breaching duct downstream of the baghouse ID Fan) is acceptable under Performance Specifications 2, 3, 4 and 12A. The commenter states that they have already elected to install Hg CEMS used to satisfy Subpart LLL requirements at such locations and may subsequently add HCl measurement capability to some of these CEMS. The commenter alleges that installation of CEMS at high elevations that can only be reached by ladder is not an accessible location in inclement weather including extreme heat, extreme cold, precipitation, lightning, or high winds. The commenter reports that these conditions occur frequently at some locations and prohibit safe access for operation, maintenance and QA activities. The commenter also reports that installation of extractive HCl CEMS sample probes at stack monitoring locations can also require much longer heated sample lines maintained at 180°C. According to the commenter, this is a bad practice for HCl CEMS and is not likely to be successful at locations where winter temperatures can routinely drop below -20°F.

One commenter (0043) believes that the EPA requirements for HCl CEMS location and sampling points for the RATA should be no different in PS-18 than in PS-2 which applies to numerous installed CEMS and which will continue to apply to CEMS used for both criteria pollutants and for HCl monitoring. The commenter opines that new and complex requirements are not needed, and the EPA should simply adopt or reference the existing requirements.

Commenter (0044) supports sampling at the breech of a stack and states that based on the experience of source testers, measurements from the breech of a stack that passes EPA Method 1 and 2 requirements do not differ from measurements made on the stack. According to the commenter, sampling as close to the source as possible ultimately increases the likelihood of obtaining a representative sample. Commenter provides a list of benefits of short sample lines, including: (1) decreased retention time; (2) decreased possibility of cold spots; (3) decreased capital cost of CEM systems; (4) decreased maintenance; (5) decreased possibility of sample matrix component interaction; (6) decreased sampling system materials integration and passivation time; and (7) reduced calibration gas consumption. Commenter provides data to support their conclusion that accurate and stable emissions are observed when sampling at the breech of a cement plant stack (see page 8 of their comment letter).

Commenter (0052) requests that the EPA account for CEMS monitoring at inlet locations and conditions because some sources with HCl limits also comply with control efficiency standards that may become subject to continuous monitoring requirements. Specifically, commenter states that the proposed requirement that measurement locations be at least two equivalent diameters downstream of the control device or point of pollution generation or at least half an equivalent diameter upstream from the effluent exhaust may not be practical for the inlet measurement location. Commenter suggests that span requirements in the proposed rule may need to be revised because inlet concentrations can be highly variable, ranging from 50 to 5,000 ppm.

Commenter (0042) requests that section 8.3 be revised to eliminate what they believe to be unnecessary requirements and to be consistent with PS-2 regarding the distance between the measurement location relative to a control device or concentration change and additional advice regarding where sample points or paths should be located. The commenter opines that the use of “should be” and “must be” in section 8.3 infers that, as drafted, the measurement locations specified are required rather than suggested. The commenter reports that they recommend that PS-18 be revised to clarify (as PS-2 does) that the only necessary requirement is that CEMS be installed at a location in such a manner that it will pass the RATA requirement.

Response:

The EPA agrees with the commenters the CEMS sampling point location permit representative HCl emission concentrations. Representative HCl emissions measurements can be demonstrated by passing a RATA. We also agree that the location where the reference method tests are performed may be different from the CEMS sampling point and the reference method sampling location must meet the associated reference method criteria. We have revised section 8.2 of PS-18 to clarify these technical issues.

3.6 Manufacturer’s Certification

Comment:

Commenters (0038, 0039, 0041, 0045, and 0051) opine that certain tests and associated costs are unnecessary because the tests do not need to be repeated for each design configuration or application. Commenters (0038, 0039, 0041, 0042, 0045, and 0051) support the use of a manufacturer's certification for each CEMS model to streamline many field certification and QA procedures, eliminate unnecessary test procedures and repetitions, and reduce resource requirements for CEMS users, equipment manufacturers and emission control agencies, including the EPA.

Commenters (0038, 0039, 0041, 0045, 0051) state that model-specific approvals should be allowed for calibration gas approaches and other approaches that are "subject to the approval of the Administrator" so that issues can be resolved once rather than requiring site-specific alternate monitoring approach applications and numerous reviews by the EPA and/or other agencies.

Commenters (0038, 0041, 0045) state that model-specific approvals and manufacturer certifications could result in simplification of field certifications, including elimination of repeated interference tests, simplification of the field LOD verification, elimination of the multi-point linearity test and associated need for many NIST traceable calibration standards, and elimination of the response time specification and response time test procedure.

Commenters (0042, 0043, and 0051) support a manufacturer's certification test for HCl CEMS as either a replacement or an option. According to the commenter (0042), a manufacturer's certification test would:

- Allow manufacturers to conduct technology appropriate analyzer tests and reduce the need for cement kiln CEMS users to develop detailed knowledge of interference and limit of detection test procedures;
- Reduce the number and duration of tests that need to be performed for each field installation;
- Reduce the number of calibration standards needed in the field and minimize the likelihood that a defective calibration standard or contaminated regulator will thrust a measurement program into disarray and confusion;
- Replace site-specific EPA approvals of alternative procedures with CEMS model-specific approvals; and
- Reduce the overall costs while improving efficiency in the regulated community, among equipment manufacturers, and within state and federal environmental enforcement authorities.

Commenter (0042) opines that the use of a manufacturer's certification is particularly applicable to optical analyzer HCl CEMS applications because the fundamental calibration of the measurement system is established by the manufacturer via design choices, HITRAN and other spectral libraries, development of FTIR reference spectra (which are stored as magnetic files and thus, never drift or change), selection of analysis algorithms, and other factors. The commenter reports that they have discussed the concept of creating a manufacturer's certification for HCl CEMS under PS-18 with representatives of companies (lists companies on page 3 of their comment letter) providing HCl CEMS and that all of the companies that they contacted supported the idea of a manufacturer's certification.

Commenter (0043) supports the concept of a manufacturer's certification for certain aspects of the PS-18 initial certification, which are best done once per model by the manufacturer and which would then allow streamlining of field certification and on-going QA procedures. The commenter believes that manufacturers are best able to perform a one-time analyzer interference test, laboratory linearity test, LOD test, and seek approvals for alternative procedures (such as those used to dilute high level HCl calibration standards). According to the commenter, all of these issues would be handled more efficiently by direct communications between the manufacturer and EPA technical personnel.

Commenter (0051) supports:

- An analyzer interference test (excluding all sampling system components) performed by the manufacturer using interference gases appropriate for the specific optical measurement technology, which are selected based on well-known and well-documented spectral considerations, along with submission of additional supporting information by the manufacturer to demonstrate the analyzer does not suffer from interference.
- An LOD test performed by the manufacturer (given that LODs are now well known and published ,and that a simple confirmation test can be performed in the field to verify that sampling system components do not detract from the CEMS capabilities).
- A linearity test performed by the manufacturer because (1) technologies at levels below 10 ppm, including NDIR, FTIR, TDLs and CRDS analyzers operated on dilution extractive systems are all very linear measurement technologies; (2) linearity of these analyzers has been demonstrated in numerous tests; and (3) fundamental reference spectra and analysis algorithms and/or design of the measurement systems is consistent for a particular analyzer and is not subject to change between individual measurement systems.
- Model-specific approvals for calibration gas dilution approaches and other issues "subject to the approval of the Administrator" so that these issues may be resolved once and done consistently rather than requiring site-specific alternate monitoring approach applications and numerous reviews by the EPA and/or other control agency personnel.

Commenter (0051) opines that taken together, a properly constructed laboratory interference test, linearity demonstration, and field verification of calibration accuracy and drift stability at zero and one upscale level, is sufficient to demonstrate the accuracy and reliability of HCl CEMS data. Additionally, the commenter asserts that these measures, together with DSs at one representative concentration, are a more comprehensive and restrictive set of requirements than apply to the EPA FTIR reference methods and are sufficient for initial certification and on-going QA of HCl CEMS.

Response:

The EPA acknowledges the support for manufacturers' model evaluation for specific aspects of instrument performance including level of detection and interference tests. In both the proposal and the final requirements in PS-18, we allow initial vendor or integrator evaluation of level of detection and interference checks. However, we continue to include an onsite check of selected performance parameters. This is to address the possibility that certain factors in the source specific environment (including the gas matrix) may cause the manufacturers' controlled environment test results to be inapplicable. The EPA is aware of tests conducted by manufacturers or vendors (http://www.cemteks.com/images/1022083_HCl_Test_TDL_Report_12-09-11_9.pdf**)** on optical instrumentation in a controlled environment where detection limits were more than ten times better than the field determined detection limit when the instrument was subject to the normal vibration operating onsite. We have revised PS-18 to require the quantitative determination of LOD in a controlled environment such as a laboratory or manufacturers facility. We have also revised PS-18 to reduce the calibration drift requirements to a mid-level challenge and to eliminate the direct requirement for evaluation of instrument linearity. However, PS-18 continues to require measurement error testing at zero and three concentrations relative to span.

3.7 Interference Test

3.7.1 Internally Inconsistent, Incompletely Explained, and Inappropriate

Comment:

Commenter (0042) opines that the test procedures and acceptance criteria in section 11.1 (Interference Test) are internally inconsistent, incompletely explained, inappropriate and potentially unachievable even for analyzers without interferences. The commenter specifically points out the following:

- Commenter states that section 11.1.3 allows testing a single system, or relying on a test by the manufacturer, provided that multiple measurements have the "same make and model numbers, but section 1.2.5 states that "[s]ubstantive changes to the system configuration require retesting according to the PS."
- The commenter states that the definition in section 3.13 for interference test indicates that the interference means the test to detect analyzer responses to interferences, whereas section 11.1.5.1 requires that the entire extractive CEMS be tested using interference test gases.
- The commenter states that what constitutes a similar measurement system (including operating conditions such as sample line temperature) and/or the need for re-testing is ambiguous and requires clarification.
- According to the commenter, as proposed, PS-18 would require a cavity ring-down spectroscopy (CRDS) analyzer coupled with different sampling systems or different sampling system components to provide add-on HCl capability to repeat the test for each sampling system or configuration and provides an example in their letter (page 20). The commenter states that this would result in the need for extractive CEMS to repeat the test for heated sampling lines provided by different manufacturers or different sample line lengths.
- According to the commenter, although the EPA suggests that the interference test is a one-time test, providers may need to repeat the tests for different span values applicable to cement kilns and/or other sources.

- Commenter reports that instrument systems with no interference may fail the test because of the experimental noise at the levels of the necessary measurements (provides example, page 20 of their comment letter).
- According to the commenter, the general technologies interference test is not appropriate for any technology. According to the commenter, for example, there is no need to inject O_2 into an FTIR analyzer as it absorbs no infrared (IR) energy. Additionally, the commenter reports that other gasses included in the EPA's Table 1 list cannot interfere with FTIR HCl measurements, that similar statements can be made for other specific analysis methods such as TDL and CRDS, and that concentrations of certain gases are not relevant for cement kiln applications.
- The commenter does not understand, and requests an explanation of the statement in section 11.1.6 regarding baseline HCl agreeing with theoretical HCl.
- The commenter believes the instructions at section 11.1.7 are insufficient, and that the procedure required to perform this test is not apparent to them, and that the methods to calculate the experimental error are not specified.
- The commenter requests clarification of the footnote to Table 2 ("[g]ases for short path IP cell interference tests added at relative concentration ratios indicated in the table.") which only applies to CO_2, O_2, and H_2O interferences. The commenter asks how the results of the interference tests at lower concentration path lengths would be extrapolated to the levels encountered in field applications.
- The commenter opines that IP-CEMS would need to undergo unnecessary or useful additional expensive laboratory tests to satisfy the additional interference test requirements and parameter levels in the proposed PS-18 (provides example, page 21 of their comment letter).

Response:

The EPA acknowledges that certain manufacturers' certifications may need to be repeated when instruments are upgraded. Repair or replacement of instrument components with the same make and/or model replacement parts do not require recertification but continue to require the single point check at field installations to ensure major instruments repairs have been properly performed. We have revised section 1.2.5 to note the exception for full field test verification of those parameters that were initially certified by the manufacturer. The EPA's intent with the differences between the definition in section 3.13 for manufacturers' interference test and the section 11.1.5.1 in-field interference check was to include a requirement for a field check of the manufacturers' interference check with the actual source gas matrix for a specific monitor and location. We have revised section 11.1.2 to clarify the required manufacturer or vendor interference test. It was also the EPA's intention, as stated in section 11.1.5.1, to evaluate the system's ability to differentiate between HCl and potential interferences generated by the sample extraction or sample observation path experienced at each installation. We have removed the requirement that your baseline HCl concentration measurement must agree with the certified reference gas concentration. We have also revised section 11.1.7 to clarify the requirements for recording temperature, pressure and gas sampling rate needed to calculate results needed to demonstrate successful interference testing.

We also found that the complete system verification of LOD required in section 11.5.6 provides adequate evaluation of a CEMS ability to perform with adequate sensitivity and compensate for potential interferences. These requirements were included in the PS to allow alternative technologies not yet envisioned to be evaluated in actual operation so that the potential use of scrubbers, conditioners or other components of a CEMS system that might add material to the gas stream could be qualified.

We have revised PS-18 to add flexibility to the interference test and to take advantage of other QC measures. Specifically, we have revised the interference requirements in section 13 to focus on accuracy related to either the instrument detection limit or span. We have revised the text in section 13.5 to allow total interference up to 3.0 percent of the HCl concentration used in the interference test or to be no greater than 2.5 percent of the calibration span, whichever is less restrictive. We have provided an alternative acceptance if the sum of the interference responses does not exceed six times the LOD or 0.5 ppmv for a calibration span of 5 to 10 ppm, or 0.2 ppmv for a calibration span of less than 5 ppmv. These revisions are consistent with the requirements for interference check found in reference Method 7 in Appendix A-4 of this subpart. We have also edited footnote 2 in Table 1 of PS-18 to clarify that selected gases comprising the balance of the gas volume in short path IP-CEMS cells are added at absolute concentrations rather than concentrations relative to the difference in optical path length. We have revised the text in section 11.1.1 of PS-18 to clarify the alternative to perform an interference test or a dynamic spike of the installed unit to meet the interference test.

3.7.2 Absolute Limit

Comment:

Commenter (0039) recommends that the acceptance criteria for the interference test include a provision for an absolute limit for the combined interference response (e.g., plus or minus 0.25 ppm).

Response:

The EPA does not agree that acceptance criteria for the interference test should establish an absolute limit. Establishing an absolute limit would discourage development of more sensitive technologies in the future. Instead, the EPA has established quality limits for the interference test either based on a concentration that is well within the quantifiable limit of the instrument (i.e., 10 to 15 times the analyzer LOD), or based on a percent of span.

3.7.3 Interference Test Should be Removed or Deferred Until Achievable

Comment:

Commenter (0047) opines that the interference test is difficult to conduct and may be impossible to pass. The commenter adds, if an HCl CEMS is not properly accounting for potential interferences, the instrument will not be able to meet the RATA and/or dynamic spiking audit (DSA) criteria. The commenter believes that the test should be removed or at least reserved until the EPA can demonstrate that the test is both achievable and useful. The commenter notes that the EPA's pilot project was supposed to look at the practicality of performing the test, but they could not find any data in the docket to support the test.

Response:

The EPA disagrees with the commenter that instruments can be appropriately qualified based solely on RATA and dynamic spiking audits. The EPA disagrees because the source HCl concentrations may be so low that the reference method and the CEMS meet RATA requirements due to the low concentrations compared to the compliance limit. Requirements for interference testing are consistent with those in other performance specifications, (for example PS-12A) and the interference limits are necessary to generate results sufficient to determine if a facility or emission source is in compliance with the applicable rule and that the CEMS can measure, interference free, at concentrations necessary to demonstrate compliance. Also, since the dynamic spike audit procedure is optional, there is no assurance that this performance check will be performed and available to evaluate the CEMS data quality. Additional response to the ability of current technologies to meet relative accuracy tests requirements are provided in section 3.12 of this document.

3.7.4 Supports a One-Time Test

Comment:

Commenters (0038, 0039, 0041, and 0045) support an analyzer interference test performed by the manufacturer using interference gases appropriate for the specific optical measurement technology and selected based on well-known and well-documented spectral considerations along with submission of supporting information by the manufacturer. Commenter (0040) questions why the interference test would have to be repeated every time if the test is conducted in the factory (or by a certifying agency such as TUV). Commenter (0040) supports a certification process that involves a one-time test on a like-kind analyzer under controlled conditions.

Response:

The EPA acknowledges the commenters support of like-kind analyzer interference testing performed by the manufacturer. We have revised section 11.1 in PS-18 to clarify that the one-time requirement allows manufacturer or vendor testing of like model number equipment and associated sample conditioning equipment used to control interferences. We have also clarified that interference testing does not necessarily include sample transport equipment, but does include dilution or instrument-specific interference control features. The combination of vendor interference testing and other quality control tests in PS-18 to qualify its performance as a CEMS is critical to demonstrating compliance with the applicable rules.

3.7.5 Laser Based Gas Analyzer Considerations

Comment:

Commenter (0048) states that cross sensitivity/interference effects for a laser based gas analyzer should be considered as a zero point effect in addition to a span point effect. Commenter states that zero cross sensitivity arises from absorbance lines of interfering gas that are at or close to the same wavelength of the line used for measurement. Commenter recommends that, in addition to adding interference test gases to a calibration cell containing HCl, as required by PS-18 section 11.1.5.2, the test should also be performed in a nitrogen background without HCl in the test cell to evaluate zero cross interference.

Response:

The EPA acknowledges that instruments should measure at or below detection limit when no HCl is present in the gas stream. However, the EPA disagrees that an additional test should be required during interference testing to measure response at zero because other tests to evaluate calibration error and drift challenge the instrument and sample transport system at low and/or zero HCl concentration.

3.7.6 Summation of all Cross Interferences

Comment:

Commenter (0048) asserts that the summation of all the cross interferences as described in PS-18 section 11.1.11 can lead to an overestimate of the true value if the individual values are less than the LOD and the LOD is recorded as that value. Commenter provides an example that, if the LOD is 0.03 volume per million (vpm) HCl and no cross sensitivity could be measured for each interference gas (8 ea.), then the sum would be 0.24 vpm (4.8 percent of 5 ppm HCl range); whereas, if the cross sensitivity was recorded from a mixture of all interfering gases, then the value would be 0.03 vpm HCl (0.6 percent of 5 ppm HCl range). Commenter suggests that the EPA add a note to remind the user that repeated readings may result in measurements below the LOD.

