NPRM 90-11

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 25, 29, 91, 121, 125, and 135

[Docket No. 26180; Notice No. 90-11]

RIN 2120-AD19

Emergency Locator Transmitters

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking; notice of technical standard order withdrawal.

SUMMARY: The FAA proposes to require installation of an improved emergency locator transmitter (ELT) that meets the requirements of a revised Technical Standard Order (TSO) on U.S.-registered airplanes and to terminate approval to use ELTs authorized under the original TSO issued for this equipment. The new equipment would be required for future installations. The proposal is prompted by unsatisfactory performance experienced with ELTs that are manufactured under the original TSO and relates to safety recommendations by the National Transportation Safety Board (NTSB) and the search and rescue (SAR) community. Although most of the unsatisfactory field experience has been with automatic ELTs, the FAA also proposes improved standards for survival ELTs. The proposals would save lives by increasing the number of survivors rescued after aircraft accidents.

DATES: Comments must be received on or before July 31, 1990.

ADDRESSES: Comments on this notice should be mailed in triplicate to: Federal Aviation Administration, Office of the Chief Counsel, Attention: Rules Docket (AGC-10), Docket No. 26180, 800 Independence Avenue, SW., Washington, DC 20591. Comments delivered must be marked Docket No. 26180. Comments may be examined in Room 915G between 8:30 a.m. and 5 p.m. on weekdays, except on Federal holidays.

FOR FURTHER INFORMATION CONTACT: Phil Akers, Aircraft Engineering Division (AIR-120), Aircraft Certification Service, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591; telephone (202) 267-9571.

SUPPLEMENTARY INFORMATION:

Comments Invited

Interested persons are invited to participate in the making of the proposed rule by submitting such written data, views, or arguments as they may desire. Comments relating to the environmental, energy, federalism, or economic impact that might result from adopting the proposals in this notice are also invited. Comments addressing economic issues should be accompanied by detailed supporting information that explains the derivation of any estimates provided by the commenter. Comments should identify the regulatory docket or notice number and should be submitted in triplicate to the Rules Docket address specified above. All comments received on or before the closing date for comments specified will be considered by the Administrator before taking action on this proposed rulemaking. The proposals contained in this notice may be changed in light of comments received. All comments received will be available, both before and after the closing date for comments, in the Rules Docket for examination by interested persons. A report summarizing each substantive public contact with Federal Aviation Administration (FAA) personnel concerned with this rulemaking will be filed in the docket. Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must include a preaddressed, stamped postcard on which the following statement is made: "Comments to Docket No. 26180." The postcard will be date stamped and mailed to the commenter.

Availability of the NPRM

Any person may obtain a copy of this NPRM by submitting a request to the Federal Aviation Administration, Office of Public Affairs, Attention: Public Inquiry Center (APA-430), 800 Independence Avenue, SW., Washington, DC 20591, or by calling (202) 267-3484. Communications must identify the notice number of this NPRM.

Persons interested in being placed on the mailing list for future NPRM's should request a copy of Advisory Circular No. 11-2A, Notice of Proposed Rulemaking Distribution System, which describes the application procedure.

Background

History

In 1971, responding to a congressional mandate for rulemaking (Public Law 91-596), the FAA adopted amendments to parts 25, 29, 91, 121 and 135 of the Federal Aviation Regulations to require the installation and use of ELTs that meet the requirements of TSO-C91. The amendment requires that certain U.S.-registered civil airplanes be equipped with automatic ELT's.

An automatic ELT is a crash-activated electronic signaling device used to facilitate search and rescue efforts in locating downed aircraft. In most installations the device is attached to the aircraft structure as far aft as practicable in the fuselage, or in the tail surface, in such a manner that damage to the beacon will be minimized in the event of a crash impact.

Certain aircraft such as turbojet-powered aircraft and aircraft engaged in scheduled air carrier operations are excepted from this requirement because the rule is applicable to those airplanes that are most difficult to locate after an accident. The ELT is particularly helpful in locating airplanes that are operated by pilots who do not file a flight plan or work with the air traffic control system.

Survival ELTs are manually-operated or actuated upon contact with water. These ELTs are required items of ditching equipment for transport category airplanes and rotorcraft. They are also required items of emergency equipment for extended overwater operations on aircraft used in air carrier, air taxi, and commercial operations.

Since the adoption of these regulations there has been unsatisfactory field experience with the automatic ELTs. Most aviation groups, when addressing the severity of this problem, refer to a failure-to-function rate of two-thirds and a 97 percent false-alarm rate. Validating and quantifying the composition of these statistics are important elements of the FAA's ELT program; these issues are further addressed in the discussion under "ELT statistics."

Because of the unsatisfactory performance experienced with use of ELTs, the FAA requested the Radio Technical Commission for Aeronautics (RTCA) to develop a revised technical standard which would address false alarms and failure-to-activate rates. The RTCA effort produced a minimum operational performance standard that is referenced in TSO-C91a which was issued in April 1985. Installation of ELTs that meet this improved standard, however, is currently voluntary.

National Transportation Safety Board (NTSB) Recommendations

NTSB safety recommendations A-78-5 through A-78-12 issued in 1978 also addressed the ELT problems; they are now classified by the NTSB as "Closed-Acceptable Action", primarily because TSO-91a was issued. Following the issuance of the new TSO, the NTSB, in 1987, issued safety recommendation A-

87–104, which recommends that existing ELTs be replaced by 1989 with ELTs that comply with TSO–C91a, and that ELTs be subject to specific maintenance requirements.

ELT Maintenance

Part 91, subpart C, contains inspection and maintenance requirements for the continued airworthiness of aircraft and their components. Section 91.52 requires the ELT to be in operable condition and provides specific requirements for battery replacement. TSO–C91a contains instructions for periodic maintenance and calibration. These instructions are necessary for an ELT's continued airworthiness and must be provided with each ELT unit manufactured under this TSO. These required instructions provide specific information to enable appropriately rated persons to inspect ELTs and maintain them in an airworthy condition necessary to meet the needs of the flying public and the Search and Rescue community. Further, TSO–C91 and TSO–C91a manufacturers' instructions are being reviewed by the FAA to ensure that these requirements are met. Section 43.13(a) of the Federal Aviation Regulations requires persons performing inspections and maintenance to use manufacturers' instructions or those acceptable to the FAA Administrator. The aircraft owner or operator is responsible for ensuring that the ELT is included in these inspections and is maintained accordingly.

