

NATIONAL STACK TESTING GUIDANCE

I. INTRODUCTION

- A stack test measures the amount of a specific pollutant or pollutants being emitted through regulated stacks at facilities subject to the requirements of the Clean Air Act (CAA). Although stack testing is an important tool used to determine a facility's on-going compliance with emission limits established pursuant to the CAA, it is most valuable in determining whether a facility has the ability to comply with the requirements of the CAA in the first instance. However, this tool has not been consistently applied or utilized across the country by the U.S. Environmental Protection Agency (EPA), or delegated state/local agencies.

- A review by the EPA Office of the Inspector General (OIG) ("Report of EPA's Oversight of Stack Testing Programs," 2000-P-00019, September 11, 2000) criticized EPA for not issuing comprehensive national guidance in this area, and not providing sufficient oversight of state/local stack testing programs. The OIG concluded that this lack of guidance and oversight had an adverse effect on the use of stack testing as a tool in determining compliance. As a result of their findings, OIG recommended that EPA develop national guidance that addresses issues such as:
 - recommended testing frequencies;
 - discrepancies in test procedures; and
 - inconsistent reporting of tests and results.

- In addition to national guidance, the OIG recommended that EPA enhance its oversight program.

- In response to the OIG report, the Office of Enforcement and Compliance Assurance (OECA) made a commitment to address the concerns raised in the report and provide clarification, as necessary, on the issues identified. The Office of Compliance (OC) was given the responsibility for satisfying this commitment.

- The concerns raised by the Inspector General have been addressed in several different guidance documents issued by the Agency. The CAA Stationary Source Compliance Monitoring Strategy (CMS) issued by the Agency in April 2001 addresses testing frequencies, and the reporting of test results. The Timely And Appropriate Enforcement Response To High Priority Violations (HPV Policy) issued by the Agency in December 1998 supplements the CMS reporting guidance by specifying how violations identified through stack testing must be addressed. The basic requirements associated with each of these policies are summarized in this document for the reader's convenience. However, for a more thorough understanding of the requirements set forth in each of these policies, we recommend that the reader obtain copies of the policies. An electronic version of CMS can be obtained at: www.epa.gov/compliance/resources/policies/monitoring/cmsspolicy.pdf, and the HPV policy obtained at www.epa.gov/compliance/resources/policies/civil/caa/issue-ta-rpt.pdf

- This guidance document was developed to address the remaining issues raised by the Inspector General, specifically those associated with the conduct of stack tests. A Workgroup with representatives from OECA Headquarters and the EPA Regions was formed to develop the guidance. In formulating this guidance, the Workgroup reviewed all existing Agency policy on the issue; evaluated all identified State regulations and guidance on stack testing; and solicited state/local input in various different forums. This policy supersedes any previous Agency guidance that may be perceived as being in conflict.

II. GOALS OF THE NATIONAL GUIDANCE ON STACK TESTING

- Expand upon the requirements of CMS and the HPV Policy to fully address the concerns raised by the Inspector General in his report on this issue.
- Improve uniformity on how stack tests are conducted.
- Improve coordination among EPA and state and local agencies.
- Enhance EPA oversight of state/local programs to ensure that the tool of stack testing is being used properly and sufficiently carried out.

III. DEFINITION OF STACK TESTING

- For the purposes of this policy, stack testing is defined as any standardized procedure of actions using calibrated tools to determine a rate or concentration in order to verify emissions from a source or the accuracy of a monitor or gauge. It does not include visible emission observations.

IV. CAA STATIONARY SOURCE COMPLIANCE MONITORING STRATEGY

- The CMS, which addresses certain issues that were raised as concerns in the Inspector General report, was developed in collaboration with the State and Territorial Air Pollution Program Administrators and the Association of Local Air Pollution Control Officials (STAPPA/ALAPCO). It recognizes that consistent, complete and accurate stack test information is critical in managing a national air program. Hence, it recommends:
 - States/locals should conduct a stack test whenever they deem appropriate.
 - States/locals should conduct a stack test where there is no other means for determining compliance with the emission limits. In determining whether a stack test is necessary, States/locals should consider factors such as: size of emission unit; time elapsed since last stack test; results of that test and margin of compliance; condition of control equipment; and availability and results of associated monitoring data

- The date and results (Pass/Fail) of all stack tests are to be entered in the national air data base (AIRS/AFS, or its successor), and the High Priority Violator (HPV) status is to be adjusted as appropriate.

