§ 7.507 Air-monitoring components.

(a) Each refuge alternative shall have an air-monitoring component that provides persons inside with the ability to determine the concentrations of carbon dioxide, carbon monoxide, oxygen, and methane, inside and outside the structure, including the airlock.

(b) Refuges alternatives designed for use in mines with a history of harmful gases, other than carbon monoxide, carbon dioxide, and methane, shall be equipped to measure the harmful gases’ concentrations.

(c) The air-monitoring component shall be inspected or tested and the test results shall be included in the application.

(d) The air-monitoring component shall meet the following:

   (1) The total measurement error, including the cross-sensitivity to other gases, shall not exceed ±10 percent of the reading, except as specified in the approval.

   (2) The measurement error limits shall not be exceeded after start-up, after 8 hours of continuous operation, after 96 hours of storage, and after exposure to atmospheres with a carbon monoxide concentration of 999 ppm (full-scale), a carbon dioxide concentration of 3 percent, and full-scale concentrations of other gases.

   (3) Calibration gas values shall be traceable to the National Institute for Standards and Technology (NIST) “Standard Reference Materials” (SRMs).

   (4) The analytical accuracy of the calibration gas and span gas values shall be within 2.0 percent of NIST gas standards.

   (5) The detectors shall be capable of being kept fully charged and ready for immediate use.

§ 7.508 Harmful gas removal components.

(a) Each refuge alternative shall include means for removing harmful gases.

   (1) Purging or other effective procedures shall be provided for the airlock to dilute the carbon monoxide concentration to 23 ppm or less and the methane concentration to 1.0 percent.