The FAA agrees with the intent of NTSB recommendation A–87–104 and recognizes the need for more specific ELT maintenance requirements. The two components that commonly cause ELT unserviceability are the battery and the G-switch (an actuation device that operates on acceleration forces measured in G's; one G denotes the acceleration of the earth's gravity). Other malfunctions are caused by poor installation or problems associated with the antenna system. As a first step to improve ELT maintenance, Action Notice A 8310.1, which recommends a specific supplemental inspection procedure for ELTs, was issued to all FAA field personnel in September 1988. This information was also included in the February issue of Advisory Circular 43–16, General Aviation Airworthiness Alerts. These documents have been placed in the docket. A copy may be obtained by contacting the person identified under **"FOR FURTHER INFORMATION CONTACT."** The supplemental inspection applies to ELTs authorized under both TSO–C91 and TSO–C91a. The inspection can be accomplished by closely examining the ELT, its battery pack and antenna, and checking the signal emissions and G switch. If the ELT's antenna is radiating a signal, it can be heard on any frequency through a low-cost AM radio held about 6 inches from the ELT's antenna. Because the ELT transmits on the emergency frequency, such tests must be conducted within the first 5 minutes after any hour and limited to three sweeps of the transmitter's audio signal. The aircraft's VHF receiver, tuned to 121.5 MHz, may also be used. This receiver, however, is more sensitive and does not check the integrity of the ELT system or provide the same level of confidence as does the AM radio. To check the G-switch of a TSO–C91 ELT, remove it from its mounting and give it a quick rap with the hand. For TSO–C91a ELTs, use a throwing motion coupled with a rapid reversal. Since these are not measured checks, they do not quantify the adequacy of G-switch or power output of the antenna, but do provide an acceptable level of confidence that the ELT is functioning properly.

Early this year, the FAA developed criteria for measured testing of the ELT signal and the G-switch. Technical assistance from the National Aeronautics and Space Administration (NASA) was used to validate the tests on several DOT airplanes and to determine its practicality. Currently, these tests are being carried out at six different repair stations to gather more information on ELT maintenance. Measurements of the G-switch actuation limits, however, are being taken by only one of the six repair stations due to the need for specialized equipment to conduct that test.

Data obtained from the tests performed at the repair stations will be included in a study to quantify the level of safety and dependability expected with the use of TSO–C91a ELTs. The data will also be used to quantify the need for improved maintenance of all ELTs.

Interagency Committee on Search and Rescue

In 1973, the Interagency Committee on Search and Rescue (ICSAR) was established to oversee and act as a coordinating forum for national SAR matters. This committee also coordinates the development of policy, procedures and equipment with other national agencies involved with emergency services. The objectives of the committee are to provide increased effectiveness and standardization for the national SAR system.

ELT Monitors

In 1987, the Interagency Committee on Search and Rescue sponsored a program to field test the effectiveness of an aircraft cockpit monitor which is a design improvement specified by TSO–C91a. The monitor would alert the pilot when the aircraft's ELT has been activated. If the activation is a non-distress signal (false alarm), the ELT can be silenced before search and rescue forces are alerted and deployed. This experiment, though only moderately successful, provided some useful data on monitoring ELT performance.

A large percentage of false alarms originate from ELTs installed on aircraft located at airports. The Interagency Committee on Search and Rescue is currently sponsoring another program to record ELT activations at selected airports through the use of stationary monitors. Most of these monitors are linked to equipment that automatically logs the ELT activations. Stationary monitors, when properly used, would significantly reduce the number of non-distress missions because immediate action could be taken to silence these false alarms before SAR forces are deployed.

ELT Awareness

To provide some improvement in ELT performance, the FAA has increased its efforts to reduce the number of false alarms experienced with the use of existing ELTs approved under TSO–C91. The Administrator, at the April 1987 National Air Transportation Association convention, addressed how fixed-base operators can help to locate and silence false alarms at airports. A pamphlet titled "Attention to ELT's; Insurance To Life" was developed and distributed at the convention and has been distributed to all active U.S. pilots. The information contained in the pamphlet is discussed at pilot safety seminars and has been incorporated in the FAA Back-To-Basics program.

Availability of TSO–C91a ELTs

ARNAV Systems, Inc., has obtained FAA approval of an ELT that meets the specifications of TSO–C91a. TSO–C91a authorization was issued for the model ELS–10 in October 1986 and for a lower cost model, the ELT–100, in March 1988. These ELTs market for approximately $900 and $350, respectively, and have beneficial design enhancements, such as built-in test equipment. No adverse field experience has been reported on approximately 200 installations of these units. There has been one documented accident involving an aircraft equipped with an ARNAV ELT; the ELT activated

properly in that case. Furthermore, there have been no reports of false alarms involving ARNAV ELTs. The most recent TSO–C91a authorization was issued to Narco Avionics Inc., for its model ELT–910 in June 1989. It is expected to market for approximately $400. Several other ELT manufacturers have expressed an interest in producing TSO–C91a ELTs.

406 MHz ELTs

A new 406 MHz ELT, specifically designed to work with the Search and Rescue Satellite-Aided Tracking System, is coming into international use, and a national standard for this beacon has been developed by RTCA. The SAR community in general strongly advocates the adoption of 406 MHz ELTs, and the Coast Guard has issued carriage requirements for similar beacons in certain maritime applications. This ELT is estimated to market for at least twice the cost of the TSO–C91a ELTs. Although acceptable performance with the satellite system can be obtained using 121.5/243 MHz ELTs built to the standards of TSO–C91a, the 406 MHz system is expected to provide significant performance and information improvements such as greater signal margin, better position accuracy, specific airplane identification information, global coverage, and less susceptibility to interference. These features are expected to permit more effective and timely SAR response.

In accomplishing these improvements, the 406 MHz system transmits short coded signals every 50 seconds on a frequency that is not used for communications. It is, however, impossible to have homing or frequency monitoring capabilities on this frequency without specialized equipment. The 121.5 MHz signal must be added to the 406 MHz system to provide for continued universal monitoring by the aviation community and to provide homing capability using existing equipment. Homing capability is especially needed in mountainous areas and during times of poor visibility.