V. HIGH PRIORITY VIOLATOR POLICY

- Facilities are expected to be in compliance with emission limitations at all times. Failing a stack test at any time is a violation for which appropriate enforcement action must be taken, including adjusting the facility's status to HPV. The policy states:

"The following criteria trigger HPV status. . . Violations that involve testing, monitoring, record keeping or reporting that substantially interfere with enforcement or determining the source's compliance with applicable emission limits. . . A violation of an allowable emission limit detected during a reference method stack test".

- A facility that fails a test is expected to document the failure, submit a report to the appropriate delegated agency, resolve the conditions that led to the failure, and test again.

VI. CONDUCT OF STACK TESTS

- The focus of this guidance document is to address issues associated with the conducting of stack tests and the interpretation of the results. It addresses the following major issues:

1. The time frame for conducting stack tests
2. Waivers
3. Notification of stack tests
4. Observation of stack tests
5. Representative performance
6. Stoppages
7. Postponements
8. Test reports
9. Technical issues: soot-blowing and rounding of significant figures

THE TIME FRAME FOR CONDUCTING STACK TESTS

- The primary issue that arises is whether facilities can be granted an extension beyond the required time period to complete a stack test.
- The time frame for conducting initial stack tests is established in 40 C.F.R. Part 60.8 for New Source Performance Standards (NSPS); 40 C.F.R. Part 61.13 for National Emission Standards for Hazardous Air Pollutants (NESHAP); and 40 C.F.R. Part 63.7 for National Emission Standards for Hazardous Air Pollutants for Source Categories (MACT). There are no regulatory provisions to extend the testing deadlines in any of these programs, regardless of the

circumstances. As a result, a facility that has not completed a stack test within the requisite time frame would be in violation of the requirement to stack test and demonstrate compliance with the underlying standard. For example, under the NSPS program, a facility would be held in violation for failure to conduct an initial stack test within the first 180 days following startup or within 60 days after reaching maximum production rate, whichever is earlier.

- In addition to the requirement to conduct an initial stack test, a facility may be subject to testing requirements established in their operating permit or an enforcement document (e.g., Administrative Order, consent decree). Failure to conduct a stack test in accordance with the terms and time frames established in the permit or enforcement document would be a violation of the permit or enforcement order. In addition, the facility may be found to have violated the underlying regulatory requirement.

- Section 113(a) of the CAA provides statutory authority to use any available information to prove CAA violations. Within the context of this situation, 40 C.F.R. §§60.11 & 61.12 allows an enforcement action to proceed based exclusively on any credible evidence. Data from the associated reference test method is not required. Evidence gathered by means other than a reference test can be considered when determining whether a facility would have been in compliance with the applicable requirements if the stack test had been conducted on a timely basis.

- If a facility fails to conduct a stack test within the required time frame, the only way for the delegated agency to legally grant additional time to conduct the test is through an enforcement action stemming from the failure to test. This applies regardless of whether the delegated agency determines that circumstances warranted the additional time. This is necessary to ensure that a stack test ultimately is conducted and that the facility is capable of complying with the underlying regulatory requirements.

- Although the delegated agency is limited in how it can grant additional time to test, it does have the flexibility to take into consideration the circumstances contributing to the failure when determining the scope of the enforcement response. For example:

- A facility requests additional time to conduct an initial stack test because it knows that it can not meet the underlying regulatory requirements. Additional time may be granted through an enforceable order. However, the failure to test is a violation of the requirement to test within the required time frame, and the facility's acknowledgement that they cannot comply is a violation of the underlying regulatory requirement, and penalties should be assessed consistent with the HPV Policy.

