

FEDERAL AVIATION AGENCY  
Washington 25, D.C.  
**TECHNICAL STANDARD ORDER**  
Regulations of the Administrator

**Part 514**

**Subject:** SURVIVOR LOCATOR LIGHTS

TSO-C85

**Technical Standards Orders for Aircraft Materials, Parts and Appliances**

Part 514 which contains minimum performance standards and specifications for materials, parts, and appliances used in aircraft consists of two subparts. Subpart A contains the general requirements applicable to all Technical Standard Orders. Subpart B contains the technical standards and specifications to which a particular product must conform.

ANY TECHNICAL STANDARD ORDER MAY BE OBTAINED BY SENDING A REQUEST TO FAA, WASHINGTON 25, D.C.

**Subpart A—GENERAL**

**§ 514.0 Definition of terms.**

As used in this part:

(a) "Administrator" means the Administrator of the Federal Aviation Agency or any person to whom he has delegated his authority in the matter concerned.

(b) "FAA" means Federal Aviation Agency.

(c) "Manufacturer" means a person who controls the design and quality of an article produced under the TSO system, including all parts thereof and processes and services related thereto obtained from outside sources.

(d) "Article" means the materials, parts, or appliances for which approval is required under the Civil Air Regulations for use on civil aircraft.

**§ 514.1 Basis and purpose.**

(a) *Basis.* Section 601 of the Federal Aviation Act of 1958, and §§ 3.18, 4a.31, 4b.18, 5.18, 6.18, 7.18, 10.21, 13.18, and 14.18 of this title (Civil Air Regulations).

(b) *Purpose.* (1) This part prescribes in individual Technical Standard Orders the minimum performance and quality control standards for FAA approval of specified articles used on civil aircraft,<sup>1</sup> and prescribes the methods by which the manufacturer of such articles shall show compliance with such standards in order to obtain authorization for the use of the articles on civil aircraft.

(2) The performance standards set forth in the individual Technical Standard Orders are those standards found necessary by the Administrator to assure that the particular article when used on civil aircraft will operate satisfactorily, or accomplish satisfactorily its in-

tended purpose under specified conditions.

**§ 514.2 TSO authorization.**

(a) *Privileges.* No person shall identify an article with a TSO marking unless he holds a TSO authorization and the article meets the applicable TSO standards prescribed in this part.

(b) *Letters of acceptance issued prior to July 1, 1962.* An FAA letter of acceptance of a statement of conformance issued for an article prior to July 1, 1962, is an authorization within the meaning of this part and the holder thereof may continue to manufacture such article without obtaining an additional TSO authorization, but shall comply with the requirements of § 514.3 through § 514.10.

(c) *Application.* The manufacturer or his duly authorized representative shall submit an application for a TSO authorization together with the following documents (See Appendix A of this subpart for sample application) to the Chief, Engineering and Manufacturing Branch, Flight Standards Division, in the region in which the manufacturer is located.<sup>2</sup>

(1) A statement of conformance certifying that the applicant has complied with the provisions of Subpart A and the article meets the applicable performance standards established in Subpart B of this part (See Appendix B of this subpart for sample statement of conformance);

(2) Copies of the technical data required in the performance standards set forth in Subpart B of this part for the particular article;

(3) A description of his quality control system in the detail specified in § 1.36 of this title (Civil Air Regulations). In complying with

this provision the manufacturer may refer to current quality control data filed with the Agency, as a part of a previous application.

*NOTE:* When a series of minor changes in accordance with § 514.5 is anticipated, the manufacturer may set forth in his application the basic model numbered article with open brackets after it to denote that suffix change letters will be added from time-to-time e.g., Model No. 100 ( ).

(d) *Issuance.* (1) Upon receipt of the application and adequate supporting documents specified in paragraph (c) of this section to substantiate the manufacturer's statement of conformance with the requirements of this part and his ability to produce duplicate articles in accordance with the provisions of this part, the applicant will be given an authorization to identify his article with the applicable TSO marking.

(2) If the application is deficient in respect to any requirements, the applicant shall, upon request by the Chief, Engineering and Manufacturing Branch, submit such additional information as may be necessary to show compliance with such requirements. Upon the failure of the applicant to submit such additional information within 30 days after the date of the request therefor, his application will be denied and he will be so notified by the Chief, Engineering and Manufacturing Branch.

*NOTE:* The applicant will be issued an authorization or notified of the denial of his application within 30 days after the date of receipt of such application or, in the event that additional information has been requested, within 30 days after the date of receipt of such additional information.

<sup>1</sup> Articles may also be approved and manufactured for use on civil aircraft as a part of the type design of a type certificate for an aircraft engine or propeller.

<sup>2</sup> Regional Offices are located at New York, Atlanta, Kansas City, Fort Worth, Los Angeles, Anchorage.