Response:

The EPA agrees with the commenter that the sum of individual effects of interferents measured at or near the HCl detection limit may generate interference that does not meet the proposed performance criteria. We have revised section 13 in the final PS-18 to clarify our intent. We have added section 13.5 to include criteria for interference testing that is based on a percent of span, and we have provided options for low span ranges that promote future improvements in technology without penalizing current technology measuring HCl plus interferents at current compliance limits.

3.8 Beam Intensity Test for IP-CEMS

Comment:

Commenter (0049) states that it is unclear if the beam intensity test is allowed to be performed in a laboratory by the instrument manufacturer. Commenter asks the EPA to clarify that the test is not required to be performed in the field and instead can be performed by the instrument manufacturer at their facility.

Commenter (0048) states that the beam intensity test for IP-CEMS should not be a required test to be conducted during initial CEMS certification, and should only be done by the instrument manufacturers as part of the manufacturing conformance process. Commenter asserts that if the test is performed in the field, attenuator selection with suitable optical properties may not be possible and may result in the introduction of additional optical fringes, thus compromising analyzer performance.

Response:

The EPA agrees with the commenters that clarity is needed for the initial beam intensity testing options for IP-CEMS. We have amended PS-18 (sections 11.2.1 and 11.2.2) to clarify that beam attenuation tests are conducted by the manufacturer. Beam intensity measurements, which are an integral part of IP-CEMS operation, must still be performed in the field as specified in PS-18 and Procedure 6.

3.9 Level of Detection (LOD) Determination

Comment:

Commenter (0044) states that the requirement of a field test for LOD is onerous and not in line with the current capability and proven track record of HCl CEMS. Commenter states that many NDIR and FTIR CEMS have been extensively used for measurement of HCl for compliance in the EU and have already been subjected to rigorous third party and TUV testing in the field. Commenter provides data showing the detection limits for an NDIR system as published by TUV (see page 13 of their comment letter).

Commenter (0042) opines that the LOD test should be simplified (see comments from this commenter regarding performing this test as part of a manufacturer's certification, Chapter 2). The following suggestions were provided:

- Commenter asserts that the statements in sections 11.5.2 and 11.5.3 regarding the challenge standard mixture from Table 1 is inappropriate for the LOD test. According to the commenter, requiring the use of complex gas mixtures which do not absorb energy in the spectral regions used for analysis introduces unnecessary complexity and cost. Commenter states that PS-18 should be revised to state that the standard challenge mixture should not be included in the field test alternative in section 11.5.6.
- Commenter opines that there is no advantage to performing the LOD test in the lab (in addition to the field) and the requirement to conduct the test in the lab in section 11.5.6 should be eliminated.

- The commenter states that section 11.5.6 requires performing dynamic DSs in accordance with Appendix A to proposed PS-18, whereas section 11.5.6.1 requires three spike repetitions at no more than five times the LOD. The commenter requests clarification on the EPA's intent. Specifically, the commenter (0042) states they do not understand how DS at five times the LOD could characterize the LOD and that the first sentence of section 11.5.6.2 implies that the LOD is "three times the noise for zero HCl concentration which appears to contradict section 11.5.6.1."

Commenter (0042) asserts that the proposed PS-18 and Procedure 6 requirements do not account for unique cement kiln measurement challenges and conditions. Some kilns in in-line raw mills will have HCl emissions less than the required LOD for all hours on operation (typically 85-90 percent of kiln system operating hours), whereby the only measurement meeting the EPA's 95 percent certainty (3 times the LOD) will occur during mill off operation.

Response:

The EPA disagrees with the commenter that the LOD test should be restricted to manufacturer's certifications. The intent of this requirement is to add the system noise from site installations including vibration and other environmental factors plus adding native stack gas matrix interference to the verification of detection limit for HCl CEMS. Published laboratory LOD determination for TDL technologies showed low (0.007 ppm) LOD, yet file installations demonstrated higher (0.1 to 0.3 ppm) detection capability. The EPA agrees that the LOD determination and detection limit verification can be simplified. We have revised section 11.5 of PS-18 to require manufacturer or vendor determination and simplified the field verification of the instrument LOD in what is now section 11.5.6 of PS-18. The revised field verification procedure does not require addition of interferent gases since the intent of the verification is to test interferents that occur due to the source gas matrix at the facility where HCl CEMS are installed.

Comment:

Commenters (0038, 0039, 0041, and 0045) support a LOD test performed by the manufacturer considering that LOD values are well-known and published. Commenters (0038, 0039, and 0041) state that a simple confirmation test can be performed in the field to verify that sampling system components do not detract from the CEMS capabilities. Commenter (0042) requests that a simplified field LOD test be required in lieu of what is proposed whereby the test would simply determine the quantitative addition of HCl necessary to increase the HCl signal above the noise for whatever HCl concentration is present in the effluent. The commenter (0042) states that the HCl would be introduced via dynamic spike using traditional spike procedure with SF6 or calibrated or mass flow to quantify dilution and that visual observation that the monitor response is clearly above the background noise is sufficient.

Response:

The EPA acknowledges and thanks the commenter for additional experimental data on LOD. The EPA disagrees with the commenter that the PS-18 is unduly onerous. We have revised the PS-18 requirements to allow an initial instrument evaluation by the manufacturer or vendor for both LOD and interferences. Manufacturer or vendor tests may be performed in controlled environments such as manufacturing or laboratory facilities. However, the LOD must be verified at each installation site using a simplified dynamic spike/standard addition procedure to determine if the installation and environmental conditions are tolerated by the CEMS and do not degrade the manufacturer’s or vendor’s LOD.

Our observation of detection limits in field applications compared to capabilities in well-controlled laboratory or manufacturing environments leads us to conclude that detection limits determined where temperature and vibration are well controlled can be significantly lower than detection limits determined in field applications.

We have revised the text in section 11.5.2 to clarify our intent that one may perform the reduced dynamic spike procedure during initial installation to establish LOD. Section 11.5.6 describes the reduced onsite LOD verification test required for PS-18. That text reduces replicate dynamic spikes from nine to three. Performance Specification 18 requirements are equivalent to QA spiking requirements in reference Method 320 which states “Record spectra of at least three independent (section 3.22 of this method) spiked samples.” The intention of section 11.5.6.1 as a subordinate of section 11.5.6 is clear and directs LOD verification based on three dynamic spike measurements rather than nine replicate measurements used for ongoing QA purposes in Procedure 6.

The EPA disagrees with the comment that the challenge standard mixture from Table 1 of PS-18 is inappropriate for manufacturer- or vendor-determined LOD. Performance Specification 18 is written to be technology independent and the list of interferents in Table 1 provides a standard list of major components and potential interferents to instruments capable of continuously measuring HCl gas in stationary sources. Inclusion of some of the components in Table 1 originate from the need to generate a consistent mix of make-up gases from stack gas matrices. While selected gases may not directly interfere with a particular instrument’s optical measurement technology, these gases may react with other gases in the matrix or with the materials of construction used to transport or contain emission gases and thereby interfere with CEMS measurement quality.

Performing the dynamic spiking at a concentration equivalent to three times the LOD conforms to standard LOD measurements performed for a variety of environmental methods and documented in 40 CFR part 136 Appendix B. Measurements within three times LOD should provide measureable signal near the quantifiable limit of the method and serve adequately to confirm the LOD. A valid measurement at three times LOD does not change the LOD determined by the manufacturer or vendor. The EPA agrees that three times the LOD is less restrictive than three times the noise at zero HCl concentration for the initial verification of LOD. Failure to meet the LOD verification at three times the LOD, which is approximately nine times the noise, demonstrates a significant difference between the detection limit under controlled environment and the detection limit in a specific field application.

We have revised PS-18 to require the instrument response from the addition of HCl to be greater than or equal to the manufacturer or vendors LOD. Requiring a measureable signal above native that is three times the LOD is consistent with the fundamental determination of detection limits since the standard deviation of replicate measurements within two to five times the estimated detection limit is a measure of the random error, (i.e., noise) of the measurement method. Three times the noise becomes the closest field equivalent to a more restrictive and complicated multiple replicate measure of standard deviation times Student's t for the degrees of freedom of the replicate analyses.

3.10 Response Time (RT) Determination

Comment:

Commenter (0046) states that the provision at section 11.6.7 requires you to "repeat the entire [response time determination] procedure three times," and to repeat something means that you have already completed the action once. Commenter states that the provision could be interpreted to mean that the response time test needs to be conducted a total of four times. The commenter states that although there is similar wording in PS-4A, the commenter suggests that to make the provision more clear, the wording should be changed to "repeat the entire procedure until you have three sets of data to determine the mean upscale and downscale RTs."

Commenter (0042) states a 15-minute response time is not relevant to concentrations used to determine 30-day rolling averages and that the 15-minute cycle time requirement in the Subpart A - General Provisions at sections 60.13 and 63.8 may be determined simply by inspection and that the 95 percent response time specification and test procedure should be removed. The commenter states that this comment has been raised by the commenter in previous pre-proposal comments on previous drafts of PS-18 and provides additional support for their position on page 22 of their comment letter.

Response:

The EPA acknowledges and thanks the commenter for clarification to the required number of replicate tests to determine response time. We have amended PS-18 to clarify that three sets of data are sufficient to determine upscale and downscale response time.

The EPA recognizes that the response time for various HCl CEMS technologies may vary with the technology or with the specific procedural application that needs to consider response time. We have revised the definition of response time and added clarifying text to section 11.6 to describe the procedural differences to follow when you determine response time for measurement error, level of detection, or dynamic spiking purposes.

3.11 Calibration Error (CE) Test

Comment:

Commenter (0042) believes that the term "calibration error (CE) test" should be removed and replaced with "linearity test" or some other term in all areas of the proposal in order to ensure that there is no confusion with the CE test that is used in Part 75 and the MATS standard (where it means daily zero and upscale tests).

Response:

The EPA agrees with the commenter and has revised the text and equations in PS-18 and Procedure 6 to replace the terminology calibration error (CE) test with measurement error to avoid confusion with Part 75.

Comment:

Commenter (0048) states that the term “line strength factor” is misleading and does not include the whole complexity of the TDL measurement. Commenter states that CEs can be induced not only by HCl line strength dependence over gas temperature range, but also by narrowing and broadening of the HCl line due to different background gases (e.g., H_2O).

Commenter (0042) responded to the EPA’s solicited comment requesting information and approaches used by manufacturers to determine line strength factors and noted two cross-stack TDL CEMS using different approaches that have demonstrated acceptable performance in industry sponsored field evaluation studies. The EPA did not perform laboratory or field tests on these types of CEMS. It can be assumed that all cement plant users will use the manufacturer’s provided factors and calculations. Commenter supports using manufacturers determined line strength factors and that a successful RATA is sufficient proof that the procedures are effective.

Commenter (0048) further states that the line strength factor in HITRAN specifically refers to the dipole strength and not the line shape. Commenter concludes that calculating an effective concentration using PS-18 Equation 4 is not applicable to all IP-TDLS instruments because overall contribution of these parameters on HCl measurement accuracy is complicated, the compensation methodology is specific to each IP analyzer manufacturer, and compensations are empirically derived during factory calibration.

Commenter (0040) is a manufacturer of CEMS equipment and states that they provide look-up tables to which the user can refer to determine line strength variation with temperature, and provides an example plot (see page 3 of their comment letter).

Response:

The EPA agrees that line strength factors are instrument specific. However, the EPA had already indicated in the proposed rule (section 11.7.3.5) that LSM is based on manufacturer’s specifications. Therefore, no further changes have been made to PS-18 or Procedure 6 in this regard. We acknowledge Commenter 0040’s confirmation that line strength factor variation (LSF) is provided by vendors which supports the direction provided in PS-18 for this correction factor in selected equations in PS-18.

Comment:

Commenter (0042) states that they identified numerous errors in the calibration error specification. The errors they identified include the following:

- Section 11.7 states that the "CE must be less than five percent" whereas section 13.3.2 states that the calibration error must be less than five percent of span.
- Section 13.3.2 states that the calibration error should be calculated using Equation 7, but Equation 7 is used for calculating calibration drift for IP CEMS, and Equation 3 for extractive CEMS and Equation 6 for IP-CEMS should be referenced (which indicate that CE is determined as percent of span). Additionally, both equations 3 and 6 need to be corrected to include the summation and determination of the average response. The commenter explains that a CE specification of 5 percent is twice as restrictive as 5 percent of span for the mid-level gas (provides an example for cement kilns, see page 23 of their comment letter where the 5 percent specification becomes unachievable at the low level required at 0-30 percent of span).

Similarly, commenter (0047) states that the proposed specification of less than 5 percent is too stringent at the level of the Subpart UUUUU emission standards and resulting span. To avoid confusion, the commenter suggests that the EPA should be consistent and complete in its description of the specification, which the commenter understands to be "5 percent of the span value."

Response:

The EPA agrees with commenter 0042 and 0047 that section 13.3.2 would benefit from clarification to relate measurement error to span. We have revised PS-18 to provide clarification that measurement error must be less than or equal to 5 percent of the span at the required challenge concentrations. We note that both equation 3 and equation 6 use the term $\overline{MC_i}$ which is the average of the measured HCl calibration gas concentration i. For clarity, we have added this term to the nomenclature in section 12.

Comment:

Commenter (0046) states that the equation in section 11.7.1.6 for the average of the three CEMS responses appears to be incomplete. Commenter assumes that the equation should be the average MC_i equal to the summation of the individual MC_i values divided by 3.

Response:

The EPA acknowledges Commenters 0042 and 0046 interest in clarity and reiterates that section 11.7 clearly states that the CE is expressed as a function of span. We have removed the redundant statement in section 11.7 to ensure our intent in section 13.3.2 is clear. We also acknowledge and have corrected the references in section 13.3.2 to Equations 3, 6, and 7.

3.12 Relative Accuracy (RA) Test

3.12.1 Reference Method

Comment:

Commenters (0041, 0038, 0045, 0039, and 0051) express concern about the accuracy and uncertainty of the reference methods proposed to assess the accuracy of CEMS, including the efficacy of RATAs at low concentrations. Commenters (0041, 0038, 0045, and 0039) contend that the reference methods may produce arbitrary or unreliable RA test results.

Commenters (0041, 0038, 0045, 0039) state that an interference test, linearity demonstration, field verification of calibration accuracy and drift stability at zero and one upscale level, and dynamic spikes at one representative concentration, are sufficient to demonstrate the accuracy and reliability of HCl CEMS data.

Commenter (0040) expresses concern that in the RA determination, there is not a sufficient cut-off in cases when the reference mean is low or near zero, and the concentration is less than 50 percent of the standard, which could result in excessive burden to pass the test. Commenter suggests using criteria similar to the PS-12A absolute mean difference value of one fifth of the emission standard when concentrations are less than 50 percent of the standard. Commenter states that one fifth is the highest LOD permitted in PS-18 section 13.1. Commenter further states that other tests required such as DS calibration drift, LOD and interference tests are sufficient to establish the accuracy of the instrument.

Commenter supports a waiver from conducting the relative accuracy test when the mean concentration is less than 0.6 ppmw to allow replacement of the test with the DS test without the limitations found in Procedure 6.

Commenter (0051) requests that the EPA carefully consider the efficacy of RATAs at low concentrations.

Response:

The EPA disagrees with the commenter that the reference methods are not accurate at low HCl concentrations. We also disagree with the assertion that using the specified reference methods is arbitrary either because of the fundamental technology of the reference method or because of the difficulty in making reference method measurements at low HCl concentrations. For Portland Cement facilities, Subpart LLL specifies the RM – Method 321 -- for relative accuracy testing in 63.1350(l)(1). Reference method results using Method 321 based on extractive FTIR technology should be as reliable and directly comparable to extractive FTIR CEMS. For MATS facilities, Subpart OOOO allows Method 26A as a reference method and the EPA has specifically investigated the accuracy and LOD of Method 26A and FTIR at low levels. The EPA/ORD data previously included in the docket (EPA-HQ-OAR-2013-0696-0027 and -0028) show that for both RMs, reliable measurements as low as 0.1 ppm are possible. In fact, for Method 26A, measurements less than 0.1 ppm within a calibrated analytical range are possible for as short as 30 minute runs. For FTIR, dynamic spiking at effective HCl levels ranging from 0.2 – 0.5 ppm resulted in recoveries ranging from 67 – 93 percent.

In general, if a subpart does not specify the RM, then RM listed in PS-18 are allowed. We have retained the relative accuracy text in section 11.9.1 that indicates:
"Unless otherwise specified in an applicable subpart of the regulations, use Method 26A in 40 CFR part 60 Appendix A-8, Method 320 and Method 321, both found in 40 CFR part 63 Appendix A, or ASTM D6348-12 including mandatory annexes, as the acceptable reference methods for HCl measurement."

The EPA disagrees with commenters (0041, 0038, 0045, and 0039) who contend that a reference method comparison to asses HCl CEMS is not necessary. As specified in PS-18, reference methods must traverse the duct or stack during RA tests. No other requirement in PS-18 provides this performance comparison to the single point sampling performed by the HCl CEMS. We have revised PS-18 elsewhere to clarify the allowable locations for the CEMS measurement point or path and we continue to require an initial RA in PS-18 and periodic RA in Procedure 6 to ensure CEMS sampling locations are representative of total HCl emissions as required in section 8.2 of PS-18.

The EPA agrees with commenter (0040 and 0051) that some relief should be provided for relative accuracy tests required in Procedure 6 when source concentrations are much less than the emission limit. The EPA does not agree that a complete waiver of the relative accuracy tests is warranted under these conditions. However, we have revised Procedure 6 to provide several options for quarterly relative accuracy audits including a dynamic spike accuracy determination that allows facilities and owners to demonstrate CEMS performance relative to span or the emission standard, whichever is less restrictive.

Comment:

Commenter (0044) states that it is unclear whether EPA Method 26A may be used as a reference method for a relative accuracy test on a Portland cement plant. Commenter states that if Method 26A is not allowed, it should be made clear in PS-18. Commenter assumes that Method 26A is not allowed as it was not used in the determination of the maximum achievable control technology (MACT) standard, and the MACT standard may, therefore, be biased in its reporting of HCl emissions due to the high alkaline particulate associated with the Portland Cement Plant emissions.

Response:

Section 2.3 provides examples of reference methods that are candidates for relative accuracy testing during initial and ongoing quality checks of PS-18 CEMS operation. However, the allowable reference methods for specific source categories are prescribed in the applicable standard. For example, the Portland Cement MACT standard in Subpart LLL only lists optical methods (e.g., Method 321) as a reference for HCl measurements due to the interference of alkaline particulate with manual methods such as Method 26A. In contrast, the MATS rule lists both the optical methods and manual Method 26A since both manual and instrumental methods provide acceptable compliance measurements at these sources.

