12.0 What Calculations and Data Analysis Must I Perform for my PM CEMS?

(1) How do I determine RCA and RRA acceptability? You must plot each of your PM CEMS and reference method data sets from an RCA or RRA on a graph based on your PM CEMS correlation line to determine if the criteria in paragraphs 10.4(5) or (6), respectively, are met.

(2) How do I calculate ACA accuracy? You must use either Equation 2-1a or 2-1b to calculate ACA accuracy for each of the three audit points. However, when calculating ACA accuracy for the first audit point (0 to 20 percent of measurement range), you must use Equation 2-1b to calculate ACA accuracy if the reference standard value (Rv) equals zero.

$$\text{ACA Accuracy} = \frac{|R_{CEM} - R_V|}{R_V} \times 100\% \qquad \text{Eq. 2-1a}$$

Where:
ACA Accuracy = The ACA accuracy at each audit point, in percent,
RCEM = Your PM CEMS response to the reference standard, and
RV = The reference standard value.

$$\text{ACA Accuracy} = \frac{|C_{CEM} - C_{RV}|}{C_s} \times 100\% \qquad \text{Eq. 2-1b}$$

Where:
ACA Accuracy = The ACA accuracy at each audit point, in percent,
CCEM = The PM concentration that corresponds to your PM CEMS response to the reference standard, as calculated using the correlation equation for your PM CEMS,
CRV = The PM concentration that corresponds to the reference standard value in units consistent with CCEM, and
Cs = The PM concentration that corresponds to the applicable emission limit in units consistent with CCEM.

(3) How do I calculate daily upscale and zero drift? You must calculate the upscale drift using Equation 2-2 and the zero drift using Equation 2-3:

$$UD = \frac{|R_{CEM} - R_U|}{R_r} \times 100 \qquad \text{Eq. 2-2}$$

Where:
UD = The upscale drift of your PM CEMS, in percent,
RCEM = Your PM CEMS response to the upscale check value,
RU = The upscale check value, and
Rr = The response range of the analyzer.

$$ZD = \frac{|R_{CEM} - R_L|}{R_r} \times 100 \qquad \text{Eq. 2-3}$$

Where:
ZD = The zero (low-level) drift of your PM CEMS, in percent,
RCEM = Your PM CEMS response of the zero check value,
RL = The zero check value, and
Rr = The response range of the analyzer.

(4) How do I calculate SVA accuracy? You must use Equation 2-4 to calculate the accuracy, in percent, for each of the three SVA tests or the daily sample volume check:

$$\text{SVA Accuracy} = \frac{|V_M - V_R|}{V_R} \times 100 \qquad \text{Eq. 2-4}$$

Where:
SVA Accuracy = The SVA accuracy at each audit point, in percent,
VM = Sample gas volume determined/reported by your PM CEMS (e.g., dscm), and
VR = Sample gas volume measured by the independent calibrated reference device (e.g., dscm) for the SVA or the reference value for the daily sample volume check.
Note:

Before calculating SVA accuracy, you must correct the sample gas volumes measured by your PM CEMS and the independent calibrated reference device to the same basis of temperature, pressure, and moisture content. You must document all data and calculations.