### § 514.3 Conditions on authorizations.

The manufacturer of an article under an authorization issued under the provisions of this part shall—

(a) Manufacture such article in accordance with the requirements of Subpart A and the performance standards contained in the applicable TSO of Subpart B of this part;

(b) Conduct the required tests and inspections, and establish and maintain a quality control system adequate to assure that such article, as manufactured, meets the requirements of paragraph (a) of this section and is in a condition for safe operation;

(c) Prepare and maintain for each type or model of such article a current file of complete technical data and records in accordance with § 514.6; and

(d) Permanently and legibly mark each such article with the following information:

(1) Name and address of the manufacturer,

(2) Equipment name, or type or model designation,

(3) Weight to the nearest tenth of a pound,

(4) Serial number and/or date of manufacturer, and

(5) Applicable Technical Standard Order (TSO) number.

### § 514.4 Deviations.

Approval for a deviation from the performance standards established in Subpart B may be obtained only if the standard or standards for which deviation is requested are compensated for by factors or design features which provide an equivalent level of safety. A request for such approval together with the pertinent data shall be submitted by the manufacturer to the Chief, Engineering and Manufacturing Branch of the Region in which the applicant is located.

### § 514.5 Design changes.

(a) *By Manufacturer*—(1) *Minor changes.* The manufacturer of an article under an authorization issued pursuant to the provisions of this part may make minor design changes to the article without further approval by the FAA. In such case the changed article shall retain the original model number and the manufacturer shall forward to the Chief, Engineering and Manufacturing Branch such revised data as may be necessary for compliance with § 514.2(c).

(2) *Major changes.* If the changes to the article are so extensive as to require a substantially complete investigation to determine compliance with the performance standards established in Subpart B, the manufacturer shall assign a new type or model designation to the

article and submit a new application in accordance with the provisions of § 514.2(c).

(b) *By persons other than the manufacturer.* Design changes to an article by a person other than the manufacturer who submitted the statement of conformance for such article are not eligible for approval under this part, unless such person is a manufacturer as defined in § 514.0 and applies for authorization under § 514.2(c).

NOTE: Persons other than a manufacturer may obtain approval for design changes to a product manufactured under a TSO pursuant to the provisions of Part 18 or the applicable airworthiness regulations.

### § 514.6 Retention of data and records.

(a) A manufacturer holding an authorization issued pursuant to the provisions of this part shall, for all articles manufactured under such authorization on and after July 1, 1962, maintain and keep at his factory:

(1) A complete and current technical data file for each type or model of article which shall include the design drawings and specifications. This technical data shall be retained for the duration of his operation under the provisions of this part.

(2) Complete and current inspection records to show that all inspections and tests required to ensure compliance with this part have been properly accomplished and documented. These records shall be retained for at least two years.

(b) The data specified in paragraph (a) (1) of this section shall be identified and copies transferred to the FAA for record purposes in the event the manufacturer terminates his business or no longer operates under the provisions of this part.

### § 514.7 Inspection and examination of data, articles or manufacturing facilities.

The manufacturer shall, upon request, permit an authorized representative of the FAA to inspect any article manufactured pursuant to this part, and to observe the quality control inspections and tests and examine the manufacturing facilities and technical data files for such article.

### § 514.8 Service difficulties.

Whenever the investigation of an accident or a service difficulty report shows an unsafe feature or characteristic caused by a defect in design or manufacture of an article, the manufacturer shall upon the request of the Chief, Engineering and Manufacturing Branch, report the results of his investigation and the action, if any, taken or proposed by him to correct the defect in design

or manufacture (e.g., service bulletin, design changes, etc.). If the defect requires a design change or other action to correct the unsafe feature or characteristic, the manufacturer shall submit to the Chief, Engineering and Manufacturing Branch, the data necessary for the issuance of an airworthiness directive containing the appropriate corrective action.

### § 514.9 Noncompliance.

Whenever the Administrator finds that a manufacturer holding an authorization issued pursuant to the provisions of this part has identified an article by a TSO marking and that such article does not meet the applicable performance standards of this part, the Administrator may, upon notice thereof to the manufacturer, withdraw the manufacturer's authorization and, where necessary, prohibit any further certification or operation of a civil aircraft upon which such article is installed until appropriate corrective action is taken.

### § 514.10 Transferability and duration.

An authorization issued pursuant to the provisions of this part shall not be transferred and is effective until surrendered, or withdrawn, or otherwise terminated by the Administrator.

#### APPENDIX A SAMPLE APPLICATION FOR TSO AUTHORIZATION

(Date) \_\_\_\_\_

(Addressed to: Chief, Engineering and Manufacturing Branch, Federal Aviation Agency, Region.)

Application is hereby made for authorization to use the Technical Standard Order procedures.

Enclosed is a statement of conformance for the article to be produced under TSO-C-\_\_\_\_\_

The required quality control data<sup>1</sup> are transmitted: (herewith) (under separate cover).

Signed \_\_\_\_\_

#### APPENDIX B SAMPLE STATEMENT OF CONFORMANCE

(Date) \_\_\_\_\_

(Addressed to: Chief, Engineering and Manufacturing Branch, Flight Standards Division, Federal Aviation Agency.)

The undersigned hereby certifies that the article listed below by model, type or part number has been tested and meets the performance standards of Technical Standard Order C-\_\_\_\_\_. In addition, all other applicable provisions of Part 514 of the Regulations of the Administrator have been met.

