

§ 159.010-19 Termination of acceptance or listing of a independent laboratory.

(a) The acceptance or listing of a laboratory terminates if the laboratory—

- (1) Requests termination; or
- (2) Is no longer in business.

(b) The acceptance of a laboratory may be terminated by the Commandant if the laboratory—

(1) Fails to perform or supervise an inspection or test, or both, as required in an applicable subpart;

(2) Changes its test plan without Coast Guard acceptance;

(3) Attests to the lack of errors, omissions, or false statement of an approval test report that contains errors, omissions, or false statements;

(4) Does not meet § 159.010-3(a);

(5) Does not comply with § 159.010-17(a); or

(6) Unless allowed by the Commandant, contracts or transfers the performance or supervision of required inspections or tests, or both, to another laboratory or person.

(c) A laboratory is removed from the list published in an applicable subpart if the laboratory—

(1) Is no longer accepted by the Commandant; or

(2) Unreasonably refuses a request from a manufacturer to perform or supervise an approval or production inspection or test.

§ 159.010-21 Termination of acceptance or listing: Procedure.

(a) Whenever evidence is received that there exists a basis for termination of acceptance or listing of an independent laboratory under § 159.010-19 (b) or (c), the Commandant notifies the laboratory of the specific reasons for considering termination. If the deficiency could materially affect the validity of the approval issued under an applicable subpart, the Commandant may immediately suspend the acceptance of the laboratory and may direct the holder of the certificate of approval to cease claiming that the items tested or inspected by the laboratory are Coast Guard approved, pending a final decision in the matter. The Commandant may direct an investigation into the matter.

(b) Within 30 days after receipt of notice of the basis for considering termination, the laboratory may provide the Commandant evidence or arguments why acceptance or listing should continue. After consideration of all available material on the matter, the Commandant informs the laboratory, in writing, of this decision. Any person holding a certificate of approval affected by the decision is also notified of the decision.

(Sec. 1, 73 Stat. 475 (46 U.S.C. 481); sec. 201, 86 Stat. 427, as amended (46 U.S.C. 391a); sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1)); 49 CFR 1.46 (b) and (n)(4))

[FR Doc. 79-38270 Filed 12-14-79; 8:45 am]

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46 CFR Part 25

[CGD 76-082A]

Ventilation of Boats

AGENCY: Coast Guard, DOT.

ACTION: Final rule.

SUMMARY: This document adds an exception to the existing ventilation requirements in 46 CFR Part 25 for boats that meet the new ventilation requirements in 33 CFR Part 183. This document is intended to make the existing ventilation regulations agree with the new ventilation regulations published as a separate document in this issue of the *Federal Register*.

EFFECTIVE DATE: This regulation is effective on August 1, 1980. However, a manufacturer may elect to comply with this subpart at any time after July 31, 1978.

FOR FURTHER INFORMATION CONTACT: Mr. Lars E. Granholm, Office of Boating Safety (G-BBT), U.S. Coast Guard, Department of Transportation, Washington, D.C. 20590, (202/426-4027).

SUPPLEMENTARY INFORMATION: The Coast Guard published a Notice of Proposed Rulemaking concerning this amendment on July 27, 1978 (43 FR 3206). Interested persons were invited to participate in the proposed rulemaking by submitting relevant comments. No comments were received on the amendment to this subpart.

Drafting Information

The principal persons involved in drafting this amendment are: Mr. Lars E. Granholm, Project Manager, Office of Boating Safety and Ms. Mary Ann McCabe, Project Attorney, Office of Chief Counsel.

Discussion of final rule

Although no comments were received requesting changes in this amendment § 25.40-1(e)(1) needed clarification to indicate that the specification used for this paragraph is similar to the new manufacturer requirement in 33 CFR 183.620(a)(3).

Since Federal regulations issued under Section 5 of the Federal Boat Safety Act of 1971 preempt State boating regulations this change in the Federal ventilation regulations will require changes in State regulations in order to

make the State regulations identical to their Federal counterparts.

The amendment has been reviewed under the Department of Transportation's "Regulatory Policies and Procedures" (44 FR 11034, February 26, 1979). A final evaluation has been prepared and is included in the public docket. A copy of the final evaluation may be obtained from: Commandant (G-CMC/TP24), (CGD 76-082 A), U.S. Coast Guard, Washington, D.C. 20590.

In consideration of the foregoing 46 CFR § 25.40-1 is amended by revising paragraph (a) and by adding paragraphs (d) and (e) to read as follows:

§ 25.40-1 Tank and engine spaces.

(a) All motorboats or motor vessels, except open boats and as provided in paragraphs (d) and (e) of this section, the construction or decking over of which is commenced after April 25, 1940, and which use fuel having a flashpoint of 110°F, or less, shall have at least two ventilator ducts, fitted with cowls or their equivalent, for the efficient removal of explosive or flammable gases from the bilges of every engine and fuel tank compartment. There shall be at least one exhaust duct installed so as to extend from the open atmosphere to the lower portion of the bilge and at least one intake duct installed so as to extend to appoint at least midway to the bilge or at least below the level of the carburetor air intake. The cowls shall be located and trimmed for maximum effectiveness and in such a manner so as to prevent displaced fumes from being recirculated.

(d) Boats as defined in the Federal Boat Safety Act of 1971 built after July 31, 1980 or which are in compliance with 33 CFR Part 183 are excepted from these requirements.

(e) Boats, as defined in the Federal Boat Safety Act of 1971, built after July 31, 1978 are excepted from the requirements of paragraph (a) for fuel tank compartments that—

(1) Contain a permanently installed fuel tank if each electrical component is ignition protected in accordance with 33 CFR 183.410(a); and

(2) Contain fuel tanks that vent to the outside of the boat.

(46 U.S.C. 526j, 1454, 1455; 49 CFR 1.46(b), (n)(1).)

Dated: December 10, 1979.

J. B. Hayes,

Admiral, U.S. Coast Guard Commandant.

[FR Doc. 79-38641 Filed 12-14-79; 8:45 am]

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46 CFR Parts 160 and 161**[CGD 76-183a]****Specifications: Visual Distress Signals for Boats****AGENCY:** Coast Guard, DOT.**ACTION:** Final Rule.

SUMMARY: The Coast Guard is adding specifications for red aerial pyrotechnic flares, electric distress lights, and distress flags to these parts. This rule sets forth specifications for distress signals which are not presently subject to Coast Guard approval. These specifications will assure that safe and reliable signals are available to the boater who must comply with requirements to carry visual distress signals published elsewhere in this issue of the *Federal Register*.

EFFECTIVE DATE: This regulation is effective on June 17, 1980, however, affected persons may voluntarily comply at the date of publication.

FOR FURTHER INFORMATION CONTACT: LCDR H. F. Schmecht, Office of Boating Safety (G-BLC-3/TP42), Room 4308, Department of Transportation, Coast Guard Headquarters, Washington, D.C. 20593, 202-426-4177.

SUPPLEMENTARY INFORMATION: A Notice of Proposed Rulemaking was published in the *Federal Register* of October 23, 1978 (43 FR 49451). Comments were solicited with a closing date on the comment period of December 22, 1978. A public meeting was held on November 28, 1978, at the request of the Pyrotechnic Signal Manufacturers Association, Inc., and a tape recording of that meeting is available for examination at the Marine Safety Council, (G-CMC/TP24), Room 2418, Department of Transportation, Coast Guard Headquarters, Washington, D.C. 20591. This rule is being published concurrently with a new signal requirement for boaters (CGD 76-183), changes to specifications for those signaling devices currently approved (CGD 76-048a and 048b) and changes to approval procedures (CGD 76-048). These documents are published in this issue of the *Federal Register*. The National Boating Safety Advisory Council has been consulted and its opinions and advice have been considered in the formulation of this rule. The transcripts of the proceedings of the meetings of the National Boating Safety Advisory Council at which this rule was discussed are available for examination in Room 4224, U.S. Coast Guard Headquarters, Trans Point Building, 2100 Second Street, S.W., Washington, D.C. The minutes of the

meetings are available from the Executive Director, National Boating Safety Advisory Council, c/o Commandant (G-BA/TP42), U.S. Coast Guard, Washington, D.C. 20591. The *Accelerated Weathering Test* for the distress flag (§ 160.072-5) and the *Intensity Requirements* for the electric distress light (§ 161.013-5) have been changed since proposed. The reasons for those changes are discussed in this rule under the heading "Discussion of the Major Comments". Because these sections are part of a regulatory project involving five separate dockets, the Coast Guard finds that providing further notice and opportunity to comment on these changes is contrary to the public interest. However, interested persons are invited to submit comments on these two provisions. Changes to these provisions may be made in light of comments received. Comments, citing docket CGD 76-183a, should be addressed to Commandant (G-CMC/TP24), U.S. Coast Guard, Washington, D.C. 20593.

Drafting Information

The principal persons involved in the drafting of this rulemaking are: Mr. D. R. Gauthier, Project Manager, Office of Boating Safety; LT. J. T. Orchard, Project Attorney, Office of the Chief Counsel.

Discussion of Major Comments

Fifteen written comments were received. Fourteen were from industry representatives, several of which provided extensive, detailed comment on the rule.

Red Aerial Pyrotechnic Flare

Several commenters suggested that the proposed prohibition on the use of black powder in the propulsion chain be deleted. They argued that black powder serves a unique function in the manufacture, design and use of pyrotechnics. Given the size constraints on aerial pyrotechnics, there is no substitute fuel which could propel the pyrotechnic candle to the needed heights. Used properly by the manufacturer, black powder poses no safety concern to the user or carrier. The Coast Guard finds that there have been no hazards associated with the black powder in the amount and configuration as used in the currently approved aerial pyrotechnics for which there is no black powder restriction. Further, production testing and design specifications will insure the safety of the device. The Coast Guard has therefore agreed to delete the prohibition.

Several pyrotechnic manufacturers requested that maximum lot size be set at something greater than 10,000 units.

The Coast Guard selected 10,000 units to allow greater flexibility than existing restrictions on lot size for approved devices. The Coast Guard agrees to increase maximum lot size to 30,000 units to allow greater flexibility to the manufacturer in setting lot sizes suitable to his own production needs. To insure that new lots are begun when changes affecting the performance of the devices are made the Coast Guard will maintain the requirement that new lots begin with any changes in construction details, raw materials, or production line. Changes in raw materials means changes in type of material or source of supply for the material. Different shipments of the same material from the same supplier is not a change in raw materials. All devices within a lot should be manufactured with minimal change in construction details.

The Coast Guard feels that there must be a ceiling on lot size in order to reduce inadvertent variables from handling during manufacture. The Coast Guard therefore rejects one suggestion that a new lot be started after a week's production with no limit on lot size.

One manufacturer suggested a minimum 5 second burn time in lieu of the proposed 6 second burn time. The commenter argued that a 6 second minimum burn time effectively rules out 12 gauge pistol fired meteors because not enough space is available within a cartridge to pack sufficient material for the burn to be a consistent six second minimum. The manufacturer did state that these meteors could meet the 1,000 candle-minute criterion. The Coast Guard has no desire to rule out the pistol fired meteor and so has adjusted the burn time but retained the minimum 1000 candle minutes of burn. The minimum burn time is set at 5.5 seconds. The Coast Guard expects that the average burn time will be about 6 seconds.

One manufacturer suggested that the light measuring equipment and procedures be standardized. The Coast Guard concurs and has added specifications for the minimum chart sweep and chart speed of the light measuring equipment.

The Coast Guard has also deleted the first and last seconds of burn time in measuring luminous intensity. This eliminates the low points in intensity at the beginning of the burn as the intensity rises to its peak and the last second of burn as the candle disintegrates. Although this in effect reduces the intensity required by the proposal, the effectiveness of the signal is not diminished from that intended.

Several commenters found the procedures for extended dating in

160.066-10(a) to be burdensome and of little practical value and suggested that a simple 42 or 48 month dating be used. The tightly controlled conditions proposed for warehousing differ greatly from conditions in the marine environment and have little practical effect on extending signal life. The Coast Guard has therefore withdrawn the warehousing requirements. To allow a full three years device life for the boater, the Coast Guard has agreed to a simple 42 months from date of manufacture as the expiration date. Normal care in shipment and storage with an appropriate marking on the shipping carton will be adequate to maintain serviceability when the signal is sold.

Two commenters asked that rejected lots be allowed to be reworked and retested. The Coast Guard has accepted this suggestion because any reworked lot would still be required to pass the production testing requirements before being approved. The boater will have the same assurances that would exist for a lot which had not been reworked. The manufacturer will be required to maintain records of all rework performed and the results of the second test.

Orange Flag

The Coast Guard proposed that flags be Indian orange in color. Indian orange is similar to International orange and is the color used in Coast Guard approved life jackets. Several commenters suggested fluorescent orange as a more visible color. The Coast Guard agrees with these comments, however, it finds that any bright red-orange color meets the minimum requirements for visibility and recognizability. The term fluorescent orange, like Indian or International orange, is more restrictive than need be. The color is therefore specified as being a bright red-orange.

Every flag or cloth manufacturer submitting a comment described the weathering test in § 160.072-5 as impractical and too stringent as written. Only very heavy materials such as vinyl coated nylon could pass. This test is based on that used for Coast Guard approved lifeboat covers and the point is well taken that the requirements for these two materials are quite different. Also, there were substantial ambiguities in the test procedures, such as the manner in which the flag is suspended and characteristics of the water and air blasts. The Coast Guard has considered these comments and rewritten the test to address failure both while being stored in the marine environment and while in use in adverse weather.

Electric Distress Light

As discussed in the preamble to CGD 76-183, published elsewhere in this issue of the **Federal Register**, in consideration of several comments on the proposed distress signal carriage requirement the Coast Guard has decided to accept only automatically keyed S-O-S lights. Many of the modifications to the proposed specifications for electric distress lights are because of that change.

Because of the change to an automatic signalling light the Coast Guard has found it necessary to define the intensity requirement in terms of the Equivalent Fixed Intensity (EFI) of the light. The EFI is the intensity of the light corrected for the length of the shortest flash. The minimum contact closure time of $\frac{1}{2}$ second required for the S-O-S signal results in a change in measured intensity. The light as now described is the same as that originally intended although the manner in which the light is described has changed.

Several commenters have noted that the regulation does not specify batteries but rather directs the manufacturer to provide the consumer with the information needed in order to replace the battery and a warning that batteries are most effective when they have not passed the expiration date. These commenters have pointed out that the lantern is only as reliable as its power source, and, while we go to great lengths in setting specifications for the lantern, we provide no specifications for the battery which powers the lantern. Water activated and rechargeable batteries are allowed and pose few problems. Dry cell batteries, the most common by far in lanterns, present several problems beyond the control of either the Coast Guard or the light manufacturer. The battery is perishable and is affected by temperature, humidity, and use.

Requiring batteries to be date stamped would not solve those problems. Nor is there sufficient marketing incentive to encourage battery manufacturers to comply with such a requirement because batteries required to power the lanterns that will be certified under this regulation would form a very small part of the battery manufacturer's market. Consumer activism may result in open dated batteries within the next five years but even then the date is not a reliable indication of effectiveness.

Charge indicators are neither reliable nor accurate in the battery range discussed here without adding about two dollars to the consumer cost of the lantern.

Also, different light designs have different battery requirements. A light

with a low amperage draw and a very efficient lens may be able to perform satisfactorily with what for another lantern would be an inadequate battery.

In view of the many potential variables in light design, the Coast Guard has not been able to develop practical standards for lantern batteries. Therefore, the Coast Guard requires the manufacturer to advise the consumer on the battery replacement needs in order to provide the consumer with the information necessary to assure performance. Even if standards for batteries could be developed, the responsibility would nevertheless fall to the operator to replace or charge the battery as needed.

One manufacturer noted that the intensity requirements of § 161.013-5 required that a lantern which operated on both directional beam and all-around light meet the minimum requirements for both modes. The Coast Guard agrees with the manufacturer's contention that the light should be required to meet the minimum requirements for either type beam but not for both. It was never intended that it would have to meet both. A new paragraph has been added to § 161.013-5 to clarify the intent.

One light manufacturer argues that the requirement in proposed § 161.013-3 that a light be tested after submersion in water for 72 hours is excessive considering the intended use for the light. The Coast Guard disagrees. A high degree of watertight integrity is needed to prolong battery life in the marine environment.

Evaluation

This final rule has been reviewed under Department of Transportation Regulatory Policies and Procedures published February 26, 1979 (44 FR 11034). A final evaluation has been prepared and is available for inspection at the Marine Safety Council (G-CMC/TP24), Room 2418, Department of Transportation, Coast Guard Headquarters, Washington, D.C. 20591. The Coast Guard has determined that this final rule is not a significant regulation.

These devices may be used in satisfying new signal requirements which will affect about two million boaters. Using these devices a boater could comply with that requirement for about \$3.50 per year. A more detailed discussion of the cost of this regulation is contained in CGD 76-183 which is also published in this issue of the **Federal Register**.

In consideration of the foregoing, Title 46, Code of Federal Regulations, Subchapter Q, is amended by adding

subparts 160.066, 160.072, and 161.013, to read as follows:

PART 160—LIFESAVING EQUIPMENT

Subpart 160.066—Distress Signal for Boats, Red Aerial Pyrotechnic Flare

Sec.

- 160.066-1 Type.
- 160.066-5 Design, construction and manufacturing requirements.
- 160.066-7 Performance requirements.
- 160.066-9 Labeling.
- 160.066-10 Expiration date.
- 160.066-11 Approval procedures.
- 160.066-12 Operational tests.
- 160.066-13 Technical tests.
- 160.066-14 Production testing.
- 160.066-18 Listed Independent Laboratories.

Authority: Section 5, 85 Stat. 215 as amended, 46 U.S.C. 1454; 49 CFR 1.46(n)(1).

§ 160.066-1 Type.

(a) Red aerial pyrotechnic distress signals specified by this subpart must be either self-contained or pistol launched, and either meteor or parachute assisted type.

§ 160.066-5 Design, construction, and manufacturing requirements.

- (a) Each signal must be either:
 - (1) a self-contained unit with all necessary components for firing the signal, or
 - (2) a cartridge intended for firing from a signal pistol that is approved under Subpart 160.028 of this chapter.
- (b) Each signal unit must have an interior chamber which contains the main propulsion charge and which is constructed so that it is capable of withstanding the forces generated by ignition without rupture, crack, or deformation of any kind.
- (c) Signals must be constructed in lots numbered serially by the manufacturer. A new lot must be started when:
 - (1) any change in construction details occurs;
 - (2) any change in sources of raw materials occurs;
 - (3) production is started on a new production line or on a previously discontinued production line; or
 - (4) a lot exceeds 30,000 units.

§ 160.066-7 Performance requirements

- (a) Each signal must:
 - (1) Burn "vivid red" when tested as specified in § 160.021-4(d)(7) for at least 5.5 seconds.
 - (2) Have a peak luminous intensity of at least 10,000 candela.
 - (3) Burn a total of not less than 1,000 candleminutes (Cm) using the formula $I \times T = Cm$ where:

I = the luminous intensity measured as in subsection (c);

T = the total burn time of the device in minutes; and

Cm = the candle-minute rating of the device.

(4) Burn out completely before falling back to the level of launch.

(5) Function in a manner that would not cause burns or injury to an unprotected person firing the signal in accordance with the manufacturer's instructions.

(6) Not malfunction in a manner that would cause burns or injury to an unprotected person firing the signal in accordance with the manufacturer's instructions.

(b) Each signal must meet the requirements of paragraph (a) after:

- (1) submersion in water for 24 hours, or
- (2) if protected by a sealed container, submersion in water for 24 hours inside the sealed container immediately followed by submersion for 10 minutes without the container, and
- (3) being exposed to the Elevated Temperature, Humidity, and Storage Test in § 160.066-13(b).

(c) Testing for burn time and luminous intensity pursuant to paragraphs (a)(1) and (a)(2), respectively, shall be conducted in conformity with the following requirements and procedures:

- (1) The chart speed of the light measuring equipment shall not be slower than 5 seconds per inch;
- (2) The chart sweep of the light measuring equipment shall not be slower than .5 seconds for full scale;
- (3) The first and last seconds of the burn shall be eliminated in measuring luminous intensity;
- (4) The time during which the candle burns (excluding first and last seconds of burn) is to be used to determine the luminous intensity by averaging the readings taken during the burning; and
- (5) Burn time is to be measured from first light of the signal to dark.

§ 160.066-9 Labeling.

- (a) Each signal must be legibly and indelibly marked with the following information:
 - (1) the manufacturer's name,
 - (2) the designed burning time of the pyrotechnic candle(s),
 - (3) the specific signal pistol for which the signal is designed, if any,
 - (4) the lot number,
 - (5) the Coast Guard approval number,
 - (6) operation and storage instructions,
 - (7) the month and year of expiration determined by § 160.066-10, and
 - (8) the words: "Aerial Flare. Acceptable as a Day and Night Visual Distress Signal for boats as required by 33 CFR 175.110. For Emergency Use Only".

(b) If the signal is too small to contain all of the information required by paragraph (a) and any labeling which may be required by paragraph (d), the information required by subparagraphs (a) (2), (6), and (8) may be printed on a separate piece of paper packed with each signal or with the smallest container in which several signals are packed.

(c) The largest carton or box in which the manufacturer ships signals must be marked with the following or equivalent words: "Keep under cover in a dry place."

(d) Compliance with the labeling requirements of this section does not relieve the manufacturer of the responsibility of complying with the label requirements of the Federal Hazardous Substances Act, 15 USC 1263.

§ 160.066-10 Expiration date.

Each approved signal must have an expiration date marked on it. That date must not be more than forty-two months from date of manufacture.

§ 160.066-11 Approval procedures.

- (a) Red aerial pyrotechnic flare distress signals are approved under the procedures of subpart 159.005 of this chapter.
- (b) The manufacturer must produce a lot of at least 100 signals from which samples for approval testing must be drawn. Approval testing must be conducted in accordance with the operational tests in § 160.066-12 and the technical tests in § 160.066-13. In order for the signal to be approved, the samples must pass both the operational and the technical tests.
- (c) The approval tests must be performed by an independent laboratory accepted by the Commandant under § 159.010 of this chapter. A list of independent laboratories accepted by the Commandant is in § 160.066-18.

§ 160.066-12 Operational tests.

- (a) The procedure for conducting operational tests is described in figure (1).
 - (1) An "accept lot" decision must be reached in order to pass the operational tests.
 - (2) If a "reject lot" decision is reached, the entire lot is rejected.
 - (3) Signals from "reject lots" may be reworked by the manufacturer to correct the deficiency for which they were rejected and be resubmitted for inspection. Records shall be kept of the reasons for rejection, the reworking performed on the "reject lot", and the result of the second test. Signals from "reject lots" may not, unless

subsequently accepted, be sold or offered for sale as being in compliance with this specification.

(b) Each signal selected for the operational tests must be conditioned by:

(1) being submerged under at least 25 mm (1 in.) of water for 24 hours without any protection other than its waterproofing; or

(2) if waterproofing is provided by a sealed plastic bag or other waterproof packaging, submersion under 25 mm (1 in.) of water for 24 hours in the packaging, followed immediately by submersion under 25 mm (1 in.) of water for 10 minutes with the signal removed from the packaging.

(c) After each signal selected has undergone the conditioning required by paragraph (b) of this section it must be fired as described by the manufacturer's operating instructions. The following data as observed must be recorded for each signal:

(1) burning time of the pyrotechnic candle;

(2) color;

(3) whether the pyrotechnic candle burns out above, at, or below the level of launch.

(d) A signal fails the operational tests if:

(1) it fails to fire,

(2) the pyrotechnic candle fails to ignite,

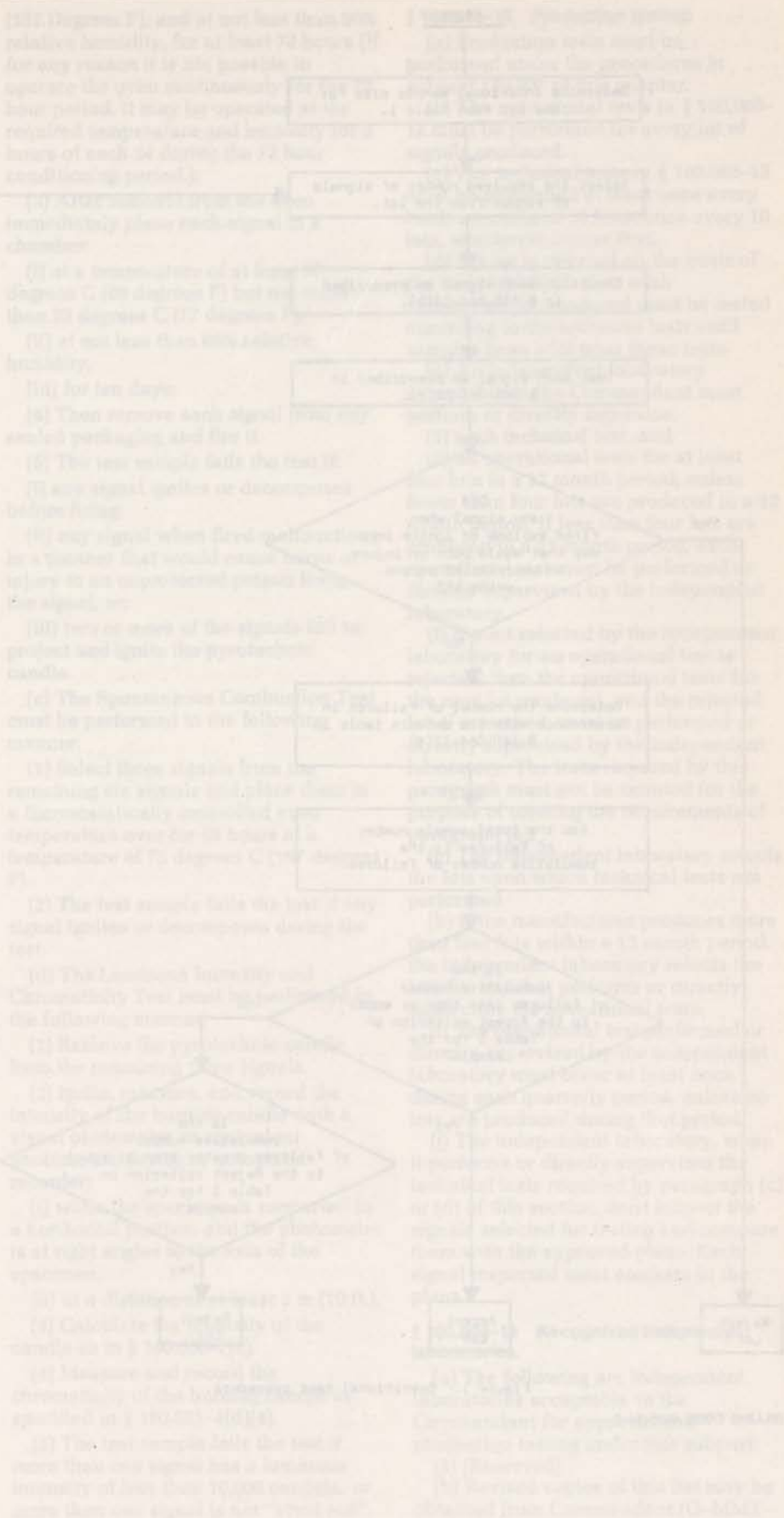
(3) the pyrotechnic candle continues to burn after it falls back to the level of launch,

(4) the observed color is other than vivid red, or

(5) the burning time is less than 5.5 seconds.

(e) A lot is rejected if a "reject lot" decision is reached using Figure (1) and Table 1 after completion of the operational tests.

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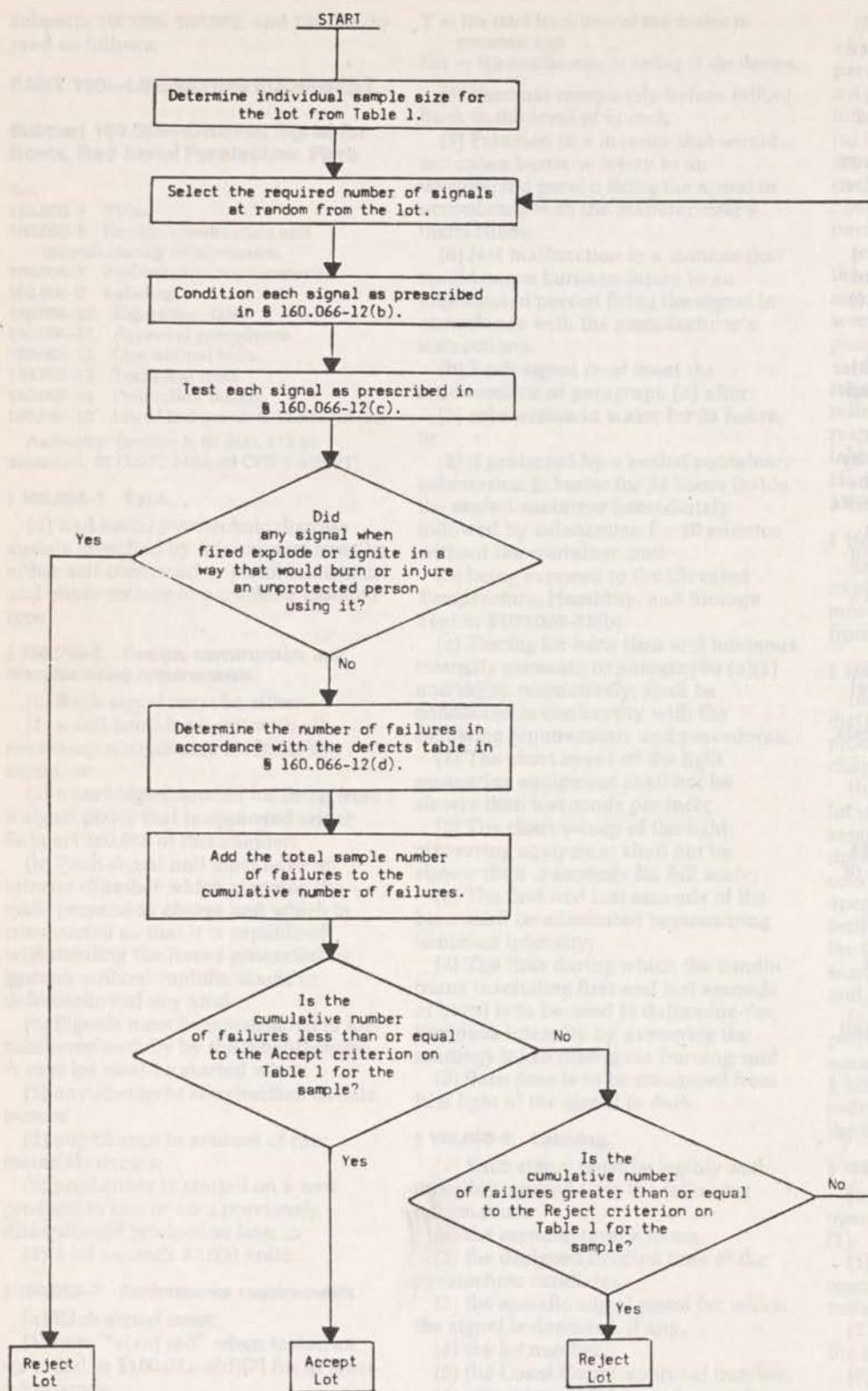


Figure 1. Operational test procedure.