Comment:

Commenter (0046) states that Method 26 should be added to the list of example reference methods for conducting a RATA at PS-18 sections 2.3 and 11.9.1. Commenter is a trade association and states that one of their members has been successfully using Method 26 to show that the CEMS instrument passes RATAs under a Texas Commission on Environmental Quality (TCEQ)-approved QA/QC plan. Commenter expresses concern that if Method 26 is not explicitly added to the list, facilities will be precluded from using this method when conducting future RATAs. Commenter notes differences between Method 26 and Method 26A, including: (a) Method 26A is sampled isokinetically while Method 26 is not; (b) Method 26 uses smaller impingers; and (c) Method 26 samples a smaller volume than Method 26A. Commenter notes that isokinetic sampling is important in obtaining a representative sample when entrained particles (water droplets) are in the gas stream, and the size of the impingers and the volume of sample collected are related to the detection limit of the method and not the accuracy. Commenter asserts that if a facility has a dry stack (no entrained water droplets) and may not need lower detection limits, the less complicated Method 26 should be allowed as part of their RATA. Commenter states that Methods 320 and 321 are also non-isokinetic methods. Commenter further states that Method 26 is mentioned as an applicable method for analyzing audit samples at Procedure 6 section 5.2.1.2, and if the method is appropriate to analyze audit samples it should also be appropriate to analyze stack gas samples.

Response:

The EPA disagrees with the commenter that Method 26 should be added as a reference method in PS-18. In PS-18, the EPA requires reference methods that traverse stacks during RATA tests to collect representative samples that are not biased by emission gas stratification. Method 26 does not meet this requirement. In addition, source-specific rule language may not allow for certain specific reference methods. For example, for Portland Cement facilities in Subpart LLL, Method 321 is the only reference method allowed for relative accuracy testing. We have revised section 11.9.1 of PS-18 to clarify which RM are allowable when the applicable subpart does not specify the RM. We have also added language to section 11.9.1 of PS-18 noting that use of Method 26 as the RM may be approved by the Administrator on a case-by-case basis.

Comment:

Commenter (0042) asserts that PS-18 should not specify the use of inconsistent test methods applied in an inconsistent manner. The commenter explains that PS-18 allows the use of several FTIR test methods, or the wet-chemistry Method 26A, but defers to the applicable subpart. The commenter believes that the results provided by the differing FTIR test methods may be influenced by the type of FTIR used (4-8 wave number resolution versus 0.5 wave number resolution, liquid nitrogen cooled MCT detectors versus air cooled DTGS detectors, etc., the particular manufacturer and particular reference spectra, the quantification algorithm and whether it is adjusted by a qualified spectroscopist for site-specific conditions or just administered as a commercially market program (provides example and refers to EPRI study on page 29 of their comment letter and refers to Attachment A of their comment letter for further support for their position)). The commenter states that they believe that there is a strong likelihood that an HCl CEMS will fail an initial RATA, or annual RATAs, because it is compared to a different kind of measurement system or under different source operating conditions, and/or it is compared to FTIR methods with a considerable amount of inherent variability depending on many factors.

Response:

The EPA agrees with Commenter 0042 that consistent reference methods should be used as the basis of comparison to CEMS measurement results. The reference methods are specified in the rule subpart or in PS-18 as a default and must be conducted according to the reference method requirements. The appropriate reference methods are used to determine the compliance limits in applicable subparts and are adequate to demonstrate the comparability of CEMS results for ducted HCl emissions at affected facilities. Regarding variations in reference methods noted by the commenter, the EPA agrees that the appropriate equipment/technology need to be selected and refers the commenter to the appropriate sections of each of the reference methods that indicate the experience of the source tester required to properly execute methods on a consistent basis. For example, section 2.3 of reference Method 321 states that "the analyst must have knowledge of spectral patterns to choose an appropriate absorption path length or determine if sample dilution is necessary. The analyst should also understand FTIR instrument operation well enough to choose instrument settings that are consistent with the objectives of the analysis."

The EPA asserts that PS-18 was written to be consistent with the basis of other performance specifications with the intent to move toward performance-based requirements that do not inhibit technology improvements. Performance Specification 18 attempts to be consistent with other performance specifications regarding the allowable measurement error and calibration drift during initial instrument evaluation and during ongoing operation. The allowable drift for CEMS in PS-18 is ±5 percent of span during initial evaluation. The allowable drift for CEMS in Procedure 6 for ongoing quality control is ±10 percent of span. For emission standards where these drift and calibration error requirements are at or below the instrument quantitation limit, facilities and test firms are allowed to request an alternative measurement method approval for a higher span under sections 60.8(b)(2), 61.13(h)(1)(ii), 63.7(e)(2)(ii) or other applicable alternative method approval mechanism. Guideline document 22 (GD-022) gives direction to the public in navigating this process and can be found at: http://www.epa.gov/ttnemc01/guidlnd/gd22.pdf.

The EPA acknowledges that measurements at or below the MDL of a reference method or a candidate CEMS instrument can complicate relative accuracy determination. Relative accuracy is calculated using Equation 14 in PS-18. We have revised section 13.4 to indicate that the average reference measurement is used in the denominator of Equation 14 only when the emission level is 75 percent or more than the applicable standard. Otherwise, the denominator in Equation 14 becomes the emission standard. The precedent for this approach in PS-2 is continued in PS-18. Demonstrating that both the reference method and the CEMS measurements agree at low concentration has value to demonstrate CEMS performance when evaluated in combination with the other performance-based requirements in PS-18 even when either or both the reference method and CEMS report results near the measurement detection limit.

We recognize that calibration standards and measurement technology exist to demonstrate the quality of HCl emission measurements at or above 1 ppm and that existing CEMS measurement technology can meet PS-18 relative accuracy requirements (EPA-HQ-OAR-2013-0696-0030 and 0031). For HCl emission limits equal to or less than 1 ppm, relative accuracy is measured near the quantitation limit of current instrument technology, and an alternative acceptance criteria similar to those in PS-2 of 40 CFR part 60 Appendix B may be applicable. We have revised PS-18 section 13.4 to allow the acceptable relative accuracy of the CEMS compared to a reference methods in units of HCl concentration to be 20.0 percent of the reference method. If the average RM emission level for the RA test is less than 75 percent of the HCl concentration equivalent to the emission standard, the relative accuracy requirement is based on the emission standard and may be no more than 15.0 percent of the applicable standard.

The EPA disagrees with commenter 0042 regarding the flexibility of PS-18 and the need to be more prescriptive about the equipment and procedures needed to perform continuous HCl measurement. It is incumbent on the facility to select a technology including the instrument and integration hardware to meet the performance requirements in the allowable performance specifications if the facility chooses to pursue a compliance path that includes continuous HCl measurement.

3.12.2 Revisions to Reference Method 26A Dual Train Requirement

Comment:

Commenters (0052, 0046, 0047) request that the requirement for paired trains be removed when Method 26A is used as the reference method when conducting a RATA.

Commenter (0052) states that they have been using Method 26A during annual performance testing and contends that the method is very durable, well-designed and provides accurate/high quality data that has been compared with HCl CEMS data from their fleet. Commenter states that a duplicate train is not necessary to ensure higher quality data. Commenter states that leak check requirements in the method ensure sample integrity and the HCl sample is stable when in solution.

Commenter (0046) states that because the EPA did not require dual trains for any other reference method, it is an indication that the EPA believes there is a problem with Method 26A. However, Commenter states that both Methods 26 and 26A have been widely used for a number of years to develop data both to set standards and to show compliance, and the commenter is not aware of any data that would indicate that the proper use of either method would result in inaccurate data. Commenter states that variability is higher as measurements get closer to the detection limit; however, this is true for any analytical method, not just Method 26A. Commenter notes that Method 26A has a known negative bias below 20 ppmv; however, this bias would show up in both trains (if a dual train was used) and would not have any impact on determining accuracy.

Commenter (0052) states that many sample locations are not designed for duplicate train testing and may have only one port.

In dissent of the dual train requirement, commenter (0052) states that because the reference method must match the CEMS in a RATA, the two values already provide a QA check that is equivalent to a paired train. Commenter (0052) states that if the reference method data is of poor quality, the RATA will fail. Commenter (0046) states that if there is a large enough error in the reference method, that data point will either have to be discarded (if allowed) or the instrument will not pass the RATA, thus, it is the responsibility of the facility to collect accurate data and not the EPA. Commenter (0046) states that a facility should have the choice if they want to use single trains and risk failing the RATA due to suspect reference method data.

Commenter (0052) states that random uncontrolled events can occur from train preparation to sample analysis that can affect the results of a reference method test, and if such an event occurs during a RATA, the sample may not meet the relative difference performance criteria and would count as one of a maximum of three exclusions/rejections allowed in the proposed PS-18. Commenter contends that if dual trains are employed, there is twice the probability of a random event occurring that could result in a rejection. Commenter further states that the determination of whether a sample meets the RD could take up to three weeks because on-site analysis is impractical (commenter states that testing firms have acknowledged that it would be difficult to transport all the analytical equipment necessary to analyze the samples onsite).

Commenter (0052) states that dual trains will nearly double the cost of reference method testing for the RATA. Commenter (0046) states that dual trains are more expensive and complicate the testing process. Commenter (0046) states that the EPA has not provided data to back up the assertion that dual trains are warranted and suggests that the EPA provide such data (i.e., showing that data from a single train is unreliable).

Commenter (0046) states that PS-12A is the only known PS that requires the use of paired reference method sampling trains (see PS-12A section 8.4.2), and requires dual trains when using Method 29. Commenter states that paired trains are recommended but not required in PS-11 (see section 8.6(1)(i)). Commenter suggests an alternative standard in which the EPA would recommend the use of paired trains but not require them, similar to the requirements of PS-11.

Commenter (0047) states that in sections 11.9.4.4 and 11.9.4.6, the EPA proposes to require paired or duplicate trains when performing RATAs using Method 26A as the reference method and to require the discarding of data pairs that do not meet specified relative difference criteria. The commenter states that they are unaware of any purpose or precedent for such a requirement and recommends that the requirement be removed from PS-18. According to the commenter, as illustrated in an attachment to their comments (see pages 4 and 5 of Attachment 2 of their comment letter), requiring dual trains will simply add unnecessary time and cost to RATA testing and result in the discarding of otherwise valid reference method runs. The commenter also notes that the additional burdens will not increase accuracy, but will make it more unlikely that facilities will choose to implement HCl CEMS.

Response:

The EPA acknowledges that requiring duplicate Method 26A trains during RATA tests adds some complexity and cost to initial and ongoing quality demonstration of CEMS performance. Our primary concern is the confidence in reference method data at low concentrations. We also acknowledge that the proposal in PS-18 only requires duplicate sampling for Method 26A and does not address duplicate Method 320/Method 321 as a requirement during RATA testing. Furthermore, from the data provided by stakeholders and through our EPA/ORD partners evaluating the use of paired Method 26A trains, we are convinced that Method 26A performed as a prescriptive method generate acceptable confidence to allay concerns about the quality of this reference method at concentrations at the compliance limits of current MACT rules. Accordingly, we have revised PS-18 to remove the requirement for pair reference Method 26A sampling trains during RATA tests.

3.12.3 Update Method 320 and 321

Comment:

Commenter (0042) requests that the EPA update Method 320 and 321 to be consistent with ASTM D6348-12, which they state has been revised four times since Method 320 and 321 were written.

Response:

This comment is beyond the scope of the proposed action. In this action, the EPA did not propose revisions to Method 320 or Method 321.

3.12.4 RA Specification at Low HCl Concentrations

Comment:

One commenter (0043) asserts that an alternate RA specification is needed at low HCl concentrations. The commenter includes attached reports to their comment letter that conclude: “[r]elative accuracy test specifications should include an absolute mean difference tolerance which accounts for the LOD and Level of System (LOS) of the reference measurement system and its sensitivity. The mean difference specification must be set much higher than the LOD, and should be set considering the practical quantification limit of the reference system. An acceptable RATA specification for HCl CEMS which reflects current limits of technology could be: RA ≤20 percent of the reference mean, or RA ≤10 percent of the emission standard, or absolute value of mean difference ≤0.5 ppm, whichever is least restrictive.” The commenter believes that an alternate RA specification should be included for when HCl concentrations are less than 1.0 ppm of a mean difference of ≤0.2 ppm (similar to what is included in the promulgated Subpart UUUUU, Appendix B) for the cement industry.

Response:

The EPA agrees that alternative RA specifications are needed at low HCl concentrations. We repeat part of the response in section 3.12.1 of this document to address this comment. The EPA acknowledges that measurements at or below the MDL of a reference method or a candidate CEMS instrument can complicate relative accuracy determination. Relative accuracy (RA) is calculated using Equation 14 in PS-18. We have revised section 13.4 to indicate that the average reference measurement is used in the denominator of Equation 14 only when the emission level is 75 percent or more than the applicable standard. Otherwise, the denominator in Equation 14 becomes the emission standard. The precedent for this approach in PS 2 is continued in PS-18. Demonstrating that both the reference method and the CEMS measurements agree at low concentration has value to demonstrate CEMS performance when evaluated in combination with the other performance-based requirements in PS-18 even when either or both the reference method and CEMS report results near the measurement detection limit.

Comment:

Commenter (0043) reports that the simple LOS field demonstration procedure used in their attached documentation of conducted field evaluations is sufficient and easy to perform and obviates the need for more laboratory tests and more complex field test procedures proposed by the EPA. The commenter believes the LOS/LOD of these three measurement systems is now adequately demonstrated and need not be repeated unless there are significant differences in other installations. As an example, the commenter points out that it would be appropriate to repeat the LOS system for the OMNI or ABB FTIR CEMS if they were installed with 200 foot heated sample lines, or it would be appropriate to repeat the LOS for the TDL if installed on a much shorter measurement path length.

Response:

The EPA acknowledges the effort from the commenter to determine an independent level of detection for their equipment and system as well as the effort to determine the LOS for quantitative measurement of HCl with their equipment. Owners or operators are able to apply for an alternative measurement method approval under sections 60.8(b)(2), 61.13(h)(1)(ii), 63.7(e)(2)(ii), or other applicable alternative method approval mechanism if stakeholders believe they have an acceptable alternative to specific requirements in PS-18. Guideline document 22 (GD-022) gives direction to the public in navigating this process. That document can be found at: http://www.epa.gov/ttnemc01/guidlnd/gd22.pdf.

Comment:

Commenter (0042) requests an RA test exemption for sources that have HCl emissions less than 0.6 ppm. The commenter explains that section 11.9.4 requires an RA test against a reference method (FTIR Method 321 for Subpart LLL). According to the commenter, an RA test should not be required below 0.6 ppm HCl (and perhaps higher level) because of the combined uncertainty associated with reference method, together with both the uncertainty of calibration standards and the concentration resolution of HCL CEMS and concentration resolution of Method 321 (which are both ± 0.1 ppm), prevents obtaining reliable RA results.

Response:

See the response to an alternative RA requirement in the response to comments in sections 3.12.1 and 3.12.4 above. A RATA is used to verify both the representative location of the CEMS as well as the value the CEMS reports. Continuous emissions monitoring systems that measure at the detection limit at the installation site are not exempt from performing a RATA to demonstrate the CEMS and a traversing reference method quantitatively agree.

Comment:

Commenter (0042) includes an attachment to their comment letter (see Attachment A of their comment letter) as support for their position. Attachment A of their comment letter presents an analysis that concludes that "[c]omparisons of HCl CEMS with FTIR based Method 321 for determining relative accuracy is insufficient to gage CEMS accuracy" and that "analyte spiking should be sufficient[2] to gage the accuracy of the CEMS." The commenter opines that laboratory interference tests, linearity tests and CD tests are sufficient to ensure measurement accuracy at low levels.

Response:

The EPA acknowledges the support for the use of dynamic analyte spiking as a quality control assessment of HCl CEMS performance. The EPA disagrees with the comment that relative accuracy tests are not necessary. While performance evaluation tests listed by the commenter check instrument response to known HCl concentrations, none of them confirm the uniformity of the concentration of HCl across the stack or duct, therefore, a reference method that traverses the stack is needed to determine relative accuracy.

Comment:

Commenters (0042, 0047) state that in section 11.9.4.3, the EPA proposes to require a DS verification test (as described in appendix A of their comment letters) whenever the HCl measurements are less than or equal to 20 percent of the applicable standard. One commenter (0047) states that the EPA has provided no justification and he is unaware of any purpose or precedent for requiring alternative or additional QA testing, in addition to a RATA, because a unit is operating well below the applicable standard or is operating below the reference method quantification limit. The commenter (0047) requests that this requirement should be removed from the specification because the requirement does not appreciably provide any more assurances that the HCl CEMS is operating properly than demonstrated by meeting the relative accuracy requirements. Commenter (0042) asserts that kilns with very low or no HCl should not be required to conduct extra tests and that DS procedures equivalent to those used in PS-15 DS

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[2] Kinner, Laura, L., EMI. *Potential Error in Method 321 Analyses and Implications for Accuracy Comparisons with Installed CEMS*. (*Attachment A* to EPA-HQ-OAR-2013-0696-0042)

should be allowed as an alternative to the RA test, not in addition to the RA test, to validate installed CEMS.

Response:

The EPA acknowledges the support for the use of DS as a performance check. The EPA agrees that requiring a DS strictly on the basis that emissions are low presents a disincentive to maintaining low emissions. We have revised PS-18 to remove this requirement for low emission sources.

Comment:

Commenter (0042) states that, as section 11.9.7 is written, the PS-18 option to perform DS during an RA test, if successful, can be used as an alternative to "quarterly RATA tests." The commenter believes that the EPA intended it to be written so that a successful DS during certification allows the source operator to use DS as an alternative to quarterly gas audits, or three run Relative Accuracy Audits (RAA), but not an alternative to the annual RATA (quarterly RATAs are not required).

Response:

The EPA agrees with Commenter 0042 that the intent of section 11.9.7 was to allow dynamic spiking as one of the quarterly relative accuracy audits and not a replacement for the initial RATA or yearly RATA except in the case of the extended time allowed between RATA when all of the QC requirements requirement for HCl monitoring are met. EPA has revised section 11.9.7 to clarify the intent. We have revised section 11.9.7 of PS-18 to clarify the use of DS for RAAs but not RATA.

3.12.5 Stratification Test

Comment:

Several commenters (0042, 0044, and 0049) opine that a stratification test is overly burdensome and unwarranted.