The technical data required by the TSO in the quantity specified are transmitted: (herewith) (under separate cover).

Authorization to use TSO identification on this article is requested.

Signed \_\_\_\_\_

<sup>1</sup> Reference may be made to data already on file with the FAA.

## Federal Aviation Agency Standard

for

## Survivor Locator Lights

- 1.0 Purpose. To establish minimum performance standards for survivor locator lights intended for attachment on life preservers and life rafts.
- 2.0 Scope. This standard covers battery powered survivor locator lights designed to provide electric illumination for life preservers and life rafts for the purpose of facilitating the location of persons who have survived an emergency landing at sea. The term "light assembly" includes the complete assembly of power source, wiring, attachment provisions, and light proper.
- 3.0 Minimum Performance Requirements.
- 3.1 Light Intensity. The light assembly shall emit a white light with a minimum effective intensity of one (1) candle when measured in all directions in the horizontal plane. The light assembly shall provide the required intensity for a minimum of eight (8) hours. If a flashing light is used, the effective intensity shall be computed by the following formula:

$$I_e = \frac{\int_{t_1}^{t_2} I(t) dt}{0.2 + (t_2 - t_1)}$$

$I_e$  = effective intensity (candles)

$I(t)$  = instantaneous intensity as a function of time

$t_2 - t_1$  = flash time interval (seconds)

- 3.2 Light Distribution. The light assembly shall be so designed that when installed on the life preserver or life raft illumination will be provided to the fullest extent practicable in all directions from the horizontal plane to the vertical.
- 3.3 Attachment Provisions. The method of attaching the light assembly to the life preserver or life raft shall be such that it cannot become detached without deliberate effort. Parts, materials and adhesives used in the installations shall be compatible with the life preserver or life raft materials and construction.

- 3.4 Moisture Penetration. All components of the light assembly which may be detrimentally affected by the presence of water shall be suitably protected against the entry of moisture to the extent that prolonged immersion in fresh or salt water will not adversely affect its operation.
- 3.5 Source of Electrical Power. The source of electrical power for the light shall be a part of the light assembly but need not be a part of the light fixture. Either dry cells or immersible water activated batteries suitable for the purpose may be used.
- 3.6 Light Activation. A method for controlling activation of the light shall be provided. The method shall be readily apparent to the user. For water activated batteries removal of the cell from water is acceptable as a method of light deactivation.
- 4.0 Required Tests.
- 4.1 Initial Qualification Tests. The tests indicated in the following subparagraphs shall be conducted for initial qualification. These tests shall be conducted on a minimum of three samples. Each test article shall be representative of production units and shall be individually identified. The use of other standard test procedures which will provide equivalent or better results than obtained by using the stated specifications will be acceptable.
- a. Salt Spray. All metal parts shall operate satisfactorily and shall not corrode when subjected to a salt spray in accordance with Federal Specification QQ-M-151 for a period of 100 hours.
  - b. Rubber Goods. A sample of rubber goods shall be tested in accordance with specification FED-STD-601.
  - c. Survivor Locator Light Intensity. It shall be demonstrated that the survivor locator light provides a minimum effective intensity of 1 candle as specified in paragraph 3.1 for a period of 8 hours.
  - d. Flame Resistance. All nonmetallic materials shall be tested for flame resistance in accordance with Federal Specification CCC-T-191, Method 5906.
  - e. Survivor Locator Light Watertightness. Each test sample light shall be submerged for a period of 8 hours in fresh water at 70° F. to such a depth that the highest point of the light is under a three foot head. After removal from the water, the light shall be examined to determine that no leakage has taken place.
- 4.2 Individual Functional Test. For dry cell type powered lights each light assembly shall be operated to demonstrate that the assembly is in an operating condition by lighting the light with the means provided. For water activated types each assembly including the battery shall be checked to assure that it is in an acceptable condition for proper operation.

§ 514.91 Survivor locator lights - TSO-C85.

(a) Applicability. Minimum performance standards are hereby established for survivor locator lights intended for installation on life preservers (adult and child) and life rafts for use in civil aircraft of the United States. New models of survivor locator lights manufactured on or after the effective date of this section shall meet the requirements specified in Federal Aviation Agency Standard, "Survivor Locator Lights", dated April 22, 1964.<sup>1/</sup>

(b) Marking. The survivor locator light shall be permanently marked in accordance with the provisions of § 514.3(d), except that the weight of the light assembly may be omitted.

(c) Data requirements. In accordance with the provisions of § 514.2, as applicable, manufacturers of survivor locator lights shall furnish to the Chief, Engineering and Manufacturing Branch, Flight Standards Division, Federal Aviation Agency, in the region in which the manufacturer is located, the following technical data: Six copies of an instruction manual containing descriptive information of the device, information for its maintenance and overhaul, instruction concerning the proper mounting of the light on the life preservers or life rafts to ensure continued compliance with prescribed minimum performance standards and pertinent operating instruction and limitations for the device.

(d) Effective date. July 6, 1964.

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<sup>1/</sup>Copies may be obtained upon request addressed to Library Services Division, HQ-620, Federal Aviation Agency, Washington, D.C. 20553