Table 1.—Accept and Reject Criteria for Operational Test Lots

Lot size	Individual sample size	Sample size	Cumulative sample size	Accept ¹	Reject ²
260 or less.....	8	First.....	8	(?)	4
		Second.....	16	1	5
		Third.....	24	2	6
		Fourth.....	32	3	7
		Fifth.....	40	5	8
		Sixth.....	48	7	9
		Seventh.....	56	9	10
261 to 500.....	13	First.....	13	(?)	4
		Second.....	26	1	6
		Third.....	39	3	8
		Fourth.....	52	5	10
		Fifth.....	65	7	11
		Sixth.....	78	10	12
		Seventh.....	91	13	14
501 to 1,200.....	20	First.....	20	(?)	5
		Second.....	40	3	8
		Third.....	60	6	10
		Fourth.....	80	8	13
		Fifth.....	100	11	15
		Sixth.....	120	14	17
		Seventh.....	140	18	19
1,201 to 3,200....	32	First.....	32	1	7
		Second.....	64	4	10
		Third.....	96	8	13
		Fourth.....	128	12	17
		Fifth.....	160	17	20
		Sixth.....	192	21	23
		Seventh.....	224	25	26
More than 3,200	50	First.....	50	2	9
		Second.....	100	7	14
		Third.....	150	13	19
		Fourth.....	200	19	25
		Fifth.....	250	25	29
		Sixth.....	300	31	33
		Seventh.....	350	37	38

¹ Cumulative number of failures.² Lot may not be accepted. Next sample must be tested.**§ 160.066-13 Technical tests.**

(a) The following conditions apply to technical tests as described in this section:

(1) a total of nine signals must be selected at random from the lot being tested;

(2) if the signals are protected by sealed packaging, then the conditioning for the technical tests must be conducted with the signal in the sealed packaging;

(3) if signals in the test sample fail to pass one of the technical tests, the entire lot is rejected;

(4) Signals from "reject lots" may be reworked by the manufacturer to correct the deficiency for which they were rejected and be resubmitted for inspection. Records shall be kept of the reasons for rejection, the reworking performed on the "reject lot", and the result of the second test. Signals from "reject lots" may not, unless subsequently accepted, be sold or offered for sale as being in compliance with this specification.

(b) The Elevated Temperature, Humidity, and Storage Test must be conducted in the following manner:

(1) Select three signals from the nine;

(2) Place each signal in a thermostatically controlled even-temperature oven held at 55 Degrees C

(131 Degrees F), and at not less than 90% relative humidity, for at least 72 hours (If for any reason it is not possible to operate the oven continuously for the 72 hour period, it may be operated at the required temperature and humidity for 8 hours of each 24 during the 72 hour conditioning period.);

(3) After removal from the oven immediately place each signal in a chamber:

(i) at a temperature of at least 20 degrees C (68 degrees F) but not more than 25 degrees C (77 degrees F),

(ii) at not less than 65% relative humidity;

(iii) for ten days;

(4) Then remove each signal from any sealed packaging and fire it.

(5) The test sample fails the test if:

(i) any signal ignites or decomposes before firing;

(ii) any signal when fired malfunctions in a manner that would cause burns or injury to an unprotected person firing the signal, or;

(iii) two or more of the signals fail to project and ignite the pyrotechnic candle.

(c) The Spontaneous Combustion Test must be performed in the following manner:

(1) Select three signals from the remaining six signals and place them in a thermostatically controlled even temperature over for 48 hours at a temperature of 75 degrees C (167 degrees F).

(2) The test sample fails the test if any signal ignites or decomposes during the test.

(d) The Luminous Intensity and Chromaticity Test must be performed in the following manner:

(1) Remove the pyrotechnic candle from the remaining three signals.

(2) Ignite, measure, and record the intensity of the burning candle with a visual photometer or equivalent photometric device or automatic recorder:

(i) while the specimen is supported in a horizontal position and the photometer is at right angles to the axis of the specimen,

(ii) at a distance of at least 3 m (10 ft.).

(3) Calculate the intensity of the candle as in § 160.066-7(c).

(4) Measure and record the chromaticity of the burning candle as specified in § 160.021-4(d)(4).

(5) The test sample fails the test if more than one signal has a luminous intensity of less than 10,000 candela, or more than one signal is not "vivid red".

§ 160.066-15 Production testing.

(a) Production tests must be performed under the procedures in subpart 159.007 of this chapter.

(b) The operational tests in § 160.066-12 must be performed for every lot of signals produced.

(c) The technical tests in § 160.066-13 must be performed at least once every twelve months, or at least once every 10 lots, whichever occurs first.

(d) If a lot is rejected on the basis of the technical tests, then each subsequent lot produced must be tested according to the technical tests until samples from a lot pass these tests.

(e) An independent laboratory acceptable to the Commandant must perform or directly supervise:

(1) each technical test, and

(2) all operational tests for at least four lots in a 12 month period, unless fewer than four lots are produced in a 12 month period. If less than four lots are produced in a 12 month period, each operational test must be performed or directly supervised by the independent laboratory.

(f) If a lot selected by the independent laboratory for an operational test is rejected, then the operational tests for the next lot produced, and the rejected lot, if reworked, must be performed or directly supervised by the independent laboratory. The tests required by this paragraph must not be counted for the purpose of meeting the requirements of paragraph (e).

(g) The independent laboratory selects the lots upon which technical tests are performed.

(h) If the manufacturer produces more than four lots within a 12 month period, the independent laboratory selects the lots for which it performs or directly supervises the operational tests.

(i) The operational test performed or directly supervised by the independent laboratory must occur at least once during each quarterly period, unless no lots are produced during that period.

(j) The independent laboratory, when it performs or directly supervises the technical tests required by paragraph (c) or (d) of this section, must inspect the signals selected for testing and compare them with the approved plans. Each signal inspected must conform to the plans.

§ 160.066-18 Recognized independent laboratories.

(a) The following are independent laboratories acceptable to the Commandant for approval and production testing under this subpart:

(1) [Reserved]

(b) Revised copies of this list may be obtained from Commandant (G-MMT-)

3/TP42), U.S. Coast Guard
Headquarters, Washington, D.C. 20593.

Subpart 160.072—Distress Signals for Boats, Orange Flag

Sec.

160.072-1 Applicability.

160.072-3 General performance requirements.

160.072-5 Accelerated weathering test.

160.072-7 Manufacturer certification and labeling.

160.072-9 Manufacturer notification.

Authority: Section 5, 85 Stat. 215 as amended, 46 USC 1454; 49 CFR 1.46(n)(1).

§ 160.072-1 Applicability.

(a) This subpart establishes standards for distress flags for boats.

§ 160.072-3 General performance requirements.

(a) Each flag must:

(1) be a square or rectangle at least 90 cm (36 inches) wide and at least 90 cm (36 inches) long. If the flag is a rectangle, the shorter side cannot be less than $\frac{2}{3}$ the length of the longer side;

(2) have no less than 70% of the total area colored a bright red-orange color;

(3) display a black disc and a black square on the red-orange background on both sides arranged as follows:

(i) The diameter of the disc and the length of one side of the square shall be equal, and shall each be $\frac{1}{3}$ of the length of the longest side of the flag, or 30 cm (12 inches), whichever is greater.

(ii) The disc and square must be centered on one axis of the flag parallel to the longest side of the flag as shown in Figure 160.072-3. If the flag is a square, the axis may be parallel to any side.

(iii) The disc and square shall be separated by a distance of $\frac{1}{3}$ the length of the longest side of the flag or 15 cm (6 inches), whichever is greater.

(4) be capable of passing the accelerated weathering test of § 160.072-5;

(5) have reinforced corners, each with a grommet; and,

(6) be packaged with 4 pieces of line, with a tensile strength of at least 225 N (Newtons) (50 lbs) no less than 30 cm (12 inches) long, capable of passing through the grommets freely.

§ 160.072-5 Accelerated weathering test.

(a) Condition the flag, folded to $\frac{1}{16}$ th its size or as packaged, whichever is smaller, by submersion in 5% by weight sodium chloride solution for 2 hours followed immediately by storage at 95% (± 5) related humidity and 40°C ($\pm 3^\circ$) (100°F $\pm 5^\circ$) for at least 15 days.

(b) Unfold and suspend flag by the lines provided, secured through each grommet.

(c) Subject the flag to alternate 3 minute cycles of 5% by weight sodium chloride solution at 55 degrees ($\pm 5^\circ$) C and air blasts of 40 knots at 55 degrees ($\pm 5^\circ$) C, perpendicular to and over the entire surface of one side of the flag, without interruption for a period of not less than 24 hours.

(d) The flag fails the accelerated weathering test if

(1) after conditioning, the flag cannot be unfolded without damage,

(2) there is any tearing,

(3) the flag does not retain its bright red/orange color,

(4) the disc and square images no longer meet the requirements of

§ 160.072-3(a)(3) or,

(5) there is any visible rot over more than 3% of the flag's surface.

§ 160.072-7 Manufacturer certification and labeling.

(a) Each distress flag intended as a Day Visual Distress Signal required by 33 CFR Part 175 must be certified by the manufacturer as complying with the requirements of this subpart.

(b) Each distress flag must be legibly and indelibly marked with:

(1) the manufacturer's name; and

(2) the following words—

"Day Visual Distress Signal for Boats. Complies with U.S. Coast Guard Requirements in 46 CFR 160.072. For Emergency Use Only".

§ 160.072-9 Manufacturer notification.

(a) Each manufacturer certifying flags in accordance with the specifications of this subpart must send written notice to the Commandant (G-BBT/TP42), U.S. Coast Guard, Washington, D.C. 20591—

(1) within 30 days after first certifying a flag,

(2) every five years as long as the manufacturer continues to produce flags, and

(3) each time the design or construction material of the flag changes.

Subpart 161.013—Electric Distress Light for Boats

Sec.

161.013-1 Applicability.

161.013-3 General performance requirements.

161.013-5 Intensity requirements.

161.013-7 Signal requirements.

161.013-9 Independent power source.

161.013-11 Prototype test.

161.013-13 Manufacturer certification and labeling.

161.013-15 Manufacturer notification.

Authority: Section 5, 85 Stat. 215 as amended, 46 USC 1454; 49 CFR 1.46(n)(1).

§ 161.013-1 Applicability.

(a) This subpart establishes standards for electric distress lights for boats.

§ 161.013-3 General performance requirements.

(a) Each electric light must:

(1) Emit a white light which meets the intensity requirements of § 161.013-5;

(2) Be capable of automatic signaling in a manner which meets the requirements of § 161.013-7;

(3) Contain an independent power source which meets the requirements of § 161.013-9;

(4) Float in fresh water with the lens surface at or above the surface of the water;

(5) Be equipped with a waterproof switch; and

(6) Meet the requirement of subparagraphs (a) (1) through (4) of this section after floating for at least 72 hours followed by submersion in 5% by weight sodium chloride solution for at least 2 hours.

(b) The electric light may not be equipped with a switch mechanism which permits continuous display of a beam of light except that the light may be equipped with a switch which returns to the off position when pressure is released.

§ 161.013-5 Intensity requirements.

(a) If an electric light emits light over an arc of the horizon of 360 degrees, the light must:

(1) When level, have a peak intensity within 0.1 degrees of the horizontal plane;

(2) Have a peak Equivalent Fixed Intensity of at least 75 cd; and,

(3) Have a minimum Equivalent Fixed Intensity within a vertical divergence of ± 3 degrees of at least 15 cd.

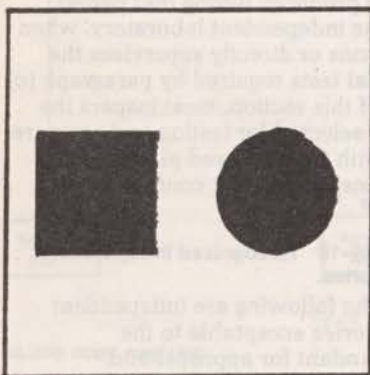


Figure 160.072-3

(b) If an electric light emits a directional beam of light, the light must:

(1) Have an Equivalent Fixed Intensity of no less than 25 cd within ± 4 degrees vertical and ± 4 degrees horizontal divergence centered about the peak intensity; and,

(2) Have a minimum peak Equivalent Fixed Intensity of 2,500 cd.

(c) The Equivalent Fixed Intensity (EFI) is the intensity of the light corrected for the length of the flash and is determined by the formula:

$$EFI = I \times (t_c - t_i) / 0.2 + (t_c - t_i)$$

Where:

I is the measured intensity of the fixed beam,
 t_c is the contact closure time in seconds, (0.33 for this S-O-S signal), and
 t_i is the incandescence time of the lamp in seconds.

(d) An electric light which meets the requirements of either paragraph (a) or (b) of this section need not, if capable of operating in both manners, meet the requirements of the other paragraph.

§ 161.013-7 Signal requirements.

(a) An electric light must have a flash characteristic of the International Morse Code for S-O-S and, under design conditions,

(1) Each short flash must have a duration of $\frac{1}{3}$ second;

(2) Each long flash must have a duration of 1 second;

(3) The dark period between each short flash must have a duration of $\frac{1}{3}$ second;

(4) The dark period between each long flash must have a duration of $\frac{1}{3}$ second;

(5) The dark period between each letter must have a duration of 2 seconds;

(6) The dark period between each S-O-S signal must have a duration of 3 seconds.

(b) The flash characteristics described in paragraph (a) must be produced automatically when the signal is activated.

§ 161.013-9 Independent power source.

(a) Each independent power source must be capable of powering the light so that it meets the requirements of § 161.013-3(a)(1) and emits a recognizable flash characteristic of the International Morse Code for S-O-S at a rate of between 3 and 5 times per minute after six hours of continuous display of the signal.

(b) If the independent power source is rechargeable, it must have a waterproof recharger designed for marine use.

(c) If the independent power source requires external water to form an electrolyte, it must operate in sea water and fresh water.

§ 161.013-11 Prototype test

(a) Each manufacturer must test a prototype light identical to the lights to be certified prior to the labeling required by § 161.013-13.

(b) If the prototype light fails to meet any of the general performance requirements of § 161.013-3 the lights must not be certified under this subpart.

(c) Each manufacturer must:

(1) Forward the test results within 30 days to the Commandant (G-BBT/TP42), U. S. Coast Guard, Washington, D.C. 20591; and

(2) retain records of the test results for at least 5 years, or as long as the light is manufactured and certified, whichever is longer.

§ 161.013-13 Manufacturer certification and labeling.

(a) Each electric light intended as a Night Visual Distress Signal required by 33 CFR part 175 must be certified by the manufacturer as complying with the requirements of this subpart.

(b) Each electric light must be legibly and indelibly marked with:

(1) Manufacturer's name;

(2) Replacement battery type;

(3) Lamp size; and

(4) The following words—

"Night Visual Distress Signal for Boats Complies with U. S. Coast Guard Requirements in 46 CFR 161.013. For Emergency Use Only."

(c) If an electric light is designed for use with dry cell batteries the label must advise the consumer on the battery replacement schedule which under normal conditions would maintain performance requirements of § 161.013-3.

§ 161.013-17 Manufacturer notification.

(a) Each manufacturer certifying lights in accordance with the specifications of this subpart must send written notice to the Commandant (G-BBT/TP42), U. S. Coast Guard, Washington, D.C. 20591 within 30 days after first certifying them, and send a new notice every five years thereafter as long as it certifies lights.

(46 U.S.C. 1454; 49 CFR 1.46(n)(1).)

J. B. Hayes,

Admiral, U.S. Coast Guard, Commandant.

Dated: October 30, 1979.

[FR Doc. 79-38273 Filed 12-14-79; 8:45 am]

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46 CFR Part 160

[CGD 76-048a and CGD 76-048b]

Distress Signals, Signal Pistols, and Line-Throwing Appliances; Specifications, Tests, and Inspection and Approval Procedures

AGENCY: Coast Guard, DOT.

ACTION: Final rules.

SUMMARY: These regulations contain revised specifications for pyrotechnic distress signals, signal pistols for flare-type distress signals and line throwing appliances. The revisions include amendments of the marking and labeling requirements, changes in certain design specifications for pistols intended to fire a wide range of distress flares, changes to diameter and strength requirements for service lines used in line throwing appliances, conversion of dimensions to SI (metric) units, and addition of a requirement for placing the service life expiration date on pyrotechnic signal markings. The amendments are necessary to incorporate new inspection and approval procedures, to change marking requirements to reflect these new procedures, and to inform the consumer of the storage life of pyrotechnic signals.

The revisions also place the responsibility for conducting factory inspections on the equipment manufacturer. This will free some of the Coast Guard's field personnel for other duties while still providing sufficient inspection to assure the quality of the product.

The revised regulations should be considered in conjunction with the visual distress signal rules for boats (CGD 76-183 and CGD 76-183a) that appear elsewhere in this issue of the *Federal Register*. The revised regulations should also be considered in conjunction with the test, inspection and approval procedure rules (CGD 76-048) that appear elsewhere in this issue of the *Federal Register*.

EFFECTIVE DATE: These amendments become effective on January 17, 1980.

FOR FURTHER INFORMATION CONTACT: Mr. Robert Markle, Office of Merchant Marine Safety (G-MMT-3/TP12), Room 1210, Department of Transportation, U.S. Coast Guard Headquarters, Washington, D.C. 20593 (202-426-1444).

SUPPLEMENTARY INFORMATION: On October 23, 1978, the Coast Guard published two notices of proposed rulemaking in the *Federal Register* for these regulations (43 FR 49445 and 43 FR 49447). Four comments were received on the proposed regulations before the comment period closed on December 22,

1978. These are discussed in greater detail in subsequent paragraphs. The Coast Guard has combined the contents of the two separate proposals into a single final notice since they both pertained to the same regulations, and prompted such extensive changes that it was found necessary to republish the affected regulations in their entirety.

Summary of Final Evaluation

A final evaluation has been prepared for these regulations in accordance with the Department of Transportation's Regulatory Policies and Procedures published in the **Federal Register** on February 26, 1979 (44 FR 11034). That document requires that the evaluation quantify, to the extent practicable, the estimated cost of the regulations to the private sector, consumers, and Federal, State and local governments, as well as the anticipated benefits and impact of the regulations.

The principal costs to pyrotechnic manufacturers will be those related to obtaining an independent laboratory to witness or perform initial tests required for Coast Guard approval as well as periodic production tests. As discussed in the final evaluation, these costs would amount to approximately \$120,000 per year. This amount greatly exceeds the present cost to the Coast Guard for performing inspections and tests on pyrotechnic devices, as it assumes that the independent laboratories must incur travel costs for their personnel, an expense which the Coast Guard is able to minimize by relying on inspectors from its various field offices.

It is anticipated that manufacturers will pass the costs of inspections to the purchasers of the equipment, and that these costs will ultimately be borne by consumers and recipients of marine products and services. The Coast Guard is presently performing inspections and tests at public expense. One of the effects of this change in procedure is that the manufacturer of the equipment and ultimately the users of marine products and services will bear the expense of performing these inspections and tests, rather than the general taxpayer. This is identified as one of the principal benefits of these regulations.

Another benefit is that the Coast Guard will be able to make more efficient use of its own resources. The Coast Guard's inspection responsibilities have increased in recent years and will continue to increase because of new laws and regulations in the environmental protection and occupational safety areas. The use of independent laboratories for performance of inspection will enable

the Coast Guard to avoid some of the increases in budget and personnel that would otherwise be necessary.

The final evaluation has been included in the public docket for this rulemaking, and may be obtained from the Marine Safety Council (G-CMC/TP24), Room 2418, Department of Transportation, U.S. Coast Guard Headquarters, Washington, D.C. 20593. (202) 755-4901.

Drafting Information

The principal persons involved in drafting these regulations are: Mr. Robert Markle, Office of Merchant Marine Safety, and Mr. Coleman Sachs, Office of the Chief Counsel.

Discussion of the Regulations

These regulations amend the following subparts of Title 46 of the Code of Federal Regulations:

Subpart 160.021—Hand Red Flare Distress Signals

Subpart 160.022—Floating Orange Smoke Distress Signals (5 minutes)

Subpart 160.023—Hand Combination Flare and Smoke Distress Signals

Subpart 160.024—Pistol-Projected Parachute Red Flare Distress Signals

Subpart 160.026—Signal Pistols for Red Flare Distress Signals

Subpart 160.031—Line-Throwing Appliance, Shoulder Gun Type (and Equipment)

Subpart 160.036—Hand-held Rocket-Propelled Parachute Red Flare Distress Signals

Subpart 160.037—Hand Orange Smoke Distress Signals

Subpart 160.040—Line-Throwing Appliance, Impulse-Projected Rocket Type (and Equipment)

Subpart 160.057—Floating Orange Smoke Distress Signals (15 minutes)

The amendments to the regulations include the following primary changes:

a. The procedures by which the manufacturer obtains approval and conducts production inspections and tests are those in new Part 159 of Title 46 of the Code of Federal Regulations published elsewhere in this issue of the **Federal Register**. These replace previous procedures whereby Coast Guard marine inspectors witnessed approval and production tests at the

manufacturer's facilities (e.g. § 160.021-4).

b. Operational tests, technical tests, and lot sampling requirements have been changed in the distress signal subparts to permit the production of larger lots of distress signals (e.g. § 160.021-4(b)).

c. The marking requirements for the distress signals have been changed to require marking of a service life expiration date (e.g. § 160.021-5 (a) and (b)).

d. A note has been added to each distress signal specification stating that compliance with the marking requirements in the subpart does not relieve the manufacturer of the responsibility to comply with the labeling requirements of the Federal Hazardous Substances Act (e.g. § 160.021-5(c)).

e. All measurements previously stated in English units have been converted to SI (metric) units with the equivalent English units noted in parentheses. English units have not been noted where SI units were already in use (e.g. § 160.021-4(d)(7)).

f. The marking requirements for the line throwing appliances have been changed to eliminate the need for USCG and Coast Guard Marine Inspection Office identification, since the Coast Guard offices will no longer be involved in production testing on a regular basis. The requirements have been deleted from § 160.031-6(a), and § 160.040-5(d) has been deleted in its entirety.

g. The signal pistol subpart has been changed to permit optional chamber and bore dimensions for pistols intended for firing signals other than those meeting Subpart 160.024. A provision that the pistol be designed to fire only a distress signal and not a conventional round of ammunition has also been added (see § 160.028-2).

h. The service line requirements for rocket type line throwing appliances have been changed to require a line with a breaking strength of at least 2,250 N (Newtons) (500 lb.) and a minimum diameter of 4 mm ($\frac{5}{32}$ in.) (see § 160.040-4(c)).

i. The marking requirements for floating orange smoke signals have been changed to require addition of the words "Approved for daytime use only" (see § 160.022-5(a) and 160.057-5(a)).

In addition, several changes have been made that were not discussed in the Notice of Proposed Rulemaking. These changes are primarily editorial in nature and do not affect any of the regulation's technical requirements. The Coast Guard has therefore determined that they may be accomplished without

further notice and opportunity for public comment. The changes are as follows:

a. The words "for Merchant Vessels" have been dropped from all but one subpart heading in the distress signal regulations since their use will no longer apply exclusively to merchant vessels (See CGD 76-183 elsewhere in this issue of the **Federal Register**). The headings have also been reworded in a standard prose style, rather than with the modifiers listed after the noun.

b. Subparts 160.023, 160.024, 160.036, 160.037 all prescribed similar requirements for containers intended to house signal equipment. The use of any specific type of container has never been a factor in the approval process for signals, and this part of the specifications only provides guidance for the watertight construction and marking of containers that are used on merchant vessels. In order to shorten the regulations, the container requirements will be retained only in Subpart 160.021. Subparts 160.023, 160.024, 160.036, and 160.037 refer to the 160.021 requirements.

c. The title of the first section in each subpart has been changed from "Applicable specifications" or its equivalent to "Incorporation(s) by reference", and the contents of these sections have been changed to conform to the Office of the Federal Register's current policies on incorporation by reference as published in the **Federal Register** on March 28, 1979 (44 FR 18630). The most recent edition of each document referred to in the body of the subpart is listed in this section. Approval to incorporate the material by reference has been obtained from the Office of the Federal Register, as stated in each incorporation by reference section.

d. In comparing the specification regulations in this project to those in CGD-183a covering visual distress signals for boats, it was determined that a requirement for manufacturers to keep records on reworked and retested lots had been inadvertently omitted from this project. This matter is being rectified in these final rules.

On the effective date of these regulations, each manufacturer of approved distress signals and line throwing appliances will have to satisfy the new rules in order to have its Coast Guard approvals remain in effect. A sufficient delay in the effectuation of these rules is being provided to permit the manufacturers to make arrangements for testing with independent laboratories and to have those laboratories reviewed and accepted by the Coast Guard. Applications for approval of new distress signals meeting the amended

regulations will be accepted immediately. All current approvals for distress signals and line throwing appliances will remain in effect if independent laboratory inspections have begun on the effective date of these regulations.

Changes in technical requirements for items affected by this notice will not affect existing approvals. However, if a new hot slag test for hand held flares is introduced in a future notice, all new flares produced will have to pass the test. Although the approval for any flare that does not meet the test will be terminated, existing flares may continue to be used until their service life has expired.

Discussion of Comments—General

One commenter objected to the adaptation of merchant vessel distress signals to recreational boats, citing possible confusion that could result if the same devices were authorized for use on both types of craft. The commenter also noted differences in the capabilities and requirements of merchant seamen and recreational boaters. Implying that higher standards are used in the manufacture of merchant vessel equipment, the commenter felt that combined specifications would increase costs to recreational boaters. Additional contentions were that separate statutes apply to merchant vessels and recreational boats, requiring the issuance of separate regulations, that some of the requirements of the existing regulations are only necessary for merchant vessels and should not be applied to recreational boats, and that future modifications to the specifications would be inhibited by virtue of their dual applicability.

The Coast Guard has found no reason to prohibit the use of merchant vessel distress signals on recreational boats. Rather than creating confusion, this development is likely to eliminate confusion for the recreational boater. Other than hand held flares, any device approved for merchant vessels will be acceptable to meet recreational boating requirements. It is hoped that further development of a hot slag test procedure for hand held flares, as discussed below, will eliminate this one exception.

As distress signals do not form an integral part of a vessel's operating equipment, but are merely ejected or displayed to summon assistance in times of emergency, differences in the functional requirements of merchant vessels and recreational boats have no relevance to their use. The important consideration is the likelihood of encountering mishaps in the marine

environment. Both types of craft are never immune to these occurrences.

It is equally apparent that differences in the capabilities of merchant seamen and recreational boaters have no bearing upon the issue of authorizing the use of merchant vessel distress signals on recreational boats. The Coast Guard is aware of no special training that is given to merchant seamen on the proper use of these devices. Instructional material furnished with the signal must be relied upon by the recreational boater and the merchant seaman alike.

Costs to recreational boaters will not necessarily increase as a result of this rulemaking. Use of merchant vessel distress signals is not being required but merely allowed on recreational boats. A separate specification for less expensive devices to be used exclusively on boats is being issued in conjunction with this rule in Section 160.066 of CGD 76-183.

The separate statutory bases for regulating merchant vessels and recreational boats poses no impediment to the issuance of these regulations. Individual regulations are frequently promulgated in reliance upon more than one source of statutory authority.

The commenter cited as examples of requirements in the existing regulations which should be unique to merchant vessel devices those applying to storage containers, wooden handles on hand held flares, and ejection mechanisms on signal pistols. Each of these matters is addressed at a later point in this discussion.

In response to the commenter's final contention, the Coast Guard can conceive of no situation in which future modifications to distress signal specifications will be inhibited by virtue of its authorizing merchant vessel devices to be used on recreational boats. If it becomes apparent that merchant vessels and recreational boats have substantially different signal requirements, a new specification will be proposed.

Two commenters were concerned that the proposed amendments to the distress signal regulations would require all existing distress signals to be reapproved at great expense. As explained previously, existing approvals will not be affected by this rulemaking.

One commenter expressed the opinion that the Coast Guard should remain in the factory inspection process, at least for items produced in small quantities and those intended primarily for use on merchant vessels. As explained in the Notice of Proposed Rulemaking on CGD 76-048 (43 FR 49440, October 23, 1978), this is no longer desirable because of budgetary and manpower considerations. Furthermore, the

replacement of the Coast Guard with independent laboratories for the performance of inspections and tests will shift the cost burden from the taxpayer to the actual users of marine devices, creating a more equitable arrangement.