- A facility requests additional time to conduct an initial stack test because it is unable to obtain the maximum production rate within the start-up period. Insisting that the facility conduct the test within the required time frame may not be appropriate because the information obtained during the test would not be meaningful and useful in determining compliance with the underlying requirements. Therefore, additional time may be appropriate. Failure to test within the required time frame under these circumstances is a violation of the requirement to test, but is not automatically considered a violation of the

underlying regulatory requirements, and the delegated agency should choose an appropriate enforcement response.

- A facility fails to test within the requisite time frame as a result of equipment failure beyond the control of the facility, severe meteorological conditions, and/or safety considerations. Regardless, the facility is in violation of the requirement to test, and an enforceable order is required to grant additional time. However, the delegated agency may determine that nothing beyond an order to test is necessary.

STACK TEST WAIVERS

- Stack tests to determine initial compliance are, in many instances, the only test some emissions units will be subject to for a years to come. As a result, waivers generally should be used sparingly and under limited circumstances. The primary issue of concern with respect to waiver requests is whether stack tests should be waived for identical units.

- Although units may be identical in design, control devices and process operations may significantly alter their performance and ability to comply with the underlying regulatory requirements, both initially, and on a continuing basis. Therefore, if the identical units have the ability to emit a pollutant in excess of the prescribed emission limit, a stack test should not be waived unless:

- (1) the units are located at the same facility; and
- (2) the delegated authority is satisfied that emissions from a representative sample of identical units at the facility are less than or equal to 50% of the applicable standard, and the facility can demonstrate the ability to comply with this margin of compliance an on-going basis.

- Please note that waivers can be granted only by the appropriate delegated authority. See "How to Review and Issue Clean Air Act Applicability Determinations and Alternative Monitoring," EPA 305-B-99-004, Section 4.2, pp.19-22 (February 1999); See also, "Delegation of 40 C.F.R. Part 63 General Provisions Authorities to State and Local Air Pollution Control Agencies," from John S. Seitz, Director, Office of Air Quality Planning and Standards, July 10, 1998. If the delegated state/local agency has the authority to approve a waiver, they still should consult with the Regional office to ensure national consistency.

NOTIFICATION OF A STACK TESTS

- The primary issue of concern is what constitutes sufficient notification of a planned stack test under the regulatory requirements. Sufficiency is defined to include both the timing of the notification, as well as the content of the notification.

- Unless specified otherwise in the subparts, both the NSPS and NESHAP programs require at least thirty (30) calendar days notice of any stack test (40 C.F.R. §60.8(d) and 40 C.F.R. §61.13(a) and (c)), while the MACT program requires at least sixty (60) calendar days (40

C.F.R. §63.7(b)). If for some reason the stack test must be delayed, sources are required to notify the delegated agency and EPA of the delay. The timeframe for notification differs under each program. Written notification should be sent to the appropriate state/local agency and concurrently to the EPA Regional office. These minimum regulatory requirements should be met to allow the appropriate delegated agency the opportunity to review and revise the testing protocol in advance of the stack test, and observe the test if they so choose. The test date should be acceptable to both the delegated agency and the facility. If adequate notification is not provided, the test results may be deemed unacceptable, and the source required to test again.

