Question 9.23

Topic: Linearity Check Following Span Adjustment

Question: If a facility changes the span of a gas monitor, is a linearity check required?

Answer: It depends. Sections 2.1.1.5 and 2.1.2.5 of Appendix A to Part 75 require a diagnostic linearity check to be performed following a span adjustment of a gas monitor *only if* the span adjustment is so significant that the calibration gases currently used for daily calibration error tests and linearity checks are unsuitable for use with the new span value. For instance, suppose that the span of a NO_x monitor is 1000 ppm and the "low," "mid," and "high" calibration gases currently in use have concentrations of 250 ppm, 525 ppm, and 825 ppm, respectively. If, following a required annual span and range evaluation, the span is changed to 900 ppm, these calibration gas concentrations, expressed as percentages of the new span value, would be, respectively, 27.8%, 58.3%, and 91.6%.

Since the calibration gases are still within the tolerance bands for low, mid, and high-level concentrations (i.e., 20.0 to 30.0% of span for low-level, 50.0 to 60.0% of span for mid-level, and 80.0 to 100.0% of span for high level), a diagnostic linearity check would not be required in this case. However, if the span had been lowered to 800 ppm or less, the current calibration gases would no longer be within the tolerance bands and a diagnostic linearity check would be required.

In cases where a span adjustment is required and the current calibration gases are unsuitable for use with the new span value, the owner or operator has up to 90 days after the end of the quarter in which the need to adjust the span is identified to implement the change (see Sections 2.1.1.5 and 2.1.2.5 of Appendix A). This allows time to purchase and receive the new calibration gases.

References: Appendix A, Section 2.1.1.5 and 2.1.2.5

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