

wave-cross trending, limiting vehicular traffic, and pre-notification of actions that could produce CO to be conducted underground) for reducing the number of non-fire produced alert or alarm signals provided they are approved in the mine ventilation plan. The use of reasonable time delays and other approaches, such as diesel-discriminating sensors have been successful in reducing the number of alert and alarm signals from CO that are not a result of a fire or heating.

We do not consider the use of time delays or other computer or administrative techniques as a replacement for the proper installation and maintenance of the AMS. For example, alert and alarm signals that are the result of short duration spikes caused by radio frequency interference could be eliminated by using shielded cable. Also, if higher levels of CO result from improperly maintained diesel-powered equipment, we would expect correction of this condition per existing regulations before considering approval of a time delay.

Proposed paragraph (n) deals with the examination, testing, and calibration of sensors used as part of an AMS, and is consistent with the Advisory Committee recommendations.

The Advisory Committee recommended that sensors should be visually examined each coal producing shift. Under paragraph (n)(1) at least once each shift when belts are operated as part of a production shift, mine operators would have to visually examine CO or smoke sensors and alarms installed in accordance with § 75.350(b). We are aware of instances where operators have placed sensors in improper locations following belt moves or sensors have been damaged by roof falls or equipment. Sometimes these conditions have gone undetected. Since § 75.362(b) already requires an examination for hazardous conditions in the belt entry once each shift that the belt operates, the sensor examinations could coincide with the on-shift inspection. Paragraph (n)(1) adds the requirement that the sensors be visually examined. It is anticipated that generally this will not cause any additional time to be spent doing the on-shift belt examination. By requiring that sensors and alarms are examined visually each shift, we believe that inoperable or inappropriately placed sensors can be detected and corrected in a timely manner. Under existing § 75.363 a certified person must make a record of misplaced or damaged sensors. This provision would continue to be in effect.

Proposed paragraph (n)(2) would require testing of alarms for operation at least once every seven (7) days for an AMS installed in accordance with §§ 75.350(b) or 75.350(c). Testing of alarms is critical to assure that they will operate properly when needed. The testing method is dependent upon the type of alarm installed.

Paragraph (n)(3) would require the calibration of sensors that are part of an AMS installed in accordance with §§ 75.340(a)(1)(ii), 75.340(a)(2)(ii), 75.350(b), or 75.350(c) at least every 31 days. Paragraph (n)(3)(i) would require proper calibration of CO sensors with a known concentration of CO in air sufficient to activate the alarm. Paragraph (n)(3)(ii) also would require that smoke sensors be functionally tested according to the manufacturer's specifications. The nature of the functional test would be to subject the sensor to one of the following methods: "(1) Calibrated test method, (2) Manufacturer's calibrated sensitivity test instrument, (3) Listed control equipment arranged for the purpose, (4) Smoke detector/control unit arrangement whereby the detector causes a signal at the control unit where its sensitivity is outside its listed sensitivity range, [and] (5) Other calibrated sensitivity test methods approved by the authority having jurisdiction to assure that the sensor responds properly" (NFPA 72).

It has been our experience, and is consistent with manufacturers' recommendations, that the calibration schedule proposed is sufficient to assure proper operation. However, proposed § 75.351(k) requires that AMSs be maintained in proper operating condition. Therefore, if experience at an individual mine indicates that more frequent calibration is necessary to maintain proper operating condition, the operator must calibrate the sensor at an interval sufficient to assure that the performance required by the proposed rule is maintained. In addition, each methane sensor installed in accordance with §§ 75.323(d)(1)(ii) or 75.362(f) must be calibrated in accordance with the manufacturer's calibration specifications as in paragraph (n)(iii). Calibration must be done with a known concentration of methane in air sufficient to activate the alarm.

Paragraph (n)(4) would require certification of the accuracy of calibration gases as directly traceable to National Institute of Standards and Technology (NIST) standards. Alternatively, paragraph (n)(4) would permit traceability to an analytical standard prepared in a method traceable to NIST. This paragraph is necessary

since the accuracy of the calibration gas has a direct bearing on the accuracy and functional performance of the sensor. According to NIST, traceability is "the property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." The NIST standard is a physical standard: "Only measurement results and values of standards are traceable. To support a claim (of traceability), the provider of a measurement result or value of a standard must document the measurement process or system used to establish the claim and provide a description of the chain of comparisons that were used to establish a connection to a particular stated reference. All of the information regarding traceability to NIST is available on-line at <http://www.nist.gov/traceability>."

Paragraph (o), consistent with an Advisory Committee recommendation, would require certain records to be maintained when an AMS is used to comply with §§ 75.323(d)(1)(ii), 75.340(a)(1)(ii), 75.340(a)(2)(ii), 75.350(b), 75.350(c), or 75.362(f). Records of the type proposed provide a history of system performance and mine operator response. They are considered essential to the operation of an effective system and can be invaluable in determining sources of recurring alert and alarm signals and system malfunctions.

Proposed § 75.351(o)(1) would require that the responsible person designated by the operator maintain the following records: record of alert and alarm signals, record of malfunctions and corrective actions, record of seven day test of alert and alarm signals, calibrations, and maintenance performed on the AMS. The responsible person would create these records at the end of the shift as these situations occur. Paragraph (o)(1)(i) would require that a record be kept of all alert and alarm signal activations. The required record would include the date, time, location and type of sensor, and the cause of the activation. Proposed paragraph (o)(1)(ii) would require a record to be made of all AMS malfunctions. This record would contain the date, extent, and cause of the malfunction. It would also include the corrective action taken to return the system to proper operation. As specified by this section, the records required by paragraphs (o)(1)(i) and (ii) would be made by the responsible person.

Proposed paragraph (o)(1)(iii) would require that a record also be maintained