Another commenter suggested an alternative procedure for approval. The primary features of the program would be that the Coast Guard would initially approve the design of a product, an independent laboratory would thereupon test it for compliance with the approved design, and the manufacturer would conduct subsequent production tests with periodic spot checks by the independent laboratory. If problems were found either as a result of the independent laboratory spot checks or compliance testing of products on the market, increased tests by the independent laboratory would be required. This would place an additional cost burden on the manufacturer, thereby acting as an incentive to keep quality high. Furthermore, the Coast Guard could condition the approval of a product upon the financial responsibility of its manufacturer in order to prevent domestic markets from being flooded with products of inferior grade.

Although no changes have been made in these rules in response to this comment, the Coast Guard notes that there are a number of similarities between the suggested procedures and those which are being adopted. For instance, testing by the independent laboratory is required on no more than 4 lots per year unless lots tested by the laboratory fail the tests. In this case additional laboratory tests are required. All other production tests are the responsibility of the manufacturer (e.g. § 160.021-4(b)). The suggestion to require that the manufacturer be a financially responsible concern has not been adopted because the Coast Guard has no indication that this is a reliable indicator of product quality.

Two commenters suggested allowing production lots larger than 10,000 units for distress signals. One suggested a maximum of 30,000 units and the other suggested a maximum of one week's production, except that when this was less than 10,000 units, the lot could extend until 10,000 units were produced. The Coast Guard agrees with the suggestion to increase lot size. The basis for the sampling plan is MIL-STD-105D using the "multiple sampling plan for normal inspection" with an "AQL" (acceptable quality level) of 6.5. This sampling plan is valid for any lot size, so the upper limit of the lot size can be extended and remain statistically valid.

The suggested maximum lot size of 30,000 units has been adopted. The one week's production criterion has not been adopted since it is not considered to be relevant to lot size. The change has been made in §§ 160.021-4(b)(1), 160.022-4(b)(1), 160.024-4(b)(1), 160.036-4(b)(1), and 160.037-4(b)(1), as well as the corresponding table of accept and reject criteria for each of those sections.

One commenter suggested a change in the standards used to designate a new lot since the proposed standards could be interpreted several ways. The proposed standards required that a new lot be designated whenever any change or modification in raw materials or manufacturing methods occurs. The Coast Guard agrees that this may be interpreted in a variety of ways and should therefore be clarified. The standards in §§ 160.021-4(b)(1), 160.022-4(b)(1), 160.024-4(b)(1), 160.036-4(b)(1), 160.037-4(b)(1), and 160.057-4(b)(1), have been revised to require that a new lot be started with: (i) any change in construction details, (ii) any change in sources of raw materials, or (iii) the start of production on a new production line or on a previously discontinued production line.

One commenter expressed the opinion that the sampling plan for distress signals in the Notice of Proposed Rulemaking was unclear. The commenter stated, as an example, that the proposal did not properly identify how the test devices were to be divided among the various tests. The complete text of the revised rules which is published in this notice clearly indicates what devices are to be subjected to the various tests.

One commenter noted the apparent disparity between the elevated temperature, humidity and storage test, and the spontaneous ignition test in each of the distress signal subparts. The elevated temperature, humidity and storage test requires the signal to function properly after being subjected to 90° C temperature and 90% relative humidity for 72 hours. The spontaneous ignition test requires the signal to withstand a temperature of 75° C for 48 hours without igniting or decomposing; however, there is no requirement that it function properly at the end of the test period. The commenter suggested lowering the temperature of the elevated temperature, humidity and storage test to correspond to the temperature in the spontaneous ignition test. The Coast Guard agrees. In past studies, it has been found that the temperature in a magazine chest or in a lifeboat where the signals are kept on a ship, may rise as high as 65° C. It has been concluded

that both tests may be conducted at a temperature of 75° C with an adequate margin of safety still maintained. The spontaneous ignition test has been changed to require low humidity (less than 10% relative humidity) so that the tendency of the flare to deteriorate at high temperature is checked at both high and low humidity. The changes have been made in §§ 160.021-4(d) (5) and (6), 160.022-4(d) (3) and (4), 160.024-4(d) (2) and (3), 160.036-4(d) (2) and (3), 160.037-4(d) (4) and (5), and 160.057-4(d) (4) and (5).

Three commenters supported the proposal to extend the expiration date of the signals beyond three years, but objected to the temperature and humidity requirements for storage in order to obtain the one year extension. Furthermore, all three stated that a full year extension was not necessary in order to move signals through the distribution system to the customer. All three stated that a six month extension should be adequate for the customer to obtain a full three years of useful life from the signal. The Coast Guard agrees. There is no strong reason to compel the expiration of a signal's service life exactly three years from its date of manufacture. The Coast Guard has tested signals over 20 years old that have kept dry, and has found that they usually work well, although with some deterioration in performance. In their actual use on ships and boats, however, the signals are more likely to be damaged in storage, subjected to extremes of heat and humidity, and have their protective packaging damaged. Under such conditions, the three year "rule-of-thumb" has proved to be adequate to assure that most signals in use are in good condition. Such damage is not likely to occur when the signals are in the distribution system between the manufacturer and the customer. The requirement for controlled condition storage in order to extend the expiration date of the signals has therefore been dropped and has been replaced with a requirement for the signal shipping carton to be marked with the following or equivalent wording: "Keep under cover in a dry place". The expiration date may be no more than 42 months after the date of manufacture. The changes have been made in §§ 160.021-5(b) and (c)(3), 160.022-5(b)(3) and (c), 160.023-5(b) and (c)(2), 160.024-5(b) and (c)(3), 160.037-5(b) and (c)(3), 160.057-5(b)(3) and (c).

One commenter objected to the proposal to add a note to the specifications that would remind manufacturers of the need to comply with Consumer Product Safety

Commission markings. The commenter expressed the opinion that the rules of the Consumer Product Safety Commission do not expressly cover pyrotechnic distress signals, although they do cover fireworks. The commenter suggested direct reference to 15 U.S.C. 1263, the Federal Hazardous Substances Act. This is the same reference that was used in Subpart 160.066 in CGD 76-183a. The Coast Guard agrees. The revised note appears after the following sections of the rules: 160.021-5(c), 160.022-5(c), 160.023-5(c), 160.024-5(c), 160.028-5(a), 160.031-6(c), 160.036-5(c), 160.037-5(c), 160.040-6(b), 160.057-5(c).

One commenter objected to the container requirements in the distress signal subparts, stating that they weren't appropriate for recreational boats and therefore should not be included in specifications for devices used on both merchant vessels and recreational boats. As explained previously, these container specifications are not related to the approval of the signals. Furthermore, they clearly state that they apply to lifeboats and liferafts on merchant vessels. The Coast Guard does not believe any change is necessary as a result of this comment. It has, however, consolidated the container requirements in a single section, as discussed above. (See §§ 160.021-6, 160.023-6, 160.024-6, 160.028-6, 160.036-6, and 160.037-6.)

Comments on Hand Held Flares—Subpart 160.021

One commenter objected to the requirements in § 160.021-2(a) for the placement of wooden handles on hand-held flares. The commenter stated that wooden handles were not necessary for flares on recreational boats and therefore the specification was not appropriate for the devices intended to be used on these craft. It is self-evident that some type of handle is necessary on hand-held pyrotechnic devices; however, nothing compels that these be constructed exclusively of wood. The section referred to also contains a statement that specifically allows alternate designs that meet the performance requirements of the regulation.

A hot slag test for hand-held flares was proposed in the Notice of Proposed Rulemaking. This test would have been added as § 160.021-4(d)(8). The test has not been added as yet owing to several comments concerning its need and questions raised about its validity. The test required an ignited flare to be held 1.2m (4 ft.) above 10 layers of newsprint paper, the top layer of which is marked off in a grid. If more than half of the blocks of the grid were burned at its conclusion, the flare failed the test.

The commenters had two concerns regarding the test. In the first place, all of the presently approved flares drip some quantity of glowing slag. The commenters indicated that this had not proved to be a problem over the years in marine, highway, and railroad usage. The commenters believed that this was sufficient justification to conclude that there would also be no problems on recreational boats. The other concern was that newspaper was not a valid medium for the test, in that it does not simulate any particular material or hazardous condition that exists on recreational boats.

The Coast Guard does not agree with the contention that hot dripping slag poses no problems for recreational boats. This matter has been discussed at length by the National Boating Safety Advisory Council and has proved to be of serious concern. In light of the objections that have been raised to the hot slag test as proposed, the Coast Guard has decided to consider alternatives. Working for the Coast Guard, the National Bureau of Standards conducted a test series using several types of hand-held flares, burning them over newsprint of varying moisture content, and also burning them over heptane. Heptane is a standard test fuel used to determine octane ratings for gasoline, and is also one of the components of gasoline. As such, it represents the hazard that could be present on a boat with gasoline in the bilge. The possibility of this gasoline exploding was one of the primary concerns with the use of flares that dripped hot slag. At the conclusion of the tests, a demonstration was held at the National Bureau of Standards for a special sub-committee of the National Boating Safety Advisory Council on September 11, 1979.

There are five primary alternatives that will be available to the Coast Guard once the results of the tests and demonstration have been analyzed. One is that it will be determined that hand-held flares are potentially too dangerous to be used on recreational boats. In this case, Subpart 160.021 will remain as it is published in this Final Rule, and hand-held flares will not be permitted on recreational boats for meeting the visual distress signal requirement. A second possibility is that a surface burning test such as the newspaper version of the hot slag test will be found to be the best test for the hot slag hazard, and another final rule making will be published adding the test to Subpart 160.021. A third possibility is that the heptane hot slag test will be identified as providing the best estimate of slag hazard, in

which case, it will be added to Subpart 160.021. The fourth possibility is that both a surface burning test and a heptane test will be found to be necessary, and both will be added to Subpart 160.021. The fifth possibility is that hot slag will be found to constitute no real hazard for recreational boats, eliminating the need for any testing requirement and permitting hand-held flares to be used as part of the required visual distress signals on recreational boats. Further comments are invited on this matter. These comments should reference CGD 76-048 a and b and be sent to the Commandant (G-CMC/TP24), U.S. Coast Guard Headquarters, Washington, D.C. 20593. The use of hand-held flares on recreational boats is discussed further in docket 76-183 elsewhere in this issue of the **Federal Register**.

Comments on Signal Pistols—Subpart 160.028

One commenter indicated that the requirement in § 160.028 for signal pistols to be equipped with ejection mechanisms should not be applied to pistols designed to fire the visual distress signals for boats specified in proposed § 160.066, as found in CGD 76-183a. The commenter stated that such mechanisms were not necessary for smaller signals complying with Subpart 160.066. The Coast Guard agrees and has added a note to § 160.028-3(c) that makes that section apply only to pistols for firing merchant vessel signals meeting Subpart 160.024. This exception also includes the firing pin specifications which are appropriate only for signals meeting the design requirements of Subpart 160.024.

Comments on Smoke Signals—Subpart 160.037

One commenter suggested the addition of a specification for a 50 second floating smoke signal. The suggestion was not adopted. Specifications for a 50 second hand-held smoke signal are contained in Subpart 160.037. Section 160.037-2(a) specifically permits alternate constructions which conform to the performance requirements in the subpart. A 50 second floating smoke signal would be given special consideration under this section.

One commenter suggested that the chemical p-Nitroaniline be prohibited in smoke signals owing to its toxicity. The Coast Guard has not adopted the suggestion. Atlantic Research Corporation in a study performed for the Coast Guard in 1977 concluded that the short term exposure to p-Nitroaniline that a smoke signal operator might be

subjected to would not have any serious consequences. This conclusion is supported by the Coast Guard's experience with smoke signals that have been approved and used for over 30 years. No adverse reaction from chemical exposure has ever been reported from the use of any visual distress signal.

One commenter suggested a change in the waterproofing of igniter button test in § 160.037-4(c)(2)(ii) that would permit a signal in a can with a screw-on cap to be tested under water with the cap in place. The suggestion has not been accepted. There is no reason why a signal in a can should not be waterproof in the ready to fire condition when other signals are required to be waterproof in the same condition.

One commenter suggested that the test to determine the volume and density of smoke produced by a signal measure the total smoke output rather than the rate of smoke output, as is now required in the test procedure in § 160.037-4(d)(8). The commenter also recommended that the smoke emitting time in § 160.037-4(c)(2)(iii) be extended to 75 seconds if the total volume of smoke produced in that time was acceptable. These suggestions have not been accepted. Ordinarily, a manufacturer can adjust the composition of a smoke signal to burn faster or slower, thereby regulating the rate at which smoke is produced. Furthermore, no test procedure for a total volume of smoke test was suggested, and the Coast Guard is not aware of any such procedure that has been validated.

Comments on Line Throwing Appliance—Subpart 160.040

One commenter suggested that the strength of the service line for line throwing appliances in § 160.040-4(c) be changed from 2,250 N (500 lb.) to 2,000 N (450 lb.). This would conform to specifications for minimum service line strength for line throwing appliances now under international consideration as a revision to the Safety of Life at Sea (SOLAS) Convention. The Coast Guard has not adopted the suggestion, since all presently approved line throwing appliances meet the 2,250 N criterion. Furthermore, the revision to the SOLAS Convention is still only a proposal and is subject to change. Should it be adopted, the Coast Guard may reconsider the service line strength requirement.

In consideration of the foregoing, Title 46 of the Code of Federal Regulations is amended as follows:

SUBCHAPTER Q—SPECIFICATIONS

PART 160—LIFESAVING EQUIPMENT

1. By revising Subpart 160.021 of Part 160 to read as follows:

Subpart 160.021—Hand Red Flare Distress Signals for Merchant Vessels

Sec.

- 160.021-1 Incorporations by reference.
- 160.021-2 Type.
- 160.021-3 Materials, workmanship, construction and performance requirements.
- 160.021-4 Approval and production tests.
- 160.021-5 Labeling and marking.
- 160.021-6 Container.
- 160.021-7 Procedure for approval.
- 160.021-9 Recognized independent laboratories.

Authority.—46 U.S.C. 481, 49 U.S.C. 1655(b)(1), 49 CFR 1.46(b).

§ 160.021-1 Incorporations by reference.

(a) The following is incorporated by reference into this subpart:

(1) "The Universal Color Language" and "The Color Names Dictionary" in *Color: Universal Language and Dictionary of Names*, National Bureau of Standards Special Publication 440, December 1976.

(b) NBS Special Publication 440 may be obtained by ordering from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (Order by SD Catalog No. C13.10:440).

(c) Approval to incorporate by reference the publication listed in this section was obtained from the Director of the Federal Register on November 1, 1979. The publication is on file at the Federal Register Library.

§ 160.021-2 Type.

(a) Hand red flare distress signals specified by this subpart shall be of one type which shall consist essentially of a wooden handle to which is attached a tubular casing having a sealing plug at the handle end, the casing being filled with a flare composition and having a button of ignition material at the top, with a removable cap having a friction striking material on its top which may be exposed for use by pulling a tear strip. The flare is ignited by scraping the friction striker on top of the cap against the igniter button on top of the flare. The general arrangement of the flare is shown by Figure No. 160.021-2(a). Alternate arrangements which conform to all the performance requirements of

this specification (and other arrangements which conform with all performance requirements except candlepower and burning time, but provide not less than 3,000 candela-minutes with a minimum of ½ minute burning time) will be given special consideration.

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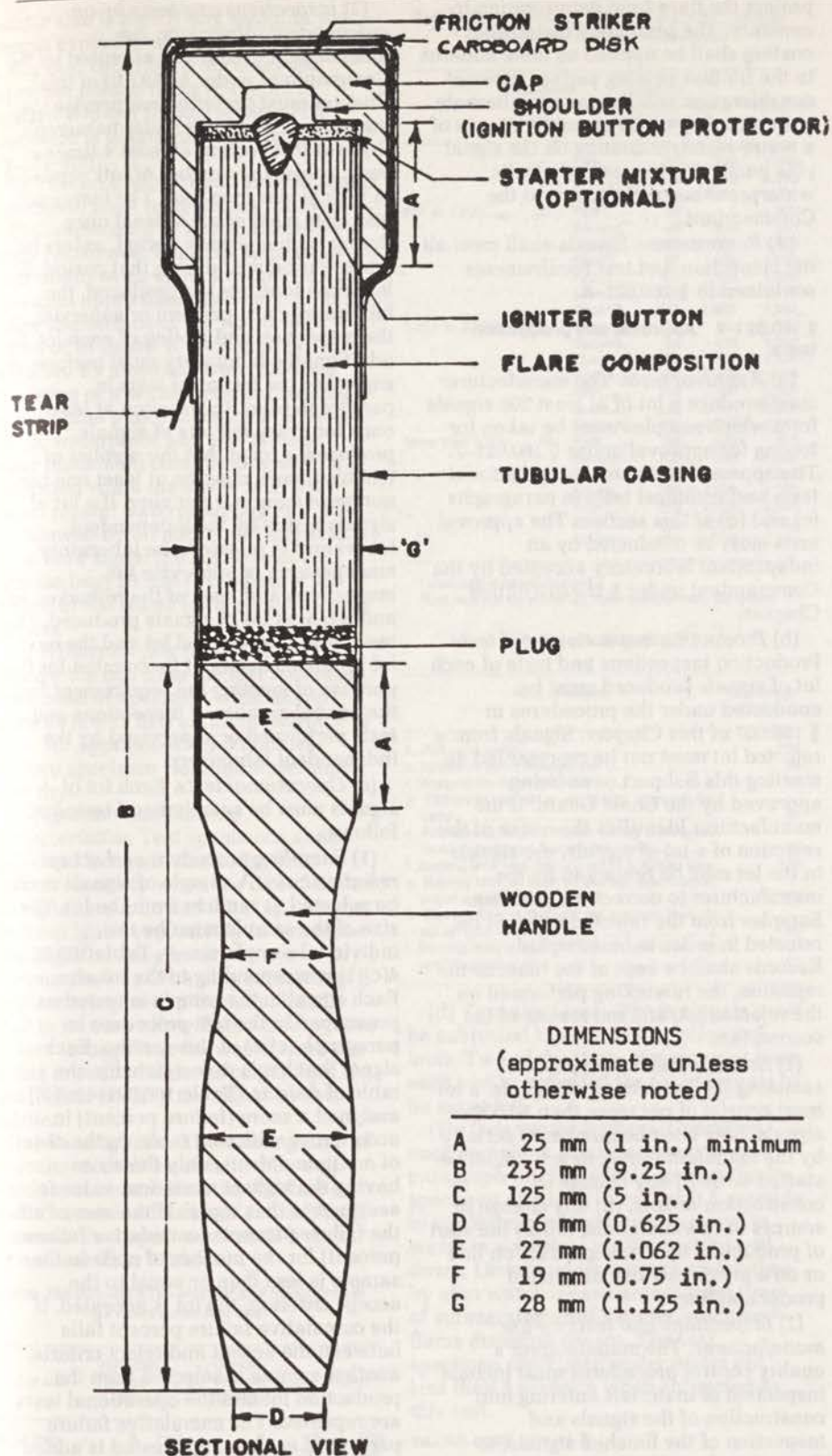


Figure 160.021-2(a). Hand Red Flare Distress Signal - General Arrangement.

§ 160.021-3 Materials, workmanship, construction and performance requirements.

(a) *Materials.* The materials shall conform strictly to the specifications and drawings submitted by the manufacturer and approved by the Commandant. The color of the tube shall be red. Flare compositions containing sulphur shall not contain more than 2.6 percent of potassium chlorate or an equivalent amount of any other chlorate. Flare compositions containing chlorates in any quantity shall not contain any ammonium salts.

(b) *Workmanship.* Hand red flare distress signals shall be of first class workmanship and shall be free from imperfections of manufacture affecting their appearance or that may affect their serviceability. Moistureproof coatings shall be applied uniformly and shall be free from pinholes or other visible defects which would impair their usefulness.

(c) *Construction.* The casing shall be fitted and secured to the handle with not less than a 25 mm (1 in.) overlap and shall be attached to the handle in such a manner that failure of the joint will not occur during tests, ignition, or operation. The plug shall be securely affixed in the casing to separate the flare composition from the wooden handle. The flare composition shall be thoroughly mixed and be uniformly compressed throughout to preclude variations of density which may adversely affect uniformity of its burning characteristics. The cap shall have a lap fit of not less than 25 mm (1 in.) over the end of the casing and flare composition to entirely and securely protect the exposed surface of the igniter button and end of flare composition and casing, and shall have an inner shoulder so constructed that it is mechanically impossible for the inner surface of the cap to come in contact with the igniter button. The cap shall be securely attached to the casing in such manner as to preclude its accidental detachment. The cap shall be provided on its top with a friction striking material which shall, by a pull of the tear strip, be entirely exposed for striking the friction igniter button. The igniter button shall be non-water soluble or be protected from moisture by a coating of some waterproof substance, and shall be raised or exposed in such manner as to provide positive ignition by the friction striker. The igniter button shall be firmly secured in or on the top of the flare composition; the arrangement shall be such that the ignition will be transmitted to the flare composition. The assembled flare, consisting of tear strip, cap, casing, and handle, shall be sealed and treated to

protect the flare from deterioration by moisture. The protective waterproof coating shall be applied so none adheres to the friction striking surface. Special consideration will be given to alternate waterproofing of the signal by means of a water-resistant coating on the signal plus packaging in a sealed plastic waterproof bag satisfactory to the Commandant.

(d) *Performance.* Signals shall meet all the inspection and test requirements contained in § 160.021-4.

§ 160.021-4 Approval and production tests.

(a) *Approval tests.* The manufacturer must produce a lot of at least 100 signals form which samples must be taken for testing for approval under § 160.021-7. The approval tests are the operational tests and technical tests in paragraphs (c) and (d) of this section. The approval tests must be conducted by an independent laboratory accepted by the Commandant under § 159.010 of this Chapter.

(b) *Production inspections and tests.* Production inspections and tests of each lot of signals produced must be conducted under the procedures in § 159.007 of this Chapter. Signals from a rejected lot must not be represented as meeting this Subpart or as being approved by the Coast Guard. If the manufacturer identifies the cause of the rejection of a lot of signals, the signals in the lot may be reworked by the manufacturer to correct the problem. Samples from the rejected lot must be retested in order to be accepted. Records shall be kept of the reasons for rejection, the reworking performed on the rejected lot, and the results of the second test.

(1) *Lot size.* For the purposes of sampling the production of signals, a lot must consist of not more than 30,000 signals. Lots must be numbered serially by the manufacturer. A new lot must be started with: (i) any change in construction details, (ii) any change in sources of raw materials, or (iii) the start of production on a new production line or on a previously discontinued production line.

(2) *Inspections and tests by the manufacturer.* The manufacturer's quality control procedures must include inspection of materials entering into construction of the signals and inspection of the finished signals, to determine that signals are being produced in accordance with the approved plans. Samples from each lot must be tested in accordance with the operational tests in paragraph (c) of this section.

(3) *Inspections and tests by an independent laboratory.* An independent laboratory accepted by the Commandant under § 159.010 of this Chapter must perform or supervise the inspections and tests under paragraph (b)(2) of this section at least 4 times a year, unless the number of lots produced in year is less than four. The inspections and tests must occur at least once during each quarterly period, unless no lots are produced during that period. If less than four lots are produced, the laboratory must perform or supervise the inspection and testing of each lot. In addition, the laboratory must perform or supervise the technical tests in paragraph (d) of this section at least once for every ten lots of signals produced, except that the number of technical tests must be at least one but not more than four per year. If a lot of signals tested by the independent laboratory is rejected, the laboratory must perform or supervise the inspections and tests of the reworked lot and the next lot of signals produced. The tests of each reworked lot and the next lot produced must not be counted for the purpose of meeting the requirement for the annual number of inspections and tests performed or supervised by the independent laboratory.

(c) *Operational tests.* Each lot of signals must be sampled and tested as follows:

(1) *Sampling procedure and accept/reject criteria.* A sample of signals must be selected at random from the lot. The size of the sample must be the individual sample size in Table 160.021-4(c)(1) corresponding to the lot size. Each signal in the sample is tested as prescribed in the test procedure in paragraph (c)(2) of this section. Each signal that has a defect listed in the table of defects (Table 160.021-4(c)(2)) is assigned a score (failure percent) in accordance with that table. In the case of multiple defects, only the score having the highest numerical value is assigned to that signal. If the sum of all the failure percents (cumulative failure percent) for the number of units in the sample is less than or equal to the accept criterion, the lot is accepted. If the cumulative failure percent falls between the accept and reject criteria, another sample is selected from the production lot and the operational tests are repeated. The cumulative failure percent of each sample tested is added to that of the previous samples to obtain the cumulative failure percent for all the signals tested (cumulative sample size). Additional samples are tested and the tests repeated until either the accept or reject criterion for the cumulative

sample size is met. If any signal in the sample explodes when fired or ignited in a way that could burn or otherwise injure the person firing it, the lot is rejected without further testing. (This procedure is diagrammed in figure 160.021-4(c)).

(2) *Test procedure.* Each sample signal (specimen) must be tested as follows:

(i) *Conditioning of test specimens—water resistance.* Immerse specimen horizontally with uppermost portion of the signal approximately 25 mm (1 in.) below the surface of the water for a period of 24 hours. If the signal is protected by alternate waterproofing consisting of a water-resistant coating on the signal plus packaging in a sealed plastic waterproof bag, the 24-hour water immersion conditioning will be conducted while the signal is in the sealed plastic waterproof bag and will be followed by an additional immersion of the bare signal (i.e., after removal from the bag) 25 mm (1 in.) below the surface of the water for a period of 10 minutes.

(ii) *Waterproofing of igniter button.* Remove the cap from the test specimen. Place head of specimen without cap about 25 mm (1 in.) under the surface of water for approximately 5 minutes. Remove specimen from the water and wipe dry.

(iii) *Ignition and burning characteristics.* Test specimens shall ignite and burn satisfactorily with uniform intensity when the directions on the signal are followed. Test specimens shall not ignite explosively in a manner that might be dangerous to the user or persons close by. The plug separating the flare composition from the handle shall in no case allow flame or hot gases to pass through it or between it and the casing in such manner as might burn the hand while holding the signal by the handle.

(iv) *Burning time.* The burning time of a specimen shall be obtained by stop watch measurements from the time a distinct sustained flame is emitted until it ceases. Test specimens shall burn in air not less than 2 minutes.

Table 160.021-4(c)(1).—Accept and reject criteria for operational test lots.

Lot size	Individual sample size	Sample size	Cumulative sample size	Accept ¹	Reject ¹
280 or less.....	8	First.....	8	(?)	400
		Second..	16	100	500
		Third.....	24	200	600
		Fourth....	32	300	700
		Fifth.....	40	500	800
		Sixth.....	48	700	900
		Seventh..	56	950	951
281 to 500.....	13	First.....	13	0	400
		Second..	26	100	600
		Third.....	39	300	800
		Fourth....	52	500	1,000

Table 160.021-4(c)(1).—Accept and reject criteria for operational test lots.—Continued

Lot size	Individual sample size	Sample size	Cumulative sample size	Accept ¹	Reject ¹
501 to 1,200.....	20	Fifth.....	65	700	1,100
		Sixth.....	78	1,000	1,200
		Seventh..	91	1,350	1,351
		First.....	20	0	500
		Second..	40	300	800
		Third.....	60	600	1,000
		Fourth....	80	800	1,300
1,201 to 3,200....	32	Fifth.....	100	1,100	1,500
		Sixth.....	120	1,400	1,700
		Seventh..	140	1,850	1,851
		First.....	32	100	700
		Second..	64	400	1,000
		Third.....	96	800	1,300
		Fourth....	128	1,200	1,700
More than 3,201	50	Fifth.....	160	1,700	2,000
		Sixth.....	192	2,100	2,300
		Seventh..	224	2,550	2,551
		First.....	50	200	900
		Second..	100	700	1,400
		Third.....	150	1,300	1,900
		Fourth....	200	1,900	2,500
		Fifth.....	250	2,500	2,900
		Sixth.....	300	3,100	3,300
		Seventh..	350	3,750	3,751

¹ Cumulative failure percent.

² Lot may not be accepted. Next sample must be tested.

Table 160.021-4(c)(2)

Kind of defects	Percentage of failure
a. Failure to ignite.....	100
b. Ignites or burns dangerously.....	50
c. Nonuniform burning intensity.....	50
d. Chimneys so as to materially obscure the flame.....	25
e. Fire flashes down between casing and handle so as to endanger burning the hand.....	50
f. Burning time less than 70 pct of specified time.....	100
g. Burning time at least 70 pct but less than 80 pct of specified time.....	75
h. Burning time at least 80 pct but less than 90 pct of specified time.....	50
i. Burning time at least 90 pct but less than 100 pct of specified time.....	25

(d) *Technical tests.* Three signals must be subjected to each of the following tests. Two of the three signals must pass each test in order for the lot of signals to be accepted.

(1) *Underwater burning.* Condition each sample in accordance with paragraph (c)(2)(i) of this section. Ignite specimen and let it burn about 5 seconds in air. Submerge the burning signal in water in a vertical position with head down. Obtain under water burning time by stop watch measurement from time of submersion until distinct, sustained flame emission ceases. The test specimen shall burn under water not less than 5 seconds when subjected to this test.

