

(k) *Test No. 9BM.* (1) The steps described in paragraphs (c)(2) and (c)(3) of this section are repeated.

(2) An 80 p.p.m. mixture is fed to the bilge monitor for eight (8) hours. At the end of the eight (8) hour period, an oil content reading is obtained and recorded.

(3) The steps described in paragraphs (c)(2) and (c)(3) of this section are repeated.

(4) The monitor is fed with water until a steady reading is obtained and recorded.

(l) *Test No. 10BM.* (1) All power to the bilge monitor is shut off for one (1) week. After one week the monitor is started, zeroed, and calibrated.

(2) The monitor is fed with an 80 p.p.m. mixture for one (1) hour. An oil content reading is then obtained and recorded.

(3) The steps described in paragraphs (c)(2) and (c)(3) of this section are repeated.

(4) The monitor is fed with water for one (1) hour. An oil content reading is then obtained and recorded.

(5) The steps described in paragraphs (1)(2), (1)(3), and (1)(4) of this section are repeated three (3) additional times. During the last time that the step described in paragraph (i)(2) of this section is repeated, the monitor is inclined at an angle of 22.5° with the plane of its normal operating position.

§ 162.050-33 Bilge alarm: Design specification.

(a) This section contains requirements that apply to bilge alarms.

(b) Each bilge alarm must be designed to meet the requirements for a cargo monitor in §§ 162.050-25(b) through (g), § 162.050-25(i), and the requirements in this section.

(c) Each bilge alarm must have a device that produces a warning signal, and a signal that can be used to actuate stop valves in a vessel's fixed piping system, when—

(1) the oil content of the mixture being measured by the bilge alarm exceeds 15 p.p.m. ±5 p.p.m., and

(2) malfunction, breakdown, or other failure of the bilge alarm occurs.

§ 162.050-35 Bilge alarm: Approval tests.

(a) This section contains requirements that apply to bilge alarms.

(b) *Test Conditions.* (1) Each test must be conducted under the conditions prescribed for cargo monitors in §§ 162.050-27 (b)(1) through (b)(5), §§ 162.050-27 (b)(7), (b)(8), (b)(10), (b)(11), and (b)(13).

(2) Each test must be performed using a light distillate fuel oil having a relative density of approximately 0.83 at 15 °C.

(3) The oil content of each sample must be measured using the method described in § 162.050-39.

(c) *Test No. 1A.* The bilge alarm is calibrated and zeroed. The metering and water pumps of the test rig are started and the oil content of the mixture is increased until the alarm actuates. A sample of the mixture causing actuation of the alarm is taken. The alarm is then fed with water for fifteen (15) minutes.

(d) *Test No. 2A.* (1) The bilge alarm is fed with a 40 p.p.m mixture until the bilge alarm actuates. The time of turning on the metering pump of the test rig and the time of alarm actuation are recorded. The flow rate on the flow meter of the test rig is also recorded.

(2) The response time of the alarm is calculated as follows:

$$\text{response time} = T_2 - \left[T_1 + \frac{(\pi)(D^2)(L)}{4Q} \right]$$

T_2 =time of alarm actuation

T_1 =time of turning on the metering pump of the test rig

D =inside diameter of the mixture pipe (cm)

L =length of the mixture pipe (cm)

Q =flow rate (cm³/sec)

(e) *Test No. 3A.* (1) The metering and water pumps of the test rig are started and the oil content of the mixture is increased until the bilge alarm actuates. A sample of the mixture causing actuation of the alarm is taken.

(2) If the alarm has a positive displacement mixture pump, the mixture pressure is reduced to one-half (½) of the alarm's maximum design pressure. If the alarm has a centrifugal mixture pump or is not equipped with a mixture pump, the mixture flow rate is reduced

§ 162.050-37

46 CFR Ch. I (10-1-06 Edition)

to one-half (½) of the alarm's maximum design flow rate. After reduction of pressure or flow rate, the oil content in the mixture is increased until the alarm actuates. A sample of the mixture causing actuation of the alarm is taken.

(3) If the alarm has a positive displacement mixture pump, the influent pressure is increased to twice the alarm's minimum design pressure. If the alarm has a centrifugal mixture pump or if the alarm is not equipped with a mixture pump, the influent flow rate is increased to twice the alarm's maximum design flow rate. After increasing the pressure or flow rate, the oil content in the mixture is increased until the alarm actuates. A sample of the mixture causing actuation is taken.

(f) *Test No. 4A.* (1) The steps described in paragraph (e)(1) of this section are repeated.

(2) The metering and water pumps of the test rig are stopped for eight (8) hours.

(3) The metering and water pumps are started and the oil content of the mixture is increased until the bilge alarm actuates. A sample of the mixture causing actuation is taken.

(g) *Test No. 5A.* (1) The supply voltage to the bilge alarm is raised to one-hundred ten (110) percent of its design supply voltage. The oil content of the mixture is then increased until the alarm actuates. A sample of the mixture causing actuation is taken.

(2) The supply voltage to the alarm is lowered to ninety (90) percent of its design supply voltage. The oil content of the mixture is then increased until the alarm actuates. A sample of the mixture causing actuation is taken.

(3) Upon completion of the steps described in paragraph (g)(2) of this section, the supply voltage to the alarm is returned to its design value.

(4) The steps described in paragraphs (g)(1), (g)(2), and (g)(3) of this section are repeated varying each other power supply to the alarm in the manner prescribed in those steps for supply voltage.

(h) *Test No. 6A.* (1) The steps described in paragraph (e)(1) of this section are repeated.

(2) The bilge alarm is fed with a 5 to 10 p.p.m. mixture for eight (8) hours. After eight (8) hours the oil content of the mixture is then increased until the alarm actuates. A sample of the mixture causing actuation is taken.

(i) *Test No. 7A.* (1) All power to the bilge alarm is shut off for one (1) week. After one (1) week the alarm is then started, zeroed, and calibrated.

(2) The steps described in paragraph (e)(1) of this section are repeated. Water is then fed to the monitor for one (1) hour.

(3) The steps described in paragraph (i)(2) are repeated seven (7) additional times. During the last hour, the alarm must be inclined at an angle of 22.5° with the plane of its normal operating position.

§ 162.050-37 **Vibration test.**

(a) Equipment submitted for Coast Guard approval must first be tested under the conditions prescribed in paragraph (b) of this section. The test must be performed at an independent laboratory that has the equipment to subject the item under test to the vibrating frequencies and amplitudes prescribed in paragraph (b) of this section. The test report submitted with the application for Coast Guard approval must be prepared by the laboratory and must contain the test results.

(b) Each monitor and bilge alarm and each control of a separator must be subjected to continuous sinusoidal vibration in each of the following directions for a 4 hour period in each direction:

(1) Vertically up and down.

(2) Horizontally from side to side.

(3) Horizontally from end to end.

The vibrating frequency must be 80Hz, except that the vibrating frequency of equipment that has a resonant frequency between 2Hz and 80Hz must be the resonant frequency. If the vibrating frequency is between 2Hz and 13.2Hz, the displacement amplitude must be ±1mm. If the vibrating frequency is between 13.2Hz and 80 Hz, the acceleration amplitude must be ±[(.7)(gravity)].