- For stack tests that are being conducted pursuant to requirements in an operating permit or an enforcement order, the timeframe for notification may differ and be governed by the permit or order.
- Notification is not necessary if the stack test is being conducted for the facility's own benefit (i.e., not required by regulation, permit or enforcement order). However, if the facility fails such a test, the facility must report the failure and submit the relevant test data to the delegated agency pursuant to the reporting requirements of Title V. At a minimum, the facility must report the failure as part of their quarterly deviation reports, semi-annual reports and annual compliance certification. This information must be entered by the delegated agency in the national data system as appropriate.
- At the time of notification, a test protocol should be submitted to the delegated agency for review and approval. The submission of a protocol prior to the stack test helps to ensure that the testing requirements are interpreted correctly and reference methods are followed; minimize potential problems encountered during the test; and reduce the possibility of testing errors. The format of such protocols may vary. However, certain basic elements should be addressed in a protocol to assist in national consistency, and ensure that a complete and representative stack test is conducted. For a prototype of a sufficiently detailed protocol, see Emission Measurement Center Guideline Document (GD-042), "Preparation and Review of Site-Specific Emission Test Plans," (March 1999) (www.epa.gov/ttn/emc/guidlnd.html).
- Testing protocols should be maintained by the facility, and made available to the Regions upon request.
- If a facility wishes to deviate from a required reference method, the facility would need to gain approval from the delegated authority in advance of the test. For "major" changes, the facility must receive prior written approval for a major change from Office of Air Quality Planning and Standards (OAQPS) prior to conducting the stack test. See "Delegation of 40 C.F.R. Part 63 General Provisions Authorities to State and Local Air Pollution Control Agencies," from John S. Seitz, Director, OAQPS, July 10, 1998). For "minor" or "intermediate" changes, the facility must receive prior approval from the appropriate delegated authority. If the deviation is to be approved by a state/local agency, it should be in consultation with the EPA Regional office or as otherwise required by the delegation. See also "How to Review and Issue Clean Air Act Applicability Determinations and Alternative Monitoring," EPA 305-B-99-004, Section 4.2, pp.19-22 (February 1999). The request may be submitted as part of the testing protocol, and

must document to the satisfaction of the delegated agency the requested change, and the rationale for the change.

- In addition to any deviations from the required reference methods, the facility should document within the testing protocol any adjustments that will be made prior to the stack test such as tuning the burner or changing bags in a baghouse. If an agency representative is present to observe the test, the facility also should notify the observer of such adjustments before the test begins.

OBSERVATION OF STACK TESTS

- The major issue that arises with respect to observing stack tests is whether a delegated agency should have an observer present for all stack tests, and if not, how often should they be present to observe the tests.
- There is no requirement that delegated agencies be present to observe all stack tests. However, whenever possible, given staffing and resource constraints, delegated agencies should observe the tests to ensure that the regulatory testing requirements are being met; the approved testing protocol is being followed; and the results are being accurately and completely recorded and documented in the test report. The presence of an observer also helps to reduce the likelihood of sample recovery and handling errors, as well as equipment errors, and to ensure that testing is conducted under the proper process conditions.
- If the delegated agency chooses not to observe the test, prior review of the testing protocol is even more critical to ensure that the test is conducted in such a manner so as to satisfy the regulatory requirements.
- If the delegated authority was not provided adequate notification and an opportunity to observe the stack test, the resulting test data may be rejected and a new stack test required. If this situation prevents the facility from completing a valid stack test within the requisite timeframe, the facility is in violation of the requirement to stack test and demonstrate compliance. However, if the facility provided adequate notice and the delegated agency affirmatively declined to observe the test, the test results should not to be rejected solely because the test was not observed by agency personnel.

REPRESENTATIVE TESTING CONDITIONS

- The NSPS and MACT programs require that performance tests be conducted under such conditions as the Administrator of EPA specifies based on the representative performance of the affected facility. The MACT program describes representative performance as normal operating conditions. Operations during periods of startup, shutdown and malfunction do not constitute representative conditions for the purposes of a performance test. See 40 C.F.R. 60.8(c) and 63.7(e) Given that individual facilities often operate under a variety of conditions, the question often arises as to what conditions should be used when conducting a stack test.

- Facilities are responsible for ensuring compliance with the emission limits under all conditions, and hence any stack test that is conducted must demonstrate that a facility is capable of complying with the applicable standards at all times. Thus, a facility should test under the most severe conditions that create the highest emissions. For example, if operating at maximum capacity would result in the highest levels of emissions, the facility should conduct a stack test operating at maximum capacity or allowable/permitted capacity. In addition, the facility should use the highest emitting fuel for the pollutant tested or as otherwise justified, and should process material that causes the highest emissions.

- If maximum capacity represents the most severe operating conditions, and the facility did not test at that level, the facility has not demonstrated its ability to comply with the underlying requirements at all times. Such a failure may necessitate a re-test. For example, if the facility tested at 90% of capacity but subsequently operated at 95%, a retest at 95% may be required.