Commenter (0044) believes that the requirements for a stratification test for HCl are unwarranted because extractive CEM or cross-stack TDL instruments are only effective in measuring HCl in the vapor phase, and stratification only occurs with non-vapor droplets and higher-mass aerosols. Commenter asserts that gas phase measurements have always been associated with a homogeneous mixture of molecules across a stack or duct under turbulent flow conditions, which is always the case at plants with HCl emission streams. Commenter further states that HCl will remain as a gas if the temperature and pressure in the stack or duct allow it to remain above its dew point pressure. According to the commenter, if the temperature falls below the dew point, most HCl molecules will be removed from the vapor phase as droplets which will fall out in the stack or will be carried through the stack and will fall out as acid rain. Commenter states that if any droplets get into the sampling system, they will only be vaporized to their individual constituents if there is enough enthalpy in the sampling system; however, according to the commenter, HCl associated as a wet gas mixture would require more enthalpy than a sampling system less than 200°C could deliver and, therefore, would remain behind as a salt on the filter. Commenter states that only when all of the moisture is removed from the sampling system would there be enough enthalpy to sublime the HCl salts back to their vapor phase. Commenter provides a graph showing DS test data to support their conclusions (see page 3 of their comment letter).

Commenter (0044) suggests that other reasons why a stratification test is not warranted include (1) the fact that other extractive HCl reference methods, including Methods 320, 321, and ASTM D6348-12, do not require a stratification test and (2) if stratification exists and is statistically significant, the error would be revealed by the RA test.

Commenter (0049) states that the stratification test seems overly burdensome for sources using Method 26A since the test results will not be available onsite, which would force most sources to use only instrumental methods (e.g., Method 320) due to the need for real-time HCl data.

Commenter (0049) asks the EPA if an affected source can assume full stratification and use Method 1 sample point locations instead of performing a stratification test to measure HCl.

Commenter (0042) states that the proposed stratification test procedures and acceptance criteria specified in section 11.9.3 of the proposal (1) are unnecessary for most sources and do not need to be performed, (2) contain confusing references to the CEMS and reference method sampling points, (3) provide inappropriate acceptance criteria, and (4) are not supported by any data. The commenter suggests that the stratification test sections be revised to (1) eliminate the test when the monitor and RA test locations are downstream of ID fan or other well-mixed location, (2) eliminate the test for sources that have no measurable HCl during mill on operation, (3) explicitly state stratification tests should not be done during transient conditions including mill off operation, (4) specify that only an O_2 traverse is necessary if the only potential source of stratification is air in-leakage, (5) specify a stratification test, when necessary, be done at the RA test location and not the CEMS location, if different, and (6) specify that LOD criteria for allowing the alternative SO_2, CO_2, and CO tests is based on the reference method LOD and not the CEMS LOD. Greater detail regarding the reasons and requested changes to the procedures specified in section 11.9.3 follow:

- The purpose of the test is not "to verify that excess stratification of the target pollutant does not render the sampling point of the CEMS non-representative." The commenter opines that passing the RATA is sufficient to demonstrate that the CEMS is installed to provide representative emissions measurement. The commenter believes that the first sentence of section 11.9.3.1 correctly states the purpose of the tests (to "[p]erform a stratification test at each test site to determine the appropriate number of sample traverse points").
- The test does not provide any information about stratification of the target compound (HCl) at the reference method sampling location. The commenter asserts that section 11.9.3.2 allows substitution of SO_2, CO_2 and CO or NO_x traverses under certain conditions.
- The first sentence states that the "test must be conducted during normal facility operating conditions." The commenter states that, for kiln systems, they interpret that to mean the

stratification test would be required to be performed during mill operation which represents 85-90 percent of kiln operating hours. The commenter argues that it is not possible to perform a stratification test during rapidly changing effluent concentrations during mill off operation because temporal variations would be wrongly interpreted as spatial variations.

- Section 11.9.3.2 allows performance of an SO_2 stratification test if the HCl concentration is less than 10 times the LOD of the CEMS. Commenter states that the CEMS cannot traverse and is not involved in the stratification tests. The commenter assumes that the EPA is referring to the LOD of the FTIR analyzer used in Method 321 and RATA stratification tests and recommends that this language be corrected.
- Section 11.9.3.2, together with the acceptance criteria in sections 11.9.3.5.1 through 11.9.3.5.3 are impractical (a good FTIR analyzer has a detection limit of about 0.1 ppm) and that after expending the time to perform the required test (despite the result being apparent from the outset) the result is that single point sampling for the RA test is allowed.
- Section 11.9.3.3 allows substitution of CO_2, CO or NO_x stratification test if both HCl and SO_2 are less than ten times the CEMS LOD (where, as noted before, the references to the CEMS LOD is irrelevant).
- Section 11.9.3.5.1 acceptance criteria for achieving single point RA sampling of ± 5 percent or ± .5 ppm, and the 11.9.3.5.2 acceptance criteria for achieving and using 3-point RA sampling of ± 10 percent or ± 1.0 ppm, are both followed by the phrase “whichever is least restrictive.” The commenter states that the criteria in 11.9.3.5.3 for performing 12-point RA sampling states only > 10 percent. According to the commenter, a ± 1.0 absolute criterion needs to be added to section 11.9.3.5.3, otherwise the third specification may be more restrictive than the prior two specifications (which they believe was not intended).

Commenter (0042) asserts that, unless the EPA can demonstrate that HCl stratification is an actual issue, the EPA should revise PS-18 to incorporate the identical requirements in PS-2, section 8.13.2 that requires sampling three points on a line and requiring stratification tests only where there is a reason to expect stratification actually exists. The commenter reports that they could not find any supporting data or information in the docket that stratification tests are needed. Section 11.9.3.2 unnecessarily specifies that Method 6C be used for an SO_2 traverse. The commenter states that the tester will be using an FTIR test method that can measure all pollutants mentioned simultaneously and that it is only necessary to traverse the stack to determine relative differences in SO_2 or other gas concentrations. The commenter opines that there is no need to acquire and use a series of EPA Protocol SO_2 calibration gases and comprehensive series of procedures intended for test runs.

Commenter (0049) states that the restriction that HCl levels must be less than 10 times the level of detection to allow for the use of SO_2 as a surrogate for HCl should be removed. Commenter asserts that there is no scientific basis for this restriction. Commenter states that the restriction that HCl levels must be less than 10 times the level of detection to allow for the use of SO_2 as a surrogate for HCl should be removed. Commenter asserts that there is no scientific basis for this restriction. Commenter states that SO_2 is a suitable indicator of the presence (or lack thereof) of stratification and should be allowed as a surrogate for HCl. Commenter further states that an instrumental method of measurement for stratification testing, such as SO_2 CEMS analyzers if the FTIR Method 320 is not used, will reduce the testing schedule and cost burden on affected units.

Commenter (0047) points out that the EPA proposes a "stratification test" to "verify that excess stratification of the target pollutant does not render the sampling point of the CEMS non-representative" in section 11.9.3. The commenter believes that this statement is confusing and recommends that the EPA remove the description of the test in section 11.9.3, or revise it to refer to the representativeness of the reference method sampling location and not the CEMS sampling location. Although the commenter agrees that stratification testing in a stack in a location near the CEMS sampling point might provide useful information on whether emissions near the CEMS sampling point are stratified, the commenter does not believe that is the purpose of the test EPA proposes. The commenter notes that they believe, consistent with section 11.9.3.1, that the purpose of the stratification test is to determine the appropriate number of traverse points for reference method sampling at the site where the reference method runs for the RATA will be performed. According to the commenter, if representative reference method sampling is assured by use of the appropriate number of sample traverse points, and the RATA criteria are passed, it is the RATA (not the stratification test) that confirms that there is no significant stratification at the CEMS measurement point.

Commenter (0047) notes that many units that may be subject to PS-18 under Subpart UUUUU have already have performed stratification testing at their reference method sampling location under other rules, like Part 75, and to avoid unnecessary repetitive stratification testing. Thus, according to the commenter, the EPA should include an exemption from the stratification testing requirement for reference method locations that have been previously evaluated. The commenter also believes that the EPA should include a concentration below which stratification testing is not necessary and suggests that a concentration less than 10 times the LOD of the analyzer as an appropriate point for such an exemption.

Commenter (0047) supports the EPA's proposal to establish a stack diameter below which stratification testing is not necessary, but believes that the EPA's proposed selection of 4 inches is more circumstantial than reasonable. The commenter supports a recommendation in an attachment to their comments (see page 4 of Attachment 2) of 2 meters as a de minimis stack diameter for exemption from stratification testing, because this is consistent with the measurement location criteria in proposed section 8.3.1.

Commenter (0043) asserts that there are no stratification test results in the docket and believes there are no scientific or engineering reasons for the EPA to include stratification tests in PS-18. The commenter asserts that the provided HCl field evaluations (see Attachments A and B of their comment letter) support the assertion that stratification tests are unnecessary and impractical.

Response:

The EPA disagrees with the commenters that stratification testing is unnecessary and unduly burdensome. Contrary to the assertions of some commenters that stratification testing is not necessary, the EPA's concern is that polar water soluble pollutants including HCl may adhere to solid particles, absorb into neutral or acidic water droplets or otherwise become stratified and unevenly distributed in ducted stack gases. While turbulent flow and other conditions may eliminate stratification under certain conditions, the EPA does not agree that those conditions can be easily defined. Nor does the EPA agree that if stratification exists, it would always be revealed by the relative accuracy test. To ensure collection of representative RM samples, it is necessary to confirm the absence of stratification before allowing single point or 3-point sampling that does not include the centroid of the duct. However, the EPA does recognize that there is a need to provide one or more options for RM sample point selection that do not require stratification testing, and we also understand that the proposed language of section 11.9.3 may have caused some confusion. We have, therefore, revised PS-18 to offer three RM traverse point options that can be used without the need for stratification testing. These options are a 3-point traverse (commonly known as the '3-point long line) that includes the centroid of the duct, a 6-point traverse as allowed under 40 CFR part 75, or a 12-point traverse, as was requested by one commenter. Testers desiring to test at a single point or at three points within 2 meters of a single port (commonly known as a '3-point short') will need to conduct stratification testing to demonstrate the absence of stratification or only minimal stratification, respectively. We have revised PS-18 to clarify that the purpose of stratification testing is only for selection of RM sampling points and have simplified the use of SO_2 as a surrogate for stratification testing without restriction to offer a simpler option when using Method 26A as the RM. Commenters asked for exemptions from stratification testing for several reasons: (1) for locations that have been previously evaluated, (2) for ducts less than 2 meters in diameter, and (3) for very low concentrations. The EPA disagrees that once a source is shown to be unstratified it can be assumed that it will remain unstratified indefinitely. The EPA sees no justification to provide a 2-meter diameter exemption with neither empirical data nor other basis to support it. Regarding a low concentration exemption, the EPA has not provided such an exemption, but sources with HCl or SO_2 concentrations in the range of 0.2 ppm will likely be able to qualify for single point sampling following stratification testing based on the 0.2 ppm absolute value criteria now included in section 11.9.3 of PS-18. Finally, as commenters recommended, we have revised PS-18 to clarify that the stratification testing must be conducted at the same location as the RM testing and that stratification testing should not be conducted during transient conditions.

Comment:

Commenter (0042) states that section 11.9.3.2 unnecessarily specifies that Method 6C be used for an SO_2 traverse. The commenter explains that the tester will be using an FTIR test method that can measure all pollutants mentioned simultaneously and that it is only necessary to traverse the stack to determine relative differences in SO_2 or other gas concentrations. The commenter opines that there is no need to acquire and use a series of EPA Protocol SO_2 calibration gases and comprehensive series of procedures intended for test runs.

Commenter (0049) states that SO_2 is a suitable indicator of the presence (or lack thereof) of stratification and should be allowed as a surrogate indicator for HCl stratification. Commenter further states that an instrumental method of measurement for stratification testing, such as SO_2 CEMS analyzers if the FTIR Method 320 is not used, will reduce the testing schedule and cost burden on affected units.

Commenter (0042) asserts that the basis for the EPA's stratification test hierarchy (i.e., HCl, then SO_2, then other parameters) is inappropriate if the cause of stratification in air in-leakage since emissions data are corrected to 7 percent O_2 dry basis and the effects of air in-leakage cancel out if the O_2 and HCl CEMS are acquired at the same point. According to the commenter, if detection of stratification due to air in-leakage is desired, an O_2 or CO_2 traverse would be most effective and that no specification of a test method for performing the CO_2, CO or NO_x traverse is included (in contrast to the SO_2 option).

Response:

The EPA appreciates the commenter's support for use of SO_2 as an indicator of stratification and, considering that HCl and SO_2 should be similarly controlled and stratified (if stratification is present), we have revised PS-18 to allow the use of SO_2, which should behave like HCl, as a surrogate for HCl in stratification testing without restriction and have eliminated the hierarchy of compounds for stratification testing as proposed. The EPA agrees with the commenters on the use of Method 320 for the determination of SO_2 concentration for stratification testing and we have revised PS-18 to add this alternative in addition to the use of Method 6C. The EPA disagrees that there is no need to acquire and use the QA/QC procedures associated with these methods and maintains normal conduct of the methods to ensure accuracy and precision (i.e., lack of calibration drift) over the course of the stratification run. The EPA understands that O_2 or CO_2 testing may be appropriate for detecting stratification due to air leakage, but we have limited the stratification testing options in PS-18 to HCl and SO_2 because SO_2 better parallels the behavior of HCl than O_2 or CO_2.

3.12.6 Linearity Test

Comment:

Commenters (0041, 0038, 0045, 0039) support a linearity test performed by the manufacturer for the following reasons: (1) technologies, including FTIR (at levels below 10 ppm), TDLs and CRDS analyzers are all very linear measurement techniques; (2) linearity of these analyzers has been demonstrated in numerous tests, including at EPA and independent laboratories; and (3) the fundamental reference spectra and analysis algorithms and/or design of the measurements systems is consistent for a particular analyzer and is not subject to change between individual measurement systems.

Response:

The EPA agrees there are benefits to manufacturer evaluation of instruments for HCl monitoring before field evaluation is performed. We have revised PS-18 to modify the calibration error test to be consistent with other performance specifications that require measurement error tests. Therefore, the absolute requirement for linearity has been removed and in its place we require measurement error tests at multiple concentrations.

3.13 Reporting

3.13.1 Specifying Reporting Requirements

Comment:

Commenter (0047) believes that specifying reporting requirements in the performance specification without regard to the program or permit under which the performance specification is required is neither reasonable nor efficient. The commenter asserts that in many cases, the specified reporting will conflict with reporting requirements in applicable rules (which, according to the commenter, is the case with Subpart UUUUU, Appendix B). The commenter recommends that the EPA limit the requirements in PS-18 to recordkeeping and that the specification state that recorded information should be reported as specified in the applicable regulation or permit.

Response:

The EPA disagrees with the commenter that performance specifications should not specify reporting requirements. Specifying reporting requirements in the performance standard promotes consistency across rules. The performance specification is intended to supply generic requirements and fill gaps that are not addressed in the source-category-specific rule. We have revised the reporting requirements in PS-18 and Procedure 6 to require specific reporting unless otherwise specified in an applicable rule or permit.

3.13.2 Section 11.10.3

Comment:

Commenter (0047) believes that the reporting requirements in section 11.10.3 requires further explanation as to what the EPA wants reported and why. The commenter states that if the EPA intends to refer to information that is relevant using Method 205, then the EPA needs to make that clear and provide references to appropriate provisions in that method.

Response:

The EPA agrees that Method 205 does not include a clear procedure to record and report the information required to determine the quality of Method 205 dilutions. We have revised the requirements in section 11.10.3 to clarify the reporting requirements. For systems that use Method 205 to prepare HCl reference gas standards, you must record results of Method 205 performance test field evaluation, reference gas certifications, and gas dilution system calibration.

3.14 Calculations and Data Analysis

3.14.1 Equation 2

Comment:

Commenter (0048) states that in PS-18 Equation 2, the summation should be over the number of interference measurements, which is not necessarily three measurements as shown in the equation.

Response:

Performance Specification 18 assumes the test will be done according to the description that requires three replicate tests at each condition. If manufacturers choose to perform additional replicate tests, it is their responsibility to pick the three that best represent their instruments performance.

3.14.2 Equation 7

Comment:

Commenter (0039) states that periodic zero measurement checks for IP-CEMS must be performed while using a separate measurement path from normal operation that excludes the native measurement path. Commenter states that the evaluation of zero drift according to PS-18 Equation 7 in section 12.4.4 subtracts the native concentration measurement from each of the two zero challenges; however, because the zero measurement and the native measurement are essentially the same result under this scenario (i.e., both are made by filling the calibration cell with zero gas and directing the laser beam through both the calibration cell and the native path), the approach will instead only relate to the amount of variation in the native stack corrections between measurements taken at different times. Commenter suggests that the assessment of the analyzer zero drift should be done using a separate measurement path that excludes the native background, and that a test that confirms that this separate path is equivalent to the normal measurement should be included as part of the factory verification. Commenter states that the manufacturer would provide test data and technical documentation as support.

Response:

The EPA acknowledges commenter 0039’s concern that measuring zero gas drift for IP-CEMS should exclude the native measurement path concentration. Section 11.8.6.2 of PS-18 states that “For IP-CEMS, you may exclude the in stack measurement path when determining zero gas concentration.” We have revised Equation 7 to be consistent with section 11.8.6.2. However, we disagree with the contention that zero drift should be exclusively done by the factory or instrument vendor. Environmental conditions and component degredation for in-service units require initial field verification and periodic drift assessment.

3.15 Method Performance

3.15.1 CD and CE Specification Will Force Arbitrary Adjustments

Comment:

Commenter (0042) opines, as discussed in many stakeholder conference calls with the EPA previously, that the proposed PS-18 and Procedure 6 CD specification and CE specification will force arbitrary adjustments to force responses to match external calibration standards which will detract from data quality (e.g., arbitrary adjustments will be applied to the analyzer output even though the analyzer has not drifted or changed to account for minor sampling system residuals in extractive CEMS). The commenter further opines that this will encourage poor practices, such as performing FTIR background measurements (not addressed in the proposed regulations) through the sample system rather than direct to the gas cell.

Response:

The EPA disagrees with commenter 0042 that the CD and CE (now measurement error (ME) requirements in PS-18 and Procedure 6 will force arbitrary adjustments to force responses to match external calibration standards. Neither the CD nor ME procedures in PS-18 or Procedure 6 force any instrument adjustments. The EPA generally agrees that some technologies may not meet the drift requirements in PS-18 and Procedure 6. The requirements in PS-18 and Procedure 6 are no more stringent than other existing performance specifications. We also note that certain technologies can meet the requirements for calibration drift as proposed in PS-18 and Procedure 6 (section 7.7 of Attachment A to commenter 0042 docket submission; EPA-HQ-OAR-2013-0696-0042). The lowest span we envision in current rules is 5 ppm which would yield a 0.25 ppm drift allowance. Other spans such as 10 ppm would increase the drift tolerance accordingly.