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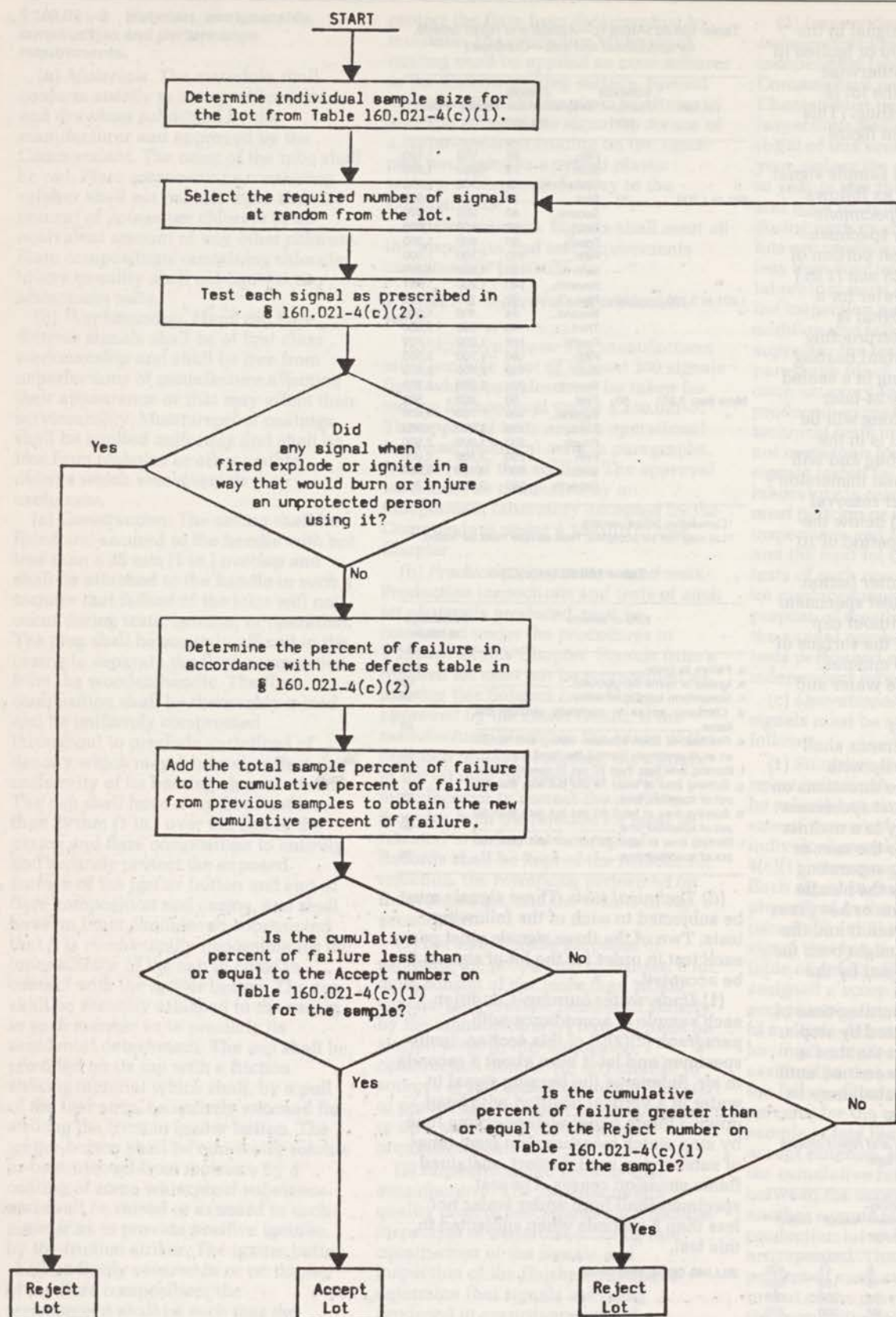


Figure 160.021-4(c). Operational test procedure.

(2) *Bending strength.* Place the specimen on supports 15 cm (6 in.) apart. Attach a weight of 35 kg (77 lb.) to a length of wire. Hang the weight from the supported signal by looping the wire around the signal approximately equidistant from the two points of support. Let the weight hang approximately 5 minutes. The test specimen shall not deflect more than 7 mm (1/4 in.), nor shall the joint between the casing and the handle fail, when subjected to this test.

(3) *Tensile strength.* Place the specimen in a chuck firmly holding it about 13 mm (1/2 in.) below the cap. Attach a weight of 35 kg (77 lb.) to a length of wire. Hang the weight from the supported signal by looping the wire through a hole bored perpendicular to and through the axis of the handle. Let the weight hang approximately 5 minutes. The test specimen shall not show noticeable distortion, nor shall the joint between the casing and handle fail, when subjected to this test.

(4) *Luminous intensity.* The luminous intensity of each specimen tested shall be measured by a visual photometer or equivalent photometric device, while the specimen is supported in a horizontal position and the photometer is at right angles to the axis of the specimen. Visual luminous intensity readings shall be observed and recorded at approximately 20 second intervals during the burning of the specimen. The minimum photometric distance shall be 3 m (10 ft.). Recording photometers shall have a chart speed of at least 25 mm (1 in.) per minute. The luminous intensity of specimen shall be computed as the arithmetical average of the readings recorded. The average luminous intensity of a test specimen shall be not less than 500 candela. The burning time of a specimen shall be obtained by stop watch measurements from the time distinct, sustained flame is emitted until it ceases. Test specimens shall burn in air not less than 2 minutes.

(5) *Elevated temperature, humidity and storage.* Place specimen in a thermostatically controlled even-temperature oven held at 75°C. with not less than 90 percent relative humidity for 72 hours. Remove specimen and store at room temperature (20° to 25°C.) with approximately 65 percent relative humidity for 10 days. If for any reason it is not possible to operate the oven continuously for the 72-hour period, it may be operated at the required temperature and humidity for 8 hours out of each 24 during the 72-hour conditioning period. (Total of 24 hours on and 48 hours off.) The signal shall not ignite or decompose during this

conditioning. The signal shall ignite and operate satisfactorily following this conditioning.

(6) *Spontaneous ignition.* Place the specimen in a thermostatically controlled even-temperature oven held at 75°C. with not more than 10% relative humidity for 48 consecutive hours. The signals shall not ignite or undergo marked decomposition.

(7) *Chromaticity.* The color of the burning signal must be vivid red as defined by Sections 13 and 14 of the "Color Names Dictionary." Two identical test plates of white cardboard about 30 cm x 60 cm (12" x 24") are used. Except for a negligible amount of stray daylight, the first test plate is illuminated by light from the specimen placed at a distance of about 1.5 m (5 ft.). The second test plate is illuminated only by light from an incandescent lamp operated at a color temperature close to 2,848°K at a distance of about 30 cm (1 ft.). The first plate is viewed directly, the second through combinations of Lovibond red, yellow, and blue glasses selected so as to approximate a chromaticity match. By separating the test plates by a wide unilluminated area (subtending at the observer about 45°), it is possible to make accurate determinations of chromaticity in terms of the 1931 CIE Standard Observer and Coordinate System, in spite of fluctuations in luminous intensity of the specimen by factors as high as 2 or 3. The CIE coordinates are converted to the Munsell notation which is cross-referenced to the color name in Section 13 of the "Color Names Dictionary" (see the discussion in Section 10 of "The Universal Color Language").

§ 160.021-5 Labeling and marking.

(a) *Labeling.* Each hand red flare distress signal shall bear a label securely affixed thereto, showing in clear, indelible black lettering on a red background, the following wording and information:

(Company brand or style designation)
Hand Red Flare Distress Signal
500 Candela—2 Minutes Burning Time
Use Only When Aircraft or Vessel Is Sighted

Directions—Pull tape over top of cap. Remove cap and ignite flare by rubbing scratch surface on top of cap sharply across igniter button on head of signal.

Caution—Stand with back to wind and point away from body when igniting or flare is burning.

Service Life Expiration Date (Month and year to be inserted by manufacturer) (Month and year manufactured) (Lot No.—).

Manufactured by (Name and address of manufacturer). U.S. Coast Guard Approval No.—

(b) *Marking of expiration date.* The expiration date must be not more than 42 months from the date of manufacture.

(c) *Other marking.* (1) There shall be die-stamped, in the side of the wooden handle in figures not less than 3 mm (C 1/8 in.) high, numbers indicating the month and year of manufacture, thus: "6-54" indicating June, 1954.

(2) In addition to any other marking placed on the smallest packing carton or box containing hand red flare distress signals, such cartons or boxes shall be plainly and permanently marked to show the service life expiration date, date of manufacture, and lot number.

(3) The largest carton or box in which the manufacturer ships signals must be marked with the following or equivalent words: "Keep under cover in a dry place."

Note.—Compliance with the labeling requirements of this section does not relieve the manufacturer of the responsibility of complying with the label requirements of 15 USC 1263, the Federal Hazardous Substances Act.

§ 160.021-6 Container.

(a) *General.* Containers for stowage of hand red flare distress signals in lifeboats and life rafts on merchant vessels are not required to have specific approval or to be of special design, but they shall meet the following test for watertightness when closed, and shall be capable of being opened and reclosed hand-tight to meet the same watertightness test. The materials shall be copper, brass, bronze, or equally corrosion-resistant to salt water and spray. The type container illustrated by Figure Number 160.021-6(a) is recommended for most purposes.

(b) *Watertightness test for containers.* Whenever a question arises as to the watertightness of a container, the following test may be made to determine whether it is satisfactory in this respect. Open the container, remove the contents, insert colored blotting paper as a lining, re-close container as tightly as possible by hand (no wrenches or special tools permitted), submerge container with top about 30 cm (1 ft.) below the surface of the water for two hours, remove container from water, wipe off excess moisture on outside, then open the container and examine the blotting paper and entire interior for evidence of moisture penetration. If any moisture or water is evidenced, the container is not satisfactory.

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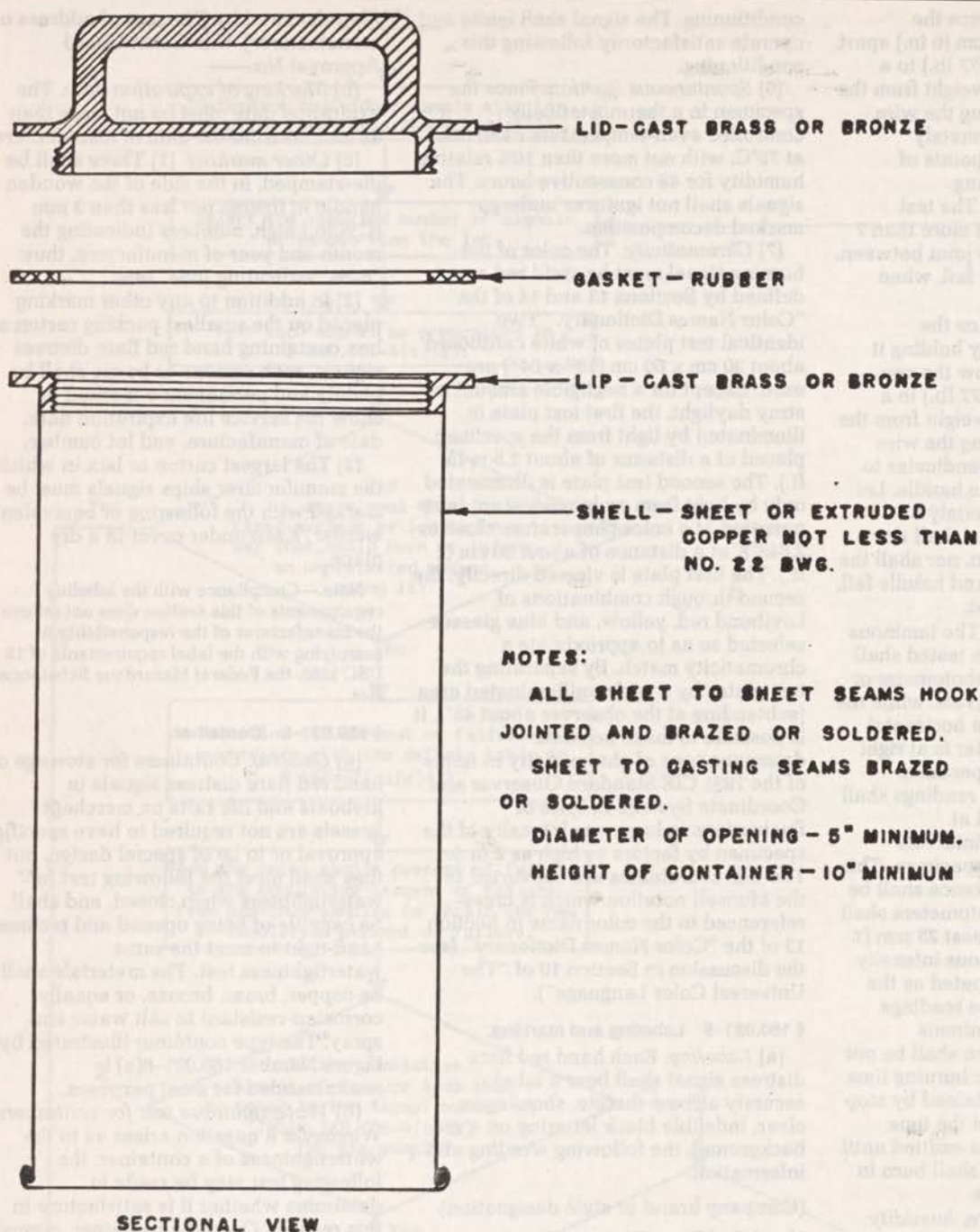


Figure 160.021-6(a). Watertight Container for Hand Red Flare Distress Signals.

BILLING CODE 4910-14-C

(c) *Marking of container.* Containers shall be embossed or bear a brass or equivalent corrosion-resistant nameplate, or otherwise be suitably and permanently marked, to plainly show in letters not less than 13 mm (½ in.) high the following wording: "HAND RED FLARE DISTRESS SIGNALS". No additional marking which might cause confusion as to the contents shall be permitted. The vessel's name ordinarily is painted or branded on equipment such as this container, and nothing in this subpart shall be construed as prohibiting same.

§ 160.021-7 Procedure for approval.

(a) Signals are approved by the Coast Guard under the procedures in Subpart 159.005 of this Chapter.

§ 160.021-9 Recognized independent laboratories.

(a) The following independent laboratories have been accepted by the Commandant for conducting the approval and production tests required in this Subpart:

(1) (Reserved).

(b) Revised copies of this list may be obtained from Commandant (G-MMT-3/TP12), U.S. Coast Guard Headquarters, Washington, D.C. 20593.

2. By revising Subpart 160.022 of Part 160 to read as follows:

Subpart 160.022—Floating Orange Smoke Distress Signals (5 Minutes)

Sec.

160.022-1 Incorporations by reference.

160.022-2 Type.

160.022-3 Materials, workmanship, construction, and performance requirements.

160.022-4 Approval and production tests.

160.022-5 Marking.

160.022-7 Procedure for approval.

160.022-9 Recognized independent laboratories.

Authority: 46 U.S.C. 481, 49 U.S.C. 1655(b)(1), 49 CFR 1.46(b).

§ 160.022-1 Incorporations by reference.

(a) The following are incorporated by reference into this subpart:

(1) "The Color Names Dictionary" in *Color: Universal Language and Dictionary of Names*, National Bureau of Standards Special Publication 440, December 1976.

(2) "Development of a Laboratory Test for Evaluation of the Effectiveness of Smoke Signals," National Bureau of Standards Report 4792, July 1956.

(b) NBS Special Publication 440 may be obtained by ordering from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (Order by SD Catalog No. C13.10:440).

(c) NBS Report 4792 may be obtained from the Commandant (G-MMT-3/TP12), U.S. Coast Guard, Washington, D.C. 20593.

(d) Approval to incorporate by reference the materials listed in this section was obtained from the Director of the Federal Register on November 1 and 29, 1979. The materials are on file in the Federal Register Library.

§ 160.022-2 Type.

(a) Floating orange smoke distress signals, specified by this subpart shall be of one type which shall consist essentially of an outer container, ballast, an air chamber, an inner container, the smoke producing composition, and an igniter mechanism. Alternate arrangements which conform to the performance requirements of this specification will be given special consideration.

§ 160.022-3 Materials, workmanship, construction, and performance requirements.

(a) *Materials.* The materials shall conform strictly to the specifications and drawings submitted by the manufacturer and approved by the Commandant. Metal for containers shall be not less than 0.5 mm (0.020 in.) in thickness. Other dimensions or materials may be considered upon special request when presented with supporting data. Igniter systems shall be corrosion-resistant metal. The combustible material shall be of such nature that it will not deteriorate during long storage, nor when subjected to frigid or tropical climates, or both.

(b) *Workmanship.* Floating orange smoke distress signals shall be of first class workmanship and shall be free from imperfections of manufacture affecting their appearance or that may affect their serviceability.

(c) *Construction.* The outer container shall be of a size suitable for its intended use. All sheet metal seams should be hook-jointed and soldered. The whole container shall be covered with two coats of waterproof paint or equivalent protection system. The igniter mechanism shall be simple to operate and provide ignition in most unfavorable weather. The mechanism shall be protected with a watertight cover having a finish which is corrosion-resistant to salt water and spray. The cover shall be easily and quickly removable by hand without the use of tools. If attachment of the cover is by formed screw threads, it shall be of such construction or material to prevent rusting or corrosion and will not back off and loosen under shipboard vibration.

(d) *Performance.* Signals shall meet all the inspection and test requirements contained in § 160.022-4.

§ 160.022-4 Approval and production tests.

(a) *Approval tests.* The manufacturer must produce a lot of at least 100 signals from which samples must be taken for testing for approval under § 160.022-7. The approval tests are the operational tests and technical tests in paragraphs (c) and (d) of this section. The approval tests must be conducted by an independent laboratory accepted by the Commandant under § 159.010 of this Chapter.

(b) *Production inspections and tests.* Production inspections and tests of each lot of signals produced must be conducted under the procedures in § 159.007 of this Chapter. Signals from a rejected lot must not be represented as meeting this Subpart or as being approved by the Coast Guard. If the manufacturer identifies the cause of the rejection of a lot of signals, the signals in the lot may be reworked by the manufacturer to correct the problem. Samples from the rejected lot must be retested in order to be accepted. Records shall be kept of the reasons for rejection, the reworking performed on the rejected lot, and the results of the second test.

(1) *Lot size.* For the purposes of sampling the production of signals, a lot must consist of not more than 30,000 signals. Lots must be numbered serially by the manufacturer. A new lot must be started with:

(i) any change in construction details, (ii) any change in sources of raw materials, or

(iii) the start of production on a new production line or on a previously discontinued production line.

(2) *Inspections and tests by the manufacturer.* The manufacturer's quality control procedures must include inspection of materials entering into construction of the signals and inspection of the finished signals, to determine that signals are being produced in accordance with the approved plans. Samples from each lot must be tested in accordance with the operational tests in paragraph (c) of this section.

(3) *Inspections and tests by an independent laboratory.* An independent laboratory accepted by the Commandant under § 159.010 of this Chapter must perform or supervise the inspections and tests under paragraph (b)(2) of this section at least 4 times a year, unless the number of lots produced in a year is less than four. The inspections and tests must occur at least

once during each quarterly period, unless no lots are produced during that period. If less than four lots are produced, the laboratory must perform or supervise the inspection and testing of each lot. In addition, the laboratory must perform or supervise the technical tests in paragraph (d) of this section at least once for every ten lots of signals produced, except that the number of technical tests must be at least one but not more than four per year. If a lot of signals tested by the independent laboratory is rejected, the laboratory must perform or supervise the inspections and tests of the reworked lot and the next lot of signals produced. The tests of each reworked lot and the next lot of signals must not be counted for the purpose of meeting the requirement for the annual number of inspections and tests performed or supervised by the independent laboratory.

(c) *Operational tests.* Each lot of signals must be sampled and tested as follows:

(1) *Sampling procedure and accept/reject criteria.* A sample of signals must be selected at random from the lot. The size of the sample must be the individual sample size in Table 160.022-4(c)(1) corresponding to the lot size. Each signal in the sample is tested as prescribed in the test procedure in paragraph (c)(2) of this section. Each signal that has a defect listed in the table of defects (Table 160.022-4(c)(2)) is assigned a score (failure percent) in accordance with that table. In the case of multiple defects, only the score having the highest numerical value is assigned to that signal. If the sum of all the failure percents (cumulative failure percent) for the number of units in the sample is less than or equal to the accept criterion, the lot is accepted. If this sum is equal to or more than the reject criterion the lot is rejected. If the cumulative failure percent falls between the accept and reject criteria, another sample is selected from the production lot and the operational tests are repeated. The cumulative failure percent of each sample tested is added to that of the previous samples to obtain the cumulative failure percent for all the signals tested (cumulative sample size). Additional samples are tested and the tests repeated until either the accept or reject criterion for the cumulative sample size is met. If any signal in the sample explodes when fired or ignited in a way that could burn or otherwise injure the person firing it, the lot is rejected without further testing. (This procedure is diagrammed in figure 160.022-4(c).)

(2) *Test Procedure.* Each sample signal (specimen) must be tested as follows:

(i) *Conditioning of test specimens—water-resistance.* Immerse specimens horizontally with uppermost portion of the signal approximately 25 mm (1 in.) below the surface of the water for a period of 24 hours.

(ii) *Smoke emitting time.* Ignite specimen according to the directions printed on the signal and place signal in tub or barrel of water. The smoke emitting time of a specimen shall be obtained by stop watch measurements from the time of distinct, sustained smoke emission until it ceases. The watch shall be stopped during periods of flame emission. The smoke emitting time for a specimen shall be not less than 4 minutes.

(iii) *Ignition and smoke emitting characteristics.* Test specimens shall ignite and emit smoke properly when the directions on the signal are followed. Test specimens shall not ignite explosively in a manner that might be dangerous to the user or persons close by. Test specimens shall emit smoke at a uniform rate while floating in calm to rough water. Signals should be so constructed that water submerging the signal in moderately heavy seas will not cause it to become inoperative.

Table 160.022-4(c)(1).—Accept and reject criteria for operational test lots.

Lot size	Individual sample size	Sample size	Cumulative sample size	Accept ¹	Reject ²
280 or less.....	8	First.....	8	(³)	400
		Second.....	16	100	500
		Third.....	24	200	600
		Fourth.....	32	300	700
		Fifth.....	40	500	800
		Sixth.....	48	700	900
		Seventh.....	56	950	951
281 to 500.....	13	First.....	13	0	400
		Second.....	26	100	600
		Third.....	39	300	800
		Fourth.....	52	500	1,000
		Fifth.....	65	700	1,100
		Sixth.....	78	1,000	1,200
		Seventh.....	91	1,350	1,351
501 to 1,200.....	20	First.....	20	0	500
		Second.....	40	300	800
		Third.....	60	600	1,000
		Fourth.....	80	800	1,300
		Fifth.....	100	1,100	1,500
		Sixth.....	120	1,400	1,700
		Seventh.....	140	1,850	1,851
1,201 to 3,200....	32	First.....	32	100	700
		Second.....	64	400	1,000
		Third.....	96	800	1,300
		Fourth.....	128	1,200	1,700
		Fifth.....	160	1,700	2,000
		Sixth.....	192	2,100	2,300
		Seventh.....	224	2,550	2,551
More than 3,201	50	First.....	50	200	900
		Second.....	100	700	1,400
		Third.....	150	1,300	1,900
		Fourth.....	200	1,900	2,500
		Fifth.....	250	2,500	2,900
		Sixth.....	300	3,100	3,300
		Seventh.....	350	3,750	3,751

¹ Cumulative failure percent.

² Lot may not be accepted. Next sample must be tested.

TABLE 160.022-4(c)(2)

Kind of defects	Percentage of failure
a. Failure to ignite.....	100
b. Ignites or burns dangerously.....	50
c. Nonuniform smoke emitting rate.....	50
d. Smoke-emitting time less than 70 pct of specified time.....	100
e. Smoke-emitting time at least 70 pct but less than 80 pct of specified time.....	75
f. Smoke-emitting time at least 80 pct but less than 90 pct of specified time.....	50
g. Smoke-emitting time at least 90 pct but less than 100 pct of specified time.....	25

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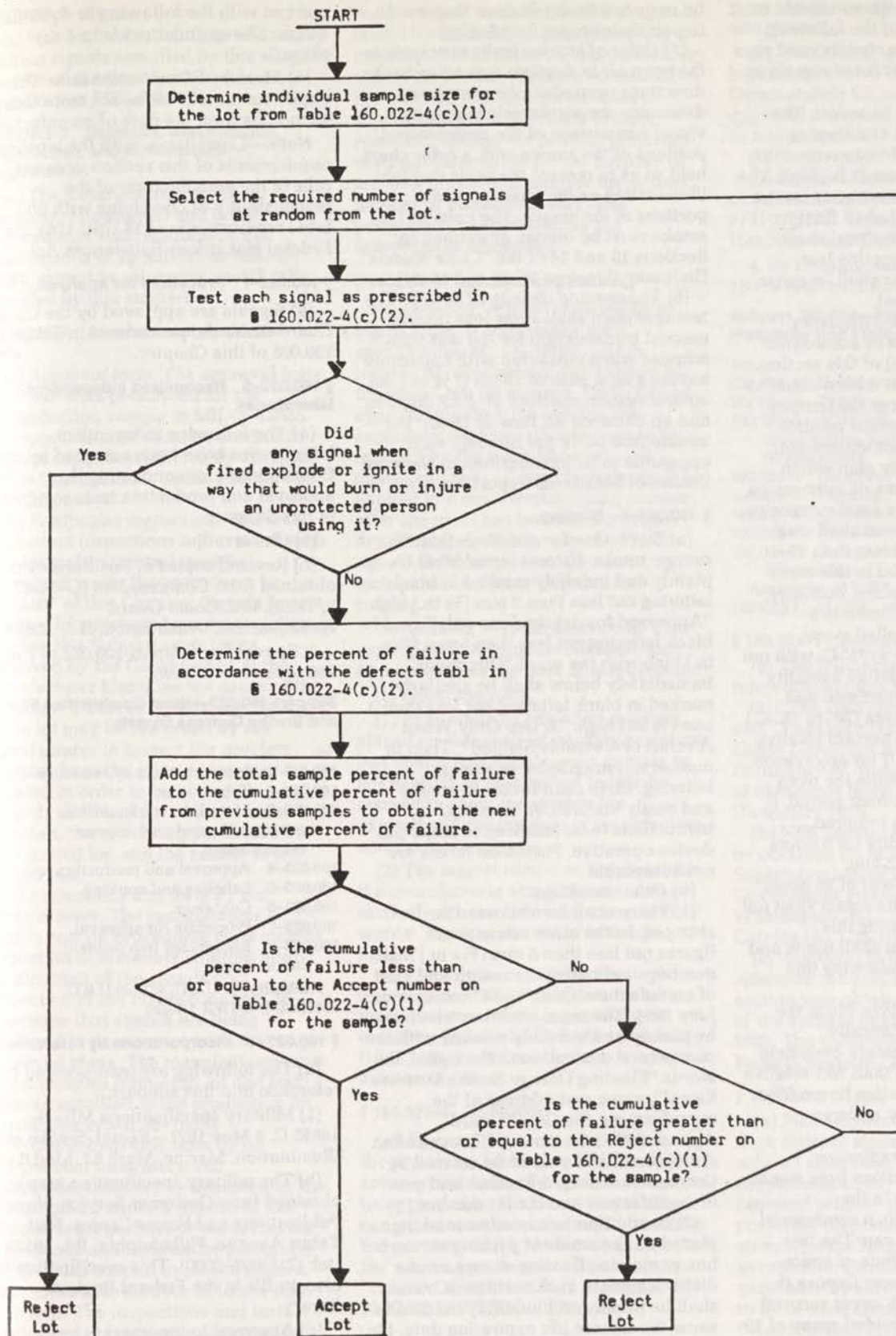


Figure 160.022-4(c). Operational test procedure.

(d) *Technical tests.* Three signals must be subjected to each of the following tests. Two of the three signals must pass the test in order for the lot of signals to be accepted.

(1) *Smoke emission in waves.* The signal shall be ignited and thrown overboard under conditions where the waves are at least 30 cm (1 ft.) high. The smoke emitting time must be at least 4 minutes and the signal shall float in such a manner that the signal shall function properly during this test. Failure to pass this test shall be cause for the lot to be rejected.

(2) *Underwater smoke emission.* Condition each sample in accordance with paragraph (c)(2)(i) of this section. Ignite specimen and let it burn about 15 seconds in air. Submerge the burning signal in water in a vertical position with head down. Obtain underwater smoke emission time by stop watch measurements from time of submersion until distinct, sustained smoke emission ceases. The test specimen shall emit smoke underwater not less than 15 seconds when subjected to this test.

(3) *Elevated temperature, humidity, and storage.* Place specimen in a thermostatically controlled even-temperature oven held at 75° C. with not less than 90 percent relative humidity for 72 hours. Remove specimen and store at room temperature (20° to 25° C.) with approximately 65 percent relative humidity for ten days. If for any reason it is not possible to operate the oven continuously for the 72-hour period, it may be operated at the required temperature and humidity for 8 hours out of each 24 during 72-hour conditioning period. (Total of 24 hours on and 48 hours off). The signal shall not ignite or decompose during this conditioning. The signal shall ignite and operate satisfactorily following this conditioning.

(4) *Spontaneous ignition.* Place the specimen in a thermostatically controlled even-temperature oven held at 75° C. with not more than 10% relative humidity for 48 consecutive hours. The signal shall not ignite or undergo marked decomposition.

(5) *Susceptibility to explosion.* Remove smoke composition from signal and punch a small hole in the composition. Insert a No. 6 commercial blasting cap. Ignite the cap. The test specimen shall not explode or ignite.

(6) *Corrosion resistance.* Expose the complete specimen with cover secured hand-tight to a finely divided spray of 20 percent by weight sodium chloride solution at a temperature between 32° C and 38° C (90° F and 100° F) for 100 hours. The container and cap must not

be corroded in any fashion that would impair their proper functioning.

(7) *Color of smoke.* Ignite specimen in the open air in daytime according to the directions printed on the signal, and determine the smoke color by direct visual comparison of the unshadowed portions of the smoke with a color chart held so as to receive the same daylight illumination as the unshadowed portions of the smoke. The color of the smoke must be orange as defined by Sections 13 and 14 of the "Color Names Dictionary" (colors 34-39 and 48-54).