- To avoid such a re-test, the burden is on the facility to demonstrate to the satisfaction of the delegated agency that it is capable of complying with the underlying regulatory requirements at all times. Such a demonstration may be made and a re-test avoided if the margin of compliance with the standard was large enough to demonstrate compliance under the harsher, more adverse operating conditions.

- For certain facilities, operating at maximum capacity may not result in the highest emissions or lead to the most difficult conditions for the control device to achieve maximum efficiency. In such circumstances, the facility should test at whatever level of capacity results in the greatest emissions and is representative of their operations.

- If a facility does not operate at the level which represents the most severe conditions, the facility may test, upon approval of the delegated agency, at the level at which it operates. For example, the highest emissions at a facility are created when that facility operates at 95% of capacity. However, the facility never operates above 85% of capacity. It is reasonable to allow the facility to test at 85% as long as the facility, to the satisfaction of the delegated agency, demonstrates that the facility does not operate above 85% capacity. Historical facility records may be used for the demonstration.

- This guidance does not affect the ability of state/local agencies to prohibit a facility from operating at levels different from the level used during the stack test, or restrict production to reflect conditions equivalent to those present during the stack test.

STOPPAGES

- The issue often arises as to whether it is appropriate to stop a stack test once it has been started, and if so, under what circumstances.

- There is nothing in the testing procedures that would allow a facility to stop a stack test once it has been started. Hence, failure to complete a stack test once it has been initiated is a violation of the requirement to conduct a stack test. As with requests for time extensions, an enforcement order should be issued to ensure that a stack test ultimately is conducted. Whether the source is in violation of the underlying regulatory requirements or further enforcement action is required by the delegated agency may be determined by the circumstances surrounding the stoppage. For example:

- If a facility stopped the stack test because it was in jeopardy of failing the test, it would be considered in violation of both the requirement to conduct a stack test and to comply with the underlying regulatory requirement or permit condition. Consistent with 40 C.F.R. §§60.11 & 61.12, any credible evidence may be used to demonstrate non-compliance. The test should be reported in the Title V quarterly deviation reports, semi-annual reports, and annual compliance certifications. In addition, the stoppage should be reported as a failure in the national data system, and penalties should be assessed consistent with the HPV policy.

- If a facility stopped a test because of equipment failure beyond the control of the facility, severe meteorological conditions, and/or safety concerns which would prevent the test from being completed in an accurate manner, and the delegated agency concurs with this assessment, the facility still would be in violation of the requirement to conduct a stack test. Failure to conduct the test should be reported pursuant to Title V. Since no test was conducted, the delegated agency would not enter the aborted test in the national data system.

POSTPONEMENTS

- The major issue that arises is whether it is appropriate to postpone a stack test once it has been scheduled, and if so, under what circumstances.

- Postponements should be treated similar to stoppages. If a postponement results in the facility failing to complete the test within the required time frame, the facility is in violation of the requirement to test. Regardless of whether the postponement affects a facility's ability to test in a timely manner, the delegated agency should carefully scrutinize the circumstances surrounding the postponement to determine whether the facility was in violation of the underlying emission limitations, and therefore, postponed the test to avoid a documented violation. Consistent with 40 C.F.R. §§60.11 & 61.12, any credible evidence may be used to demonstrate non-compliance.

TEST REPORTS

- The major issue is what information is needed to adequately document stack test results.
- The written test report should be sufficient to document compliance with the underlying regulatory requirements or permit conditions, and adherence to the test requirements. When

reviewing the testing protocol, the delegated agency should identify for the facility any information they want included in the final test report.