RTCA Special Committee 160 has developed a minimum operational performance standard for a 406 MHz ELT to be used as an optional adjunct to a 121.5/243 MHz ELT. The intended configuration of this triple frequency ELT can be accomplished by either of two approaches: (1) Installation of a stand-alone 406 MHz ELT to augment an existing 121.5/243.0 MHz ELT installation; or (2) Installation of an integrated 121.5/243.0/406 MHz ELT, of which the 121.5/243.0 MHz portion would meet the requirements of TSO–C91a. This RTCA standard, Document No. RTCA/DO–204, has been coordinated with the European Organization for Civil Aviation Electronics and was approved by RTCA on September 29, 1989.

A 406 MHz ELT would operate at much higher power levels than the 121.5/243.0 MHz ELT. Batteries that have lithium chemistry appear to be the only logical power source for the 406 MHz ELT. Because the FAA is concerned about the safety characteristics of the lithium batteries, a review of TSO–C97 for lithium sulfur dioxide batteries is currently underway. That TSO was issued in August 1979 and is being assessed for its adequacy in view of current technology and its applicability to other types of lithium chemistry batteries.

The FAA does not foresee the need for any future rulemaking on mandatory carriage of 406 MHz ELTs within the continental United States; however, international requirements for these ELTs are under consideration by the International Civil Aviation Organization. Currently, there are no international agreements for carriage of 406 MHz ELTs. To move forward on the development of U.S. requirements, the FAA is considering a TSO for these ELTs, using RTCA/DO–204 standard as the reference document and is examining the safe use of the lithium batteries. Issuance of a TSO for 406 MHz ELTs would allow voluntary use of 406 MHz ELTs that are in compliance with the TSO.

Upgrade of Existing ELTs

There have been several inquiries from ELT manufacturers on whether it would be practical to modify existing units approved under TSO–C91, if such improvement modifications meet the requirements of TSO–C91a. Transport Canada, the Canadian counterpart of the DOT, is studying the potential for upgrading existing ELTs to the TSO–C91a standard. The study identified the following as necessary upgrade requirements: The new specifications for the G-switch, the ELT monitor, pilot accessible controls, satellite compatibility, environmental testing, and crash survivability. Preliminary cost information from the study estimates the improvements to be $700 per unit. Considering the cost of a new ELT and the age of most ELTs currently in use, the FAA views an ELT upgrade effort to be impractical.

G-Switch

After an exhaustive effort by RTCA to develop an improved G-switch specification, there continues to be scrutiny of its adequacy. Most critics question the low threshold limit (Gth = 2.0 + /–.3 Gs). The threshold limit is the number of G's below which the G-switch will not activate the ELT.

Late in 1987, the FAA's National Resource Specialist for Crash Dynamics evaluated the new G-switch specification and all related documents. Following is a summary of the evaluation:

- The TSO–C91a G-switch response curve is an appropriate specification for a longitudinal axis-sensitive ELT, although there is still a very limited potential for false alarms. The curve was defined for the purpose of sensing more than 80 percent of the survivable accidents while rejecting activations due to flight or ground loads such as turbulence, hard landings, and heavy braking (tire skidding occurs at approximately 0.8 G).
- Anyone installing an ELT should adhere to all installation guidelines contained in the new RTCA standard for mounting an ELT.
- The G-switch approved under TSO–C91 should be removed from service because of a high probability of false activation from airframe vibration and non-activation due to jamming.
- As TSO–C91a ELTs come into service, they should be field tested and/or reviewed closely.

The FAA believes that TSO–C91a provides an adequate G-switch specification for sensing an airplane crash and would minimize false alarms. In the event of a false activation, the ELT monitor would alert the pilot or ground personnel. Additionally, the RTCA Special Committee 160 has determined that this is an appropriate specification to be included in its standard for 406 MHz ELTs.

FCC Rulemaking

In February 1988, the Federal Communications Commission issued amendments to its rules to authorize additional types of modulation for ELTs and emergency position indicating radio beacons (the maritime equivalent of the ELT). Of particular interest is the requirement that ELTs manufactured after October 1988 have a clearly defined carrier frequency distinct from modulation sidebands. This is a satellite compatibility requirement and is also contained in TSO–C91a.

In the last 5 years, members of Congress and aviation oriented organizations have recommended that the FAA take action to address ELT problems. Requiring an ELT retrofit program has been deliberated and is the most controversial solution to the ELT

problems. Currently, there is general agreement among the members of organizations showing interest in the FAA's ELT program that these proposals will expedite the transition to the TSO–C91a ELTs and are appropriate for addressing the ELT problems.

Discussion of the Proposals

All future ELT installations in U.S.-registered airplanes would have to conform with TSO–C91a. For the purposes of this notice the term "future installations" apply to newly manufactured airplanes, and to replacement of existing ELTs as they become unusable or unserviceable after the effective date of this rulemaking. This action would be accomplished by replacing specific references to TSO–C91 in the FAR with a generic term "an approved ELT that is in operable condition", and by withdrawing all TSO–C91 authorizations issued to ELT manufacturers. In effect, this would allow TSO–C91a or any subsequent TSO issued for ELTs to be used as a basis for compliance with the FAR. TSO–C91 ELTs already installed in aircraft may be used until they become unusable or unserviceable.

Current production of unsold TSO–C91 ELTs for general aviation airplanes is sufficiently small that accumulation of such inventories is unlikely. The FAA expects this inventory to be completely depleted by the time this rule becomes effective.

Automatic ELT Requirements, 14 CFR Part 91

The proposed requirement for automatic ELTs would become effective 6 months after the effective date of the final rule. ELT activation failures and false alarms have been consistently high in years past and will continue in the future if corrective action is not taken. There has been no significant improvement in ELT performance through voluntary programs sponsored by the FAA, other government agencies, or organizations. Rulemaking action may be the most appropriate solution to problems associated with use of ELTs.

ELT Statistics

ELTs complying with TSO–C91a offer the potential for saving more lives in the event of an aircraft accident. Statistics from the Air Force Rescue Coordination Center (AFRCC) show that not having an ELT signal in an accident reduces chances of survival by 43 percent. In 1987, there were 16 missions where the ELT did not function and the length of time to locate the aircraft was greater than 72 hours. Thirty-five fatalities occurred in these accidents. Some survivors of the initial crash in these accidents could have been saved if the airplane's ELT had been functioning properly. To a lesser degree, false alarms have also contributed to the safety problems associated with use of ELTs. Due to the time needed to confirm an actual distress signal, false alarms often delay the dispatch of SAR forces. There are also cases where false alarms have blocked ELT signal emanating from another aircraft in the same local area. Additionally, the AFRCC estimates that $3.5 million in federal, state, and Civil Air Patrol volunteer resources are expended every year on ELT false alarm missions.