(8) *Volume and density of smoke.* The test specimen shall show less than 20 percent transmission for not less than 3 minutes when measured with apparatus having a light path of 19 cm (7½ in.), an optical system aperture of +3.7 degrees, and an entrance air flow of 18.4m³ per minute (650 cu. ft. per minute), such apparatus to be as described in National Bureau of Standards Report No. 4792.

§ 160.022-5 Marking.

(a) *Directions for use.* Each floating orange smoke distress signal shall be plainly and indelibly marked in black lettering not less than 3 mm (⅛ in.) high "Approved for daytime use only", and in black lettering not less than 5 mm (⅜ in.) high with the word "Directions". Immediately below shall be similarly marked in black lettering not less than 3 mm (⅛ in.) high: "1. Use Only When Aircraft or Vessel Is Sighted". Then in numbered paragraphs, in similar lettering, there shall follow in simply and easily understood wording, instructions to be followed to make the device operative. Pasted-on labels are not acceptable.

(b) Other markings.

(1) There shall be embossed or die-stamped, in the outer container in figures not less than 5 mm (⅜ in.) high, numbers, indicating the month and year of manufacture, thus: "6-54" indicating June 1954. The outer container shall also be plainly and indelibly marked with the commercial designation of the signal, the words "Floating Orange Smoke Distress Signal", name and address of the manufacturer, the Coast Guard Approval No., the service life expiration date (month and year to be entered by the manufacturer), the month and year of manufacture and the lot number.

(2) In addition to any other marking placed on the smallest packing carton or box containing floating orange smoke distress signals, such cartons or boxes shall be plainly and indelibly marked to show the service life expiration date, the month and year of manufacture, and the lot number.

(3) The largest carton or box in which the manufacturer ships signals must be

marked with the following or equivalent words: "Keep under cover in a dry place."

(c) *Marking of expiration date.* The expiration date must be not more than 42 months from the date of manufacture.

Note.—Compliance with the labeling requirements of this section does not relieve the manufacturer of the responsibility of complying with the label requirements of 15 USC 1263, the Federal Hazardous Substances Act.

§ 160.022-7 Procedure for approval.

(a) Signals are approved by the Coast Guard under the procedures in Subpart 159.005 of this Chapter.

§ 160.022-9 Recognized independent laboratories.

(a) The following independent laboratories have been accepted by the Commandant for conducting the approval and production tests required in this Subpart:

(1) (Reserved).

(b) Revised copies of this list may be obtained from Commandant (G-MMT-3/TP12), U.S. Coast Guard Headquarters, Washington, D.C. 20593.

3. By revising Subpart 106.023 of Part 160 to read as follows:

Subpart 160.023—Hand Combination Flare and Smoke Distress Signals

Sec.

160.023-1 Incorporations by reference.

160.023-2 Type.

160.023-3 Materials, workmanship, construction and performance requirements.

160.023-4 Approval and production tests.

160.023-5 Labeling and marking.

160.023-6 Container.

160.023-7 Procedure for approval.

160.023-9 Recognized independent laboratories.

Authority: 46 U.S.C. 481, 49 U.S.C. 1655(b)(1), 49 CFR 1.46(b).

§ 160.023-1 Incorporations by reference.

(a) The following are incorporated by reference into this subpart:

(1) Military specifications MIL-S-18655 C, 3 May 1971—Signal, Smoke and Illumination, Marine, Mark 13, Mod 0.

(b) The military specification may be obtained from Customer Service, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA. 19120 (tel: (215)697-2000). This specification is also on file in the **Federal Register** library.

(c) Approval to incorporate by reference the materials listed in this section was obtained from the Director of the Federal Register on November 1, 1979.

§ 160.023-2 Type.

(a) Hand combination flare and smoke distress signals specified by this subpart shall be of the type described in specification MIL-S-18655.

§ 160.023-3 Materials, workmanship, construction, and performance requirements.

(a) The materials, construction, workmanship, general and detail requirements shall conform to the requirements of specification MIL-S-18655, except as otherwise specifically provided by this subpart.

§ 160.023-4 Approval and production tests.

(a) *Approval tests.* The approval tests are those tests prescribed for the preproduction sample in MIL-S-18655. The approval tests must be conducted by an independent laboratory accepted by the Commandant under § 159.010 of this Chapter.

(b) *Production inspections and tests.* Production inspections and tests of each lot of signals produced must be conducted under the procedures in § 159.007 of this Chapter. Signals from a rejected lot must not be represented as meeting this Subpart or as being approved by the Coast Guard. If the manufacturer identifies the cause of the rejection of a lot of signals, the signals in the lot may be reworked by the manufacturer to correct the problem. Samples from the rejected lot must be retested in order to be accepted. Records shall be kept of the reasons for rejection, the reworking performed on the rejected lot, and the results of the second test.

(1) *Inspections and tests by the manufacturer.* The manufacturer's quality control procedures must include inspection of materials entering into construction of the signals and inspection of the finished signals, to determine that signals are being produced in accordance with the approved plans. The manufacturer must select samples from each lot and test them as specified in the production lot procedures in MIL-S-18655.

(2) *Inspections and tests by an independent laboratory.* An independent laboratory accepted by the Commandant under § 159.010 of this Chapter must perform or supervise the inspections and tests under paragraph (b)(1) of this section at least 4 times a year, unless the number of lots is less than four. The inspections and tests must occur at least once during each quarterly period, unless no lots are produced during this period. If less than four lots are produced, the laboratory must perform or supervise the inspection

and testing of each lot. If a lot of signals tested by the independent laboratory is rejected, the laboratory must perform or supervise the inspections and tests of the reworked lot and the next lot of signals produced. The tests of each reworked lot and the next lot produced must not be counted for the purpose of meeting the requirement for the annual number of inspections and tests performed or supervised by the independent laboratory.

§ 160.023-5 Labeling and marking.

(a) *Labeling.* A label showing firing instructions in accordance with specification MIL-S-18655, and to include the commercial designation of the signal, the lot number, Coast Guard approval number, the service life expiration date (month and year to be inserted by the manufacturer), and month and year of manufacture, shall be applied in a neat, workmanlike manner after the paint has become thoroughly dry. The label shall be attached to the signal and then protected by a transparent moisture impervious coating.

(b) *Marking of Expiration Date.* The expiration date must be not more than 42 months from the date of manufacture.

(c) Other marking.

(1) In addition to any other marking placed on the smallest packing carton or box containing signals, such cartons or boxes shall be plainly and indelibly marked to show the service life expiration date, the date of manufacture, and the lot number.

(2) The largest carton or box in which the manufacturer ships signals must be marked with the following or equivalent words: "Keep under cover in a dry place."

Note.—Compliance with the labeling requirements of this section does not relieve the manufacturer of the responsibility of complying with the label requirements of 15 U.S.C. 1263, the Federal Hazardous Substances Act.

§ 160.023-6 Container.

(a) *General.* The container for storing the signals on lifeboats and liferafts is not required to be of a special design or be approved by the Coast Guard. The container must meet the requirements in Subpart 160.021 (§ 160.021-6) except that the wording on the container must be: "HAND COMBINATION FLARE AND SMOKE DISTRESS SIGNALS."

§ 160.023-7 Procedure for approval.

(a) Signals are approved by the Coast Guard under the procedures in Subpart 159.005 of this Chapter.

§ 160.023-9 Recognized independent laboratories.

(a) The following independent laboratories have been accepted by the Commandant for conducting the approval and production tests required in this Subpart:

(1) (Reserved).

(b) Revised copies of this list may be obtained from Commandant (G-MMT-3/TP12), U.S. Coast Guard Headquarters, Washington, D.C. 20593.

4. By revising Subpart 160.024 of Part 160 to read as follows:

Subpart 160.024—Pistol-Projected Parachute Red Flare Distress Signals**Sec.**

- 160.024-1 Incorporations by reference.
- 160.024-2 Type.
- 160.024-3 Materials, workmanship, construction, and performance requirements.
- 160.024-4 Approval and production tests.
- 160.024-5 Marking.
- 160.024-6 Container.
- 160.024-7 Procedure for approval.
- 160.024-9 Recognized independent laboratories.

Authority: 46 U.S.C. 481, 49 U.S.C. 1655(b)(1), 49 CFR 1.46(b).

§ 160.024-1 Incorporations by reference.

(a) The following is incorporated by reference into this subpart:

(1) "The Universal Color Language" and "The Color Names Dictionary" in *Color: Universal Language and Dictionary of Names*, National Bureau of Standards Special Publication 440, Dictionary 1976.

(b) NBS Special Publication 440 may be obtained by ordering from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (Order by SD Catalog No. C13.10:440).

(c) Approval to incorporate by reference the publication listed in this section was obtained from the Director of the Federal Register on November 1, 1979. The publication is on file at the Federal Register Library.

§ 160.024-2 Type.

(a) Pistol-projected parachute red flare distress signals specified by this subpart shall be of one type which shall consist essentially of a cartridge having centered primer, propelling charge, and projectile consisting of a case, delay element, expelling charge, and pyrotechnic candle attached to a parachute by shroud lines; the cartridge to be of such dimensions that it can be fitted into and fired from a signal pistol with chamber and bore dimensions within the limits provided by Figure 160.028-2(a) of subpart 160.028 of this Chapter.

§ 160.024-3 Materials, workmanship, construction, and performance requirements.

(a) *Materials.* The materials used in pistol-projected parachute red flare distress signals shall conform strictly to the specifications and drawings submitted by the manufacturer and approved by the Commandant. In general, all metallic parts shall be corrosion-resistant or properly protected against corrosion.

(b) *Workmanship.* Pistol-projected parachute red flare distress signals shall be of first class workmanship and shall be free from imperfections of manufacture affecting their appearance or that may affect their serviceability.

(c) *Construction.* The exterior case of the cartridge shall be made of suitable metal and shall protect against the entrance of moisture. The projectile case and delay element shall be so constructed as to prevent any possibility of the propelling charge blowing by and causing premature ejection of the projectile contents. The shoulder of the base of the cartridge shall be between 2.29 mm (0.090 in.) and 2.67 mm (0.015 in.) in thickness. The centered primer shall be set below the surface of the base between 0.25 mm (0.010 in.) and 0.50 mm (0.020 in.).

(d) *Performance.* Signals shall meet all of the inspection and test requirements contained in § 160.024-4.

§ 160.024-4 Approval and production tests.

(a) *Approval tests.* The manufacturer must produce a lot of at least 100 signals from which samples must be taken for testing for approval under § 160.024-7. The approval tests are the operational tests and technical tests in paragraphs (c) and (d) of this section. The approval tests must be conducted by an independent laboratory accepted by the Commandant under § 159.010 of this Chapter.

(b) *Production inspections and tests.* Production inspections and tests of each lot of signals produced must be conducted under the procedures in § 159.007 of this Chapter. Signals from a rejected lot must not be represented as meeting this Subpart or as being approved by the Coast Guard. If the manufacturer identifies the cause of the rejection of a lot of signals, the signals in the lot may be reworked by the manufacturer to correct the problem. Samples from the rejected lot must be

retested in order to be accepted. Records shall be kept of the reasons for rejection, the reworking performed on the rejected lot, and the results of the second test.

(1) *Lot size.* For the purposes of sampling the production of signals, a lot must consist of not more than 30,000 signals. Lots must be numbered serially by the manufacturer. A new lot must be started with: (i) any change in construction details, (ii) any change in sources of raw materials, or (iii) the start of production on a new production line or on a previously discontinued production line.

(2) *Inspections and tests by the manufacturer.* The manufacturer's quality control procedures must include inspection of materials entering into construction of the signals and inspection of the finished signals, to determine that signals are being produced in accordance with the approved plans. Samples from each lot must be tested in accordance with the operational tests in paragraph (c) of this section.

(3) *Inspections and tests by an independent laboratory.* An independent laboratory accepted by the Commandant under § 159.010 of this Chapter must perform or supervise the inspections and tests under paragraph (b)(2) of this section at least 4 times a year, unless the number of lots produced in a year is less than four. The inspections and tests must occur at least once during each quarterly period, unless no lots are produced during this period. If less than four lots are produced, the laboratory must perform or supervise the inspection and testing of each lot. In addition, the laboratory must perform or supervise the technical tests in paragraph (d) of this section at least once for every ten lots of signals produced, except that the number of technical tests must be at least one but not more than four per year. If a lot of signals tested by the independent laboratory is rejected, the laboratory must perform or supervise the inspections and tests of the reworked lot and the next lot of signals produced. The tests of each reworked lot and the next lot produced must not be counted for the purpose of meeting the requirement for the annual number of inspections and tests performed or supervised by the independent laboratory.

(c) *Operational tests.* Each lot of signals must be sampled and tested as follows:

(1) *Sampling procedure and accept/reject criteria.* A sample of signals must be selected at random from the lot. The size of the sample must be the individual sample size in Table 160.024-4(c)(1) corresponding to the lot size. Each signal in the sample is tested as prescribed in the test procedure in paragraph (c)(2) of this section. Each signal that has a defect listed in the table of defects. (Table 160.024-4(c)(2)) is assigned a score (failure percent) in accordance with the table. In the case of multiple defects, only the score having the highest numerical value is assigned to that signal. If the sum of all the failure percents (cumulative failure percent) for the number of units in the sample is less than or equal to the accept criterion, the lot is accepted. If this sum is equal to or more than the reject criterion the lot is rejected. If the cumulative failure percent falls between the accept and reject criteria, another sample is selected from the production lot and the operational tests are repeated. The cumulative failure percent of each sample tested is added to that of the previous samples to obtain the cumulative failure percent for all the signals tested (cumulative sample size). Additional samples are tested and the tests repeated until either the accept or reject criterion for the cumulative sample size is met. If any signal in the sample explodes when fired or ignites in a way that could burn or otherwise injure the person firing it, the lot is rejected without further testing. (This procedure is diagrammed in figure 160.024-4(c).)

(2) *Test procedure.* Each sample signal (specimen) must be tested as follows:

(i) *Conditioning of test specimens—water resistance.* Immerse specimen horizontally with uppermost portion of the signal approximately 25 mm (1 in.) below the surface of the water for a period of 24 hours.

(ii) *Firing and operating characteristics.* Signals shall fire and operate satisfactorily when shot from a pistol of the type described in Subpart 160.028. The parachute and pyrotechnic candle shall be ejected at approximately the maximum altitude reached by the projectile case. The parachute shall open and properly suspend the pyrotechnic candle without fouling. The pyrotechnic candle shall burn with uniform intensity and without damaging the parachute, shrouds, or leader line.

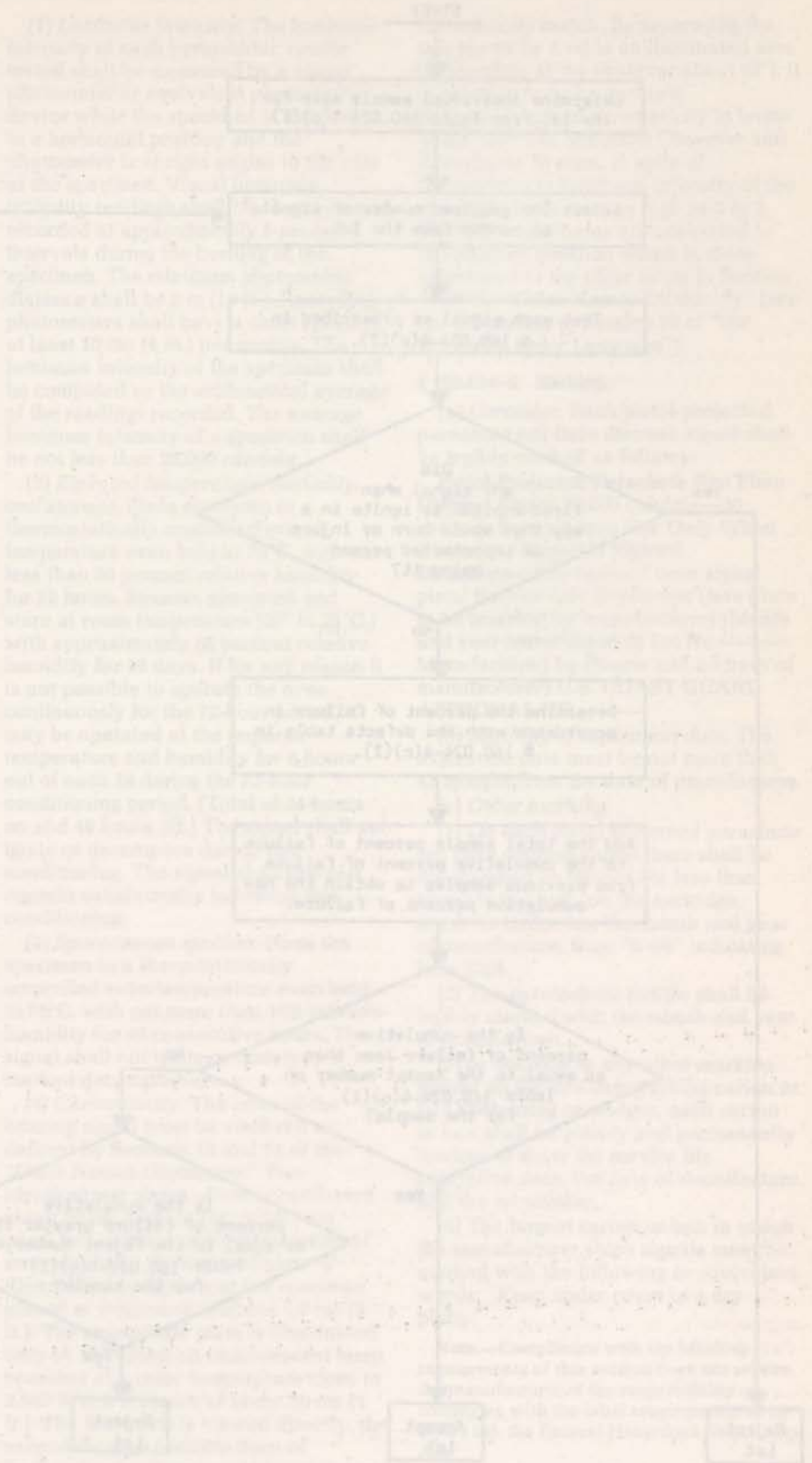
(iii) *Altitude.* The altitude reached by a signal is considered to be the height at

which the parachute and pyrotechnic candle are ejected from the projectile case, as determined by visual observation against an object of known height, such as a tower or balloon, or by triangulation from two or more points of observation, or by other method satisfactory to the Commandant. The altitude reached shall be not less than 45 m (150 ft.).

(iv) *Rate of descent.* The rate of descent of a signal is considered to be the calculated average rate obtained by dividing the altitude by the time of descent to the surface. The rate of descent shall not exceed 1.8 m (6 ft.) per second.

(v) *Burning time.* The burning time of the pyrotechnic candle shall be obtained by stop watch measurement from the time distinct, sustained flame is emitted until it ceases. The burning time shall be not less than 30 seconds.

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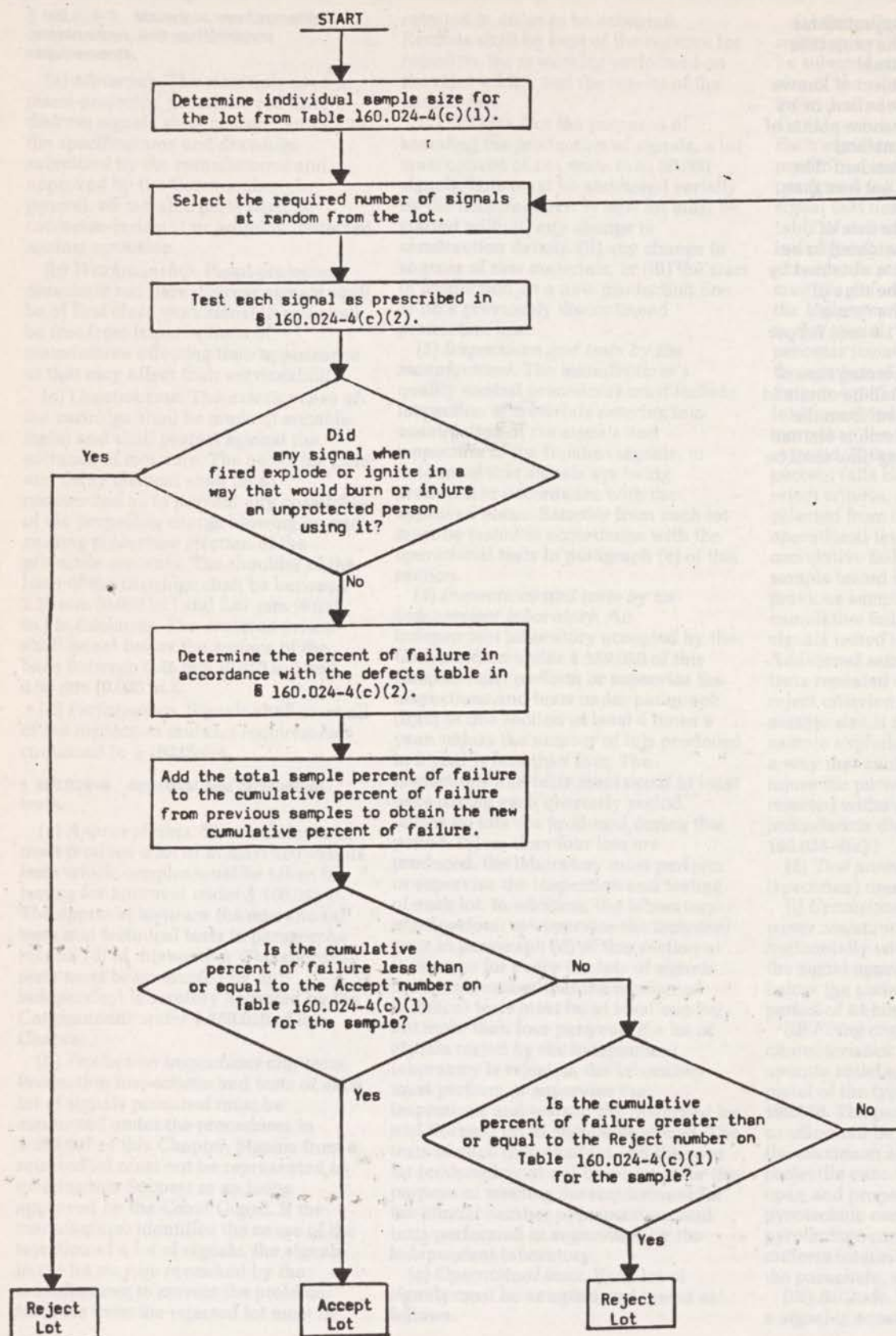


Figure 160.024-4(c). Operational test procedure.

Table 160.024-4(c)(1).—Accept and reject criteria for operational test lots

Lot size	Individual sample size	Sample size	Cumulative sample size	Accept ¹	Reject ¹
280 or less.....	8	First.....	8	(?)	400
		Second.....	16	100	500
		Third.....	24	200	600
		Fourth.....	32	300	700
		Fifth.....	40	500	800
		Sixth.....	48	700	900
		Seventh.....	56	950	951
281 to 500.....	13	First.....	13	0	400
		Second.....	26	100	600
		Third.....	39	300	800
		Fourth.....	52	500	1,000
		Fifth.....	65	700	1,100
		Sixth.....	78	1,000	1,200
		Seventh.....	91	1,350	1,351
501 to 1,200.....	20	First.....	20	0	500
		Second.....	40	300	800
		Third.....	60	600	1,000
		Fourth.....	80	800	1,300
		Fifth.....	100	1,100	1,500
		Sixth.....	120	1,400	1,700
		Seventh.....	140	1,850	1,851
1,201 to 3,200....	32	First.....	32	100	700
		Second.....	64	400	1,000
		Third.....	96	800	1,300
		Fourth.....	128	1,200	1,700
		Fifth.....	160	1,700	2,000
		Sixth.....	192	2,100	2,300
		Seventh.....	224	2,550	2,551
More than 3,201	50	First.....	50	200	900
		Second.....	100	700	1,400
		Third.....	150	1,300	1,900
		Fourth.....	200	1,900	2,500
		Fifth.....	250	2,500	2,900
		Sixth.....	300	3,100	3,300
		Seventh.....	350	3,750	3,751

¹ Cumulative failure percent.² Lot may not be accepted. Next sample must be tested.

Table 160.024-4(c)(2)

Kind of defect	Percentage of failure
a. Failure to fire (when attributable to the primer and not to the malfunction of the pistol).....	100
b. Failure to eject projectile contents.....	100
c. Failure to ignite pyrotechnic candle.....	75
d. Failure of parachute to open completely.....	75
e. Complete carrying away or destruction of parachute.....	75
f. Altitude less than 70 pct of that required.....	100
g. Altitude at least 70 pct but less than 80 pct of that required.....	75
h. Altitude at least 80 pct but less than 90 pct of that required.....	50
i. Altitude at least 90 pct but less than 100 pct of that required.....	25
j. Average rate of descent greater than 4 times maximum permitted.....	100
k. Average rate of descent less than 4 but greater than 3 times maximum permitted.....	75
l. Average rate of descent less than 3 but greater than 2 times maximum permitted.....	50
m. Average rate of descent less than twice but greater than maximum permitted.....	25
n. Burning time less than 70 pct of that required.....	100
o. Burning time at least 70 pct but less than 80 pct of that required.....	75
p. Burning time at least 80 pct but less than 90 pct of that required.....	50
q. Burning time at least 90 pct but less than 100 pct of that required.....	25

(d) *Technical tests.* Three signals must be subjected to each of the following tests. Two of the three signals must pass each test in order for the lot of signals to be accepted.

(1) *Luminous intensity.* The luminous intensity of each pyrotechnic candle tested shall be measured by a visual photometer or equivalent photometric device while the specimen is supported in a horizontal position and the photometer is at right angles to the axis of the specimen. Visual luminous intensity readings shall be observed and recorded at approximately 5-second intervals during the burning of the specimen. The minimum photometric distance shall be 3 m (10 ft.). Recording photometers shall have a chart speed of at least 10 cm (4 in.) per minute. The luminous intensity of the specimen shall be computed as the arithmetical average of the readings recorded. The average luminous intensity of a specimen shall be not less than 20,000 candela.

(2) *Elevated temperature, humidity, and storage.* Place specimen in a thermostatically controlled even-temperature oven held at 75°C. with not less than 90 percent relative humidity for 72 hours. Remove specimen and store at room temperature (20° to 25°C.) with approximately 65 percent relative humidity for 10 days. If for any reason it is not possible to operate the oven continuously for the 72-hour period, it may be operated at the required temperature and humidity for 8 hours out of each 24 during the 72-hour conditioning period. (Total of 24 hours on and 48 hours off.) The signal shall not ignite or decompose during this conditioning. The signal shall fire and operate satisfactorily following this conditioning.

(3) *Spontaneous ignition.* Place the specimen in a thermostatically controlled even-temperature oven held at 75°C. with not more than 10% relative humidity for 48 consecutive hours. The signal shall not ignite or undergo marked decomposition.

(4) *Chromaticity.* The color of the burning signal must be vivid red as defined by Sections 13 and 14 of the "Color Names Dictionary." Two identical test plates of white cardboard about 30 cm x 60 cm (12" x 24") are used. Except for a negligible amount of stray daylight, the first test plate is illuminated by light from the specimen placed at a distance of about 1.5 cm (5 ft.). The second test plate is illuminated only by light from an incandescent lamp operated at a color temperature close to 2,848°K at a distance of about 30 cm (1 ft.). The first plate is viewed directly, the second through combinations of lovibond red, yellow, and blue glasses selected so as to approximate a

chromaticity match. By separating the test plates by a wide unilluminated area (subtending at the observer about 45°), it is possible to make accurate determinations of chromaticity in terms of the 1931 CIE Standard Observer and Coordinate System, in spite of fluctuations in luminous intensity of the specimen by factors as high as 2 or 3. The CIE coordinates are converted to the Munsell notation which is cross-referenced to the color name in Section 13 of the "Color Names Dictionary" (see the discussion in Section 10 of "the Universal Color Language").

§ 160.024-5 Marking.

(a) *Cartridge.* Each pistol-projected parachute red flare distress signal shall be legibly marked as follows:

Pistol-Projected Parachute Red Flare Distress Signal 20,000 candela—30 seconds burning time Use Only When Aircraft or Vessel is Sighted
Directions—Fire upward from signal pistol Service Life Expiration Date (date to be inserted by manufacturer) (Month and year manufactured) Lot No. _____
 Manufactured by (Name and address of manufacturer) U.S. COAST GUARD
APPROVAL NO. _____.

(b) *Marking of expiration date.* The expiration date must be not more than 42 months from the date of manufacture.

(c) *Other marking.*

(1) On each pistol-projected parachute red flare distress signal there shall be die-stamped, in figures not less than 3mm (1/8 in.) high, on the cartridge, numbers indicating the month and year of manufacture, thus: "6-54" indicating June 1954.

(2) The pyrotechnic candle shall be legibly marked with the month and year of manufacture.

(3) In addition to any other marking placed on the smallest packing carton or box containing cartridges, each carton or box shall be plainly and permanently marked to show the service life expiration date, the date of manufacture, and the lot number.

(4) The largest carton or box in which the manufacturer ships signals must be marked with the following or equivalent words: "Keep under cover in a dry place."

Note.—Compliance with the labeling requirements of this section does not relieve the manufacturer of the responsibility of complying with the label requirements of 15 USC 1263, the Federal Hazardous Substances Act.

§ 160.024-6 Container.

(a) *General.* The container for storing the signals on lifeboats and liferafts is not required to be of a special design or be approved by the Coast Guard. The container must meet the requirements in Subpart 160.021 (§ 160.021-6) except that the recommended type of container is illustrated in Figure 160.024-6(a), and the wording on the container must be **Signal Pistol and Pistol-Projected Parachute Red Flare Distress Signals**.