- Similar to the test protocol, certain basic elements should be addressed in a test report to document the testing conditions and results, and enable the delegated agency to determine whether a complete and representative stack test was performed. For a prototype of a sufficiently detailed test report, see Emission Measurement Center Guideline Document (GD-043), "Preparation and Review of Emission Test Reports," (December 1998) (www.epa.gov/ttn/emc/guidlnd.html). If the test report does not contain sufficient information with which to adequately review the testing process and data results, it is within the discretion of the regulatory agency to request additional information, or require another test if appropriate.
- A test report should be submitted to the regulatory agency as soon as possible after completion of the stack test and, at a minimum, in compliance with any underlying regulatory requirements. For stack tests being conducted pursuant to 40 C.F.R. Part 60, the test report is to be submitted within 180 days after the startup date or within 60 days after reaching maximum production rate. (§60.8(a)) For those tests being conducted pursuant to 40 C.F.R. Part 61, the test report is to be submitted within 31 days after completion of the test. (61.13(f)) If the test is being conducted pursuant to 40 C.F.R. Part 63, the test report is to be submitted within 60 days after the test is completed. (§63.9(h)) In addition, all test reports should be maintained and made available to the Regions upon request.

TECHNICAL ISSUES: SOOT-BLOWING

- Soot-blowing is the cleaning of heat exchanger surfaces by the use of steam or air to dislodge accumulated material such as ash. Current Agency policy on this issue states that soot-blowing is routine maintenance constituting representative process conditions. Therefore, soot-blowing should be included as an element of a comprehensive stack test.
- Soot-blowing, is "a normal part" of a facility's operations occurring at regular intervals. Emissions cannot be discarded as being the result of an upset condition, and it would be erroneous to stop soot-blowing for the purpose of conducting a stack test. See "Inclusion of Soot-Blowing Emissions in Subpart D Compliance Testing" from John S. Seitz to David Kee (August 31, 1987); "Restatement of Guidance on Emissions Associated with Soot-Blowing" from Kathleen M. Bennett to Directors, Air & Waste Management Divisions (May 7, 1982); "Representative Testing Requirements" from Edward E. Reich to Sandra S. Gardebring (November 21, 1980).
- The above-referenced Agency determinations affirmed previous guidance stating that emissions from soot-blowing are representative of a facility's operations and outlined the procedures for including soot-blowing while stack testing. See "Integration of Soot-Blowing Emissions with Routine Operating Data for Existing Facilities" from Edward E. Reich to Leslie Carothers (March 12, 1979); "NSPS Determination - Subpart D" from Edward E. Reich to Enforcement Division Directors, Air and Hazardous Material Division Directors, and Surveillance and Analysis Division Directors (March 6, 1979).

TECHNICAL ISSUES: ROUNDING OF SIGNIFICANT FIGURES

- For guidance on how the results of a stack test should be calculated and reported, this guidance defers to the current Agency policy, "Performance Test Calculation Guidelines" from William G. Laxton and John S. Seitz to New Source Performance Standards/National Emission Standards for Hazardous Pollutants Compliance Contacts (June 6, 1990). After reiterating the established procedure concerning the use of the metric system in expressing compliance standards, the policy states that all emission standards should have at least two significant figures and at least five significant digits are carried in intermediate calculations. When rounding off the calculated emission numbers, the policy affirms the practices of the American Society for Testing and Materials:

If the first digit to be discarded is less than five, the last digit retained should not be changed. When the first digit discarded is greater than five, or if it is a five followed by at least one digit other than 0, the last figure retained should be increased by one unit. When the first digit discarded is exactly five, followed only by zeros, the last digit retained should be rounded upward if it is an odd number, but no adjustment made if it is an even number.

For example, if the emission standard is 90, then 90.357 would be rounded to 90, 90.639 would be rounded to 91, 90.500 would be rounded to 90, and 91.500 would be rounded to 92. Laxton and Seitz, pp. 3-4.

VII. REGIONAL ROLE

- As part of EPA's oversight responsibilities, EPA may observe stack tests whenever the Agency deems appropriate. The Agency also will review test reports as needed to verify that the tests are being conducted properly, and that the results are being accurately interpreted and reported by state/local agencies.
- Consistent with CMS, the Regions will periodically conduct analysis to evaluate whether the data concerning the date and results of all stack tests conducted are being reported correctly and in a timely manner, and if stack testing is being used sufficiently and effectively.