3.15.2 CD and CE Specification of Less than 5 Percent of the Span

Comment:

Commenter (0047) states that in sections 13.2 and 13.3 of the proposed PS-18, the EPA proposes CD and CE specifications of less than “five” percent of the span. The commenter believes this criterion may not be realistic given the current analytical uncertainty for HCl gas cylinders is ±5 percent. According to the commenter, this is particularly true of the 7-day CD specification given the fact that existing HCl CEMS do not provide a means of physically adjusting the instrument’s response to a calibration gas. The commenter provides some HCl calibration gas cylinder data for the EPA to review in an attachment to their comment letter (see page 6 of Attachment 2 of their comment letter).

Commenter (0043) asserts that achievable zero and upscale CD for extractive HCl CEMS is not less than ±0.5 ppm HCl when using dry calibration gas standards to determine CD. Based on the field evaluations that they provided with their comments (see Attachments A and B), the commenter believes that the proposed PS-18 specification of CD $\leq$ 5 percent of span with a 5 ppm span for cement kilns (i.e., $\leq$0.25 ppm) is not achievable.

Commenter (0042) does not believe that extractive HCl CEMS on kilns with in-line raw mills will be able to achieve the proposed CD limit of 5 percent span (i.e., ± 0.25 ppm) due to elevated concentrations that occur during mill off operation. The commenter states that they do not believe the drift specification is relevant to the level of HCl emissions during the mill off operation. Commenter requests either an exemption from the zero and upscale CD limits during the mill off operation and for 24 hours after be made, or that the CD specification apply for 6 of 7 days as is the case for CO CEMS under PS-4. The commenter explains that elevated HCl and NH_3 concentrations during mill off operation will create a "hysteresis effects" within extractive sampling systems resulting in elevated zero responses and/or residual HCl affecting upscale calibration checks during and following mill off operation.

Response:

The EPA acknowledges the challenges involved in meeting drift requirements when the allowable deviation (in terms of percent span) is approximately equal to an instruments quantitation limit. The allowable drift for CEMS in PS-18 is ±5.0 percent of span during initial evaluation. The allowable drift for CEMS in Procedure 6 for ongoing quality control is ±10.0 percent of span.

The EPA generally agrees that some technologies may not meet the drift requirements in PS-18 and Procedure 6. However, the requirements in PS-18 and Procedure 6 are no more stringent than other existing performance specifications. We also note that certain technologies can meet the requirements for calibration drift as proposed in PS-18 and Procedure 6 (Section 7.7 of Attachment A to commenter 0042 docket submission (EPA-HQ-OAR-2013-0696-0042)). The lowest span we envision in current rules is 5 ppm which would yield a 0.25 ppm drift allowance. Other spans such as 10 ppm would increase the drift tolerance accordingly.

The EPA disagrees that the level of quantitation of a particular technology limits the ability of current technology to have the resolution necessary to measure the drift variation required by PS-18 when it is applied to kilns when the mill is on. Other commenters indicate that current optical technologies used to measure HCl are inherently linear and drift free. If the span required for an emission standard CEMS results in drift and measurement error requirements at or below the instrument quantitation limit, owners or operators of subject facilities and test firms may choose a more sensitive monitoring technology or may request an alternative measurement method approval for a higher span under sections 60.8(b)(2), 61.13(h)(1)(ii), 63.7(e)(2)(ii), or other applicable alternative method approval mechanism. Guideline document 22 (GD-022) gives direction to the public in navigating this process. That document can be found at: http://www.epa.gov/ttnemc01/guidlnd/gd22.pdf. Furthermore, the changes requested by commenter 0042 would involve a separate rulemaking relating to a specific source category. Such rulemaking would be beyond the scope of the action the EPA proposed to take in establishing PS-18.

3.15.3 Calibration Error (CE) Check/Calibration Intercept Requirement

Comment:

Commenters (0042, 0047) recommend that the calibration intercept requirement span of section 13.3.1 be removed. Commenter (0042) believes that the calibration intercept requirement span is (1) duplicative of the CE requirement at three test concentrations, and (2) because the calibration intercept for HCl CEMS is not determined by regression analysis as with mass spectrometers. Commenter (0047) requests that the EPA provide data that shows an instrument was able to meet a CE specification of 5 percent of span, and also exhibit a calibration intercept greater than 15 percent of span.

Commenter (0042) requests that the requirement to perform a field linearity test from the zero to span concentrations be removed if done during manufacturer's certification (comments regarding the commenter's position on the use of manufacturer's certification are presented in Chapter 2 of this document). The commenter opines that CE (i.e., linearity) specification is not required in PS-2, PS-3 or PS-4 and is not warranted for technologies under consideration.

Response:

The EPA agrees that the requirement for linearity is redundant with other tests of the CEMS performance, and we have removed the linearity check requirement from section 13 of PS-18. However, the EPA disagrees with the commenter on the efficacy of calibration drift and measurement error determination in manufacturer's laboratory environment. Onsite installation brings with it the actual vibration and environmental effects at the specific facility being monitored as well as the effects of the site-specific sample matrix on the monitoring system. It is important to the accuracy of the measurements used to make compliance decisions that we know if the effect of the facility changes the theoretical behavior of an instrument. Therefore, we continue to require a measurement error test at multiple concentrations as part of the HCl CEMS initial qualification.

3.15.4 Relative Accuracy Check – Reference Method

Comment:

In response to an EPA solicited comment on relative accuracy tests at RM detection levels, commenter (0042) responded that an exemption from RATA should be provided when HCl emissions are below 0.6 ppm. The EPA should not penalize sources with low or levels or no measureable HCl by requiring additional QA nor require sources to expend resources for tests that have no practical use or validity due to low levels. Commenter refers to comments on the proposed PS-18 and Procedure 6 related to this issue and Attachment A to their comment letter *("Potential Error in Method 321 Analysis and Implications for Accuracy Comparisons with Installed CEMS"*) for additional information in support of their position.

Commenter (0042) requests that section 13.4 be changed to state that *"performance is acceptable if RA $\leq$ 20 percent of the RM average or $\leq$ 15 percent of the emission standard,* *whichever is least restrictive."* The commenter opines that, as written, the PS-18 RA specification becomes stricter as a percentage when emissions are less than 50 percent of the emissions standard and they believe that the EPA intended to relax the absolute accuracy requirement. The commenter opines that the last sentence of section 13.4 .should read *"[in] cases where…RA must be less than or equal to 15 percent of the "emission standard."*

Commenter (0042) requests that HCl CEMS used at cement kilns be provided the same alternate RA acceptance criteria when the RM average is less than 1.0 ppm HCl of *"an absolute difference in the mean of the RM and CEMS less than 0.2 ppm,"* as is contained in the promulgated Subpart UUUUU, Appendix B, section 3.1.2.2. The commenter asserts that (1) they can find no valid reason why the EPA should attempt to impose more restrictive RA limits on cement kilns or need to apply different approaches for different industries, (2) simply evaluating the mean difference is a technically valid procedure and (3) calculation of the 95 percent confidence coefficient is not statistically supportable due to the significant uncertainty of the HCl RM and CEMS data at low levels.

Commenter (0052) requests that the EPA include a different equation accuracy standard for low concentration emission sources in the proposed rule, such as that found in PS-10A section 13.2. Commenter suggests a 1 ppm difference standard when the relative accuracy is calculated as the absolute average difference between the reference method and the CEMS plus the 2.5 percent confidence coefficient.

Response:

The EPA agrees with the commenters' understanding of section 13.4 in PS-18 and we have revised that section to eliminate the potential confusion. We have also taken into consideration the best way to demonstrate acceptable accuracy at low emission level sources. We have revised this section further to allow the difference between reference method and CEMS to be less than or equal to 15 percent when the emission level for the test is less than 75 percent of the applicable standard or as specified in the applicable standard. This revision is an alternative way to reach the same end as both Commenters requested. Commenter 0047 data demonstrated that four out of five CEMS passed RATA under these criteria (EPA-HQ-OAR-2013-0696-0047). We chose this approach to maintain the relative accuracy requirements compared to the reference method at higher concentrations without penalizing sources with emissions between 50 and 100 percent of the emission limit. This change eases the criteria at lower concentrations when relative accuracy to the emission limit is the basis of comparison. We have also revised section 5.3.4 of Procedure 6 to provide concentration accuracy requirements for quarterly accuracy audit tests. Each of these optional audit accuracy test requirements was established using previous EPA practice with consideration for commenter's recommendations.

3.16 Tables, Diagrams, Flowcharts, and Validation Data

Comment:

Commenter (0046) states that all gas concentrations in PS-18 Table 1 have ranges except for formaldehyde (CH_20) and NH_3, and suggests that, for consistency, a range should also be provided for these constituents.

Response:

The EPA agrees with the comment that there should be some flexibility in the concentration used to check interferences and we have revised the table to provide a range of concentration for CH_2O and NH_3.

Chapter 4. Comments Received on Appendix A to Performance Specification-18 (Dynamic Spiking (DS) Procedure)

4.1 Definitions

Comment:

Commenter (0042) opines that the definition of "Calibration Range Above Span" (CRAS) is ambiguous and should be revised. The following revisions were suggested:

- The statement that *"the calibration range must accommodate the DS procedure, if that option is selected"* is self-evident and need not be included.
- The term "source category" is not relevant and should be changed to reflect the "source" because the actual, or "expected" HCl concentrations will be site-specific.
- The last sentence is ambiguous because we find no other requirements about CRAS checks or values in PS-18 and needs to be clarified. The commenter states that the only other mention of CRAS in PS-18 is in section 8.4 regarding the data recorder scan.

Response:

The EPA disagrees that it is "self-evident" that the calibration range must accommodate the DS procedure since the PS-18 requires span equal to a rule defined concentration or two (2) times the emission limit. This statement is required for clarity since other commenters contend that their technology is linear over a wide range of measurements and higher calibration concentrations are not needed.

The EPA agrees that a source category may have sources that perform differently. We have revised the text of PS-18 and Procedure 6 to remove the definition and requirements of CRAS since such requirement are stationary source specific and should be handled in individual compliance rule text.

4.2 Withdraw Dynamic Spiking (DS) Procedure or Allow Optional Use (Use of Alternative Procedures)

<u>Comment</u>:

In response to an EPA solicited question, commenter (0042) indicated that they do not believe that DS spike recoveries of 95-105 percent are achievable and do not know of any data that would support a specification that is six times more restrictive than the spike recovery required for Method 321 which will be used to assess RA at cement kilns. Temporal variations in effluent HCl concentrations and other factors affect the spike recovery determination. Dynamic spike recoveries of 90-110 percent may be achievable for some FTIR-based CEMS. The tolerance of 90-110 percent for spike recoveries is equivalent to the Procedure 6 daily drift check criteria of 2xCD specification (i.e. 2x5 percent of span) for requiring adjustments. The requirement to perform adjustments should be changed to require an inspection to determine the appropriate corrective actions(s).

Commenter (0042) also interpreted the EPA's second question to suggest that DS spikes might be performed by the quantitative addition of the spike gas at the analysis cell rather than through the sample probe and heated sample lines. This would allow verification that the analysis routines are working properly but would eliminate the ability of the DS to verify proper operation of the sampling system, including absence of cold spots, absence of ammonium chloride, absence of HCl adsorption/desorption effects. These are important capabilities of DS that can detect these types of problems which are not detected by performing zero and upscale calibration checks using compressed gas standards. It is not appropriate to modify the QA procedure so that it only appears to provide results within a tighter tolerance. The full capabilities of the DS procedure should be used to determine when corrective action is necessary and to determine what corrective action is appropriate. They do not know of any field data that supports the procedure that EPA has suggested.

Commenters (0038, 0039, 0041, 0042, 0045) state that a choice between performing dynamic spikes (DSs) or daily zero and upscale checks should be available to the manufacturer and CEMS user for all CEMS technologies, and the proposed regulation should not mandate the use of either technique to exclude particular technologies.

Commenter (0042, 0043) requests that the EPA withdraw the proposed Appendix A "Dynamic Spike Procedure" and substitute the procedures specified in the promulgated PS-15 for initial certification of CEMS or the promulgated Method 321 for on-going QA.

Commenter (0042) asserts that the detailed PS-18 DS procedure is yet another version of DS that introduces complexity and is an unproven attempt to mimic RATA by requiring nine spikes and calculation of mean spike recoveries and 95 percent CI for the series of spikes which they argue will be adversely affected by temporal variations in effluent concentrations. The commenter also asserts that the proposal conflicts with the promulgated procedures in PS-15 and Method 321.

The commenter provides further support for their position in an analysis included as Attachment B to their comment letter.[3]

Response:

The EPA agrees with the commenter that DS procedures may be used for multiple purposes and requiring nine spikes is not necessary for some of the uses of DS. We have revised section 8.2.6 and 8.3.4 of Appendix A to PS-18 to remove the requirement to generate a total of nine sets of DS data. Allowing DS as an option in PS-18 and Procedure 6 for calibration drift checks or quarterly audits, we have revised the text to specify the number of spike measurements required for each application of this procedure. Since PS-18 was proposed as an alternative to PS-15 for 40 CFR part 63 Subpart UUUUU and Subpart LLL, the commenter has the option to follow PS-15 in those subparts rather than PS-18 when it is final.

Comment:

Commenter (0043) states that the newly proposed Appendix A procedure is more complex and imposes stricter acceptance criteria than the DS procedures which have been extensively used in performing Method 321 HCl emissions tests at cement kilns for over 15 years, or those prescribed in PS-15. The commenter also notes that a review of the docket revealed only three DSs in the EPA's Office of Research and Development 2013 Power Point presentation slide, which were done for the purpose of LOD. The commenter believes that the EPA cannot hope to be successful in its efforts to complete a new PS-18 and Procedure 6 by introducing new, highly complex procedures, having no supporting information from laboratory or field trials.

Response:

The EPA disagrees with the commenter. The proposed dynamic spiking procedures improves on the procedure promulgated for PS-15. It is included in PS-18 to provide a clearly defined analyte spiking procedure, which is absent from Method 321. Since PS-18 is an alternative to PS-15 in one or more current rules, owners and operators may still choose to select other applicable measurement or monitoring procedures specifically applicable for their compliance testing and/or monitoring.

Comment:

In response to an EPA solicited question, commenter (0042) agreed that daily DS should be allowed as an alternative to daily CD checks with an acceptance criterion no stricter than 90-110 percent spike recovery. This should be an option rather than a requirement. Some CEMS cannot perform DS because they cannot measure a tracer gas to quantify the spike dilution rate and EPA's requirements in Appendix A to use NIST Traceable mass flow rate measurements are not possible. (Refers to their comments on the proposed PS-18 and Procedure 6 for additional information.)

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[3] Kinner, Laura, L. Emission Monitoring Inc. *Analyte Spiking for Use in Accuracy Determination in HCl Measurements*. (*Attachment B* to EPA-HQ-OAR-2013-0696-0042)

Commenter (0043) asserts that daily DSs are an acceptable or better alternative to daily zero and upscale checks and should be allowed by the EPA. The commenter asserts that Thermo Scientific's demonstration of zero and upscale checks using non-adsorptive gases (SO_2, CO, NO) can also be considered equivalent to the provisions of Method 321 which require daily zero checks and a daily check using a "calibration transfer standard," which may be any non-adsorptive gas selected by the operator to provide a check of the sample system and analysis cell integrity (e.g., absence of leaks), and to provide a check of the performance of the FTIR interferometer. The commenter believes that the daily zero and upscale checks using criteria pollutants along with successful daily dynamic spikes (performed according to Method 321) are essentially equivalent to performing the reference test Method 321 with every day being considered a sample run. The commenter asserts that their suggested approach is a simple and effective approach that relies on the strengths of the FTIR multi-parameter measurement capability and could satisfy both criteria pollutant and HCl monitoring requirements simultaneously.

Commenter (0042) suggests that the EPA allow for optional use of DS procedures for all certification and QA procedures as alternatives to RATAs and QA checks with external calibration standards.

Response:

In finalizing PS-18 and Procedure 6, the EPA concluded that DS procedures should be optional for the following certification and QA procedures in PS-18 and Procedure 6: (1) the upscale (mid-level) portion of the Seven-Day Calibration Drift Test, (2) the daily mid-level CD checks, and (3) the quarterly Data Accuracy Assessments.

However, the EPA does not believe that a DS procedure provides sufficient information to replace the 7-day or daily zero CD check, to replace the initial measurement error test, or to replace the RATA comparison with as a reference method.

The 7-day and daily zero CD checks using exclusively zero gas provides an absolute check of the instrument zero. Should hysteresis be a concern, humidified zero gas may be used. A procedure for use of a DS as an option for the 7-day and daily mid-level CD checks has been added to section 11.8 of PS-18 and section 4.1 of Procedure 6 in the final rule. The acceptance criteria for use of a DS as a mid-level CD check is the same as that for the classic procedure ±5.0 percent of span for a single spike; Equation A6 has been added to Appendix A of PS-18 for calculating this value. It is important to note that the 7-day and daily upscale CD checks, whether done using the classic procedure with pure calibration gases or a DS procedure, are limited to the use of a mid-level gas in promulgation of this rule. This was done to (1) ensure that the upscale calibration is closer to the measured values, (2) mitigate hysteresis effects, and (3) ensure that the CD values determined using either the classic procedure or a DS procedure are on a consistent basis.

The EPA has retained the requirement for use of pure calibration gases as the only option for measurement error. We have done so because we want at least an initial direct assessment of the linearity of the system; the concerns noted about hysteresis or gas use should not be critical impediments to fulfilling this requirement in a one-time test.

Use of a DSA as an option for quarterly data accuracy assessment was included in the proposal for Procedure 6; section 5.2.3 now includes clarifying information on spike levels, number of spikes, and spike recovery calculations.

The final rule requires conduct of a RATA involving comparison against a reference method at least yearly unless the optional criteria in are met to reduce this requirement to every other year. The RATA provides both quantitative comparison to the CEMS plus confirmation of the representativeness of the CEMS sampling location. The DS option only confirms the quantitative comparison but lacks the traversing necessary to evaluate representativeness of the CEMS sampling point.