To quantify the safety improvements expected with the TSO–C91a ELTs, the FAA has accepted NASA's offer of technical assistance and requested that a study be made. This action was prompted by House of Representatives Report 99–212, accompanying its 1985 appropriation bill, H.R. 3038. The FAA has also requested the expertise of member agencies of the Interagency Committee on Search and Rescue and the NTSB. All previous ELT data, findings, and recommendations, mostly from accidents and the development of TSO–C91a, are now being consolidated with current data and results of recent projects. The study will include recent information from Transport Canada's ELT program. This material will help clarify ELT data and show the expected improvement in safety and the number of lives to be saved with the transition to improved TSO–C91a ELTs. Thus far, the study has verified the 97 percent false-alarm rate, the two-thirds failure-to-activate rate, and all of the statistics on ELTs contained in this notice.

The SAR system, using satellite-aided tracking, has helped rescue 609 persons from aircraft accidents since it was commissioned in 1982. The ELT is the weak link. Improved ELTs would allow this system to operate with greater efficiency. In this regard, it is helpful to understand the various components of the ELT statistics so that the ELT improvements can be measured against them.

The two-thirds failure-to-activate rate if the fraction derived from NTSB reports of ELTs that did not aid in locating aircraft accidents. There are 19 reasons for non-effectiveness or failure of these ELTs listed on NTSB accident forms. Examples include insufficient Gs to activate the switch, improper installation, battery dead, water submersion, fire damage, and unit not armed. The reasons can be divided into four basic groups: poor design, failures beyond the ELT's operational capability, lack of maintenance, and undetermined. NASA is reviewing the NTSB data base and other related data to estimate the number of lives that could be saved from each improvement contained in TSO–C91a and by improved ELT maintenance.

To understand the false alarm problem, it is beneficial to know how the reports of signals on the 121.5 MHz frequency are received and processed. These signals are received predominantly by the search and rescue satellite-aided tracking system. Some signals are received by over-flying aircraft monitoring 121.5 MHz and reporting through Air Traffic Control. This information is transferred to the U.S. Mission Control Center and disseminated to a proper land (operated by the U.S. Air Force) or sea (operated by the U.S. Coast Guard) Rescue Coordination Center. In 1988, the AFRCC documented receipt of 54,292 signals. Each of the signals was evaluated for correlation with a known or potential aircraft distress situation, or with previously received ELT signals. If no correlation was established, no action was taken until the signal was verified by another satellite pass, an over-flying aircraft, or information from the FAA identifying an overdue aircraft whose flight path was in the vicinity of the signal source. The time required to receive a second report of a signal for correlation varied from a few minutes to several hours, depending on the satellite coverage sequence or the presence of aircraft monitoring the emergency frequency.

In 1988, there were 5,768 instances of correlated signals that are referred to as incidents. The AFRCC initiated files on these incidents to document actions taken for locating the source of the signal. Of these incidents, AFRCC was unable to locate 1,863 of the signal sources through telephone investigation. The incidents then became AFRCC ELT missions. Federally-funded aircraft or ground forces were used to locate the sources of the signals. In 1988, 85 distress signal sources were located, 410 signal sources ceased to emit prior to their location, and 1,368 non-distress signal sources were located.

The AFRCC calculates the false alarm rate from ELT mission data by subtracting the number of distress missions from the total number of missions.

1988 ELT Missions

Distress	85 (4.6 percent)
Ceased	410 (22.0 percent)
Non-distress	1,368 (73.4 percent)
Total	1,863 (100 percent)

1988 ELT Missions—Continued

1988 false alarms (1,863−85)	1,778 (95.4 percent)

Note: The 1984–1988 average is 96.6 percent.

Aircraft missions is another important data base maintained by the AFRCC; it contains data on incidents in which SAR aircraft were launched because an aircraft was overdue, rather than as a result of an ELT distress signal. There were 191 aircraft missions of this type in 1988, on which 107 distressed aircraft were located. In only 11 cases did the ELT aid in locating the aircraft. No data was collected on why the ELT did not aid the SAR aircraft.

Overview

In view of the high failure-to-activate rate and number of false alarms experienced with ELTs manufactured under TSO–C91, the FAA proposes to require improved TSO–C91a ELTs for future installations. The FAA also proposes to terminate approval of ELTs manufactured to the specifications of TSO–C91. The FAA supports all reasonable efforts to improve ELTs when used in conjunction with the SAR system, and solicits comments with regard to a near-term retrofit program. The proposed compliance date may be changed in light of comments received. Based on the findings of the ELT testing at repair stations, the NASA study, and substantive comments obtained from this proposed rulemaking, the need for further rulemaking action will be considered at the time the final rule is issued. Amendments to existing regulations may be used to expedite the transition to TSO–C91a ELTs. The FAA may also amend the regulations to ensure that specific inspection criteria for continued airworthiness of ELTs (TSO–C91 and TSO–C91a) is accomplished. In this regard, the FAA solicits data and specific information.

Survival ELT Requirements, 14 CFR Parts 25, 29, 121, 125, and 135

The requirement for survival ELTs would become effective 2 years after issuance of a final rule. The FAA proposes additional time for ELT manufacturers to transition to the new standard for survival ELTs since no survival ELTs are currently being produced under TSO–C91a and the false alarms and failure-to-activate problems are not inherent in this ELT.

There has been little adverse service experience with survival ELTs, and they generally function properly in times of necessity. Few ditchings have occurred in recent years; therefore, little operational data with these ELTs have been collected. As indicated in the summary, this notice also addresses updating the TSO requirements for survival ELTs. The TSO–C91a improvements applicable to survival ELTs address the satellite compatibility and improved environmental and crash-survivability specifications. Improvements to the G-switch and ELT monitor do not apply to survival ELTs because they are manually or water-activated and are not as susceptible to false alarms. The long-term safety benefits of the improved requirements for survival ELTs cannot be ascertained; however, it is reasonable to assume that improved reliability could lead to an increase in the number of lives saved in future ditchings. The proposal to require improved TSO–C91a survival ELTs on all future installations in existing or newly-manufactured aircraft would ensure the transition to improved standards at a minimal cost.

One proposal is editorial in nature. The proposal would correct a typographical error found in the last sentence § 125.209(b). The word "probably" would be replaced with the word "probable".

