

**Subpart C—Test Requirements****§ 27.30 Inspection.**

A detailed inspection shall be made by MSHA of the equipment and all components and functions related to safety in operation, which shall include:

(a) Examining materials, workmanship, and design to determine conformance with paragraph (a) of § 27.20.

(b) Comparing components and subassemblies with the drawings and specifications to verify conformance with the requirements of this part.

**§ 27.31 Testing methods.**

A methane-monitoring system shall be tested by MSHA to determine its functional performance, and its explosion-proof and other safety characteristics. Since all possible designs, arrangements, or combinations cannot be foreseen, MSHA reserves the right to make any tests or to place any limitations on equipment, or components or subassemblies thereof, not specifically covered herein, to determine and assure the safety of such equipment with regard to explosion and fire hazards.

**§ 27.32 Tests to determine performance of the system.**

(a) *Laboratory tests for reliability and durability.* Five hundred successful consecutive tests<sup>2</sup> for gas detection, alarm action, and power shutoff in natural gas-air mixtures<sup>3</sup> shall be conducted to demonstrate acceptable performance as to reliability and durability of a methane-monitoring system. The tests shall be conducted as follows:

(1) The methane detector component shall be placed in a test gallery into which natural gas shall be made to enter at various rates with sufficient turbulence for proper mixing with the air in the gallery. To comply with the requirements of this test, the detector shall provide an impulse to actuate an alarm at a predetermined percentage of gas and also provide an impulse to ac-

<sup>2</sup>Normal replacements and adjustments shall not constitute a failure.

<sup>3</sup>Investigation has shown that, for practical purposes, natural gas (containing a high percentage of methane) is a satisfactory substitute for pure methane in these tests.

tuating a power shutoff at a second predetermined percentage of gas. (See §§ 27.21, 27.22, 27.23, and 27.24.)<sup>4</sup>

(b) *Field tests.* MSHA reserves the right to conduct tests, similar to those stated in paragraph (a) of this section, in underground workings to verify reliability and durability of a methane-monitoring system installed in connection with a piece of mining equipment.

**§ 27.33 Test to determine explosion-proof construction.**

Any assembly, subassembly, or component which, in the opinion of MSHA, requires explosion-proof construction shall be tested in accordance with the procedures stated in Part 18 of this subchapter.

**§ 27.34 Test for intrinsic safety.**

Assemblies, subassemblies, or components that are designed for intrinsic safety shall be tested by introducing into the circuit(s) thereof a circuit-interrupting device which produces an electric spark from the current in the circuit. The circuit-interrupting device shall be placed in a gallery containing various flammable natural gas-air mixtures. To meet the requirements of this test, the spark shall not ignite the flammable mixture. For this test the circuit-interrupting device shall be operated not less than 100 times at 125 percent of the normal operating voltage of the particular circuit.

**§ 27.35 Tests to determine life of critical components and subassemblies.**

Replaceable components may be subjected to appropriate life tests at the discretion of MSHA.

**§ 27.36 Test for adequacy of electrical insulation and clearances.**

MSHA shall examine, and test in a manner it deems suitable, electrical insulation and clearances between electrical conductors to determine adequacy for the intended service.

<sup>4</sup>At the option of MSHA, these tests will be conducted with dust or moisture added to the atmosphere within the gallery.