§ 160.024-7 Procedure for approval.

(a) Signals are approved by the Coast Guard under the procedures in Subpart 159.005 of this Chapter.

§ 160.024-9 Recognized independent laboratories.

(a) The following independent laboratories have been accepted by the Commandant for conducting the approval and production tests required in this Subpart:

(1) (Reserved).

(b) Revised copies of this list may be obtained from Commandant (G-MMT-3/TP12), U.S. Coast Guard Headquarters, Washington, D.C. 20593.

BILLING CODE 4910-14-M

Signal Pistol and Pistol-Projected Parachute Red Flare Distress Signals		Signal Pistol and Pistol-Projected Parachute Red Flare Distress Signals		Signal Pistol and Pistol-Projected Parachute Red Flare Distress Signals	
Signal Pistol	Signal Pistol	Signal Pistol	Signal Pistol	Signal Pistol	Signal Pistol
100	100	100	100	100	100
101	101	101	101	101	101
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Signal Pistol and Pistol-Projected Parachute Red Flare Distress Signals		Signal Pistol and Pistol-Projected Parachute Red Flare Distress Signals		Signal Pistol and Pistol-Projected Parachute Red Flare Distress Signals	
Signal Pistol	Signal Pistol	Signal Pistol	Signal Pistol	Signal Pistol	Signal Pistol
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Figure 160.024-6(a). Signal Pistol and Pistol-Projected Parachute Red Flare Distress Signals.

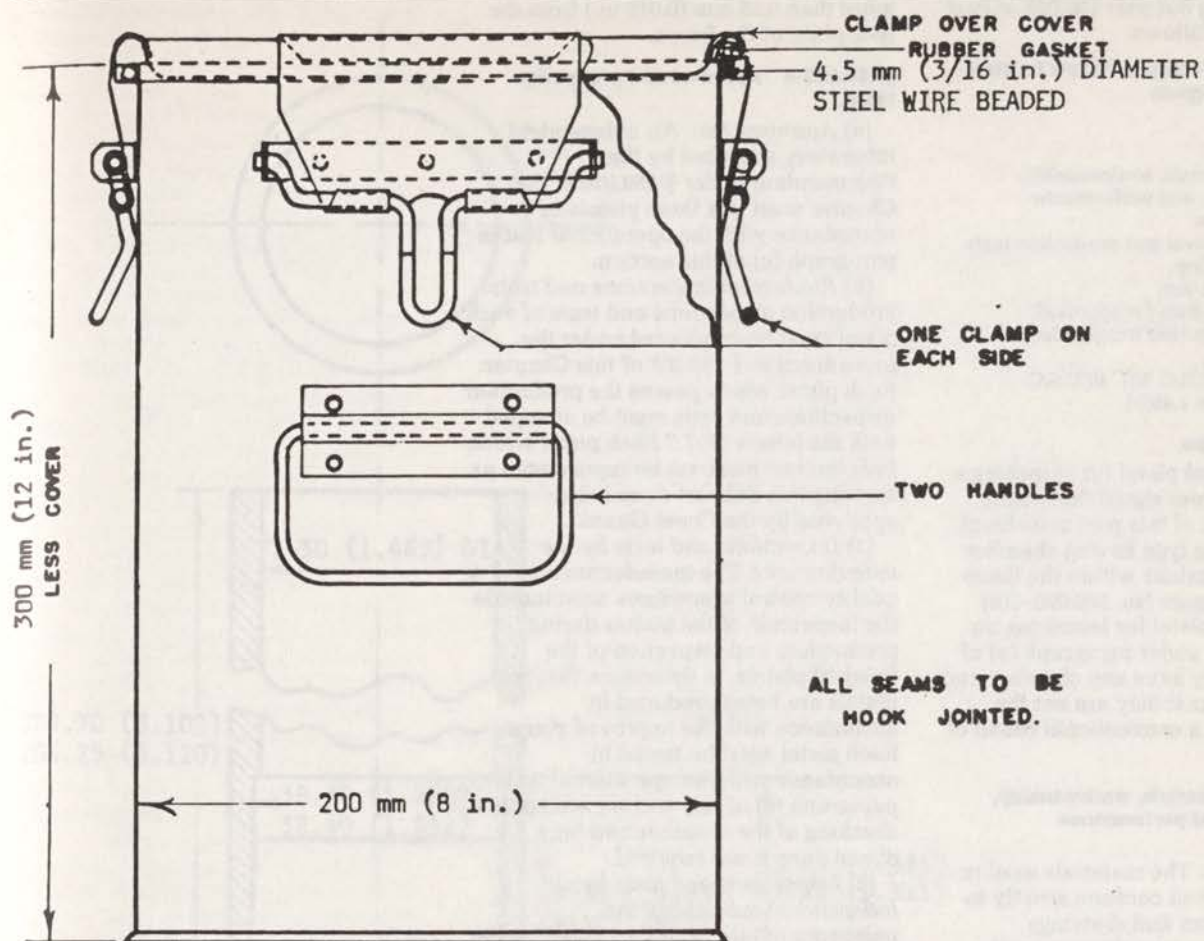


Figure 160.024-6(a). Watertight Container for Signal Pistol and Pistol Projected Parachute Red Flare Distress Signals.

BILLING CODE 4910-14-C

5. By revising Subpart 160.028 of Part 160 to read as follows:

Subpart 160.028—Signal Pistols for Red Flare Distress Signals

Sec.

160.028-2 Type.

160.028-3 Materials, workmanship, construction, and performance requirements.

160.028-4 Approval and production tests.

160.028-5 Marking.

160.028-6 Container.

160.028-7 Procedure for approval.

160.028-9 Recognized independent laboratories.

Authority: 46 U.S.C. 481, 49 U.S.C. 1655(b)(1), 49 CFR 1.46(b).

§ 160.028-2 Type.

(a) Each signal pistol for launching a parachute distress signal that meets subpart 160.024 of this part must be of the center-firing type having chamber and bore dimensions within the limits indicated by Figure No. 160.028-2(a).

(b) A signal pistol for launching an aerial flare not under paragraph (a) of this section may have any chamber and bore dimensions if they are not the dimensions for a conventional round of ammunition.

§ 160.028-3 Materials, workmanship, construction, and performance requirements.

(a) *Materials.* The materials used in signal pistols shall conform strictly to the specifications and drawings submitted by the manufacturer and approved by the Commandant. In general, all parts shall be corrosion-resistant or properly protected against corrosion. The ejection mechanism shall be of material possessing excellent wearing qualities.

(b) *Workmanship.* Signal pistols shall be of first class workmanship and shall be free from imperfections of manufacture affecting their serviceability or appearance.

(c) *Construction and performance requirements.* (Pistols intended for signals meeting subpart 160.024). Signal pistols shall be of rugged construction and shall operate satisfactorily in firing and ejecting pistol-projected parachute red flare distress signals of the type covered by Subpart 160.024. The ejection mechanism shall be of sturdy design capable of withstanding rough and repeated usage. The overall size and weight of signal pistols should be kept to a minimum consistent with adequate strength and safety. When the pistol is cocked and the trigger is pulled, the firing pin shall project between 1.52 mm and 2.54 mm (0.060 in. and 0.100 in.) beyond the face plate of the frame. When the barrel is locked in the firing position, the barrel chamber shall be not

more than 0.25 mm (0.010 in.) from the face plate of the frame.

§ 160.028-4 Approval and production tests.

(a) *Approval test.* An independent laboratory accepted by the Commandant under § 159.010 of this Chapter must test three pistols in accordance with the operational test in paragraph (c) of this section.

(b) *Production inspections and tests.* Production inspections and tests of each pistol must be conducted under the procedures in § 159.007 of this Chapter. Each pistol which passes the production inspections and tests must be stamped with the letters "P.T." Each pistol which fails the test must not be represented as meeting this Subpart or as being approved by the Coast Guard.

(1) *Inspections and tests by the manufacturer.* The manufacturer's quality control procedures must include the inspection of the pistols during production, and inspection of the finished pistols, to determine that the pistols are being produced in accordance with the approved plans. Each pistol must be tested in accordance with the operational test in paragraph (c) of this section, except that checking of the chamber and bore dimensions is not required.

(2) *Inspections and tests by an independent laboratory.* An independent laboratory accepted by the Commandant under § 159.010 of this Chapter must inspect and test three pistols at least one each year. The inspection must determine that the pistols are being produced in accordance with the approved plans. The test must be in accordance with paragraph (c) of this section.

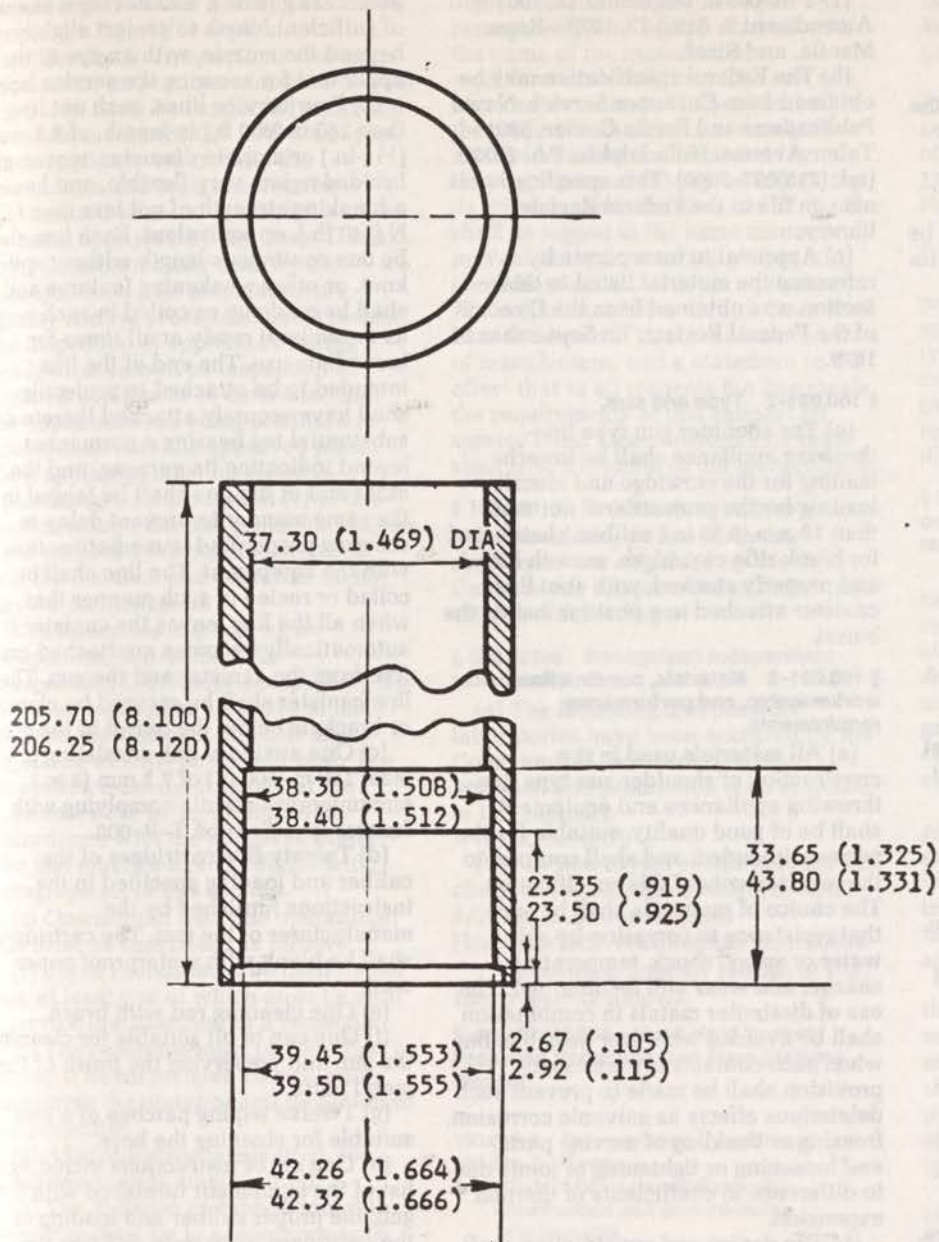
(c) *Operational test.* The operational test must be conducted as follows:

(1) Check the chamber and bore dimensions of the pistol.

(2) Fire a dummy cartridge simulating a normal signal in size and weight, but with a charge double the normal charge.

(3) Fire a normal signal.

BILLING CODE 4910-14-M



DIMENSIONS IN MILLIMETERS (INCHES)

Figure 160.028-2(a). Signal Pistol - Chamber and Bore Dimensions.

(4) Recheck the chamber and bore dimensions.

(5) The pistol must fire the signal properly, must not have any visible deformation or damage as a result of the test, and must not have any change in the chamber and bore dimensions.

§ 160.028-5 Marking.

(a) *General.* Each signal pistol shall be permanently and legibly marked with its serial number, Coast Guard approval number, and the name and address of the manufacturer.

§ 160.028-6 Container.

(a) *General.* Containers for the stowage of signal pistols and pistol projected parachute red flare distress signals in lifeboats and life rafts on merchant vessels are not required to have specific approval or to be of specific design except for certain material, marking, and test requirements, which requirements are contained in § 160.024-6 of Subpart 160.024.

§ 160.028-7 Procedure for approval.

(a) Signals are approved by the Coast Guard under the procedures in Subpart 159.005 of this Chapter.

§ 160.028-9 Recognized independent laboratories.

(a) The following independent laboratories have been accepted by the Commandant for conducting the approval and production tests required in this Subpart:

(1) (Reserved).

(b) Revised copies of this list may be obtained from Commandant (G-MMT-3/TP12), U.S. Coast Guard Headquarters, Washington, D.C. 20593.

6. By revising Subpart 160.031 of Part 160 to read as follows:

Subpart 160.031—Line-Throwing Appliance, Shoulder Gun Type (and Equipment)

Sec.

160.031-1 Incorporation by reference.

160.031-2 Type and size.

160.031-3 Materials, construction, workmanship, and performance requirements.

160.031-4 Equipment for shoulder gun type line-throwing appliance.

160.031-5 Approval and production tests.

160.031-6 Marking.

160.031-7 Procedure for approval.

160.031-9 Recognized independent laboratories.

Authority: 46 U.S.C. 481, 49 U.S.C. 1655(b)(1), 49 CFR 1.46(b).

§ 160.031-1 Incorporation by reference.

(a) The following Federal specification is incorporated by reference into this subpart:

(1) T-R-605 b, December 13, 1963 and Amendment 3, April 17, 1973—Rope, Manila, and Sisal.

(b) The Federal specification may be obtained from Customer Service, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA. 19120 (tel: (215)697-2000). This specification is also on file in the Federal Register library.

(c) Approval to incorporate by reference the material listed in this section was obtained from the Director of the Federal Register on September 24, 1979.

§ 160.031-2 Type and size.

(a) The shoulder gun type line-throwing appliance shall be breech-loading for the cartridge and muzzle-loading for the projectile, of not more than 13 mm (0.50 in.) caliber, chambered for blank rifle cartridges, smooth bored, and properly stocked, with shot line canister attached in a position below the barrel.

§ 160.031-3 Materials, construction, workmanship, and performance requirements.

(a) All materials used in the construction of shoulder gun type line-throwing appliances and equipment shall be of good quality, suitable for the purpose intended, and shall conform to the requirements of this specification. The choice of materials shall be such that resistance to corrosion by salt water or spray, shock, temperature change, and wear will be obtained. The use of dissimilar metals in combination shall be avoided wherever possible, but when such contacts are necessary, provision shall be made to prevent such deleterious effects as galvanic corrosion, freezing or buckling of moving parts, and loosening or tightening of joints due to difference in coefficients of thermal expansion.

(b) The design and construction shall be proper and substantial for effective and safe operation aboard ship.

(c) The workmanship shall be first class and free from any imperfections of manufacture affecting appearance or serviceability of the gun.

(d) The gun, when loaded and fired in accordance with the manufacturer's instructions, shall be capable of propelling through relatively still air, the service projectile with service line attached, for a distance of not less than 75 m (250 ft.) with deviation from the target not to exceed 4.5 m (15 ft.) either side.

§ 160.031-4 Equipment for shoulder gun type line-throwing appliance.

(a) Ten service projectiles, each machined from steel or bronze, weighing

about 225 g (8 oz.), and having a shank of sufficient length to project slightly beyond the muzzle, with an eye at the upper end for securing the service line.

(b) Four service lines, each not less than 180 m (600 ft.) in length, of 1.5 mm ($\frac{1}{16}$ in.) or more in diameter, woven or braided nylon, very flexible, and having a breaking strength of not less than 625 N (140 lb.), or equivalent. Each line shall be one continuous length without splice, knot, or other weakening features and shall be made up or coiled in such way as to render it ready at all times for immediate use. The end of the line intended to be attached to projectile shall have securely attached thereto a substantial tag bearing a permanent legend indicating its purpose, and the other end of the line shall be tagged in the same manner to prevent delay in securing proper and immediate action with the equipment. The line shall be coiled or reeled in such manner that when all the line leaves the canister it automatically becomes unattached and free from the canister and the gun. The line canister shall be secured by clamps or brackets below the barrel of the gun.

(c) One auxiliary line consisting of at least 150 m (500 ft.) of 7.5 mm (3 in.) circumference manila complying with federal specification T-R-605.

(d) Twenty-five cartridges of the caliber and loading specified in the instructions furnished by the manufacturer of the gun. The cartridges shall be blank with waterproof paper wad.

(e) One cleaning rod with brush.

(f) One can of oil suitable for cleaning the gun and preserving the finish of the metal parts.

(g) Twelve wiping patches of a size suitable for cleaning the bore.

(h) One set of instructions including a list of the equipment furnished with the gun, the proper caliber and loading of the cartridges to be used in firing the gun, information as to the proper maintenance of the gun and equipment, and directions for loading and firing in service use shall be permanently engraved in plastic and mounted conspicuously in the case or box required by § 160.031-4(i).

(i) A suitable case or box, properly compartmented for stowage of the appliance and auxiliary equipment, is required for stowage on merchant vessels. The auxiliary line need not be stowed in the case.

§ 160.031-5 Approval and production tests.

(a) *Approval test.* An independent laboratory accepted by the Commandant under § 159.010 of this Chapter must test an appliance in

accordance with the operational test in paragraph (c) of this section.

(b) *Production inspections and tests.* Production inspections and tests of each appliance must be conducted under the procedures in § 159.007 of this Chapter. Each appliance which fails the inspections and tests must not be represented as meeting this Subpart or as being approved by the Coast Guard.

(1) *Inspections and tests by the manufacturer.* The manufacturer's quality control procedures must include the inspection of appliances during production as well as inspection of finished appliances to determine that the appliances are being produced in accordance with the approved plans. Each appliance must be tested in accordance with paragraph (c) of this section except that the projectile may be fired without a service line attached, and the distance and deviation do not have to be measured.

(2) *Inspections and test by an independent laboratory.* An independent laboratory accepted by the Commandant under § 159.010 of this Chapter must inspect and test one appliance at least once each year. The inspection must determine that the appliances are being produced in accordance with the approved plans. The test must be in accordance with paragraph (c) of this section.

(c) *Operational test.* The operational test must be conducted as follows:

(1) Three rounds must be fired by the gun, at least one of which must be with a service line attached to a projectile.

(2) The projectile must be fired first by aiming it down an open course, and measuring the distance and deviation of the projectile.

(3) After the projectile is fired, the other two rounds must be fired.

(4) The distance and deviation of the projectile must be in accordance with § 160.031-3(d) the gun must fire each round properly and the gun must not be fractured or damaged by the test.

§ 160.031-6 Marking.

(a) *Gun.* The gun shall be permanently and legibly marked on the barrel with the manufacturer's model or type designation of the gun, the serial number for the gun, the official Coast Guard approval number, and the name of the manufacturer. The gun stock shall have recessed in it a brass or other corrosion-resistant plate showing legible maintenance instructions for the care of the gun and its parts to prevent corrosion. After the proof test, the gun barrel shall be marked with the letters "P.T." and the name or mark of the company.

(b) *Projectile.* Projectiles shall be permanently and legibly marked with the name of the manufacturer.

(c) *Line and container.* The end of a service line intended to be attached to the projectile shall have securely attached thereto a substantial tag bearing a permanent legend indicating its purpose, and the other end of the line shall be tagged in the same manner to prevent delay in securing proper and immediate action with the equipment. The container of new service lines shall bear the name of the manufacturer, date of manufacture, and a statement to the effect that in all respects the line meets the requirements of this subpart for service lines. Line canisters and reels shall bear the name of the manufacturer.

§ 160.031-7 Procedure for approval.

(a) Shoulder gun line throwing appliances are approved by the Coast Guard under the procedures in Subpart 159.005 of this Chapter.

§ 160.031-9 Recognized independent laboratories.

(a) The following independent laboratories have been accepted by the Commandant for conducting the approval and production tests required in this Subpart:

(1) (Reserved).

(b) Revised copies of this list may be obtained from Commandant (G-MMT-3/TP12), U.S. Coast Guard Headquarters, Washington, D.C. 20593.

7. By revising Subpart 160.036 of Part 160 to read as follows:

Subpart 160.036—Hand-Held Rocket-Propelled Parachute Red Flare Distress Signals

Sec.

160.036-1 Incorporation by reference.

160.036-2 Type.

160.036-3 Materials, workmanship, construction and performance requirements.

160.036-4 Approval and production tests.

160.036-5 Marking.

160.036-6 Container.

160.036-7 Procedure for approval.

160.036-9 Recognized independent laboratories.

Authority: 46 U.S.C. 481, 49 U.S.C. 1655(b)(1), 49 CFR 1.46(b).

§ 160.036-1 Incorporation by reference.

(a) The following is incorporated by reference into this subpart:

(1) "The Universal Color Language" and "The Color Names Dictionary" in *Color: Universal Language and Dictionary of Names*, National Bureau of Standards Special Publication 440, December 1976.

(b) NBS Special Publication 440 may be obtained by ordering from the Superintendent of Documents, U.S.

Government Printing Office, Washington, D.C. 20402 (Order by SD Catalog No. C13.10:440).

(c) Approval to incorporate by reference the material listed in this section was obtained from the director of the Federal Register on November 1, 1979. The material is on file in the Federal Register library.

§ 160.036-2 Type.

(a) Handheld rocket-propelled parachute red flare distress signals specified by this subpart shall be of one type which shall consist essentially of a completely self-contained device which can be fired from the hand to provide a rocket-propelled parachute red flare distress signal.

§ 160.036-3 Materials, workmanship, construction and performance requirements.

(a) *Materials.* The materials used in handheld rocket-propelled parachute red flare distress signals shall conform strictly to the specifications and drawings submitted by the manufacturer and approved by the Commandant. In general, all exposed parts shall be corrosion-resistant or properly protected against corrosion.

(b) *Workmanship.* Handheld rocket-propelled parachute red flare distress signals shall be of first class workmanship and shall be free from imperfections of manufacture affecting their appearance or that may affect their serviceability.

(c) *Construction.* The exterior case of the cartridge shall be made of a suitable metal and shall protect against the entrance of moisture. The construction shall be such that the parachute and pyrotechnic candle will be expelled at approximately the maximum altitude reached.

(d) *Performance.* Signals shall meet all of the inspection and test requirements contained in § 160.036-4.

§ 160.036-4 Approval and production tests.

(a) *Approval tests.* The manufacturer must produce a lot of at least 100 signals from which samples must be taken for testing for approval under § 160.036-7. The approval tests are the operational tests and technical tests in paragraphs (c) and (d) of this section. The approval tests must be conducted by an independent laboratory accepted by the Commandant under § 159.010 of this Chapter.

(b) *Production inspections and tests.* Production inspections and tests of each lot of signals produced must be conducted under the procedures in § 159.007 of this Chapter. Signals from a rejected lot must not be represented as

meeting this Subpart or as being approved by the Coast Guard. If the manufacturer identifies the cause of the rejection of a lot of signals, the signals in the lot may be reworked by the manufacturer to correct the problem. Samples from the rejected lot must be retested in order to be accepted. Records shall be kept of the reasons for rejection, the reworking performed on the rejected lot, and the results of the second test.

(1) *Lot size.* For the purposes of sampling the production of signals, a lot must consist of not more than 30,000 signals. Lots must be numbered serially by the manufacturer. A new lot must be started with:

- (i) any change in construction details,
- (ii) any changes in sources of raw materials, or
- (iii) the start of production on a new production line or on a previously discontinued production line.

(2) *Inspections and tests by the manufacturer.* The manufacturer's quality control procedures must include inspection of materials entering into construction of the signals and inspection of the finished signals, to determine that signals are being produced in accordance with the approved plans. Samples from each lot must be tested in accordance with the operational tests in paragraph (c) of this section.

(3) *Inspections and test by an independent laboratory.* An independent laboratory accepted by the Commandant under § 159.010 of this Chapter must perform or supervise the inspections and tests under paragraph (b)(2) of this section at least 4 times a year, unless the number of lots produced in a year is less than four. The inspections and tests must occur at least once during each quarterly period, unless no lots are produced during this period. If less than four lots are produced, the laboratory must perform or supervise the inspection and testing of each lot. In addition, the laboratory must perform or supervise the technical tests in paragraph (d) of this section at least once for every ten lots of signals produced, except that the number of technical tests must be at least one but not more than four per year. If a lot of signals tested by the independent laboratory is rejected, the laboratory must perform or supervise the inspections and tests of the reworked lot and the next lot of signals produced. The tests of each reworked lot and the next lot produced must not be counted for the

purpose of meeting the requirement for the annual number of inspections and tests performed or supervised by the independent laboratory.

(c) *Operational tests.* Each lot of signals must be sampled and tested as follows:

(1) *Sampling procedure and accept/reject criteria.* A sample of signals must be selected at random from the lot. The size of the sample must be the individual sample size in Table 160.036-4(c)(1) corresponding to the lot size. Each signal in the sample is tested as prescribed in the test procedure in paragraph (c)(2) of this section. Each signal that has a defect listed in the table of defects (Table 160.036-4(c)(2)) is assigned a score (failure percent) in accordance with that table. In the case of multiple defects, only the score having the highest numerical value is assigned to that signal. If the sum of all the failure percents (cumulative failure percent) for the number of units in the sample is less than or equal to the accept criterion, the lot is accepted. If this sum is equal to or more than the reject criterion the lot is rejected. If the cumulative failure percent falls between the accept and reject criteria, another sample is selected from the production lot and the operational tests are repeated. The cumulative failure percent of each sample tested is added to that of the previous samples to obtain the cumulative failure percent for all the signals tested (cumulative sample size). Additional samples are tested and the tests repeated until either the accept or reject criterion for the cumulative sample size is met. If any signal in the sample explodes when fired or ignites in a way that could burn or otherwise injure the person firing it, the lot is rejected without further testing. (This procedure is diagrammed in figure 160.036-4(c)).

(2) *Test procedure.* Each sample signal (specimen) must be tested as follows:

(i) *Conditioning of test specimens—water resistance.* Immerse specimen horizontally with uppermost portion of the signal approximately 25 mm (1 in.) below the surface of the water for a period of 24 hours.

(ii) *Firing and operating characteristics.* Signals shall fire and operate satisfactorily when the manufacturer's directions are followed. The parachute and pyrotechnic candle shall be ejected at approximately the maximum altitude reached by the projectile case. The parachute shall open and properly suspend the

pyrotechnic candle without fouling. The pyrotechnic candle shall burn with uniform intensity and without damaging the parachute, shrouds, or leader line. (iii) *Altitude.* The altitude reached by a signal is considered to be the height at which the parachute and pyrotechnic candle are ejected from the projectile case, as determined by visual observation against an object of known height, such as a tower or balloon, or by triangulation from two or more points of observation, or by other method satisfactory to the Commandant. The altitude reached shall be not less than 150 m (500 ft.).

(iv) *Rate of descent.* The rate of descent of a signal is considered to be the calculated average rate obtained by dividing the altitude by the time of descent to the surface. The rate of descent shall not exceed 4.5 m (15 ft.) per second.

(v) *Burning time.* The burning time of the pyrotechnic candle shall be obtained by stop watch measurement from the time a distinct, sustained flame is emitted until it ceases. The burning time shall be not less than 30 seconds.

Table 160.036-4(c)(1).—Accept and reject criteria for operational test lots

Lot size	Individual sample size	Sample	Cumulative sample size	Accept ¹	Reject ¹
280 or less.....	8	First	8	(²)	400
		Second..	16	100	500
		Third.....	24	200	600
		Fourth.....	32	300	700
		Fifth.....	40	500	800
		Sixth.....	48	700	900
		Seventh..	56	950	951
281 to 500	13	First	13	0	400
		Second..	26	100	600
		Third.....	39	300	800
		Fourth.....	52	500	1,000
		Fifth.....	65	700	1,100
		Sixth.....	78	1,000	1,200
		Seventh..	91	1,350	1,351
501 to 1,200	20	First	20	0	500
		Second..	40	300	800
		Third.....	60	600	1,000
		Fourth.....	80	800	1,300
		Fifth.....	100	1,100	1,500
		Sixth.....	120	1,400	1,700
		Seventh..	140	1,850	1,851
1,201 to 3,200	32	First	32	100	700
		Second..	64	400	1,000
		Third.....	96	800	1,300
		Fourth.....	128	1,200	1,700
		Fifth.....	160	1,700	2,000
		Sixth.....	192	2,100	2,300
		Seventh..	224	2,550	2,551
More than 3,201	50	First	50	200	900
		Second..	100	700	1,400
		Third.....	150	1,300	1,900
		Fourth.....	200	1,900	2,500
		Fifth.....	250	2,500	2,900
		Sixth.....	300	3,100	3,300
		Seventh..	350	3,750	3,751

¹ Cumulative failure percent.