Part 91 will be completely revised as of August 18, 1990 (see 54 FR 34284; August 18, 1989) to renumber all of its sections. Section 91.52 (Emergency locator transmitters) will be renumbered as § 91.207. The proposed amendment contains amendatory language for both versions of this section.

Regulatory Evaluation Summary

Executive Order 12291 dated February 17, 1981, directs Federal agencies to promulgate new regulations or modify existing regulations only if the potential benefits to society from the regulatory changes outweigh their potential costs. The order also requires the preparation of a draft regulatory impact analysis of all "major" proposals except those responding to emergency situations or other narrowly defined exigencies. A "major" proposal is one that is likely to result in an annual effect on the economy of $100 million or more, a major increase in consumer costs, or significant adverse effects on competition.

The FAA has determined that this regulatory action is not a "major" action as defined in the executive order, so a full draft regulatory impact analysis identifying and evaluating alternative proposals has not been prepared. A more concise draft preliminary regulatory evaluation has been prepared, however, which includes estimates of the economic consequences of this regulation. This preliminary regulatory evaluation is included in the docket and quantifies, to the extent practicable, estimated costs to the private sector, consumers, and to Federal, State and local governments, as well as estimated anticipated benefits and impacts.

The reader is referred to the full regulatory evaluation contained in the docket for the full detailed analysis. This section contains only a summary of the full regulatory evaluation. This section also contains an initial regulatory flexibility determination as required by the Regulatory Flexibility Act of 1980 and a trade impact assessment.

This preliminary regulatory evaluation examines the costs and benefits of the Notice of Proposed Rulemaking (NPRM) amending parts 25, 29, 91, 121, 125 and 135 of the Federal Aviation Regulations (FAR). The notice proposes to terminate the manufacture of TSO–C91 standard Emergency Locator Transmitters (ELTs), and require all new installations of ELTs to conform to the improved standards specified in TSO–C91a.

A range of costs is employed in this report to account for uncertainty about the additional cost per unit of TSO–C91a specification ELTs. Both costs and benefits for required new installations of automatically-activated (automatic ELTs) and survival type ELTs (survival ELTs) are examined over a 10-year evaluation period, from 1991 to 2000. This assumes that a final rule requiring TSO–C91a ELTs for all new civilian general aviation airplane installations will be issued by mid-1990.

Production and installation of automatic ELTs, as mandated by this proposed rule, are expected to begin 6 months after the rule's effective date. Production and installation of survival ELTs are expected to commence 2 years after the rule's effective date.

Costs of Automatic ELTs

Additional costs of switching production from TSO–C91 ELTs to the TSO–C91a standard are estimated to range from $150 to $400 per unit. This analysis employs both cost figures, providing both a low-side and a high-side forecast. Nonetheless, the FAA believes that the low-side cost estimates would more accurately project the costs that will, in fact, be imposed on the industry. If the proposed rules are implemented, the price of TSO–C91a specification ELTs should drop significantly due to economies of scale associated with large-scale production, as well as to competitive influences. Several manufacturers surveyed have estimated that there would be no

additional installation costs for TSO–C91a ELTs, although others mentioned the possibility of some additional labor costs. The FAA conservatively estimates $75 per unit in additional installation costs, primarily for installation of wiring, cockpit controls and mounting.

Any additional weight penalty of TSO–C91a units, compared to TSO–C91 units, is negligible. Therefore, these proposed rules are not expected to cause a significant increase in aircraft fuel consumption.

Also, costs of unsold TSO–C91 ELT inventory left over after the compliance deadline of this rule are expected to be negligible. Current production of unsold TSO–C91 ELTs for general aviation airplanes is sufficiently small that accumulation of such inventories is unlikely. The FAA expects this inventory to be completely depleted by the time this rule becomes effective.

The size of the current and future ELT market in the U.S., in the absence of a required retrofit, is assumed to be approximately 3,000 units annually (approximately 1.5% of the current fleet). This assumption is very conservative, in light of the fact that U.S. general aviation aircraft shipments have steadily declined from a high of nearly 18,000 in 1978, to 1,085 units in 1987. Because the fleet of general aviation airplanes is projected to show little growth through the end of this century, the FAA assumes that the future ELT market will remain relatively constant.

Assuming an additional cost of $150 per ELT unit plus $75 for installation, this proposed rulemaking would result in estimated annual costs for automatic ELTs of $675,000. Over the 1991–2000 evaluation period, estimated costs would total $6.8 million in 1988 dollars, and $3.4 million discounted to present value (10% discount rate).

Assuming an additional cost of $400 per ELT unit plus $75 for installation, this proposed rulemaking would result in estimated annual costs for automatic ELTs of $1,425,000. Over the 1991–2000 evaluation period, estimated costs would total $14.3 million in 1988 dollars, and $7.2 million discounted to present value (10% discount rate).

Costs of Survival ELTs

A manufacturer of survival ELTs estimates that each unit produced to TSO–C91 standards costs $3,500 (in 1988 dollars), and that upgrading production to TSO–C91a standards would increase the cost by 25 to 35 percent per unit, or $875 to $1,225. This cost includes allocated development and testing expenses (estimated to be $300,000–$600,000 for a given firm). For purposes of this analysis, the FAA uses both cost-per-unit estimates in calculating total costs.

Again, as for the automatic ELTs, the FAA believes that the price of TSO–C91a survival ELTs will be significantly reduced due to economies of scale and competition factors, if this proposed rule is implemented. Therefore, the low-side cost estimate of $875 per unit is projected to be the more accurate estimate.

No additional installation costs are expected nor have any additional fuel costs due to added weight been projected for TSO–C91a survival ELTs.

Current rules require survival ELTs for use in life rafts in transport category airplanes and rotorcraft. A major manufacturer of survival ELTs estimates 900 annual industry-wide survival ELT sales in the U.S. A portion of these sales go to aircraft manufacturers and are installed in aircraft to be used by foreign operators. The FAA estimates that 50 percent of total U.S. sales, or approximately 450 units annually, are used in U.S.-operated aircraft, and thus would be subject to this proposed rulemaking. Approximately 3,700 new survival ELT installations are expected over the 1991–2000 evaluation period.

Assuming an additional cost of $875 per unit, the proposed rulemaking to require all new installations of survival ELTs to conform to TSO–C91a will result in total 10-year costs over the 1991–2000 evaluation period of $3.3 million in 1988 dollars, and $1.5 million discounted present value (10 percent discount rate).

Assuming an additional cost of $1,225 per unit, total 10-year costs over the 1991–2000 evaluation period are estimated to be $4.6 million in 1988 dollars, and $2.1 million discounted to present value (10 percent discount rate).