Comment:

Commenter (0042), states that (1) single component analyzers such as cavity ring-down spectrometer (CRDS) used in extractive systems cannot use tracers such as SF6 or N_2O to determine the dilution ratio (i.e., spike injection rate), (2) there are no procedures for establishing NIST Traceable calibration for required mass flow meters measuring hot wet stack gas having variable concentrations of H_2O, CO_2 and other major components that affect calibration and measurement, and (3) alternatives need to be approved to facilitate CRDS analyzers.

Response:

The EPA disagrees with the commenter. The alternative to a tracer gas dilution calculation is to do an absolute volume dilution determination. The additional error from a dilution following Method 205 is estimated to be three percent. The contribution of this additional error does not put DS results out of an acceptable recovery range.

4.3 Spiking Concentration and Measurement Replicates

Comment:

Commenter (0044) states that two sections of the rule contradict; PS-18 Appendix A section 8.1.1 requires that you add the HCl spike at concentrations of approximately 50, 100 and 150 percent of the applicable emission limit or source emission concentration, and section 8.1.2 requires that you must measure each of the three spike concentrations (zero and two upscale). Commenter (0044) states that the zero and two upscale concentrations requirement contradicts the 50, 100, and 150 percent requirement.

Commenter (0044) states that the requirement to conduct nine independent measurements and that the same gas concentration cannot be measured twice in succession is burdensome, unnecessary, and costly. Commenter states that no reference methods exist for FTIR, including Method 320, 321 or ASTM D6348-12 that require more than three or four spike replicates at 50 percent of the expected target compound concentration. Commenter further states that the requirement for nine measurements is biased against the extractive technologies because much more spike material must be consumed because the entire sampling train must be spiked.

Commenter states that nowhere in any of the EPA testing performed in the field or at the EPA Research Triangle Park (RTP) pilot plant was hysteresis a factor when performing a DS due to the contribution of moisture from the stack matrix. Commenter opines that the need to switch concentrations and perform nine spikes is unprecedented.

Response:

The EPA acknowledges that in the proposed draft there was potential conflict between sections 8.1.1 and 8.1.2 of Appendix A to PS-18. We have revised Appendix A to PS-18 to eliminate the confusion. Revision to Appendix A conforms to the various options allowed for the use of the DS performance evaluation procedure. The revised text requires sequential measurement of an HCl spike at 100 percent of the applicable emission limit and at zero spike concentration. When an option to use dynamic spiking is allowed for various quality control or performance evaluation purposes, the spike concentration(s) and number of replicate measurements are indicated in the option text rather than in Appendix A.

4.4 Extractive CEMS Dynamic Spiking Procedure

Comment:

Commenter (0043) states that their field evaluations demonstrated the efficacy of the use of DSs as an accuracy audit procedure. According to the commenter, successful dynamic spikes were performed for the Thermo Scientific OMNI FTIR CEMS using SF_6 as a tracer gas, the ABB ACF-NT FTIR CEMS using both SF_6 and N_2O as tracers and the CEMTEK/Unisearch TDL. The commenter states that the field evaluations also demonstrated the advantages of DSs for extractive CEMS including:

- Quantitative check of the sampling system with representative effluent matrix including effluent moisture and NH_3 concentrations, hence ability to detect cold spots and ammonium chloride salt formation;
- Quantitative check of the analysis method with all components of the effluent matrix present (not simply HCl in nitrogen);
- Ability to perform the DS in a short period of time because the sampling system remains in its normal condition (continuously exposed to wet gas) and the long stabilization and recovery periods for dry calibration standards are eliminated;
- Reduction of calibration gas consumption by more than 90 percent (dynamic spikes supply only 10 percent or less of total sample flow, and also take shorter periods to perform);
- Ability to use 10 times higher concentration HCl calibration standards widely regarded to be more stable and reliable;
- Avoidance of use of questionable “certified” tag values and instead use of the on-site direct-to-cell FTIR analyses of the spike gas to determine the undiluted spike gas concentrations, thus eliminating all concerns about HCl calibration gas degradation over time; and

- Ability to detect and repair manifold leaks which are disguised by positive pressure calibration gas checks, overlooked and result in maladjustment of the measurement system calibration.

The commenter (0043) states that the field evaluations provide an extensive study of DSs conducted under the full range of conditions encountered at a contemporary cement kiln. The commenter reports that the results provide favorable comparisons with RA test results and are a legitimate basis to support the use of DSs as an accuracy audit procedure at the actual conditions encountered at cement kilns. The commenter notes that they could not locate any data in the docket that supports even a laboratory evaluation of the EPA's proposed Appendix A DS procedure, and found only one mention in the docket of EPA's Office of Research and Development performing DSs during its laboratory studies for LOD determinations.

Response:

The EPA acknowledges the effort and field test results provided by commenter 0043. When the EPA was provided with the draft report on field tests, the release of that report to the public was restricted by the sponsoring groups. With that report now submitted as part of the public comments, the EPA can use evaluation of the field test results to support PS-18 revisions. We have summarized our expansion of the use of DS for QA purposes in section 4.2 of this response to comments. We continue to believe that DS provides valuable information on measurement quality, even though it does not include a measure of representativeness. In the final PS-18, we continue to require RATA testing using a reference method that traverses the stack to provide an initial and periodic measure of the representativeness of the CEMS single point sampling location. The EPA disagrees with the commenter's contention that certified cylinder gases can be "named" or measured in the field by the CEMS instrument which later uses this "named" value for quality control purposes. An owner or operator is free to analyze cylinder gases directly in an analyzer or with other standard methods to determine if the cylinder gas has departed from its certified value. However, the EPA contends that certified HCl standard gases are available that meet the requirements of this performance specification and certified values are an independent standard of measure to compare CEMS performance against a true value.

4.5 Dynamic Spiking Procedure for IP-CEMS

Comment:

Commenter (0044) states that the proposed specification currently omits a requirement that IP-CEMS reproduce a cumulative spectra with matrix effects and a reduction of error associated with temperature and pressure differences between the stack and calibration cells. Commenter states that IP-CEMS needs to have their DS calibration cells maintained at the same temperature and pressure as the stack to ensure optimal instrument line shapes and reduce hybrid spectral generation errors. Commenter notes that the instrument line shape is critical to ensuring accurate spectral concentration data when Classical Least Squares (CLS), Partial Least Squares (PLS), peak heights, or peak areas are used in the quantification. Commenter reports that it is common knowledge among spectroscopists that the hydrogen bonding among HCl molecules and the water molecule in the sample matrix may affect the instrument line shape of the absorbance bands of a spectrum.

Commenter (0048) states that temperature differences between the gas in the validation cell and the gas in the stack pose challenges, and references the EPA's preamble discussion on the topic of the effect of temperature and pressure on HCl concentration determination during DS measurements. Commenter is a manufacturer of IP-CEMS and states that their model addresses the issue by subtracting the background (stack) HCl concentration during the in-situ validation (span check) mode (see page 2 of their comment letter for a complete description of the process). Commenter states that working with calculated (measured) concentrations rather than the absorption signal eliminates issues associated with hybrid spectra. Commenter provides the equation used to calculate the equivalent concentration (see page 2 of their comment letter). Commenter states that other IP instrument vendors have similar capability and it is recommended that the Ci_{eff} calculation be determined by either using PS-18 Equation 4 or as recommended by the IP Instrument Vendor.

Commenter (0040) provides information on how the equivalent HCl concentration is calculated from the cylinder value at room temperature correcting for temperature, pressure, line strength and the ratio of the cell to measurement paths. Commenter provides an equation to calculate the equivalent effective concentration of the calibration gas used to dynamically spike the inline flow-thru gas cell at stack conditions (see pages 1 to 2 of their comment letter).

Response:

The EPA disagrees with the commenter that cumulative spectra must be reproduced demonstrating matrix effects and the effects of temperature and pressure. The EPA included quality check parameters in PS-18 to provide a means to determine if data generated from HCl CEMS are adequate to demonstrate compliance. Performance Specification 18 includes a line strength factor in calculations for concentration that provides manufacturers to compensate for temperature and pressure effects on spectral features used to measure HCl. The EPA recognizes that different vendors have proprietary approaches and calculations to compensate for line strength corrections due to dipole-dipole, hydrogen bonding and other matrix effects that modify line shapes and, therefore, affect the accuracy of stack measurements. The line strength multiplier is a term in equation 4 of PS-18 and Equation A9 of Appendix A to PS-18. The EPA asserts that other quality and performance checks such as the RATA will identify issues with proprietary line strength function corrections, and failure of these technologies to meet the performance requirements of PS-18 will lead to the necessary corrections to generate data sufficient to demonstrate compliance with HCl emissions limits.

Chapter 5. Quality Assurance Procedures – Procedure 6

Several commenters (including commenter 0042) state that the comments they provided about the CD, RA, and DS and associated specifications in the previous chapters also apply to the proposed Procedure 6. Several of the over-riding comments (and the EPA's response to those comments) that would apply to both PS-18 and Procedure 6 are presented in Chapters 2 through 4 of this document.

5.1 Principle (Section 1.2.1)

Comment:

Section 1.2.1 states that Procedure 6 requires the analysis of reference method audit samples, if they are available, concurrently with reference method tests as specified in the general provisions of the applicable part. Commenter (0047) disagrees that the procedure requiring analysis of reference method audit samples in section 1.2.1 is a requirement of the general provisions and objects to the addition of such a requirement to the proposed QA procedure. The commenter states that audit samples are required only for performance testing.

Response:

The EPA disagrees with the commenter. Procedure 6 can require use of audit samples independent of the requirements of the general provisions in 40 CFR parts 60 and 63 related to audit samples. We have clarified the language of sections 1.2.1 and 11.9 in PS-18 accordingly so that we rely on the audit sample procedures of the general provisions but not the requirement for their use when conducting performance testing. It is standard practice for the EPA to require an audit sample under QA Procedures (e.g., Procedure 1).

5.2 Definitions (Section 2)

5.2.1 Continuous Emission Monitoring System

Comment:

Commenter (0047) opines that the definition of *Continuous Emission Monitoring System* is too broad and is different from the definition proposed in PS-18. The commenter believes that the definitions should be the same and should be limited to equipment that is covered under the two specifications (e.g., equipment that make up an HCl CEMS meeting the requirements of PS-18 and Procedure 6).

Response:

The EPA agrees with the commenter and has revised the definition of *Continuous Emission Monitoring System* to be more specific and relevant to current usage. The revised definition is also consistent with PS-12A including sections 3.1, 3.2, 3.3, and 3.4.

5.2.2 Dynamic Spiking

Comment:

Commenter (0047) states that the definition of DS is slightly different from the definition proposed in PS-18. The commenter requests that if there is a substantive reason for having two different definitions, the EPA must explain why, otherwise, the definitions should be the same.

Response:

The EPA acknowledges the commenter's request for definition consistency and we have revised PS-18 section 3.7 and Procedure 6 section A3 to make the definition of DS consistent. The definition now reads: *"Dynamic Spiking (DS) means the procedure where a known concentration of HCl gas is injected into the probe sample gas stream for extractive CEMS at a known flow rate, or used to fill a calibration cell for* in situ *IP-CEMS, in order to assess the performance of the measurement system in the presence of potential interference from the flue gas sample matrix."*

5.2.3 Liquid Evaporative Standard

Comment:

Commenter (0047) states that the definition of liquid evaporative standard is slightly different from the definition proposed in PS-18. As an example, the commenter notes that the definition in PS-18 refers to a reference gas whereas the definition in Procedure 6 refers to a calibration standard. The commenter requests that if there is a substantive reason for having two different definitions, the EPA must explain why, otherwise, the definitions should be the same. The commenter also suggests that the EPA use the defined term when referring to such gases in either specification.

Response:

The EPA acknowledges the slight differences in the definition of liquid evaporative standard between PS-18 and Procedure 6 and has revised the text to make the definitions consistent. The definition of liquid evaporative standard now reads: *"Liquid Evaporative Standard means a reference gas produced by vaporizing NIST traceable liquid standards of known HCl concentration and quantitatively mixing the resultant vapor with a diluent carrier gas."*

5.2.4 Span Value

Comment:

Commenter (0047) states that their comments on the definition of span value in PS-18 are the same as their comments on the definition of span value in Procedure 6. The commenter also recommends that the revised definitions should be identical.

Response:

The EPA acknowledges the wording in the definitions for Span Value is grammatically different while stating the same information. We have revised the definitions to make them contain identical wording.

5.2.5 HCl Concentration Values

Comment:

Commenter (0047) states that the defined term “HCl concentration values” is not used in either PS-18 or Procedure 6.

Response:

The EPA agrees with the commenter that the definition HCl concentration value is not necessary to understand the procedures and requirements in PS-18 or Procedure 6 and this definition has been removed from the definition section of PS-18.

5.2.6 Relative Accuracy

Comment:

Commenter (0047) states that the definition of relative accuracy is slightly different from the definition proposed in PS-18. The commenter requests that if there is a substantive reason for having two different definitions, the EPA must explain why, otherwise, the definitions should be the same.

Response:

The EPA acknowledges the slight difference in wording between the relative accuracy definition in PS-18 and Procedure 6. While the differences has no substantive effect on the requirement, we have revised the definitions to be word-for-word consistent with the exception that Procedure 6 refers to the equation in PS-18 used to calculate relative accuracy.

5.3 Data Quality Requirements, Calibration and Measurement Standardization Procedures

5.3.1 Daily Zero and Upscale Drift Checks

Comment:

Commenters (0038, 0039, 0041, and 0045) state that overly restrictive adjustment criteria based on daily checks results will likely reduce rather than enhance data quality. Commenter (0039) believes that for IP-CEMS in particular, an upscale calibration drift criterion of five percent is overly restrictive due to the potential noise introduced by native stack gas variations. Commenter (0039) proposes that the criterion for IP-CEMS calibration error (CE) and calibration drift (CD) tests, including the contribution of the native measurement path, be established at 10 percent.

Response:

This comment raises the same issues as those addressed in section 3.15.1 of this document and commenters are referred back to the EPA's response in that section.

Comment:

Commenter (0041) states that field verification of calibration accuracy and drift stability at zero and one upscale level are sufficient to demonstrate accuracy and reliability of HCl CEMS data.

Commenter (0041) states that an additional daily CRAS test with test gas is not required and such requirement should be removed from Procedure 6.

Commenter (0041) recommends that the EPA change the requirements for the daily CD assessment at Appendix F to part 60 Procedure 6 section 4.1.1 to delete the phrase requiring quantification of the CD at the CRAS (see page 19 of their comment letter for their proposed regulatory text change).

Response:

The EPA has revised section 4.1.1 of Procedure 6 to remove the requirement for above range calibration and provide an optional approach to qualify data in excess of 150 percent of span that may be used in cases where this is an issue and it is not addressed by the applicable rule.

Comment:

Commenters (0038, 0045, 0039, 0051) state that the EPA has not adequately evaluated zero and upscale drift criterion that are consistently achievable at sources with highly variable emissions.

Response:

The EPA has indeed considered the upscale drift criterion with respect to highly variable emissions. The EPA has provided flexibility in how to make the necessary before and after upscale native HCl gas measurements and how the native HCl concentrations can be established and rejected if necessary to correct the standard addition response from the CEMS. We have revised section 11.5 in PS-18 and sections 8.1, 8.2, and 8.3 in Procedure 6 to describe options and requirements for the native HCl concentration corrections.

Comment:

Commenter (0039) states that in addition to the proposed requirement of performing upscale calibration checks while including the native measurement path for IP-CEMS, a requirement should also be included to perform periodic upscale calibration checks for IP-CEMS while excluding the native measurement path. Commenter states that this "non-additive" approach is the only way for an IP-CEMS analyzer to be evaluated at concentration levels comparable to the native levels that are measured during normal operations.

Response:

The EPA disagrees that the only way for an IP-CEMS analyzer to be evaluated at concentration levels comparable to the native levels is to exclude the optical measurement path. It is the EPA's primary interest and objective to comprehensively evaluate measurement performance of the entire measurement path or system. Excluding the measurement path from the IP-CEMS would not meet that objective. The EPA disagrees that the HCl concentrations necessary for IP-CEMS are not comparable to native HCl concentrations since the upscale challenge concentration must be within the span required by the applicable rule, permit or as required in PS-18 respectively. The effective up-scale HCl challenge concentrations are a function of span which is a function of the emission limit and, therefore, comparable to emission concentrations and emission limits. Also, the EPA does not prevent or preclude CEMS operators from performing additional QA checks. Therefore, an owner or operator is free to perform the periodic upscale calibration checks that exclude the measurement path in addition to the CD requirements currently in PS-18 if such a check provides a benefit to the operation of the CEMS.

Comment:

Commenter (0042) states that the requirement in Procedure 6 section 4.1.1 that explicitly requires adjustment of the CEMS in response to daily zero and upscale calibration drift checks should be modified to require an inspection or other corrective action. According to commenters (0042, 0051), forcing CEMS providers to add external capabilities to facilitate arbitrary adjustments will detract from actual data quality.

The commenter (0042) suggests that a proper response when exceeding two times the CD limit is observed would be to inspect the measurements system and determine the need for and appropriate corrective action. The commenter suggests that, if the questionable CD response is determined to be due to transient effluent conditions, it may be appropriate to simply wait for stable effluent concentrations and then repeat the check. The commenter suggests that, if the questionable CD response is believed to be due to ammonium chloride build up in the sampling system, it may be appropriate to blow back the sample probe, or clean the sample lines.

Response:

The EPA acknowledges that there are other remedies in addition to instrument zero adjustment to bring CEMS units back into the allowable variation for CD and CE. We have revised section 4.1.1 to include inspection, corrective action including a successful repeat of the CD assessment. We gave retained the requirement that CD daily fall within two times the drift limits of the applicable performance standard.

Comment:

The commenter (0042) specifically focuses on sources with highly variable emission concentrations such as kilns with in-line raw mills where daily zero and upscale checks for extractive systems at these types of sources will indicate hysteresis effects or HCl residuals due to HCl/NH3/ammonium chloride salts evolving from the sampling system rather than analyzer drift. The commenter opines that mandating adjustments each time a variation of 0.5 ppm HCl is observed will require frequent adjustments on a day-to-day basis often to be reversed the next day.

Commenter (0041) states that Procedure 6 requires both a zero and upscale check for each monitoring parameter. Commenter states that each gas must be injected at the probe for a long enough time to get a stable and accurate response, and about the same amount of time must be allowed for the CEMS to recover after the gas injection is stopped. Commenter contends that if dry calibration gases are used, the data following the upscale check will be corrupted by elevated HCl concentrations desorbing from the inside of the sample line. Commenter provides four scenarios that derive the estimated maximum time period for the daily CD assessment (see page 7 of their comment letter). Commenter concludes that 3 or more hours per day will be restricted to only two valid data points per hour if extractive FTIRs use actual HCl test gases for the daily CD assessment.