² Lot may not be accepted. Next sample must be tested.

Table 160.036-4(c)(2)

Kind of defect	Percentage of failure
a. Failure to fire.....	100
b. Failure to eject projectile contents.....	100
c. Failure to ignite pyrotechnic candle.....	100
d. Failure of parachute to open completely.....	75
e. Complete carrying away or destruction of parachute.....	75
f. Altitude less than 70 pct of that required.....	100
g. Altitude less than 70 pct but less than 80 pct of that required.....	75
h. Altitude at least 80 pct but less than 90 pct of that required.....	50
i. Altitude at least 90 pct but less than 100 pct of that required.....	25
j. Average rate of descent greater than four times maximum permitted.....	100
k. Average rate of descent less than 4 but greater than 3 times maximum permitted.....	75
l. Average rate of descent less than 3 but greater than 2 times maximum permitted.....	50
m. Average rate of descent less than twice but greater than maximum permitted.....	25
n. Burning time less than 70 pct of that required.....	100
o. Burning time at least 70 pct but less than 80 pct of that required.....	75
p. Burning time at least 80 pct but less than 90 pct of that required.....	50
q. Burning time at least 90 pct but less than 100 pct of that required.....	25

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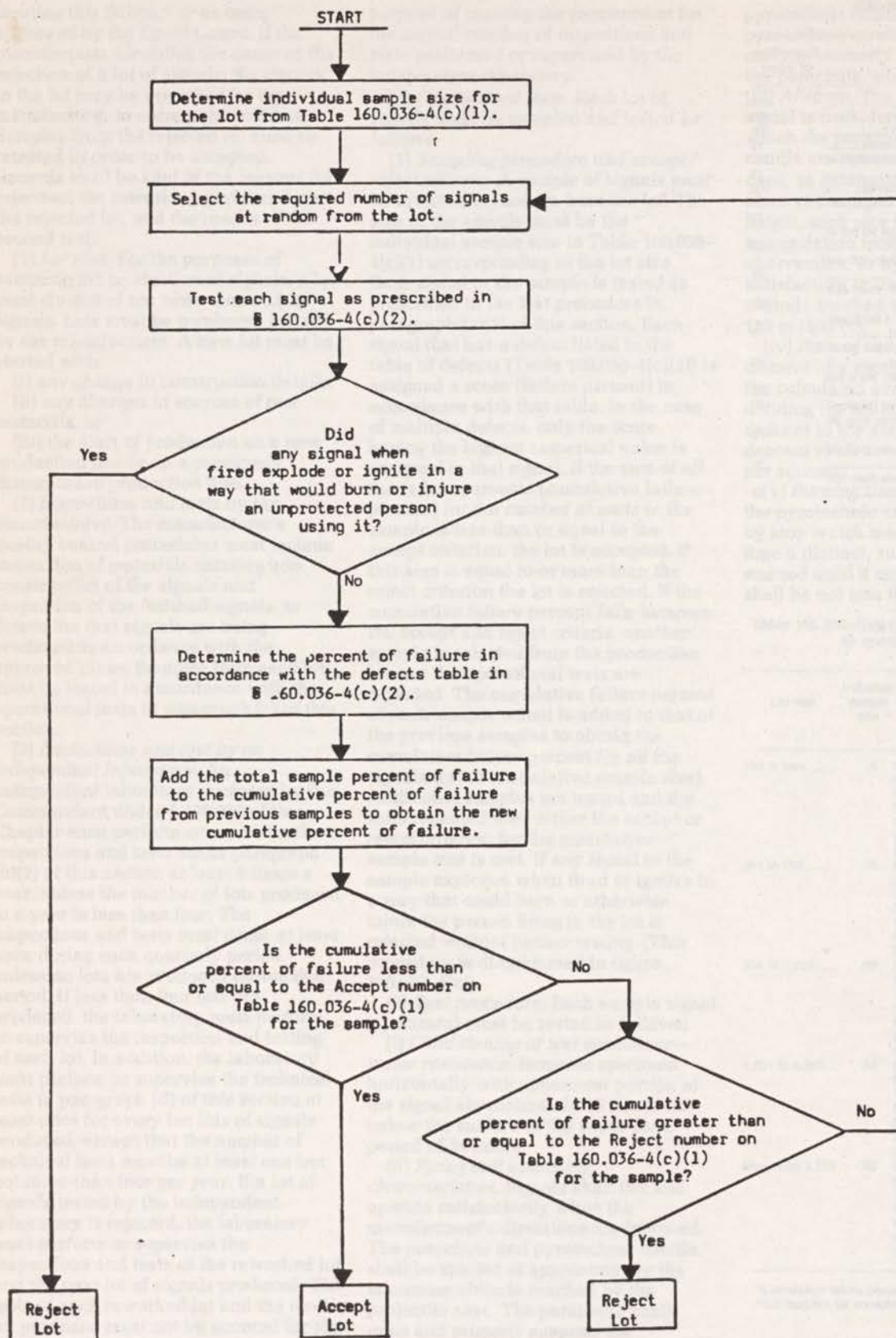


Figure 160.036-4(c). Operational test procedure.

(d) *Technical tests.* Three signals must be subjected to each of the following tests. Two of the three signals must pass each test in order for the lot of signals to be accepted.

(1) *Luminous intensity.* The luminous intensity of each pyrotechnic candle tested shall be measured by a visual photometer or equivalent photometric device while the specimen is supported in a horizontal position and the photometer is at right angles to the axis of the specimen. Visual luminous intensity readings shall be observed and recorded at approximately 5-second intervals during the burning of the specimen. The minimum photometric distance shall be 3 m (10 ft.). Recording photometers shall have a chart speed of at least 10 cm (4 in.) per minute. The luminous intensity of the specimen shall be computed as the arithmetical average of the readings recorded. The average luminous intensity of a specimen shall be not less than 20,000 candela.

(2) *Elevated temperature, humidity, and storage.* Place specimen in a thermostatically controlled even-temperature oven held at 75° C. with not less than 90 percent relative humidity for 72 hours. Remove specimen and store at room temperature (20° to 25° C.) with approximately 65 percent relative humidity for ten days. If for any reason it is not possible to operate the oven continuously for the 72-hour period, it may be operated at the required temperature and humidity for 8 hours out of each 24 during the 72-hour conditioning period. (Total of 24 hours on and 48 hours off.) The signal shall not ignite or decompose during this conditioning. The signal shall fire and operate satisfactorily following this conditioning.

(3) *Spontaneous ignition.* Place the specimen in a thermostatically controlled even-temperature oven held at 75° C. with not more than 10% relative humidity for 48 consecutive hours. The signal shall not ignite or undergo marked decomposition.

(4) *Chromaticity.* The color of the burning signal must be vivid red as defined by Sections 13 and 14 of the "Color Names Dictionary." Two identical test plates of white cardboard about 30 cm x 60 cm (12" x 24") are used. Except for a negligible amount of stray daylight, the first test plate is illuminated by light from the specimen placed at a distance of about 1.5 m (5 ft.). The second test plate is illuminated only by light from an incandescent lamp operated at a color temperature close to 2,848° K at a distance of about 30 cm (1 ft.). The first plate is viewed directly, the second through combinations of Lovibond red, yellow, and blue glasses

selected so as to approximate a chromaticity match. By separating the test plates by a wide unilluminated area (subtending at the observer about 45°), it is possible to make accurate determinations of chromaticity in terms of the 1931 CIE Standard Observer and Coordinate System, in spite of fluctuations in luminous intensity of the specimen by factors as high as 2 or 3. The CIE coordinates are converted to the Munsell notation which is cross-referenced to the color name in Section 13 of the "Color Names Dictionary" (see the discussion in Section 10 of "The Universal Color Language").

§ 160.036-5 Marking.

(a) *General.* Each hand-held rocket-propelled parachute red flare distress signal shall be legibly marked or labeled as follows:

(Company brand or style designation)
Hand-Held Rocket-Propelled Parachute Red Flare Distress Signal—20,000 candela—30 seconds burning time. **Use Only When Aircraft or Vessel Is Sighted.** **Directions**—(In numbered paragraphs, simply worded instructions for firing the device). **Service Life Expiration Date** (date to be inserted by manufacturer) (Month and year manufactured) (Lot No. —) **Manufactured by** (Name and address of manufacturer) **U.S. Coast Guard Approval No.** —.

(b) *Marking of expiration date.* The expiration date must be not more than 42 months from the date of manufacture.

(c) *Other marking.*

(1) On each hand-held rocket propelled parachute red flare distress signal there shall be die-stamped in figures not less than 3 mm ($\frac{1}{8}$ in.) high, on the signal, numbers indicating the month and year of manufacture, thus: "6-54" indicating June, 1954.

(2) The pyrotechnic candle shall be legibly marked with the month and year of manufacture.

(3) In addition to any other marking place on the smallest packing carton or box containing signals, each carton or box shall be plainly and permanently marked to show the service life expiration date, date of manufacture, and lot number.

(4) The largest carton or box in which the manufacturer ships signals must be marked with the following or equivalent words: "Keep under cover in a dry place."

Note.—Compliance with the labeling requirements of this section does not relieve the manufacturer of the responsibility of complying with the label requirements of 15 U.S.C. 1263, the Federal Hazardous Substances Act.

§ 160.036-6 Container.

(a) *General.* The container for storing the signals on lifeboats and liferafts is not required to be of a special design or be approved by the Coast Guard. The container must meet the requirements in Subpart 160.021 (§ 160.021-6) except that the wording on the container must be:

Hand-Held Rocket-Propelled Parachute Red Flare Distress Signals

§ 160.036-7 Procedure for approval.

(a) Signals are approved by the Coast Guard under the procedures in Subpart 159.005 of this Chapter.

§ 160.036-9 Recognized independent laboratories.

(a) The following independent laboratories have been accepted by the Commandant for conducting the approval and production tests required in this Subpart:

(1) (Reserved).

(b) Revised copies of this list may be obtained from Commandant (G-MMT-3/TP12), U.S. Coast Guard Headquarters, Washington, D.C. 20593.

8. By revising Subpart 160.037 of Part 160 to read as follows:

Subpart 160.037—Hand Orange Smoke Distress Signals

Sec.

160.037-1 Incorporations by reference.

160.037-2 Type.

160.037-3 Materials, workmanship, construction, and performance requirements.

160.037-4 Approval and production tests.

160.037-5 Labeling and marking.

160.037-6 Container.

160.037-7 Procedure for approval.

160.037-9 Recognized independent laboratories.

Authority: 46 U.S.C. 481, 49 U.S.C. 1655(b)(1), 49 CFR 1.46(b).

§ 160.037-1 Incorporations by reference.

(a) The following are incorporated by reference into this subpart:

(1) "The Color Names Dictionary" in *Color: Universal Language and Dictionary of Names*, National Bureau of Standards Special Publication 440, December 1976.

(2) "Development of a Laboratory Test for Evaluation of the Effectiveness of Smoke Signals," National Bureau of Standards Report 4792, July 1956.

(b) NBS Special Publication 440 may be obtained by ordering from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (Order by SD Catalog No. C13.10:440).

(c) NBS Report 4792 may be obtained from the Commandant (G-MMT-3/TP12), U.S. Coast Guard Washington, D.C. 20593.

(d) Approval to incorporate by reference the materials listed in this section was obtained from the Director of the Federal Register on November 1 and 29, 1979. The materials are on file in the Federal Register library.

§ 160.037-2 Type.

(a) Hand orange smoke distress signals specified by this subpart shall be one type which shall consist essentially of a wooden handle to which is attached a tubular casing having a sealing plug at the handle end, the casing being filled with a smoke producing composition and fuse with button of ignition material at the top, and a removable cap having a friction striking material on its top which may be exposed for use by pulling a tear strip. The signal is ignited by scraping the friction striker on top of the cap against the igniter button on top of the body of the signal. Alternate arrangements which conform to the performance requirements of this specification will be given special consideration.

§ 160.037-3 Materials, workmanship, construction, and performance requirements.

(a) *Materials.* The materials shall conform strictly to the specifications and drawings submitted by the manufacturer and approved by the Commandant. The color of the tube shall be orange. The combustible materials shall be of such nature as will not deteriorate during long storage, nor when subjected to frigid or tropical climates, or both.

(b) *Workmanship.* Hand orange smoke distress signals shall be of first class workmanship and shall be free from imperfections of manufacture affecting their appearance or that may affect their serviceability. Moisture proof coatings shall be applied uniformly and shall be free from pinholes or other visible defects which would impair their usefulness.

(c) *Construction.* The casing shall be fitted and secured to the handle with not less than a 25 mm (1 in.) overlap and shall be attached to the handle in such a manner that failure of the joint will not occur during tests, ignition, or operation. The plug shall be securely affixed in the casing to separate the smoke composition from the wooden handle. The smoke composition shall be thoroughly mixed and be uniformly compressed throughout to preclude variations of density which may adversely affect uniformity of its smoke emitting characteristics. The cap shall have a lap fit of not less than 25 mm (1 in.) over the end of the casing and smoke composition to entirely and

securely protect the exposed surface of the igniter button and end of smoke composition and casing, and shall have an inner shoulder so constructed that it is mechanically impossible for the inner surface of the cap to come in contact with the igniter button. The cap shall be securely attached to the casing in such manner as to preclude its accidental detachment. The cap shall be provided on its top with a friction striking material which shall, by a pull of the tear strip, be entirely exposed for striking the friction igniter button. The igniter button shall be non-water soluble or be protected from moisture by a coating of some waterproof substance, and shall be raised or exposed in such manner as to provide positive ignition by the friction striker. The igniter button shall be firmly secured in or on the top of the smoke composition; the arrangement shall be such that the ignition will be transmitted to the smoke producing composition. The assembled signal, consisting of tear strip, cap, casing, and handle, shall be sealed and treated to protect the signal from deterioration by moisture. The protective waterproof coating shall be applied so none adheres to the friction striking surface. Special consideration will be given to alternate waterproofing of the signal by means of a water-resistant coating on the signal plus packaging in a sealed plastic waterproof bag satisfactory to the Commandant.

(d) *Performance.* Signals shall meet all the inspection and test requirements contained in § 160.037-4.

§ 160.037-4 Approval and production tests.

(a) *Approval tests.* The manufacturer must produce a lot of at least 100 signals from which samples must be taken for testing for approval under § 160.037-7. The approval tests are the operational tests and technical tests in paragraphs (c) and (d) of this section. The approval tests must be conducted by an independent laboratory accepted by the Commandant under § 159.010 of this Chapter.

(b) *Production inspections and tests.* Production inspections and tests of each lot of signals produced must be conducted under the procedures in § 159.007 of this Chapter. Signals from a rejected lot must not be represented as meeting this Subpart or as being approved by the Coast Guard. If the manufacturer identifies the cause of the rejection of a lot of signals, the signals in the lot may be reworked by the manufacturer to correct the problem. Samples from the rejected lot must be retested in order to be accepted. Records shall be kept of the reasons for

rejection, the reworking performed on the rejected lot, and the results of the second test.

(1) *Lot size.* For the purposes of sampling the production of signals, a lot must consist of not more than 30,000 signals. Lots must be numbered serially by the manufacturer. A new lot must be started with:

(i) any change in construction details,
(ii) any change in sources of raw materials, or

(iii) the start of production on a new production line or on a previously discontinued production line.

(2) *Inspections and tests by the manufacturer.* The manufacturer's quality control procedures must include inspection of materials entering into construction of the signals and inspection of the finished signals, to determine that signals are being produced in accordance with the approved plans. Samples from each lot must be tested in accordance with the operational tests in paragraph (c) of this section.

(3) *Inspections and tests by an independent laboratory.* An independent laboratory accepted by the Commandant under § 159.010 of this Chapter must perform or supervise the inspections and tests under paragraph (b)(2) of this section at least 4 times a year, unless the number of lots produced in a year is less than four. The inspections and tests must occur at least once during each quarterly period, unless no lots are produced during this period. If less than four lots are produced, the laboratory must perform or supervise the inspection and testing of each lot. In addition, the laboratory must perform or supervise the technical tests in paragraph (d) of this section at least once for every ten lots of signals produced, except that the number of technical tests must be at least one but not more than four per year. If a lot of signals tested by the independent laboratory is rejected, the laboratory must perform or supervise the inspections and tests of the reworked lot and the next lot of signals produced. The tests of each reworked lot and the next lot produced must not be counted for the purpose of meeting the requirement for the annual number of inspections and tests performed or supervised by the independent laboratory.

(c) *Operational tests.* Each lot of signals must be sampled and tested as follows:

(1) *Sampling procedure and accept/reject criteria.* A sample of signals must be selected at random from the lot. The size of the sample must be the individual sample size in Table 160.037-4(c)(1) corresponding to the lot size.

Each signal in the sample is tested as prescribed in the test procedure in paragraph (c)(2) of this section. Each signal that has a defect listed in the table of defeats (Table 160.037-4(c)(2)) is assigned a score (failure percent) in accordance with that table. In the case of multiple defects, only the score having the highest numerical value is assigned to that signal. If the sum of all the failure percents (cumulative failure percent) for the number of units in the sample is less than or equal to the accept criterion, the lot is accepted. If the sum is equal to or more than the reject criterion the lot is rejected. If the cumulative failure percent falls between the accept and reject criteria, another sample is selected from the production lot and the operational tests are repeated. The cumulative failure percent of each sample tested is added to that of the previous samples to obtain the cumulative failure percent for all the signals tested (cumulative sample size). Additional samples are tested and the tests repeated until either the accept or reject criterion for the cumulative sample size is met. If any signal in the sample explodes when fired, or ignites in a way that could burn or otherwise injure the person firing it, the lot is rejected without further testing. (This procedure is diagrammed in figure 160.037-4(c)).

(2) *Test procedure.* Each sample signal (specimen) must be tested as follows:

(i) *Conditioning of test specimens—water resistance.* Immerse specimen horizontally with uppermost portion of the signal approximately 25 mm (1 in.) below the surface of the water for a period of 24 hours. If the signal is protected by alternate waterproofing consisting of a water-resistant coating on the signal plus packaging in a sealed plastic waterproof bag, the 24-hour water immersion conditioning will be conducted while the signal is in the sealed plastic waterproof bag and will be followed by an additional immersion of the bare signal (i.e., after removal from the bag) 25 mm (1 in.) below the surface of the water for a period of 10 minutes.

(ii) *Waterproofing of igniter button.* Remove the cap from the test specimen. Place head of specimen without cap about 25 mm (1 in.) under the surface of water for approximately 5 minutes. Remove specimen from the water and wipe dry.

(iii) *Smoke emitting time.* Ignite specimen according to directions printed on the signal. The smoke emitting time of a specimen shall be obtained by stop watch measurements from the time of distinct, sustained smoke emission until it ceases. The watch shall be stopped

during periods of flame emission. The smoke emitting time for a specimen shall be not less than 50 seconds.

(iv) *Ignition and smoke emitting characteristics.* Test specimens shall ignite and emit smoke properly when the directions on the signal are followed. Test specimens shall not ignite explosively in a manner that might be dangerous to the user or persons close by. The plug separating the smoke producing composition from the handle shall in no case allow flame or hot gases to pass through it or between it and the casing in such manner as might burn the hand while holding the signal by the handle.

Table 160.037-4(c)(1).—Accept and reject criteria for operational test lots

Lot size	Individual sample size	Sample size	Cumulative sample size	Accept ¹	Reject ¹
280 or less.....	8	First	8	(²)	400
		Second..	16	100	500
		Third	24	200	600
		Fourth....	32	300	700
		Fifth	40	500	800
		Sixth	48	700	900
		Seventh..	56	950	951
281 to 500	13	First	13	0	400
		Second..	26	100	600
		Third	39	300	800
		Fourth....	52	500	1,000
		Fifth	65	700	1,100
		Sixth	78	1,000	1,200
		Seventh..	91	1,350	1,351
501 to 1,200	20	First	20	0	500
		Second..	40	300	800
		Third	60	600	1,000
		Fourth....	80	800	1,300
		Fifth	100	1,100	1,500
		Sixth	120	1,400	1,700
		Seventh..	140	1,850	1,851
1,201 to 3,200	32	First	32	100	700
		Second..	64	400	1,000
		Third	96	800	1,300
		Fourth....	128	1,200	1,700
		Fifth	160	1,700	2,000
		Sixth	192	2,100	2,300
		Seventh..	224	2,550	2,551
More than 3,201	50	First	50	200	900
		Second..	100	700	1,400
		Third	150	1,300	1,900
		Fourth....	200	1,900	2,500
		Fifth	250	2,500	2,900
		Sixth	300	3,100	3,300
		Seventh..	350	3,750	3,751

¹ Cumulative failure percent.

² Lot may not be accepted. Next sample must be tested.

Table 160.037-4(c)(2)

Kind of defects	Percentage of failure
a. Failure to ignite.....	100
b. Ignites or burns dangerously.....	50
c. Non-uniform smoke-emitting rate	50
d. Smoke-emitting time less than 70 pct of specified time.....	100
e. Smoke-emitting time at least 70 pct but less than 80 pct of specified time.....	75
f. Smoke-emitting time at least 80 pct but less than 90 pct of specified time.....	50
g. Smoke-emitting time at least 90 pct but less than 100 pct of specified time.....	25

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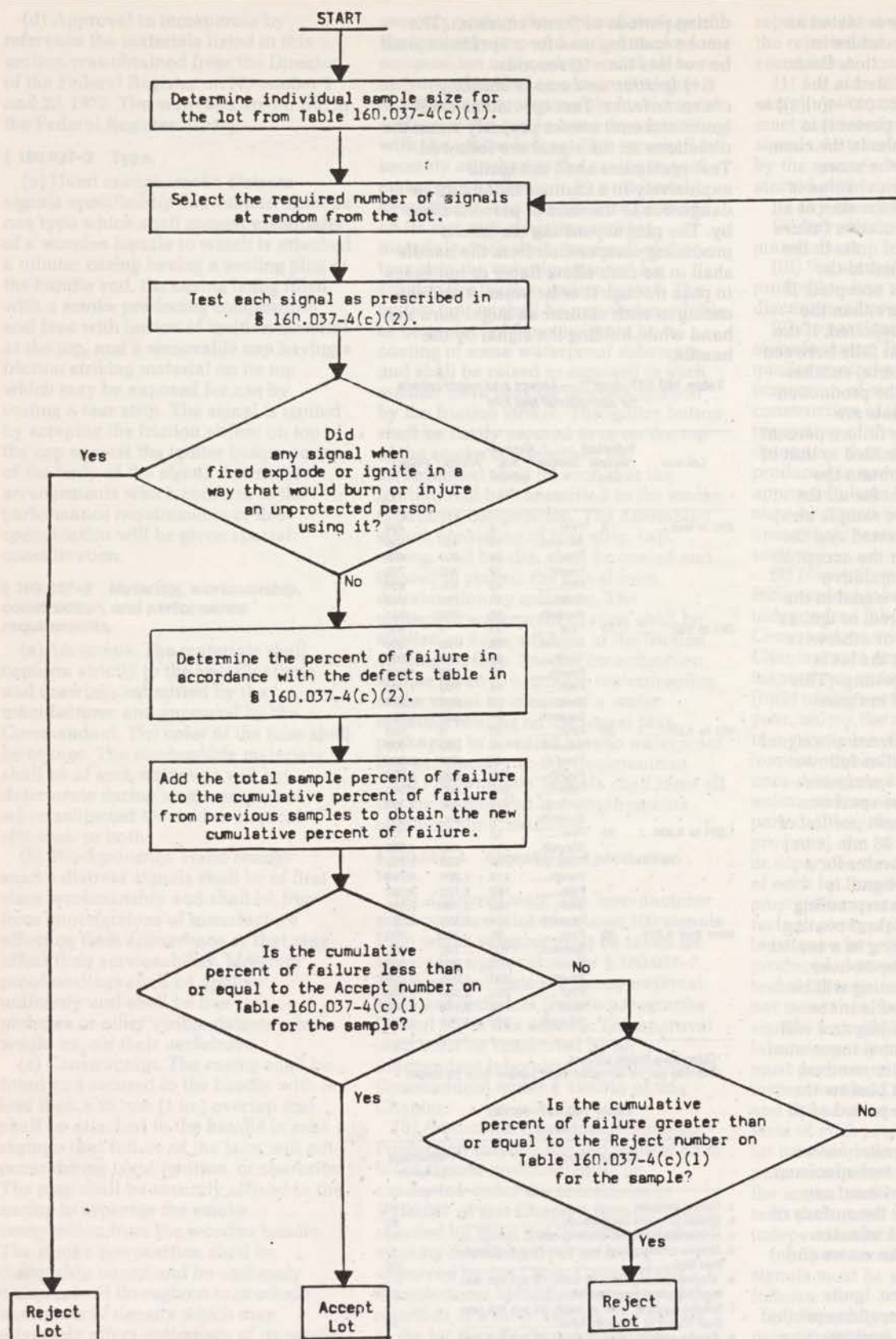


Figure 160.037-4(c). Operational test procedure.

(d) *Technical tests.* Three signals must be subjected to each of the following tests. Two of the three signals must pass each test in order for the lot of signals to be accepted.

(1) *Underwater smoke emission.* Condition each sample in accordance with paragraph (c)(2)(i) of this section. Ignite specimen and let it burn about 15 seconds in air. Submerge the burning signal in water in a vertical position with head down. Obtain underwater smoke emission time by stop watch measurements from time of submersion until smoke emission ceases. The test specimen shall burn underwater not less than 10 seconds when subjected to this test.

(2) *Bending strength.* Place the specimen on supports 15 cm (6 in.) apart. Attach a weight of 35 kg (77 lb.) to a length of wire. Hang the weight from the supported signal by looping the wire around the signal approximately equidistant from the two points of support. Let the weight hang approximately 5 minutes. The test specimen shall not deflect more than 7 mm (¼ in.), nor shall the joint between the casing and the handle fail when subjected to this test.

(3) *Tensile strength.* Place the specimen in a chuck firmly holding it about 13 mm (½ in.) below the cap. Attach a weight of 35 kg (77 lb.) to a length of wire. Hang the weight from the supported signal by looping the wire through a hole bored perpendicular to and through the axis of the handle. Let the weight hang approximately 5 minutes. The test specimen shall not show noticeable distortion, nor shall the joint between the casing and handle fail, when subjected to this test.

(4) *Elevated temperature, humidity and storage.* Place specimen in a thermostatically controlled even-temperature oven held at 75°C. with not less than 90 percent relative humidity for 72 hours. Remove specimen and store at room temperature (20° to 25°C.) with approximately 65 percent relative humidity for 10 days. If for any reason it is not possible to operate the oven continuously for the 72-hour period, it may be operated at the required temperature and humidity for 8 hours out of each 24 during the 72-hour conditioning period. (Total of 24 hours on and 48 hours off.) The signal shall not ignite or decompose during this conditioning. The signal shall ignite and operate satisfactorily following this conditioning.

(5) *Spontaneous ignition.* Place the specimen in a thermostatically controlled even-temperature oven held at 75°C. with not more than 10% relative

humidity for 48 consecutive hours. The signal shall not ignite or undergo marked decomposition.

(6) *Susceptibility to explosion.* Remove smoke composition from signal and punch a small hole in the composition. Insert a No. 6 commercial blasting cap. Ignite the cap. The test specimen shall not explode or ignite.

(7) *Color of smoke.* Ignite specimen in the open air in daytime according to the directions printed on the signal, and determine the smoke color by direct visual comparison of the unshadowed portions of the smoke with a color chart held so as to receive the same daylight illumination as the unshadowed portions of the smoke. The color of the smoke must be orange as defined by Sections 13 and 14 of the "Color Names Dictionary" (colors 34-39 and 48-54).

(8) *Volume and density of smoke.* The test specimen shall show less than 70 percent transmission for not less than 30 seconds when measured with apparatus having a light path of 19 cm (7½ in.), an optical system aperture of +3.7 degrees, and an entrance air flow of 18.4m³ per minute (650 cu. ft. per minute), such apparatus to be as described in National Bureau of Standards Report No. 4792.

§ 160.037-5 Labeling and marking.

(a) *Labeling.* Each hand orange smoke distress signal shall bear a label securely affixed thereto, showing in clear, indelible black lettering on an orange background, the following wording and information:

(Company brand or style designation)

Hand Orange Smoke Distress Signal

For daytime use—50 seconds burning time

Use Only When Aircraft or Vessel is Sighted

Directions—Pull tape over top of cap. Remove cap and ignite flare by rubbing scratch surface on top of cap sharply across igniter button on head of signal.

Caution—Stand with back to wind and point away from body when igniting or signal is burning.

Service Life Expiration Date (Month and year to be inserted by manufacturer) (Month and year manufactured) (Lot No. —). Manufactured by (Name and address of manufacturer). U.S. Coast Guard Approval No. —.

(b) *Marking of expiration date.* The expiration date must not be more than 42 months from the date of manufacture.

(c) *Other marking.* (1) There shall be die-stamped, in the side of the wooden handle in figures not less than 3 mm (⅛ in.) high, numbers indicating the

month and year of manufacture, thus: "6-54" indicating June, 1954.

(2) In addition to any other marking place on the smallest packing carton or box containing hand orange smoke distress signals such cartons or boxes shall be plainly and permanently marked to show the service life expiration date, date of manufacture, and lot number.

(3) The largest carton or box in which the manufacturer ships signals must be marked with the following or equivalent words: "Keep under cover in a dry place."

Note.—Compliance with the labeling requirements of this section does not relieve the manufacturer of the responsibility of complying with the label requirements of 15 U.S.C. 1263, the Federal Hazardous Substances Act.

§ 160.037-6 Container.

(a) *General.* The container for storing the signals on lifeboats and liferafts is not required to be of a special design or be approved by the Coast Guard. The container must meet the requirements in Subpart 160.021 (§ 160.021-6) except that the wording on the container must be: "Hand Orange Smoke Distress Signals."