Total Costs of the Proposed Rule

Total costs over the 1991–2000 evaluation period of requiring all new installations of both automatic and survival ELTs to conform to TSO–C91a specifications are expected to range from $10.1 to $18.9 million, in 1988 dollars, and $4.9 to $9.3 million, discounted to present value (10 percent discount rate).

A summary of the range of costs is shown below:

[In millions of dollars]

	Cost in 1988 dollars	Discounted present value cost
Automatic ELT	$6.8–$14.3	$3.4–$7.2
Survival ELT	$3.3–$4.6	$1.5–$2.1
Total cost of proposed rule	$10.1–$18.9	$4.9–$9.3

Benefits of Automatic ELTs

Two distinct types of benefits would be derived from this rulemaking:

(1) A reduction in resources spent in search and rescue efforts to locate false alarms. According to officials of the Aerospace Rescue and Recovery Service, approximately $2 million in Federal resources is spent annually responding to false alarms. The AFRCC estimates that the total resources spent responding to false alarms is $3.5 million annually. As previously discussed under ELT statistics, the known false alarm rate is about 97 percent of the total ELT alarms. Thus, any improvement in the quality of automatic ELTs that can reduce the number of false alarms has the potential to significantly reduce unnecessary search and rescue expenditures.

(2) Significantly higher benefits can be obtained by reducing the potential for ELTs failing to activate in accidents. According to the Aerospace Rescue and Recovery Service, the probability of death occurring while awaiting rescue increases substantially after 24 hours. If efforts to locate a downed aircraft take longer than 72 hours, any survivors of the initial impact will, most likely, have died in the intervening period.

According to the Aerospace Rescue and Recovery Service, in 1987, the average time to locate a downed aircraft when the ELT was functioning was 13.7 hours. In contrast, the average time to locate a downed aircraft with no ELT signal was 55.6 hours. In 1987, 16 missions required longer than 72 hours to locate a downed aircraft; 35 fatalities occurred in these accidents.

Statistics show that only about 3 percent of ELTs involved in accidents activate. Thus, significant improvements are possible in the effectiveness rate of ELTs in accidents. Any improvement in ELT effectiveness would cause a reduction in the time to locate downed aircraft and, therefore would have the potential to result in significant safety benefits in terms of lives saved.

Benefits of Reducing False Alarms

As a greater percentage of the general aviation fleet is covered by TSO–C91a standard ELT units through new installations, resulting in a lower false alarm rate, the costs of search and rescue efforts should be reduced. Assuming that (1) 3,000 TSO–C91a specification units are installed annually, (2) total costs of responding to false alarms are $3.5 million annually, an (3) TSO–C91a units are only 50% effective, on average, in reducing false alarms, then total benefits of the reduction in false alarms over the 1991–2000 evaluation period will be $1.4 million, in 1988 dollars, or $630,000 discounted to present value (10% discount rate).

Benefits of Increasing ELT Activation in Accidents

The net costs of requiring automatic ELTs that conform to the TSO–C91a standards would range from $5.3 million to $12.8 million in 1988 dollars, after subtracting out the $1.4 million in potential benefits that would accrue from a reduction in false alarms. If the additional cost per unit of new installations of automatic ELTs is $150, then at least 6 lives would have to be saved between 1991 and 2000, in order for the benefits of the proposed rule to exceed its $5.3 million net cost. For the purpose of quantifying benefits of this rule, a minimum value of $1 million is used to statistically represent a human life.

If the additional cost per unit is $400, then at least 13 lives would have to be saved between 1991 and 2000, in order for the benefits of the proposed rule to exceed its $12.8 million net cost. In determining the likelihood of such benefits, it is important to note that average fleet coverage by TSO–C91a ELTs would be about 8.3% during the 1991–2000 period.

If historical trends continue, more than 11,000 general aviation fatalities are expected to occur between 1991 and 2000 (NTSB data indicates that approximately 11,780 fatalities occurred between 1977 and 1986). Even with only 8.3% of the general aviation fleet covered by automatic ELTs on average, it does not seem unreasonable to project that this rulemaking could prevent at least 6 to 13 fatalities during the 1991–2000 period.

This conclusion is strengthened by noting again that 35 fatalities occurred in one year—1987—in accidents where search and rescue forces took longer than 72 hours to locate the downed aircraft. This proposed rule would have to prevent at most 2 out of these 35 fatalities each year in order for the rule's benefits to exceed its cost.

Benefits of Survival ELTs

Over the course of the 1991–2000 evaluation period, at least 4 lives must be saved in order for the benefits of the proposed rule to exceed the $3.3 million cost of the required installations of TSO–C91a survival ELTs, assuming that the additional per-unit cost is $875. At least 5 lives would have to be saved if the additional per-unit cost is assumed to be $1,225.

Historical data indicates that 38 preventable drownings occurred in the 25-year period from 1962 to 1986 in part 121 operations, and 91 preventable drownings occurred between 1967 and 1986 in part 135 operations. This equates to a rate of 15 preventable drownings every 10 years for part 121 operations, and 46 preventable drownings every 10 years for part 135 operations, or a total of 61 preventable drownings every 10 years. Preventable drownings are fatalities that occurred in aircraft ditchings or inadvertent water impacts, due to drowning and no other cause.

Therefore, it must be shown that at least 4 to 5 of the 61 preventable drownings expected to occur in part 121 and 135 operations during a given 10 year period could be prevented in order for the benefits of the proposed rule to outweigh its cost.

Only one successful search and rescue operation involving an improved survival ELT installed in a ditched aircraft is needed to justify the small additional expenditure on this equipment.

Comparison of Costs and Benefits

Total 10-year costs of these proposed rules are projected to range from $10.1 million to $18.9 million (in 1988 dollars), and $4.9 million to $9.3 million (discounted to present value). The number of prevented fatalities needed to justify these expenditures is shown in the following table:

RANGE OF PREVENTED FATALITIES NEEDED TO JUSTIFY THE COSTS OF THIS PROPOSED RULE

Source of prevented fatalities	Lives saved	
	Over 10 years	Per year
Automatic ELTs	6–13	1–2
Survival ELTs	4–5	(1)
Total	10–18	1–2

[1] 1 life saved every other year.