Response:

The EPA recognizes the challenges provided by mill on/mill off operation and measurement of very low HCl concentration following measurement error or calibration check procedures. We have revised sections of Procedure 6 dealing with calibration drift to allow dynamic spiking as an option for upscale daily calibration drift checks of HCl CEMS. The daily zero CD checks using exclusively zero gas provides an absolute check of the instrument zero. Should hysteresis be a concern, humidified zero gas and upscale DS CD check may be used. A procedure for use of a DS as an option for the daily mid-level CD checks has been added to section 4.1 of Procedure 6 in the final rule. The acceptance criteria for use of a DS as a mid-level CD check is the same as that for the classic procedure +5 percent of span for a single spike and an equation has been added to Appendix A of PS-18 for calculating this value. It is important to note that the daily upscale CD checks, whether done using the classic procedure and pure calibration gases or a DS procedure, are limited to the use of a mid-level gas in promulgation of this rule. This was done to (1) ensure that the upscale calibration is closer to the compliance limit, (2) mitigate hysteresis effects by use of a lower level calibration gas, and (3) ensure that the CD values determined using either the classic procedure or a DS procedure are on a consistent basis.

Comment:

Commenter (0042) states that the preamble summaries of PS-18 and Procedure 6 (section 4.1.1 CD Requirement) are inconsistent. The commenter states that section IV.D.3 of the proposal preamble states that Procedure 6 requires a weekly “above span linearity” challenge, whereas Procedure 6 (section 4.1.1) states that the CRAS check is required daily.

The commenter also opines that section 4.1.1 of Procedure 6 is misleading. The commenter asserts that the cited requirements in the General Provisions (40 CFR 60.13(d) and 63.8(c)) are correct for the zero and normal upscale checks (which are within the span value) but say nothing about CRAS. The commenter also asserts that sections 4.1.2, 4.1.3, and 4.1.4 of Procedure 6 also appear to apply to the zero and high level checks but say nothing relative to the CRAS or the above span QA check which are required under section 4.1.1.

Commenter (0042) requests that the EPA remove its proposed CRAS requirements for sources with variable emissions. Specifically, the commenter asserts that it is not appropriate to require QA checks above the span value for sources that do not exceed the span value and that the requirement to do CRAS is not justified for kilns with in-line raw mills (provides kiln-specific justification for their position on page 37 of their comment letter).

Commenter (0042) states that the 10 percent acceptance criteria and requirement to do above span checks weekly, asserted in section IV.D.3 of the proposal preamble (pg. 27694), is not supported and is twice as restrictive as the promulgated Subpart LLL requirements. The commenter asserts that the requirements in Subpart LLL are event-based and allow the high-level calibration checks to be performed while the CEMS is measuring high HCl concentrations.

Response:

The EPA agrees with commenter that calibration above span is a source category specific issue and we have removed above range calibration requirements from PS-18 and Procedure 6 because they are better addressed on a source category rule specific basis.

Comment:

Commenters (0042, 0051) request that Procedure 6 allow the performance of a daily dynamic spike check having an acceptance criterion of ± 10 percent of span as an alternative option to performing daily zero and upscale drift checks. The commenter states that this would be consistent with the daily zero and upscale CD “adjustment” criteria.

Response:

The EPA agrees with the commenters and has revised both PS-18 and Procedure 6 to accommodate the use of an upscale CD measurement based on dynamic spiking as an option. We continue to require the daily zero check to be performed with zero gas and not by a dynamic spiking procedure using zero gas.

Comment:

Commenter (0042) also requests that the EPA include an exemption from the daily routine zero and upscale CD check criteria during above span operation and for 24 hours following returning to below span conditions after triggering Subpart LLL “above span calibration checks” for cement kilns with in-line raw mills. The commenter suggests that the EPA substitute the Subpart LLL “above span” calibration check for the usual upscale check.

Response:

The EPA acknowledges that the transition from qualifying extractive CEMS measurements at low HCl stack gas concentrations inside the span range to higher concentration stack gas outside the span range presents challenges to CEMS operation. The EPA has, therefore, revised PS-18 to remove requirements for above span calibration and associated quality checks. In place of the requirements for calibration above span, we have included optional procedures similar to those in Subpart LLL for when source concentrations exceed the span imposed by a specific rule requirement or set by PS-18 relative to the compliance limit.

5.3.2 Injection of Test Gas

Comment:

Commenter (0041) notes that the EPA's proposed method for validation is the injection of test gas at the probe. Commenter states that there are two types of test gases, adsorptive and non-adsorptive; non-adsorptive test gases, such as NO or CO, typically have short run-in times when injected into a CEMS, while HCl, which is an adsorptive test gas, has run-in times of up to 40 minutes depending on the length of the sample lines. Commenter asserts that long run-in times will cause a high demand for HCl test gas and may result in difficulty in achieving the minimum data for valid hours. Commenter provides calculations to estimate a facility's demand for HCl test gas and concludes that there will be a demand of 5 to 10 HCl test gas cylinders (50 liters at 150 bars) per year (see page 6 of their comment letter).

Commenter (0041) states that it is challenging to have precise and reproducible test gas cylinders for HCl, which may result in frequent triggering of a recalibration of the analyzer after each change of a gas cylinder, even if the analyzer itself is stable.

Commenter (0041) states that extractive CEMS should be allowed to use calibration cells like IP CEMS for the daily CD assessment. Commenter states that the use of calibration cells will reduce the consumption of test gas, will reduce the duration of the daily assessment to less than 10 minutes and increase CEMS availability, and will increase plant and staff safety as a beneficial side effect. Commenter states that validation units (i.e., calibration cells), which are an alternative to flowing test gas, have been used successfully for various analyzer types for many years (see page 8 of their comment letter for a description of the validation unit). Commenter contends that while gas exposure from cylinders requires long stabilization times, validation media provides a stable analyzer reading almost instantly and the availability of the analyzer is unaffected. Commenter provides a graph to support the conclusion that for a specific sample component, an adequate validation medium can be found (see page 9 of their comment letter). Commenter provides laboratory and field test data to support their conclusion that validation media is stable (see pages 9 to 10 of their comment letter). Commenter provides data that compares validation by cylinder gas with validation media and concludes that analyzer performance issues show up in response to validation media (see pages 10 to 12 of their comment letter). Commenter proposes numerous regulatory text changes related to their request to use calibration cells as a means to validate extractive CEMS (see pages 16 to 19 of their comment letter).

Commenter (0041) proposes a change to the requirements for the daily CD assessment at Appendix F to Part 60 Procedure 6 section 4.1.1 to add an additional weekly test gas injection if calibration cells are used. Commenter proposes that if the weekly test gas injection does not reveal the need for subsequent calibration adjustments, then the frequency of the test could be extended to bi-weekly after 3 months and to monthly after another 3 months (see page 19 of their comment letter for the proposed regulatory test changes).

Response:

The EPA acknowledges the differing views and findings concerning the response time that is required to bring extractive systems to a stable measureable concentration when dry HCl standards are injected into the CEMS. The EPA disagrees that calibration cells are an appropriate alternative for extractive system calibration checks because they do not evaluate the sample transport unique to extractive systems. We have revised PS-18 and Procedure 6 to clarify how response times are determined for different applications in PS-18 and Procedure 6 and we have added an optional use of dynamic spiking for calibration checks and relative accuracy audits that we anticipate will remedy extractive monitor commenters concerns about the response time of sample transport systems.

5.3.3 CD Specification

Comment:

Commenter (0047) states that the EPA proposes to require the quantification and recording of CD at two concentration values and at the CRAS at least once daily, and further proposes to require adjustment of the "HCl CEMS calibration" whenever the low-level or high-level CD exceeds twice the CD specification of 5 percent of span. The commenter believes that the CRAS requirement is not sufficiently explained, and the quantification of CD at the CRAS should not be required if the CRAS does not exceed span. The commenter also does not understand why the EPA requires quantification of the CD at the CRAS, when the procedure does not provide a specification for it or require any action in response to it. In addition, the commenter expresses that they are not aware of any commercially available HCl CEMS that allows for the physical adjustment of the CEMS calibration in response to a calibration gas. The commenter believes that the EPA must remove the requirement or revise it to allow for adjustment of the data output through a software algorithm, rather than a physical adjustment to the calibration.

Response:

The EPA agrees with the commenter that requiring above range calibration added confusion to PS-18 and Procedure 6 because above calibration range excursions should be dealt with in specific source category rules, and has removed requirements for CRAS from PS-18 and Procedure 6.

Comment:

Commenter (0047) states that in section 4.1.2, the EPA proposes to require that any CEMS that "automatically adjusts the data to the corrected calibration values" be programmed to record the unadjusted concentration “prior to resetting the calibration.” The commenter states that while HCl CEMS data handling systems could be programmed to record unadjusted concentrations and then adjust the recorded data in response to the calibration gas, available HCl CEMS do not allow for resetting of the actual “calibration.” The commenter requests that the EPA make clear in this provision that adjustment of the data is allowed, and that physical resetting of the actual “calibration” is not required. The commenter supports the criteria for excessive drift, which they believe are more reasonable than the PS-18 CD specification. However, the commenter notes that the proposed criteria appear to conflict with the definition of “out of control” for CD in section 63.8(c)(7)(i)(A), which will apply to EGUs under Subpart UUUUU (see Subpart UUUUU, Table 9). The commenter notes that definitions differ with respect to the frequency of failure and amount of drift allowed. According to the commenter, the definition of “out of control” in section 63.8(c)(7)(ii), which generally applies to all performance specification failures in Part 63 subparts, also differs with respect to when the out-of-control period begins and ends. The commenter states that under section 63.8, the period begins and ends on the hour whereas in proposed Procedure 6, the period begins and ends at the time of completion of the test, which could be in the middle of an hour. The commenter suggests that the EPA reconcile these requirements in a way that ensures that the proposed specifications are achievable and that only one set of records must be kept.

Response:

The EPA acknowledges that there are multiple options to correct CEMS that fail calibration drift allowances. We have revised section 4.1.2 of Procedure 6 to provide flexible reporting of the corrective action required to bring CEMS back into control when they exceed drift allowance. The EPA agrees with the commenter that having separate definitions for out-of-control periods and differing ways to calculate hours of out-of-control periods could be confusing. Section 4.1 of Procedure 6 has been revised to be consistent with Part 63’s definition and means of calculating out-of-control periods.

5.3.4 Beam Intensity Requirement for HCL Integrated Path-CEMS (IP-CEMS)

Comment:

Commenter (0049) states that the beam intensity requirement for IP-CEMS assumes that the HCl CEMS is capable of outputting the beam intensity value to the CEMS data logger or DAHS; however, this feature may not be available for many current HCl CEMS and will need to be developed. Commenter suggests that it may be easier to record a fault contact from the HCl CEMS when the beam intensity is low and when other faults occur in the instrument that cause a reading to be invalid.

Response:

The EPA understands from extensive stakeholder involvement that all instruments using TDL technology inherently monitor beam intensity. Beam intensity monitoring is a normal part of the instrument operation. The EPA disagrees with the commenter that a “fault contact” is a sufficient quality check to determine when beam intensity is inadequate to measure HCl concentrations of sufficient qualtiy to demonstrate compliance. Instruments must monitor and compensate for beam intensity to insure TDL technology is operating in a range where the beam intensity is adequate to measure the HCl concentration. Beam intensity is an important measure of reflectivity of the optical components of the equipment as well as the performance of the laser generating the required electromagnetic radiation used detect and quantify HCl gas. The beam intensity must be monitored on a regular basis and compared to the operating range established in PS-18 to confirm that HCl measurements are of sufficient quality to demonstrate compliance.

5.4 Data Accuracy Assessment

5.4.1 Weekly Above-Span Linearity Challenge

Comment:

Commenter (0044) references the Procedure 6 requirement of a weekly above-span linearity challenge of the system with a certified calibration value greater than your highest expected hourly concentration, and questions whether the EPA intended the challenge to be performed with a calibration value corresponding to the hourly average concentration instead of the highest expected hourly concentration. Commenter provides a graph showing the variance in HCl concentration at a Portland cement plant due to process conditions, and states that the concentration may be as high as 50-100 parts per million HCl (see page 8 of their comment letter).

Commenter (0044) states that the span and range of a CEMS depend on the type of technology used. Commenter notes that the EPA references the mercury CEMS as the precedence for the above span requirement; however, the commenter asserts that the mercury CEMS has a linear response and other technologies may not be linear.

Commenter (0044) states that by adding another point above the EPA definition of span, the software calibration response of the points below the span will change. Commenter states the calibration error result is influenced by adding another point above span because the span is used in the calculation. Commenter asserts that this is not good laboratory practice and should not be acceptable unless the instrument has the capability of having multiple auto switching spans or multiple spans in the model with a qualifier on the best reported result such as a residual or standard error value. Commenter states the above span challenge can be used to determine if the analyzer can still provide accurate readings once the curve has shifted due to spanning at two times the regulatory limit if the over span value is 10 percent or more below the analyzer range and the analyzer has a linear response curve. However, the commenter states that any analyzer that does not have a linear response cannot be used.

Commenter (0044) states that the actual value at which you should apply a span should be based on the concentration region that would cause the largest error based on how often the excursions occur. Commenter provides examples to support their conclusion that the span should be selected based on the concentration level that will cause the greatest error in the measurements (see pages 9 to 10 of their comment letter).

Commenter (0044) suggests that the weekly above-span linearity challenge requirements should apply to analyzers that have the ability to output on a dual range such that the measurement and calibration error results during normal operational levels are not compromised.

Response:

The EPA agrees that above range calibration point requirements are not necessary for PS-18 and Procedure 6. We agree that details and requirements for above span calibration are better handled in source category specific actions. The EPA has removed above span calibrations from PS-18 and Procedure 6. We have provided optional calibration procedures in Procedure 6 to cover the need for such occurances. Requirements for above range calibration have also been placed in technical revisions to Subpart LLL found here, 79FR 68821, as they are specifically relevant to that rule.

5.4.2 Temperature and Pressure Accuracy Assessment for IP CEMS

Comment:

In response to an EPA solicited comment on IP-CEMS calibration cell temperature and hot stack gas measurements, commenter (0042) states that two cross-stack TDL CEMS using different approaches have demonstrated acceptable performance in industry sponsored field evaluation studies. The EPA did not perform laboratory or field tests on these types of CEMS. Successful demonstration of conformance with PS-18 requirements including the RATA or dynamic spike accuracy requirements is sufficient proof that the measurements are accurate.

Commenter (0049) states that the requirement for quarterly verification of temperature and pressure sensors will be burdensome for most IP CEMS users because in most cases the sensors will need to be removed from the process and bench tested against an NIST traceable sensor (or replaced with a NIST traceable sensor of a similar model). Commenter states that performing the temperature/pressure test in-situ may not be possible with many site designs and IP CEMS designs, and that the location of test ports directly next to the temperature probe or IP-CEMS port will not be possible at all affected units.

Commenter (0049) states that based on the existing QA/QC requirements for other CEMS analyzers that use stack temperature (i.e., volumetric stack flow monitor), there is no precedence to require quarterly testing. Commenter states that there is almost no field evidence that these instruments have excessive drift or failure rates that would justify quarterly testing and an initial verification and then annual checks would be adequate to assure that quality data is collected. Commenter further states that checking these instruments by bench (off line) testing or replacement of the sensor with a recently certified NIST traceable unit would be sufficient for QA.

<u>Response</u>:

The EPA believes there are sufficient QC requirements in PS-18 and Procedure 6 to assess the accuracy of measurements made by IP-CEMS. The EPA also recognizes that temperature and pressure measurements of stack conditions are critical to the ongoing quality of HCl measurements by IP-CEMS. The EPA acknowledges that the typical installation of temperature and pressure measurement devices may make periodic in-situ testing difficult. Replacement or rotation of temperature or pressure measurement devices with certified units is an acceptable alternative to in-situ audits. The intent of this requirement is to insure that malfunction of these units through failure, plugging or other interference is identified on a reasonable cycle to insure data is generated with sufficient quality to determine if an affected facility source is in compliance with an applicable rule. We have revised sections 5.1.1 and 5.1.2 to allow the option of replacing the temperature or pressure sensors with certified units as an acceptable alternative to in-situ auditing and that out of service replacement units may be bench tested to meet the requirements in section 5.1 of Procedure 6. We have also eased the requirement for temperature and pressure device assessment to an annual basis.

<u>5.4.3 Concentration Accuracy Auditing Requirements</u>

<u>Comment</u>:

In response to EPA’s request for comments on the use of direct instrument calibrations, commenter (0044) states that this procedure is required by QAL3 standards in Europe. Commenter suggests that the EPA review direct instrument calibration guidelines from EU sources.

Commenter (0049) states that the requirement in Procedure 6 section 5.2.2.3 to use HCl audit gases that are NIST certified or traceable assumes that these gases will be available in the very near term. However, commenter states that at the present time, calibration gas suppliers are reporting that it could take another 3 to 6 months for these NIST traceable gases to become available. Commenter states that due to this issue and the fact that PS-18 is not presently final, the EPA should waive certification of HCl CEMS past the MATS compliance deadline of April 16, 2015.

<u>Response</u>:

The EPA disagrees with the commenters that NIST traceable HCl gas standards are not available. NIST certified or NIST traceable gases are required for cylinder gas audits as described in Procedure 6 section 5.2.1. Vendor supplied gases that are certified to ±5 percent accuracy are required for HCl CEMS calibration and linearity verification. The EPA provided documentation in the proposal docket describing the availability and accuracy of NIST traceable standards available to gas vendors to meet the requirement for vendor certification of cylinder gas standards. The EPA has revised section 7.1 of PS-18 to clarify NIST traceability requirements for evaporative generators and referred to the ORD document: *DRAFT - EPA Traceability Protocol for Qualification and Certification of Evaporative HCl Gas Standards and*

Humidification of HCl Gas Standards from Cylinders located in the docket as EPA-HQ-OAR-2013-0696-0026. The document includes the strategy recommended by the commenter for determining the uncertainty of the individual components (i.e., HCl feed solution, solution feed rate, and diluent gas flow rate). This document also includes a requirement for confirming the theoretical output through a direct comparison with a NIST traceable reference gas standard. Based on the options available in PS-18, the EPA concludes there are adequate NIST traceable sources of HCl standards available to meet PS-18 and Procedure 6 requirements.

Comment:

Commenter (0049) states that a DSA is an alternative to conducting a quarterly CGA; therefore, the word RATA in Procedure 6 section 5.2.3 should be corrected to either Cylinder Gas Audit or Relative Accuracy Audit or abbreviated as CGA or RAA.

