40 C.F.R. § 1065.643

Carbon balance error verification calculations.

This section describes how to calculate quantities used in the carbon balance error verification described in § 1065.543. Paragraphs (a) through (c) of this section describe how to calculate the mass of carbon for a test interval from carbon-carrying fluid streams, intake air into the system, and exhaust emissions, respectively. Paragraph (d) of this section describes how to use these carbon masses to calculate four different quantities for evaluating carbon balance error. Use rectangular or trapezoidal integration methods to calculate masses and amounts over a test interval from continuously measured or calculated mass and molar flow rates.

(a) *Fuel and other fluids.* Determine the mass of fuel, DEF, and other carbon-carrying fluid streams, other than intake air, flowing into the system, $m_{\text{fluid}j}$, for each test interval. Note that § 1065.543 allows you to omit all flows other than fuel. You may determine the mass of DEF based on ECM signals for DEF flow rate. You may determine fuel mass during field testing based on ECM signals for fuel flow rate. Calculate the mass of carbon from the combined carbon-carrying fluid streams flowing into the system as follows:

$$m_{\text{Cfluid}} = \sum_{j=1}^{N} \left(w_{Cj} \cdot m_{\text{fluid}j} \right)$$

Eq. 1065.643-1

Where: j = an indexing variable that represents one carbon-carrying fluid stream. N = total number of carbon-carrying fluid streams into the system over the test interval. w_C = carbon mass fraction of the carbon-carrying fluid stream as determined in § 1065.655(d). m_{fluid} = the mass of the carbon-carrying fluid stream determined over the test interval.

Example:

$N = 2$ $w_{\text{Cfuel}} = 0.869$ $w_{\text{CDEF}} = 0.065$ $m_{\text{fuel}} = 1119.6$ g $m_{\text{DEF}} = 36.8$ g $m_{\text{Cfluid}} = 0.869 \cdot 1119.6 + 0.065 \cdot 36.8 = 975.3$ g