The FAA believes that this proposed rule effectively could save the maximum number of lives—18 over 10 years, or 2 per year—in light of the history of fatalities due to delayed search and rescue missions. Therefore, the FAA predicts that the benefits of this proposed rule would outweigh its cost.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) was enacted to ensure that small entities are not unnecessarily or disproportionately burdened by Government regulations. The RFA requires a Regulatory Flexibility Analysis if a rule has a significant economic impact, either detrimental or beneficial, on a substantial number of small business entities. FAA Order 2100.14A, "Regulatory Flexibility Criteria and Guidance," establishes threshold cost values and small entity size standards for complying with RFA review requirements in FAA rulemaking actions.

The small entities potentially affected by the proposed rules are parts 121, 125, and 135 operators that own nine or fewer aircraft, which is the size threshold for aircraft operators. The cost thresholds are $92,400 for operators of scheduled services with entire fleets having a seating capacity of over 60; $51,700 for other scheduled operators; and $3,600 for unscheduled operators.[1] A substantial number of small entities means a number which is not less than eleven and which is more than one-third of the small entities subject to the proposed rule.

The most likely entities to sustain a significant economic impact as a result of the proposed rules are unscheduled operators that operate extensively over water and are purchasing new aircraft with both automatic and survival ELT's. These operators would have to purchase at least two aircraft in a year in order to exceed the $3,600 threshold, assuming the highest range of estimated cost for each type of ELT.

The FAA does not expect that the proposed rules will have a significant economic impact on a substantial number of small entities because it is unlikely that 11 or more small entities will be purchasing two or more new aircraft in any given year. Small entities most likely will not be affected because generally they purchase used aircraft to conduct their operations.

Trade Impact Assessment

The proposed rules will have little or no impact on trade for either U.S. firms doing business in foreign countries or foreign firms doing business in the

[1] Thresholds appearing in the order have been inflated from 1986 to 1989 dollars using the Consumer Price Index appearing in "FAA Aviation Forecasts, Fiscal Years 1989–2000 (FAA–APO–89–1) March 1989.

United States. The proposed rules will affect only U.S. air carriers and operators. Foreign air carriers are prohibited from operating between points within the United States. Therefore, they would not gain any competitive advantage over the domestic operations of U.S. carriers. In international operations, foreign air carriers are not expected to realize any cost advantage over U.S. carriers because many foreign countries have ELT requirements as stringent as those proposed here. Moreover, the differential in costs between the current and proposed ELT rules would not be significant enough to affect adversely the international operations of U.S. carriers. Further, general aviation operations conducted in the United States are not in direct competition with foreign enterprises. For these reasons, the FAA does not expect that the proposed rules will result in any international trade impact.

Federalism Implications

The regulations proposed herein would not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this proposal would not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Conclusion

The FAA has determined that the potential benefits of the proposed regulation outweigh its potential cost and that it is not major under Executive Order 12291. In addition, this proposal, if adopted, will not have a significant economic impact, beneficial or detrimental, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. This proposal is considered significant under DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). An initial regulatory evaluation of the proposal, including a Regulatory Flexibility Determination and Trade Impact Analysis, has been placed in the docket. A copy may be obtained by contacting the person identified under "**FOR FURTHER INFORMATION CONTACT.**"

List of Subjects

14 CFR Part 25

Aircraft, Aviation safety, Air transportation, Safety.

14 CFR Part 29

Aircraft, Aviation safety, Air transportation, Safety.

14 CFR Part 91

Air carriers, Aircraft, Airworthiness directives and standards, Aviation safety, Safety, Aircraft.

14 CFR Part 121

Air carriers, Aircraft, Aircraft pilots, Airmen, Airplanes, Aviation safety, Air transportation, Common carriers, Safety, Transportation.

14 CFR Part 125

Aircraft, Airmen, Airplanes, Airports, Air transportation, Airworthiness, Pilots.

14 CFR Part 135

Air carriers, Aircraft, Airmen, Airplanes, Airspace, Aviation safety, Air taxi, Air transportation, Airworthiness, Pilots, Safety, Transportation.

The Proposed Amendment

In consideration for the foregoing, the Federal Aviation Administration proposes to amend parts 25, 29, 91, 121, 125, and 135 of the Federal Aviation Regulations as follows:

PART 25—AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRPLANES

1. The authority citation for part 25 is revised to read as follows:

Authority: 49 U.S.C. 1344, 1354(a), 1355, 1421, 1423, 1424, 1425, 1428, 1429, 1430; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983); 49 CFR 1.47(a); Pub. L. 100-202, December 22, 1987.

2. Section 25.1415 is amended by revising paragraph (d) to read as follows:

§ 25.1415 Ditching equipment.

* * * * *

(d) There must be an approved survival type emergency locator transmitter for use in one life raft.

* * * * *

PART 29—AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY ROTORCRAFT

3. The authority citation for part 29 is revised to read as follows:

Authority: 49 U.S.C. 1344, 1354(a), 1355, 1421 (as amended by Pub. L. 100223, December 30, 1987), 1423, 1424, 1425, 1428, 1429, 1430; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983); Pub. L. 100-202, December 22, 1987.

4. Section 29.1415 is amended by revising paragraph (d) to read as follows:

§ 29.1415 Ditching equipment.

* * * * *

(d) There must be an approved survival type emergency locator transmitter for use in one life raft.

PART 91—GENERAL OPERATING AND FLIGHT RULES

5. The authority citation for part 91 is revised to read as follows:

Authority: 49 U.S.C. 1301 (7), 1303, 1344, 1348, 1352-1355, 1401, 1421 (as amended by Pub. L. 100-223, December 30, 1987), 1422-1431, 1471, 1472, 1502, 1510, 1522, and 2121-2125; Articles 12, 29, 31, and 32(a) of the Convention on International Civil Aviation (61 Stat. 1180); 42 U.S.C. 4321 *et seq;* E.O. 11514; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983); Pub. L. 100-202, December 22, 1987.

If adopted, the following proposals will be reflected in part 91 in effect as of the date of issuance of this notice of proposed rulemaking:

6. Section 91.52 is amended by revising paragraphs (b)(1), (b)(2), (b)(3), (b)(4), and (d)(2) to read as follows:

§ 91.52 Emergency locator transmitters.

* * * * *

(b) * * *

(1) For operations governed by the supplemental air carrier and commercial operator rules of part 121 of this chapter, or the air travel club rules of part 123 of this chapter, there must be attached to the airplane an approved automatic type emergency locator transmitter that is in operable condition.