Response:

The EPA acknowledges the confusion in the text in sections 5.2.2 and 5.2.3 of Procedure 6. While a facility could choose to perform a RATA in each of the four quarters requiring ongoing checks of data quality, the alternatives now in sections 5.2.2, 5.2.3 and 5.2.4 are relative accuracy audits (RAA), certified gas audits (CGA), and dynamic spiking audits (DSA) and not relative accuracy testing audits and we have revised the text in these sections to make the recommended clarification.

Comment:

Commenter (0047) opines that the requirement that quarterly audits be performed at least 2 months apart in sections 5.0 and 5.2 is unreasonably restrictive and should be reduced to no more than 30 days. The commenter states that a 2-month restriction could potentially limit an owner's/operators' ability to perform the data accuracy assessment checks within an operating quarter given limited unit operation. The commenter also notes that the proposed requirement also conflicts with detailed provisions applicable to HCl CEMS in Subpart UUUUU, Appendix B, that define requirements for "quarterly" and "annual" testing in terms of QA operating quarters and that provide "grace periods" for late tests (see Subpart UUUUU, Appendix B sections 5.1.2, 5.1.3, and 5.3). The commenter believes that the EPA must reconcile these differences in order to avoid eliminating flexibility it intended to provide for HCl CEMS QA testing under Subpart UUUUU.

Response:

The EPA agrees there may be differences between source category specific rules and the general requirements in PS-18 and Procedure 6. We have revised section 5.2 of Procedure 6 with respect to the precedence of specific rules over Procedure 6. We have also revised Procedure 6 to be consistent with Procedure 5 to address flexibility of the RAA frequency. Section 5.2 of Procedure 6 includes the following addition:

"Successive quarterly audits must to the extent practicable, be performed no less than 2 months apart."

Comment:

Commenter (0047) objects to the language in section 5.2.1.2, that proposes to require the analysis of audit samples and compliance with audit sample performance requirements as described in section 63.7(c)(2)(iii). The commenter states that the audit sample requirements in that provision apply only to performance testing for compliance, and do not apply to RATAs. They note that the test methods also make it clear that the requirement only applies to the use of reference methods "to demonstrate compliance" or "for compliance determinations" and not to other uses of the methods, like QA of a CEMS (see 40 CFR part 60, Appendix A, Method 6 section 11.3.1, Method 6A section 11.2, Method 6B section12.2, and Method 7 section 11.4.1). The commenter continues that the purpose of a RATA is to provide an independent check on an installed CEMS that has its own analytical process. The commenter reports that there is no audit sample requirement for performance tests conducted with instrumental reference methods, which also are CEMS, and that the audit sample requirement is imposed on performance tests conducted with non-instrumental (or non-CEMS) reference methods because there is no other independent check on the analytical result. For these reasons, the commenter recommends that the EPA remove this provision.

Response:

The EPA acknowledges that the initial purpose of audit samples for reference methods was demonstration of performance for compliance tests. The EPA disagrees with the commenter's recommendation to remove the requirement for use of reference method audit samples from the RATA requirements. We chose not to remove the requirement to include audit samples for reference methods in PS-18 because this requirement tests the accuracy of the reference method analysis results. The EPA has clarified the requirement for audit samples in PS-18 which is referenced by Procedure 6 for RATA testing to ensure their use in the reference method testing for relative accuracy. Since the HCl CEMS measurements will generally be used to demonstrate compliance, we believe it is prudent to qualify the accuracy of the reference method whenever possible where they are used in RA applications. Where RATA tests are performed, the reference method is called upon to demonstrate, with available QA/QC documentation, a rigorous and thorough evaluation of emissions of the pollutant(s) of concern. Audit analysis provides a tool with which to validate the reference method measurements.

Comment:

Commenter (0047) states that the EPA has provided no basis for the requirement in section 5.2.1.3, which requires either a DSA or a CGA on RATAs with test results 20 percent or less of the applicable emissions standard. The commenter notes that requiring additional tests because a unit's emissions are below some random threshold provides no beneficial increase in data quality and recommends that the provision be removed.

Commenter (0047) states that the relative accuracy alternative criterion in section 5.3.5(a) should be applicable regardless of the HCl concentration relative to the equivalent emission limit concentration and should be increased from 15 to 20 percent. The commenter opines that the EPA needs to address the inconsistency with Subpart UUUUU, Appendix B, section 3.1.2.2.

Response:

The EPA agrees with commenter 0047 that low emitting sources should not be penalized by a requirement to perform additional CEMS evaluation. The EPA has removed the requirement in PS-18 for a DSA or CGA during the RATA for sources that are less than 20 percent of the applicable standard. Instead, we are requiring use of a CGA or DSA for at least one of the three subsequent quarterly accuracy audits. We have also raised the relative accuracy criteria for successful RATA agreement from 15 to 20 percent.

5.4.4 Cylinder Gas Audit

Comment:

Commenter (0047) believes that the CGA calibration error specification should be changed to a value of 15 percent of the calibration gas tag value or an absolute difference of less than or equal to 0.5 ppm. According to the commenter, with this change, criterion would become consistent with other gaseous CEMS CGA specifications, such as those contained in Procedures 2 and 5.

Response:

The EPA acknowledges that facilities and testing firms face challenges when they attempt to measure concentrations at or below the CEMS quantitation limit. However, the EPA also recognizes that setting an absolute value for CGA error specification(s) limits our ability to evaluate performance at lower emission limits. In the case recommended by the commenter, 0.5 ppm error can be on the order of half of the Subpart UUUUU emission limit and that much error is inadequate to permit evaluation of CEMS performance at or near the emission limit. Setting a fixed CGA error at 0.5 ppm also provides a disincentive for instrument vendors and testing firms to continuously improve the quality of their measurements. Therefore, we have chosen to revise PS-18 and Procedure 6 to use acceptance limits that are a percentage of span.

Comment:

In response to an EPA solicited question, commenter (0042) provided information on DS requirements on the proposal and Attachment B of their comment letter (“Analyte Spiking for Use in Accuracy Determination in HCl Measurements”). Commenter requests that the EPA revise Procedure 6 to allow either a two-level CGA or two-level dynamic spikes in all quarters when a RATA is not performed. The commenter suggests that dynamic spikes for quarterly accuracy assessment be performed in accordance with EPA Method 321.

Commenter (0042) also asserts that two or three repetitions of each spike level demonstrating acceptable performance as per Method 321 is sufficient to demonstrate the CEMS remains "in control" and cites specific support for this for HCl CEMS on cement kilns (see page 39 of the comment letter).

Response:

The EPA agrees with the commenter that a DSA should be allowed as an alternative to a RATA in three of four calendar quarters when a full RATA is not performed. We have revised the dynamic spiking procedure in Appendix A to remove the nine replicate requirement and inserted text in each section that addresses the use of dynamic spiking to specify the concentration(s) and number of replicate measurements required.

The EPA notes that the inclusion of three replicate measurements of each audit gas in section 5.2.2.2 of Procedure 6 is consistent with other performance specifications and protects the facility and the environment from a single erroneous result that could either be higher or lower than the certified cylinder value. We point the commenter to section 5.2.2.2 of Procedure 6 that repeats this requirement:

> *"5.2.2.2 Sequentially inject each of the three audit gases (zero and two upscale) three times each for a total of nine injections. Inject the gases in such a manner that the entire CEMS is challenged. Do not inject the same gas concentration twice in succession."*

We also acknowledge the similarities with the use of DS to perform quarterly non RATA audits and that three repetitions of each spike level is adequate to demonstrate acceptable performance. Section 5.3 in Procedure 6 has been revised to include the following text:

> *"5.2.3.1 To conduct a DSA, you must conduct the dynamic spiking procedure as described in Appendix A to PS-18 of Appendix B to this part. You must conduct three spikes at each of two upscale level audit gases to yield concentrations at the analyzer of 50 to 60 percent of span and 80 to 100 percent of span."*

5.4.5 RATA Frequency

Comment:

Commenter (0042) requests that HCl CEMS RATAs not be required more than every 30 months at cement kilns. The commenter explains that this would be consistent with the HCl compliance testing frequency required for sources with sorbent injections, as well as consistent with periodic compliance testing for dioxin/furan emissions and periodic testing for organic hazardous air pollutants.

Response:

In this action, we provide the requirements for generic application of a performance specification for continuous HCl monitoring that crosses multiple source categories. The frequency of RATA tests in Procedure 6 is consistent with other promulgated procedures (e.g., Procedure 1, Procedure 5) for continuous emission monitoring. The EPA did not propose PS-18 or Procedure 6 for exclusive use in Portland Cement monitoring and changes to conform to Subpart LLL schedules may conflict with the final requirements in other rules (e.g., Subpart UUUUU). Therefore, the EPA did not change the timing or frequency of RATA tests in Procedure 6.

5.4.6 RATAs Should Not Be Required At Low HCl Emission Concentrations

Comment:

Commenter (0042) requests that HCl CEMS RATAs not be required when HCl emissions are less than 0.6 ppm during normal operation. According to the commenter, and discussed elsewhere in this document, the uncertainty associated with the reference method, together with the concentration resolution of HCl CEMS (i.e., ± 0.1 ppm), leads to inaccurate and unreliable results at low levels for use in RATA determinations, and dynamic spikes (performed in accordance with procedures in Method 321) provide a more accurate indication of HCl CEMS performance when emissions are much lower than the concentration of the emission standard.

Response:

The EPA disagrees with the commenter’s assertion that reference method measurements near or below 0.6 ppmv hold no value in terms of an assessment of the relative accuracy of the installed CEMS. Even where emissions measurements are very low, it is important to compare the CEMS measurements to a reference method that traverses the exhaust stack at a criteria location, thereby reducing uncertainty that may be created by stratification in the emission location, and ultimately demonstrates that both the operation and measurement location of the installed CEMS provide data that is in comparison to a Reference Method.

5.4.7 Alternate RA Acceptance Criteria

Comment:

Commenter (0042) requests that HCl CEMS RATAs at cement kilns be provided the same alternate RA acceptance criterion when the RM average is less than 1.0 ppm HCl of “an absolute difference in the mean of the RM and CEMS less than 0.2 ppm indicates acceptable performance: as is provided in 40 CFR 63, Subpart UUUUU, Appendix B.

Response:

The EPA acknowledges that RA acceptance at low source emission HCl concentrations may challenge CEMS owners and operators. We have revised the criteria in PS-18 relative accuracy to address two issues, different requirements in rules compared to the generic requirements in PS-18 and challenges meeting the criteria for relative accuracy at low HCl emission sources. There may be differences between the generic requirements in a Performance Specification or Appendix F Procedure and an applicable rule because of extenuating circumstances unique to individual source categories or subcategories. We have accordingly revised PS-18 and Procedure

6 to indicate where specific source category rules would take precedence over requirements in this action. Specifically, the RA of the CEMS, whether calculated in units of HCl concentration or in units of the emission standard, has been revised in PS-18 and Procedure 6 and now must be less than or equal to 20.0 percent of the RM when RM_{avg} is used in the denominator of Equation 14.

5.4.8 Excessive Audit Inaccuracy

Comment:

Commenter (0044) notes that Procedure 6 section 5.3.5 references an alternative relative accuracy which applies if the emission level for the test is less than 50 percent of the applicable standard, and the alternative calculation of RA must be less than or equal to 15 percent of the RM. Commenter (0044) states that this requirement seems inconsistent with other alternative relative accuracy options used in other performance specifications. Commenter (0044) supports the use of an absolute value; i.e. plus or minus one part per million if the RM is less than three parts per million, which would be similar to the requirements for mercury CEMS under Subpart UUUUU.

Response:

The EPA disagrees that there should be an absolute value pass fail criteria for relative accuracy tests. For HCl emission limits equal to or less than 1 ppm, relative accuracy is measured nearer the quantitation limit of current instrument technology and an alternative acceptance criteria may be applicable. We have revised PS-18 section 13.4 to allow the acceptable relative accuracy of the CEMS compared to a reference method in units of HCl concentration to be 20 percent of the reference method and for cases where the average emission level for the test is less than 75 percent of the applicable standard you may substitute the equivalent emission standard in ppmvw in the denominator of the relative accuracy equation. Note this change also appears in section 6 of Procedure 6 to this subpart.

5.4.9 Criteria for Optional QA Test

Comment:

In response to an EPA solicited question, commenter (0042) responded that what is offered by EPA in Procedure 6 section 5.5.1 is unrealistic and unachievable, so it provides no opportunity for relief. It states:

> *5.5 Criteria for Optional QA Test Frequency. If all the quality criteria are met in section 4 and 5 of this procedure, the CEMS is in-control.*
>
> *5.5.1 If the CEMS is in-control and if the source releases δ 75 percent of the HCl emission limit for eight consecutive quarters that include a minimum of two RATA, the source owner or operator may revise their auditing procedures to use CGA, RAA or DSA each quarter for eight subsequent quarters following a RATA.*

The likelihood is zero that an HCl CEMS will not exceed the daily drift check control limits at any time during eight consecutive calendar quarters, as well as achieve all of the quarterly CGA specifications or DS specifications and the annual RATA specifications as proposed. The CE specifications and RA specifications are proposed at levels near the limits of current technology. The long term stability of HCl compressed gas mixtures is marginally demonstrated but only for laboratory applications. A single bad calibration standard, a flawed regulator, or inappropriate drift adjustment required by Procedure 6 may send the monitoring program out-of-control for reasons not related to the performance of the CEMS. This would obviate the opportunity for the optional QA frequency. In additions, the relief is further constrained to those sources which maintain emissions to levels that are less than 75 percent of the emission standard. The EPA has conducted no long term evaluations of HCl CEMS for the current proposal and included no data in the docket. All studies we are familiar with demonstrate that the proposed specifications are not achievable over the long term. Therefore, it is not possible to achieve the criteria for the alternate QA test frequency. Commenter refers to comments they provided on the proposed PS-18 for additional information regarding this issue.

Commenter (0046) supports the EPA's proposal to allow revised auditing procedures when a CEMS is determined to be in-control for the specified time period and the source releases less than 75 percent of the standard, as proposed at Procedure 6 section 5.5.1. The commenter (0046) states that this provision will add flexibility to the requirements without creating risks that the instrument will be out of control. Commenter (0046) suggests that a reference to Procedure 6 section 5.5 should be added to the RATA exclusion language provided in Procedure 6 section 5.2.1 and 5.2.5 (see page 4 of their comment letter for the proposed regulatory text changes). Commenter (0046) suggests the following revision to Procedure 6 section 5.5.1 (changes underlined):

> *5.5.1 If the CEMS is in-control and if the source releases ≤ 75 percent of the HCl emission limit <u>for the averaging period specified in the relevant standard</u> for eight consecutive quarters that include a minimum of two RATA, the source owner or operator may revise their auditing procedures to use CGA, RAA or DSA each quarter for eight subsequent quarters following a RATA.*

Commenter (0046) states that the above revision would clarify the provision, prevent it from being interpreted multiple ways, and make it similar to the criteria in 40 CFR Part 63 subpart A and part 60 subpart A.

Commenter (0046) further states that under the proposed change, if the averaging period for the HCl emission limit is a 12-hour rolling average and the 75 percent criteria is exceeded on an hourly rolling average or one-minute average basis, the operator would still remain eligible for the optional testing frequency. Commenter (0040) states that the TUV/MCERTS certifications determine the frequency of audit testing based on field testing of the analyzer over a period of months/years, and the policy is to audit the unit at a frequency of one half of the length of the test period (i.e., if the unit is found to perform within specs for one year then auditing should be done every six months).

Response:

The EPA acknowledges the support of reduced auditing when facilities demonstrate consistent QC performance. We have revised sections 5.2.1 and 5.2.5 to clarify the language and insert the additional references to section 5.5. The EPA also acknowledges the clarification concerning averaging period for measurements and has revised section 5.5.1 to require emissions to be less than or equal to 75 percent of the HCl emission limit for the averaging period specified in the relevant standard for eight consecutive quarters. While we have not adopted all of the commenters' language from their TUV/MCERTS experience, we contend the changes to sections 5.2.1 and 5.2.5 are responsive and maintain quality checks consistent with historical Performance Specifications in 40 CFR part 60, Subchapter C, Appendix B and F.

5.5 Reporting Requirements

5.5.1 Electronic Reporting

Comment:

Commenter (0049) asks the EPA if the results of quarterly and annual QA tests for HCl CEMS are required to be reported through the Emission Collection and Monitoring Plan System (ECMPS) or only through the Compliance and Emissions Data Reporting Interface (CEDRI).

Response:

Where a Part 75 affected facility is required to report information through its use of PS-18, that report will be submitted along with their other required reports, through ECMPS. Where a facility not affected by Part 75 is required to report information through its use of PS-18, that facility will submit their information via ERT through CEDRI. CEDRI submissions are contingent upon the ERT being modified to accept PS-18 RATA results; currently a work in progress. When ERT is capable of handling PS-18 RATA results, it will be added to the list of ERT accepted Performance Specifications posted on EPA's TTN website: http://www.epa.gov/ttn/chief/ert/ert_info.html. Until such time, RATA test results must be submitted on paper to the facilities' permitting authority. Reporting intervals are specified in the applicable subpart, or operating permit, requirements.

5.5.2 Reporting Requirements will both Duplicate and Conflict with Other Requirements

Comment:

Commenter (0047) states that Subpart UUUUU reporting requirements are similar to the proposed reporting requirements in proposed PS-18, and these reporting requirements will both duplicate and conflict with the multiple electronic and hard copy reporting requirements in Subpart UUUUU, Appendix B, and the part 63 general provisions. The commenter (0047) believes that the EPA should revise Procedure 6 to specify only what must be recorded, and to require reporting of recorded information as specified in applicable regulations and permits.

<u>Response</u>:

The EPA disagrees that PS-18 and Procedure 6 reporting requirements conflict with Appendix B and Part 63 General Provisions. EPA notes that the commenter provides no specific example of duplicative or conflicting reporting requirements. In general, the reporting requirements of Appendix B of the MATS rule are associated with PS-15 and the EGU owner or operator developed quality assurance and control program, not PS-18 or Procedure 6. Having PS-18 and Procedure 6 explicitly list necessary reporting requirements is consistent with comments received from the commenter in regards to other rules, and PS-18 and Procedure 6 will retain those requirements. With regard to the suggestion that duplicate or conflicting reporting requirements from the MATS rule may exist, EPA has revised the reporting requirement in PS-18 and Procedure 6 to indicate that unless otherwise specified in the applicable regulations or permit PS-18 and Procedure 6 reporting requirements apply.