§ 160.037-7 Procedure for approval.

(a) Signals are approved by the Coast Guard under the procedures in Subpart 159.005 of this Chapter.

§ 160.037-9 Recognized independent laboratories.

(a) The following independent laboratories have been accepted by the Commandant for conducting the approval and production tests required in this Subpart:

(1) (Reserved).

(b) Revised copies of this list may be obtained from Commandant (G-MMT-3/TP12), U.S. Coast Guard Headquarters, Washington, D.C. 20593.

9. By revising Subpart 160.040 of Part 160 to read as follows:

Subpart 160.040—Line-Throwing Appliance, Impluse-Projected Rocket Type (and Equipment)

Sec.

160.040-1 Incorporations by reference.

160.040-2 Type and size.

160.040-3 Materials, construction, workmanship, and performance requirements.

160.040-4 Equipment for impulse projected rocket type line-throwing appliance.

160.040-5 Approval and production tests.

160.040-6 Marking and labeling.

160.040-7 Procedure for approval.

160.040-9 Recognized independent laboratories.

Authority: 46 U.S.C. 481, 49 U.S.C. 1655(b)(1), 49 CFR 1.46(b).

§ 160.040-1 Incorporations by reference.

(a) The following military specifications are incorporated by reference into this subpart:

(1) MIL-R-23139 B, 16 August 1965—Rocket Motors, Surface Launched, Development and Qualification Requirements for.

(2) MIL-R-45505 A, 2 April 1971—Line Throwing Apparatuses, Rocket and Projectile Units.

(b) The military specifications may be obtained from Customer Service, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120 (tel: (215) 697-2000). These specifications are also on file in the Federal Register library.

(c) Approval to incorporate by reference the materials listed in this section was obtained from the Director of the Federal Register on September 24, 1979.

§ 160.040-2 Type and size.

(a) Impulse-projected rocket type line-throwing appliances required by this subpart shall be of a type consisting essentially of a pistol or launcher, which can be hand held and hand directed, or suitably supported and hand directed.

(b) Impulse-projected rocket type line-throwing appliances shall weigh (complete with one rocket, bridle, and leader) not to exceed 16 kg (35 lb.) and shall be of a size easily manageable by one person.

(c) Alternate arrangements which meet the performance requirements of this subpart will be given special consideration. Line-throwing appliances meeting the requirements of MIL-L-45505 Type I will be considered as meeting the requirements of this subpart subject to approval of the Commandant.

§ 160.040-3 Materials, construction, workmanship, and performance requirements.

(a) *Materials.* All materials used in the construction of impulse-projected rocket type line-throwing appliances and equipment shall be of good quality suitable for the purpose intended, and shall conform to this subpart and to the specifications submitted by the manufacturer and approved by the Commandant. The choice of materials, when there is no specific requirement, shall be such that maximum safety to operating personnel will be maintained, and that resistance to corrosion by salt water or spray, shock, temperature change, and wear will be obtained. The use of dissimilar materials in combination shall be avoided wherever possible, but when such contacts are necessary, provision shall be made to prevent such deleterious effects as

galvanic corrosion, freezing or buckling of moving parts, and loosening or tightening of joints due to differences in coefficients of thermal expansion.

(b) *Construction.* The design and construction shall be such as to obtain effective and safe operation aboard vessels at sea.

(c) *Workmanship.* Impulse-projected rocket type line-throwing appliances shall be of first class workmanship and shall be free from imperfections of manufacture affecting their appearance or that may affect their serviceability.

(d) *Performance.* When the rocket is fired from the appliance in accordance with the manufacturer's instructions, it shall be capable of passing the tests specified by § 160.040-5(c).

§ 160.040-4 Equipment for impulse-projected rocket type line-throwing appliance.

(a) Four rocket projectiles, each complete with bridle and leader of fire-resistant materials. Two of the projectiles shall be of the buoyant type.

(b) Not less than 4 primer-ejector cartridges which fit the chamber of the pistol, gun, or launcher.

(c) Four service lines, each 4 mm ($\frac{5}{32}$ in.) minimum diameter with a minimum breaking strength of at least 2,250 N (500 lb.), and in one continual length not less than that specified in the approval of the appliance carried, without splice, knot, or other retarding or weakening features. The length of each service line will be assigned in the approval of the appliance as a round number approximately one-third in excess of the average distance the line is carried in the tests required by § 160.040-7(c). The line shall be of either natural or synthetic fibers suitable for marine usage. The end of the line intended to be attached to the projectile shall have securely attached thereto a substantial tag bearing a permanent legend indicating its purpose, and the other end of the line shall be tagged in the same manner to prevent delay in securing proper and immediate action with the equipment. Each line shall be coiled, faked, or reeled in its own faking box or reel in such manner that when all the line leaves the container, it shall automatically become unattached and free from the container. The faking box or reel shall be big enough for the line. The reel type container shall consist of a reel upon which the line may be readily coiled and a canister or container into which the line may be placed that affords a fair lead through which the line may pay out. The reel must be so designed as to permit easy withdrawal after the line has been coiled. Containers of new lines shall bear the

name of the manufacturer, date of manufacture, and a statement to the effect that in all respects the line meets the requirements of this specification.

(d) (Reserved).

(e) One cleaning rod with wire brush of non-ferrous metal, prongs arranged in a spiral of sufficient rigidity and size to clean the bore.

(f) One can of oil suitable for cleaning and preserving the appliance.

(g) Twelve flannel wiping patches of sufficient size to cover the brush and suitable for wiping the bore clean.

(h) One set of instructions including a list of the equipment furnished with the appliance, information as to the proper maintenance of the appliance and equipment, and directions for loading and firing the appliance in service use shall be permanently engraved in plastic and mounted conspicuously in the case or box required by paragraph (i) of this section.

(i) A suitable case or box, properly compartmented for stowage of the appliance and auxiliary equipment, is required for stowage on merchant vessels. The service line and auxiliary line need not be stowed in the case.

§ 160.040-5 Approval and production tests.

(a) *Approval tests.* An independent laboratory accepted by the Commandant under § 159.010 of this Chapter must perform or supervise the performance tests in paragraph (c) of this section.

(b) *Production inspections and tests.* Production inspections and tests must be conducted under the procedures in § 159.007 of this Chapter. Each appliance or lot of rockets which fails the inspections and tests must not be represented as meeting this Subpart or as being approved by the Coast Guard.

(1) *Inspections and tests by the manufacturer.* The manufacturer's quality control procedures must include the inspection of appliances during production as well as inspection of finished appliances, to determine that the appliances are being produced in accordance with the approved plans. The performance tests in paragraph (c) of this section must be performed by the manufacturer.

(2) *Inspections and tests by an independent laboratory.* An independent laboratory accepted by the Commandant under § 159.010 of this Chapter must inspect and test appliances and rockets at least once each year. The inspection must determine that the appliances and rockets are being produced in accordance with the appropriate plans.

The tests must be in accordance with paragraph (c) of this section.

(c) *Performance tests.*—(1)

Appliances. Each appliance shall be tested by firing three rounds. These rounds may be regular rockets or buoyant type rockets carrying regular service lines, as provided in subparagraph (2) of this paragraph or may be dummy projectiles, of the same size and weight as the regular rocket projectile, expelled into an earthen bank or other resisting medium from a reasonable distance. At least one of the rounds shall be fired using a primer-ejector cartridge loaded with a charge double the normal charge; the other rounds may be fired using regular primer-ejector cartridges. After the firing tests have been completed, each appliance shall be fired twice using the regular primer-ejector cartridges only, for the purposes of demonstrating that the appliance is still in operating condition. The entire assembly of the appliance shall then be examined. Results of the test firing and the physical examination shall show none of the following: Failure to eject cartridge, failure to close breech, trigger malfunction, safety lock failure to function, breech catch malfunction, broken spring, broken handgrips, cracked barrel or discharge chamber, firing pin or plunger broken, distorted or excessively worn or loose breech. A single misfire is acceptable if a second cartridge fires on repeated test. Misfire of both shall be cause for rejection of the appliance. More than one loose screw shall be cause for rejection. If an appliance exhibits a single loose screw, it may be retightened.

(2) *Rockets.* The rocket shall utilize a solid fuel propellant which shall function in accordance with all applicable requirements of MIL-R-23139. The use of black powder for the rocket motor is not acceptable. The ignition of the rocket motor shall occur at such a distance from the appliance so as not to spew flame, hot gaseous exhaust, or hot particles of propellant in such a manner as to create a hazard to personnel or the vessel. The rocket shall have a service line carrier assembly permanently attached and made of material, or suitably protected, to withstand the heat from the rocket motor's exhaust. From each 200 rockets manufactured, not less than three must be selected to be tested by firing with service line attached. The rockets selected will, over a period of time, include representative samples of both the regular and buoyant type rockets, except that the approval test must include both types. The line shall be

carried, under conditions of reasonably still atmosphere, a minimum of 230 m (750 ft.), without breaking or fouling the line, and the rocket shall alight not more than 15 m (50 ft.) from either side of the target line. In no case shall a test rocket be fired without a line attached. After a buoyant type rocket is fired, it shall demonstrate its ability to float in water for not less than 2 hours. Failure to meet any of the test requirements, nose cone cracks, rupture in flight, erratic flight, or unusual burning rate, shall be cause for rejection of rockets produced until suitable correction has been made. If rockets selected from this lot are used for the tests required in paragraph (c)(1) of this section this may be accepted as meeting the requirements of this paragraph.

(3) *Primer-ejector cartridges.*

Inasmuch as primer-ejector cartridges are used for the tests required by subparagraphs (1) and (2) of this paragraph, additional tests of primer-ejector cartridges will be made only when deemed advisable by the independent laboratory. Misfiring or failure of any kind shall be cause for rejection of cartridges produced until suitable correction has been made.

§ 160.040-6 *Marking and labeling.*

(a) The appliance shall be permanently and legibly marked by die-stamping or raised letters with the model designation of the appliance, the manufacturer's serial number for the appliance, the official Coast Guard approval number, and the name of the manufacturer. The rocket-projectiles shall be legibly marked with the name of the manufacturer, the model designation, the official Coast Guard approval number, and month and year manufactured. Primer-ejector cartridges shall be permanently and legibly marked with the name of the manufacturer, and the model designation, the official Coast Guard approval number, and the month and year manufactured.

(b) The containers of new service lines shall bear the name of the manufacturer, date of manufacture, and a statement to the effect that in all respects the line meets the requirements of this subpart for service lines. Line faking boxes and reels shall bear the name of the manufacturer.

Note.—Compliance with the labeling requirements of this section does not relieve the manufacturer of the responsibility of complying with the label requirements of 15 USC 1263, the Federal Hazardous Substances Act.

§ 160.040-7 *Procedure for approval.*

(a) Rocket type line-throwing appliances are approved by the Coast Guard under the procedures in Subpart 159.005 of this Chapter.

§ 160.040-9 *Recognized independent laboratories.*

(a) The following independent laboratories have been accepted by the Commandant for conducting the approval and production tests required in this Subpart:

(1) (Reserved).

(b) Revised copies of this list may be obtained from Commandant (G-MMT-3/TP12), U.S. Coast Guard Headquarters, Washington, D.C. 20593.

10. By revising Subpart 160.057 of Part 160 to read as follows:

Subpart 160.057—Floating Orange Smoke Distress Signals (15 Minutes)

Sec.

160.057-1 Incorporations by reference.

160.057-2 Type.

160.057-3 Materials, workmanship, construction, and performance requirements.

160.057-4 Approval and production tests.

160.057-5 Marking.

160.057-7 Procedure for approval.

160.057-9 Recognized independent laboratories.

Authority: 46 U.S.C. 481, 49 U.S.C. 1655(b)(1), 49 CFR 1.46(b).

§ 160.057-1 *Incorporations by reference.*

(a) The following are incorporated by reference into this subpart:

(1) "The Color Names Dictionary" in *Color: Universal Language and Dictionary of Names*, National Bureau of Standards Special Publication 440, December 1976.

(2) "Development of a Laboratory Test for Evaluation of the Effectiveness of Smoke Signals," National Bureau of Standards Report 4792, July 1956.

(b) NBS Special Publication 440 may be obtained by ordering from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (Order by SD Catalog No. C13.10:440).

(c) NBS Report 4792 may be obtained from the Commandant (G-MMT-3/TP12), U.S. Coast Guard, Washington, D.C. 20593.

(d) Approval to incorporate by reference the materials listed in this section was obtained from the Director of the **Federal Register** on November 1 and 29, 1979. The materials are on file in the **Federal Register** library.

§ 160.057-2 *Type*

(a) Floating orange, smoke distress signals specified by this subpart shall be of one type which shall consist essentially of an outer container, ballast,

an air chamber, an inner container, the smoke producing composition, and an igniter mechanism. Alternate arrangements which conform to the performance requirements of this specification will be given special consideration.

§ 160.057-3 Materials, workmanship, construction, and performance requirements.

(a) *Materials.* The materials shall conform strictly to the specifications and drawings submitted by the manufacturer and approved by the Commandant. Metal for containers shall be not less than 0.5 mm (0.020 in.) in thickness. Other dimensions or materials may be considered upon special request when presented with supporting data. Igniter systems shall be of corrosion-resistant metal. The combustible material shall be of such nature that it will not deteriorate during long storage, nor when subjected to frigid or tropical climates, or both.

(b) *Workmanship.* Floating orange smoke distress signals shall be of first class workmanship and shall be free from imperfections of manufacture affecting their appearance or that may affect their serviceability.

(c) *Construction.* The outer container shall be cylindrical and of a size suitable for intended use. All sheet metal seams should be hook jointed and soldered. The whole container shall be covered with two coats of waterproof paint or other equivalent protection system. The igniter mechanism shall operate and provide ignition of the signal automatically when the ring life buoy to which it is attached is thrown overboard.

(d) *Performance.* Signals shall meet all the inspection and test requirements contained in § 160.057-4.

§ 160.057-4 Approval and production tests.

(a) *Approval tests.* The manufacturer must produce a lot of at least 20 signals from which samples must be taken for testing for approval under § 160.057-7. The approval tests are the operational tests and technical tests in paragraphs (c) and (d) of this section. The approval tests must be conducted by an independent laboratory accepted by the Commandant under § 159.010 of this Chapter.

(b) *Production inspections and tests.* Production inspections and tests of each lot of signals produced must be conducted under the procedures in § 159.007 of this Chapter. Signals from a rejected lot must not be represented as meeting this Subpart or as being approved by the Coast Guard. If the

manufacturer identifies the cause of the rejection of a lot of signals, the signals in the lot may be reworked by the manufacturer to correct the problem. Samples from the rejected lot must be retested in order to be accepted. Records shall be kept of the reasons for rejection, the reworking performed on the rejected lot, and the results of the second test.

(1) *Lot size.* For the purposes of sampling the production of signals, a lot must consist of not more than 1,200 signals. Lots must be numbered serially by the manufacturer. A new lot must be started with: (i) any change in construction details, (ii) any change in sources of raw materials, or (iii) the start of production on a new production line or on a previously discontinued production line.

(2) *Inspections and tests by the manufacturer.* The manufacturer's quality control procedures must include inspection of materials entering into construction of the signals and inspection of the finished signals, to determine that signals are being produced in accordance with the approved plans. Samples from each lot must be tested in accordance with the operational tests in paragraph (c) of this section.

(3) *Inspections and tests by an independent laboratory.* An independent laboratory accepted by the Commandant under § 159.010 of this Chapter must perform or supervise the inspections and tests under paragraph (b)(2) of this section at least 4 times a year, unless the number of lots produced in a year is less than four. The inspections and tests must occur at least once during each quarterly period, unless no lots are produced during that period. If less than four lots are produced, the laboratory must perform or supervise the inspection and testing of each lot. In addition, the laboratory must perform or supervise the technical tests in paragraph (d) of this section at least once for every ten lots of signals produced, except that the number of technical tests must be at least one but not more than four per year. If a lot of signals tested by the independent laboratory is rejected, the laboratory must perform or supervise the inspections and tests of the reworked lot and the next lot of signals produced. The tests of each reworked lot and the next lot produced must not be counted for the purpose of meeting the requirement for the annual number of inspections and tests performed or supervised by the independent laboratory.

(c) *Operational tests.* Each lot of signals must be sampled and tested as follows:

(1) *Sampling procedure and accept/reject criteria.* A sample of signals must be selected at random from the lot. The size of the sample must be the individual sample size in Table 160.057-4(c)(1) corresponding to the lot size. Each signal in the sample is tested as prescribed in the test procedure in paragraph (c)(2) of this section. Each signal that has a defect listed in the table of defects (Table 160.057-4(c)(2)) is assigned a score (failure percent) in accordance with that table. In the case of multiple defects, only the score having the highest numerical value is assigned to that signal. If the sum of all the failure percents (cumulative failure percent) for the number of units in the sample is less than or equal to the accept criterion, the lot is accepted. If this sum is equal to or more than the reject criterion the lot is rejected.

If the cumulative failure percent falls between the accept and reject criteria, another sample is selected from the production lot and the operational tests are repeated. The cumulative failure percent of each sample tested is added to that of the previous samples to obtain the cumulative failure percent for all the signals tested (cumulative sample size). Additional samples are tested and the tests repeated until either the accept or reject criterion for the cumulative sample size is met. If any signal in the sample explodes when fired, or ignites in a way that could burn or otherwise injure the person firing it, the lot is rejected without further testing. (This procedure is diagrammed in figure 160.057-4(c)).

(2) *Test procedure.* Each sample signal (specimen) must be tested as follows:

(i) *Conditioning of test specimens—water resistance.* Immerse specimen horizontally with uppermost portion of the signal approximately 25 mm (1 in.) below the surface of the water for a period of 24 hours.

(ii) *Smoke emitting time.* Ignite specimen according to the directions printed on the signal and place signal in tub or barrel of water. The smoke emitting time of a specimen shall be obtained by stop watch measurements from the time of distinct, sustained smoke emission until it ceases. There shall be no flame emission during the entire smoke emitting time of the signal. The smoke emitting time for a specimen shall not be less than 15 minutes. When the tests are performed or supervised by an independent laboratory, this test shall be conducted with approximately 6 mm (¼ in.) of gasoline covering the water in the tub or barrel. The gasoline vapors shall not ignite during the entire smoke emitting time of the signal.

(iii) *Ignition and smoke emitting characteristics.* Test specimens shall ignite and emit smoke properly when the directions on the signal are followed. Test specimens shall not ignite explosively in a manner that might be dangerous to the user or persons close by. Test specimens shall emit smoke at a uniform rate while floating in calm to rough water. Signals should be so constructed that water submerging the signal in moderately heavy seas will not cause it to become inoperable.

Table 160.057-4(c)(1).—Accept and reject criteria for operational test lots.

Lot size	Individual sample size	Sample size	Cumulative sample size	Accept ¹	Reject ¹
150 or less.....	2	First.....	2	(?)	200
		Second.....	4	(?)	200
		Third.....	6	0	200
		Fourth.....	8	0	300
		Fifth.....	10	100	300
		Sixth.....	12	100	300
		Seventh.....	14	299	300
151 to 500.....	3	First.....	3	(?)	200
		Second.....	6	0	300
		Third.....	9	0	300
		Fourth.....	12	100	400
		Fifth.....	15	200	400
		Sixth.....	18	300	500
		Seventh.....	21	499	500
more than 501....	5	First.....	5	(?)	300
		Second.....	10	0	300
		Third.....	15	100	400
		Fourth.....	20	200	500
		Fifth.....	25	300	600
		Sixth.....	30	400	600
		Seventh.....	35	699	700

¹ Cumulative failure percent.

² Lot may not be accepted. Next sample must be tested.

Table 160.057-4(c)(2)

Kind of defects	Percentage of failures
a. Failure to ignite.....	100
b. Ignites or burns dangerously.....	100
c. Nonuniform smoke emitting rate.....	50
d. Smoke-emitting time less than 70 percent of specified time.....	100
e. Smoke-emitting time at least 70 percent but less than 80 percent of specified time.....	75
f. Smoke-emitting time at least 80 percent but less than 90 percent of specified time.....	50
g. Smoke-emitting time at least 90 percent but less than 100 percent of specified time.....	25

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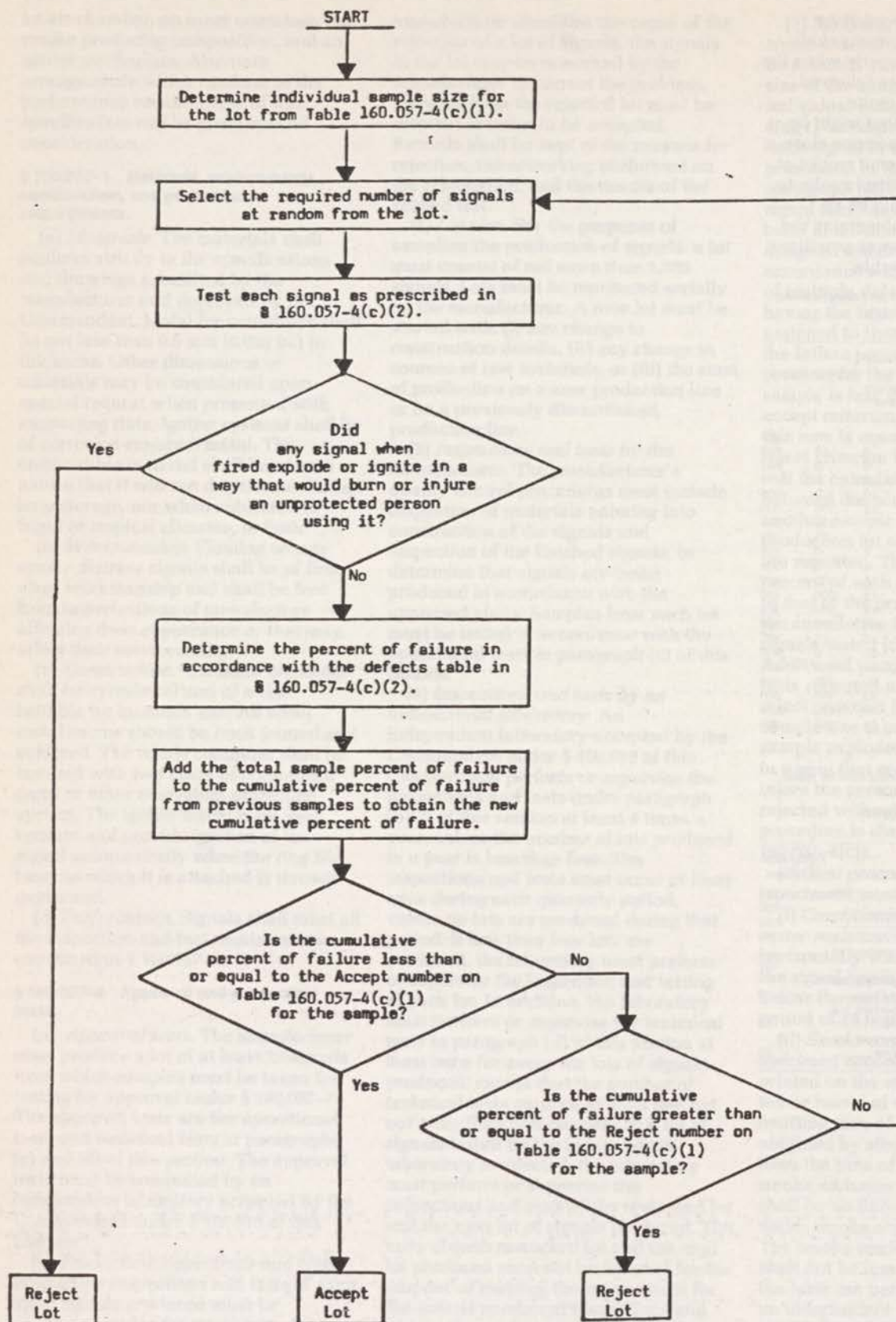


Figure 160.057-4(c). Operational test procedure.

(d) *Technical tests.* One signal must be subjected to each of the following tests. Each signal must pass the test in order for the lot of signals to be accepted.

(1) *Drop test.* One signal must be attached to a ring life buoy and arranged to be ignited by the dropping buoy in the same manner as it would be when used on a vessel. The signal and buoy must be mounted at least 27 m (90 ft.) above the surface of a body of water. The buoy is released and must cause the signal to ignite and fall to the water with the buoy. The signal must remain afloat and emit smoke at least 15 minutes.

(2) *Wave test.* A signal shall be tested in a manner simulating its use at sea. The signal shall be ignited and thrown overboard under conditions where waves are at least 30 cm (1 ft.) high. The smoke emitting time must be for the full 15 minutes and the signal shall float in such a manner that it shall function properly during this test. The signal shall be attached to a ring life buoy in accordance with the manufacturer's instructions.

(3) *Underwater smoke emission.* Condition the signal in accordance with paragraph (c)(2)(i) of this section. Ignite specimen and let it burn about 15 seconds in air. Submerge the burning signal in water in a vertical position with head down. Obtain underwater smoke emission time by stop watch measurements from time of submersion until smoke emission ceases. The test specimen shall emit smoke under water not less than 30 seconds when subjected to this test.

(4) *Elevated Temperature, Humidity and Storage.* Place specimen in a thermostatically controlled even-temperature oven held at 75°C. with not less than 90 percent relative humidity for 72 hours. Remove specimen and store at room temperature (20° to 25°C.) with approximately 65 percent relative humidity for 10 days. If for any reason it is not possible to operate the oven continuously for the 72-hour period, it may be operated at the required temperature and humidity for 8 hours out of each 24 during the 72-hour conditioning period. (Total of 24 hours on and 48 hours off.) The signal shall not ignite or decompose during this conditioning. The signal shall ignite and operate satisfactorily following this conditioning.

(5) *Spontaneous ignition.* Place the specimen in a thermostatically controlled even-temperature oven held at 75°C. with not more than 10% relative humidity for 48 consecutive hours. The signal must not ignite or undergo marked decomposition.

(6) *Susceptibility to explosion.* Remove smoke composition from signal and punch a small hole in the composition. Insert a No. 6 commercial blasting cap. Ignite the cap. The test specimen shall not explode or ignite.

(7) *Corrosion resistance.* Expose the complete specimen with cover secured hand-tight to a finely divided spray of 20 percent by weight sodium chloride solution at a temperature between 32°C and 38°C (90°F and 100°F) for 100 hours. The container and cap must not be corroded in any fashion that would impair their proper functioning.

(8) *Color of smoke.* Ignite specimen in the open air in daytime according to the directions printed on the signal, and determine the smoke color by direct visual comparison of the unshadowed portions of the smoke with a color chart held so as to receive the same daylight illumination as the unshadowed portions of the smoke. The color of the smoke must be orange as defined by Sections 13 and 14 of the "Color Names Dictionary" (colors 34-39 and 48-54).

(9) *Volume and density of smoke.* The test specimen shall show less than 70 percent transmission for not less than 12 minutes when measured with apparatus having a light path of 19 cm (7½ in.), an optical system aperture of +3.7 degrees, and an entrance air flow of 18.4m³ per minute (650 cu. ft. per minute), such apparatus to be as described in National Bureau of Standards Report No. 4792.

§ 160.057-5 Marking.

(a) *Directions for use.* Each floating orange smoke distress signal shall be plainly and indelibly marked in black lettering not less than 3 mm (⅛ in.) high "Approved for daytime use only", and in black lettering not less than 5 mm (⅜ in.) high with the word "Directions". Immediately below shall be similarly marked in black lettering not less than 3 mm (⅛ in.) high in numbered paragraphs, and in simple and easily understood wording, instructions to be followed to make the device operative. Pasted-on labels are not acceptable.

(b) *Other markings.* (1) There shall be embossed or die-stamped, in the outer container in figures not less than 5 mm (⅜ in.) high, numbers, indicating the month and year of manufacture, thus: "6-54" indicating June 1954. The outer container shall also be plainly and indelibly marked with the commercial designation of the signal, the words "Floating Orange Smoke Distress Signal (15 minutes)", name and address of the manufacturer, the Coast Guard Approval No., the service life expiration date (month and year to be entered by the manufacturer), the month and year of manufacture and the lot number.

(2) In addition to any other marking placed on the smallest packing carton or box containing floating orange smoke distress signals, such cartons or boxes shall be plainly and indelibly marked to show the service life expiration date, the month and year of manufacture, and the lot number.

(3) The largest carton or box in which the manufacturer ships signals must be marked with the following or equivalent words: "Keep under cover in a dry place."

(c) *Marking of expiration date.* The expiration date must be not more than 42 months from the date of manufacture.

Note.—Compliance with the labeling requirements of this section does not relieve the manufacturer of the responsibility of complying with the label requirements of 15 USC 1263, the Federal Hazardous Substances Act.

§ 160.057-7 Procedure for approval.

(a) Signals are approved by the Coast Guard under the procedures in Subpart 159.005 of this Chapter.

§ 160.057-9 Recognized independent laboratories.

(a) The following independent laboratories have been accepted by the Commandant for conducting the approval and production tests required in this Subpart:

(1) (Reserved).

(b) Revised copies of this list may be obtained from Commandant (G-MMT-3/TP12), U.S. Coast Guard Headquarters, Washington, D.C. 20593. (46 USC 481, 49 USC 1655(b)(1), 49 CFR 1.46(b))

Dated: December 4, 1979.

J. B. Hayes,

Admiral, U.S. Coast Guard Commandant.

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FEDERAL COMMUNICATIONS COMMISSION

47 CFR Part 83

[PR Docket No. 79-139; RM-2916; FCC 79-786]

Stations on Shipboard in the Maritime Services; Exempting Certain Vessels Operating in Vessel Traffic Service (VTS) Areas from the Requirement To Maintain a Listening Watch on VHF Channel 16 (156.800 MHz)

AGENCY: Federal Communications Commission.

ACTION: Final rule.

SUMMARY: Amendment of rules to exempt vessels subject to the Bridge-to-