

(1) You must perform the primary zero alignment method under clear path conditions. The COMS may be removed from its installation and setup under clear path conditions or, if the process is not operating and the monitor path is free of particulate matter, the zero alignment may be conducted at the installed site. Determining if the monitor path is free of particulate matter can be accomplished by, but is not limited to, the following procedure: (1) Observe the instantaneous or one minute average opacity for at least two hours prior to the clear path adjustment; (2) open the reflector or detector housing and observe the projected light beam and look for the presence of forward scattered light (halo-effect); (3) if the beam observation reveals no perceptible particulate and the 2-hour readings do not vary more than ± 3 percent opacity, adjust the clear path zero based on the lowest opacity reading recorded during the 2-hour period. There must be no adjustments to the monitor other than the establishment of the proper monitor path length and correct optical alignment of the COMS components. You must record the COMS response to a clear condition and to the COMS's simulated zero condition as percent opacity corrected to stack exit conditions. For a COMS with automatic zero compensation, you must disconnect or disable the zero compensation mechanism or record the amount of correction applied to the COMS's simulated zero condition. The response difference in percent opacity to the clear path and simulated zero conditions must be recorded as the zero alignment error. You must adjust the COMS's simulated zero device to provide the same response as the clear path condition. You must perform the zero alignment audits with the COMS off the stack at least every three (3) years.

(2) As an alternative, monitors capable of allowing the installation of an external zero device (commonly referred to as a zero-jig) may use the device for the zero alignment, provided: (1) the zero-jig setting has been established for the monitor path length and recorded for the specific COMS by comparison of the COMS responses to the installed zero-jig and to the clear path condition; and (2) the zero-jig is demonstrated to be capable of producing a consistent zero response when it is repeatedly (*i.e.*, three consecutive installations and removals prior to conducting the final zero alignment check) installed on the COMS. The zero-jig setting must be permanently set at the time of initial zeroing to the clear path zero value and protected when not in use to ensure that the setting equivalent to zero opacity does not change. The zero-jig setting must be checked and recorded prior to initiating the zero alignment. If the zero-jig setting has changed, you must remove the COMS from the stack in order to reset the zero-jig. If you employ a zero-jig, you must perform the zero alignment audits with the COMS off the stack every three (3) years. If the zero-jig is adjusted within the three-year period, you must perform the zero alignment with the COMS off the stack three years from the date of adjustment.

10.4 What are my limits for excessive audit inaccuracy? Unless specified otherwise

in the applicable subpart, the criteria for excessive inaccuracy are listed in paragraphs (1) through (4).

(1) What is the criterion for excessive zero or upscale drift? Your COMS is out-of-control if either the zero drift check or upscale drift check exceeds twice the applicable drift specification in appendix B for any one day.

(2) What is the criterion for excessive zero alignment? Your COMS is out-of-control if the zero alignment exceeds 2 percent opacity.

(3) What is the criterion to pass the quarterly performance audit? Your COMS is out-of-control if the results of a quarterly performance audit indicate noncompliance with the following criteria:

(i) The optical alignment misalignment error exceeds 3 percent opacity,

(ii) The zero compensation exceeds 4 percent opacity, or

(iii) The calibration error exceeds 3 percent opacity.

(4) What is the criterion for data capture?

The data capture will be considered insufficient if your COMS fails to obtain valid opacity data for at least 95 percent of your operating hours per calendar quarter, considering COMS downtime for all causes (*e.g.*, monitor malfunctions, data system failures, preventative maintenance, unknown causes, etc.) except for downtime associated with routine zero and upscale checks and QA/QC activities required by this procedure. Whenever less than 95 percent of the valid data averages are obtained, you must either:

(i) Perform additional QA/QC activities as deemed necessary to assure acceptable data capture, or

(ii) Determine if the COMS is functioning properly. If your COMS is malfunctioning, you may use a substitute COMS until repairs are made, provided the substitute meets the requirements specified in Section 10.6.

10.5 What corrective action must I take if my COMS is malfunctioning? You must have a corrective action program in place to address the repair and/or maintenance of your COMS. There are four classes of maintenance and repair procedures to be considered; the classes are described in paragraphs (1) through (4). They may be performed either at the manufacturer's facility, a service provider's facility, the user's instrument laboratory, or at the stack/duct at the discretion of the owner/operator and within the recommendations of the manufacturer. They must be performed by persons either skilled and/or trained in the operation and maintenance of the analyzer. After the repair/maintenance of your COMS, you must ensure the COMS is still in compliance with PS-1. Table 17-1 outlines the tests required to maintain PS-1 certification.

(1) *Routine/preventative maintenance.* Includes the routine replacement of consumables, cleaning of optical surfaces, and adjustment of monitor operating parameters as needed to maintain normal operation. Replacement of consumables which have the possibility of adversely affecting the performance of an analyzer may cause the nature of the maintenance procedure to fall within one of the classifications described below.

(2) *Measurement Non-Critical Repairs.* Includes repair and/or replacement of

standard non-critical components, the unique characteristics of which do not materially affect the performance of the monitor. These components include, but are not limited to, resistors, capacitors, inductors, transformers, semiconductors such as discrete components and integrated circuits, brackets and machined parts (not associated with internal optical components), cabling and connectors, electro mechanical components such as relays, solenoids, motors, switches, blowers, air filters, pressure/flow indicators, tubing, indicator lights, fuses, software with the same version and/or revision level, glass windows (uncoated or anti-reflection coated, but with no curvature), lenses with mounts where such mounts are not adjustable as installed, circuit boards where such boards are interchangeable and without unique adjustments (except offset and gain adjustments) for the specific analyzer of the same model, with such repairs to include the maintenance procedures required to ensure that the analyzer is appropriately setup.

(3) Replace or repair the primary measurement light source.

(4) *Measurement Critical Repairs.* Includes repair and/or replacement of measurement sensitive components, the unique characteristics of which may materially affect the performance of the monitor. These components include, but are not limited to, optical detectors associated with the opacity measurement/reference beam(s), spectrally selective optical filters, beam splitters, internal zero and/or upscale reference reflective or transmissive materials, electro-optical light switches, retro reflectors, adjustable apertures used on external zero devices or reflectors, lenses which have an adjustable mount, circuit boards which are not completely interchangeable and/or require unique adjustments for the specific analyzer, with such repairs to include the maintenance procedures required to ensure that the analyzer is appropriately setup.

(5) *Rebuilt or Refurbished analyzers.* Includes analyzers for which a major sub-assembly(ies) has/have been replaced or multiple lesser sub-assemblies with different revision levels from the original have been replaced and/or modified. Also, to be defined as a major change in the analyzer measurement detection and processing hardware or software.

(6) For other repairs or replacements not specifically described above, you must consult the manufacturer for the appropriate classification of that procedure. Manufacturers must use the above guidelines in determining the appropriate classification and provide a written recommendation. The final determination as to which category a given repair falls within will be made by the Administrator.

10.6 What requirements must I meet if I use a substitute opacity monitor? In the event your certified opacity monitor has to be removed for extended service, you may install a temporary replacement monitor to obtain required opacity emissions data, provided that:

(1) The temporary monitor is a like-kind replacement, where like-kind is defined as made by the same manufacturer; carries the same model number; uses the same reflector