EMISSION MEASUREMENT CENTER
TECHNICAL INFORMATION DOCUMENT (TID-012)

Test Method 6C -- Guidance

Introduction

Attention to Test Method 6C is increasing in the testing community in anticipation of future SO_2 reduction regulations and increase continuous emission monitoring system certification testing. State implementation plan developments for SO_2 also have focused interest on this instrumental test method. As a result, testers have raised specific questions about Method 6C, Section 7.2. This section requires an interference check for each analyzer for a particular source category. In addition, Method 6C, Section 7.5 Interference Check (if performed), further specifies that if the analyzer mean output and the reference modified Method 6 output differ by more than 7 percent of the mean of the modified Method 6 result, the test run is unacceptable. Following are some of the questions and our responses:

1. What constitutes a "particular source category"? Should an analyzer interference check be conducted for each of the following conditions?

    a. At both the inlet and outlet of a wet scrubber?
    b. For each type of wet scrubber or other devices?
    c. At high and low SO_2 concentrations, e.g., 0-250 and above 250 ppm?
    d. With and without a sample dilution system?
    e. At both oil and coal-fired systems?

2. Would one interference check suffice for all individual analyzers of a specific manufacturer model? What are the applicability limits?

3. Should an alternative interference check criteria be provided for low concentration levels? For example, 7 Percent of a stack concentration average of 20 ppm is less than 1.5 ppm and demonstrating this compliance with the interference limits may be too restrictive.

Background

The Agency has reviewed 32 sulfur dioxide interference tests of eleven (11) analyzers at combustion sources. The instrumentation methodology for Method 6C included a ultraviolet (UV), ultraviolet pulsed-fluorescence, and nondispersive infrared analyzer (NDIR). The analyzer interference checks also included the use of dilution probes.

Each of the analyzer types demonstrated successful interference checks at several coal, oil, and refuse burning facilities with and without scrubbed gas streams. The emission levels during the tests ranged from 15 to 900 ppm.

The interference checks revealed that the analyzers were generally free from interferences at concentrations greater than 100 ppm. Fourteen (14) of the 32 tests, involving 10 separate analyzers, were at concentrations of about 100 ppm or less. Out of these 14 tests, five (5) tests involving 5 analyzers failed to meet the 7 percent criteria. Four (4) out of these five (5) analyzers at two specific sites also failed the 5 ppm difference criteria.

The four (4) identified failures above involved paired interference checks of two (2) monitor models at separate source categories (municipal waste combuster and oil fired boiler). Pollutant concentrations were approximately 100 ppm. The differences from the concurrent modified Method 6 were 7 to 15 ppm; however, the differences between the paired Method 6C results were less than 2 ppm.

These specific analyzers above also showed acceptable interference checks at other concentrations and source categories. In addition, the analyzers had previously passed the interference check at the same category. Therefore, these four (4) tests out of the 32 may have had site-specific problems. Specifically, collaborative testing of the three (3) monitor types with the modified Method 6 indicate that the precision of the modified Method 6 results may not have been sufficient.

Except for the four (4) instances discussed above, the range of concentrations associated with the successful interference checks indicate that separate high and low concentration interference checks are not warranted for the combustion

categories reviewed. However, a low concentration acceptance option needs to be considered. Two of the 32 tests were at levels less than 50 ppm. Though the instrumental systems failed the interference criteria of Method 6C, the difference from the modified Method 6 results were less than 3 ppm.

The suggested ±5 ppm acceptance option is also used by the Northeastern States for Coordinated Air Use Management (NESCAUM) and recent EPA relative accuracy criteria (Performance Specification 4A). The intent of the lower level acceptance criteria is to ease the burden of passing the interference check where the emissions are low in comparison to the emission limit, and absolute accuracy of the standard is not a critical consideration. We believe that the acceptance criteria of 7 percent or 5 ppm, whichever is less stringent, is reasonable.

Responses

1. For the purposes of establishing the applicability of the results of an interference check for a given method, a particular source category is defined by the combination of process operation (e.g., electric utility), fuel or processing material (e.g., coal-fired), and emission control equipment (e.g., ESP and wet-scrubber). The combined effect that these elements have on the exhaust gas matrix and, hence, the conditions to which the sampling method is exposed further define a particular source category. In general, sources subject to the same regulations and of the same general process and emissions control design are in the same particular source category. Sources with a somewhat different equation, fuel or process materials, or control equipment but with very similar exhaust gas matrices (e.g., temperature, moisture, CO_2 and O_2 concentration, acid gas concentration, etc.) may be considered sufficiently similar to be considered the same category for purposes of the interference check. In answer to specific situations and other related questions, the following responses are offered:

a. If a scrubber imparts a change in the exhaust gas matrix that is different from previous interference checks conducted at a scrubber for an analyzer model, e.g., ammonia

injection, an interference check is recommended for the scrubber outlet but not necessarily the inlet.

b. Depending on prior application of the analyzer model type to the sample matrix of a particular scrubber type, an interference check should be performed.

c. Successful interference checks have been demonstrated for several analyzer models at combustion facilities with high and low emission levels. The information indicates that an interference check at one emission level would sufficiently qualify the analyzer.

d. The use, or nonuse, of a dilution probe should not be considered within the context of the "particular source category" or "each individual analyzer."

e. Uncontrolled fossil-fuel-fired sources, within the directions of the defining of a particular source category above, should be considered a specific category. For example, a successful interference check of an analyzer at a coal-fired facility should be acceptable for an oil-fired (distillate or residual) source. The review of interference checks at these subcategories of sources supports this finding.

2. Once an interference check has been successfully performed, that analyzer model for that particular source category would not require additional interference checks under Method 6C.

3. The interference check criteria of Section 7.5 of Method 6C will continue to require that the Method 6C output be within 7 percent of the modified Method 6 value. Optionally, when emission levels are less than 50 percent of the standard; a run during an interference check is acceptable if the difference between the modified Method 6 and Method 6C analyzer result is within ±5 ppm of the mean of the modified Method 6 value.