(2) For charter flights governed by the domestic and flag air carrier rules of part 121 of this chapter, there must be attached to the airplane an approved automatic type emergency locator transmitter that is in operable condition.

(3) For operations governed by part 135 of this chapter, there must be attached to the airplane an approved automatic type emergency locator transmitter that is in operable condition.

(4) For operations other than those specified in paragraphs (b) (1), (2), and (3) of this section, there must be attached to the airplane an approved personal type or an approved automatic type emergency locator transmitter that is in operable condition.

* * * * *

(d) * * *

(2) When 50 percent of their useful life (or, for rechargeable batteries, 50 percent of their useful life of charge) has expired, as established by the

transmitter manufacturer under its approval.

If adopted, the following proposals will be reflected in part 91 as it will be revised on August 18, 1990:

7. Section 91.207 is amended by revising paragraph (a)(1) introductory text, (a)(2), and the introductory language of (c)(2) to read as follows:

§ 91.207 Emergency locator transmitters.

* * * * *

(1) There is attached to the airplane an approved automatic type emergency locator transmitter that is in operable condition for the following operations:

* * * * *

(2) For operations other than those specified in paragraph (a)(1)(i) of this section, there must be attached to the airplane an approved personal type or an approved automatic type emergency locator transmitter that is in operable condition.

* * * * *

(c) * * *

(2) When 50 percent of their useful life (or, for rechargeable batteries, 50 percent of their useful life of charge) has expired, as established by the manufacturer under its approval.

* * * * *

PART 121—CERTIFICATION AND OPERATIONS: DOMESTIC, FLAG, AND SUPPLEMENTAL AIR CARRIERS AND COMMERCIAL OPERATORS OF LARGE AIRCRAFT

8. The authority citation for part 121 is revised to read as follows:

Authority: 49 U.S.C. 1354(a), 1355, 1356, 1357, 1401, 1421 (as amended by Pub. L. 100–223, December 30, 1987), 1422–1430, 1485, and 1502; 49 U.S.C. 106(g) (Revised Pub. L. 97–449, January 12, 1983); Pub. L. 100–202, December 22, 1987.

9. Section 121.339 is amended by revising paragraph (a)(4) to read as follows:

§ 121.339 Emergency equipment for extended over-water operations.

(a) * * *

(4) An approved survival type emergency locator transmitter. Batteries used in this transmitter must be replaced (or recharged, if the battery is rechargeable) when the transmitter has been in use for more than 1 cumulative hour, and also when 50 percent of their useful life (or for rechargeable batteries, 50 percent of their useful life of charge) has expired, as established by the transmitter manufacturer under its approval. The new expiration date for the replacement (or, recharged) battery must be legibly marked on the outside of the transmitter. The battery useful life (or useful life of charge) requirements of this paragraph do not apply to batteries (such as water-activated batteries) that are essentially unaffected during probable storage intervals.

* * * * *

10. Section 121.353 is amended by revising paragraph (b) to read as follows:

§ 121.353 Emergency equipment for operations over uninhabited terrain areas: flag and supplemental air carriers and commercial operators.

* * * * *

(b) An approved survival type emergency locator transmitter. Batteries used in this transmitter must be replaced (or recharged, if the battery is rechargeable) when the transmitter has been in use for more than 1 cumulative hour, and also when 50 percent of their useful life (or for rechargeable batteries, 50 percent of their useful life of charge) has expired, as established by the transmitter manufacturer under its approval. The new expiration date for the replacement (or, recharged) battery must be legibly marked on the outside of the transmitter. The battery useful life (or useful life of charge) requirements of this paragraph do not apply to batteries (such as water-activated batteries) that are essentially unaffected during probable storage intervals.

* * * * *

PART 125—CERTIFICATION AND OPERATION: AIRPLANES HAVING A SEATING CAPACITY OF 20 OR MORE PASSENGERS OR A MINIMUM PAYLOAD CAPACITY OF 6,000 POUNDS OR MORE

11. The authority citation for part 125 is revised to read as follows:

Authority: 49 U.S.C. 1354, 1421 (as amended by Pub. L. 100–223, December 30, 1987), 1422–1430, and 1502; 49 U.S.C. 106(g) (Revised Pub. L. 97–449, January 12, 1983); Pub. L. 100–202, December 22, 1987.

12. Section 125.209 is amended by revising paragraph (b) to read as follows:

§ 125.209 Emergency equipment: Extended overwater operations.

* * * * *

(b) No person may operate an airplane in extended overwater operations unless there is attached to one of the life rafts required by paragraph (a) of this section, an approved survival type emergency locator transmitter. Batteries used in this transmitter must be replaced (or recharged, if the batteries are rechargeable) when the transmitter has been in use for more than 1 cumulative hour, and also when 50 percent of their useful life (or for rechargeable batteries, 50 percent of their useful life of charge) has expired, as established by the transmitter manufacturer under its approval. The new expiration date for the replacement or recharged batteries must be legibly marked on the outside of the transmitter. The battery useful life or useful life of charge requirements of this paragraph do not apply to batteries (such as water-activated batteries) that are essentially unaffected during probable storage intervals.

PART 135—AIR TAXI OPERATIONS AND COMMERCIAL OPERATORS

13. The authority citation for part 135 is revised to read as follows:

Authority: 49 U.S.C. 1354(a), 1355(a), 1421 (as amended by Pub. L. 100–223, December 30, 1987), 1422–1431, and 1502; 49 U.S.C. 106(g) (Revised Pub. L. 97–449, January 12, 1983); Pub. L. 100–202, December 22, 1987.

14. Section 135.167(c) is amended by revising paragraph (c) to read as follows:

§ 135.167 Emergency equipment: Extended overwater operations.

* * * * *

(c) No person may operate an airplane in extended overwater operations unless there is attached to one of the life rafts required by paragraph (a) of this section, an approved survival type emergency locator transmitter. Batteries used in this transmitter must be replaced (or recharged, if the batteries are rechargeable) when the transmitter has been in use for more than 1 cumulative hour, and also when 50 percent of their useful life (or for rechargeable batteries, 50 percent of their useful life of charge) has expired, as established by the transmitter manufacturer under its approval. The new expiration date for the replacement or recharged batteries must be legibly marked on the outside of the transmitter. The battery useful life or useful life of charge requirements of this paragraph do not apply to batteries (such as water-activated batteries) that are essentially unaffected during probable storage intervals.

Technical Standard Order

Pursuant to § 21.621 of the Federal Aviation Regulations, the FAA proposes to withdraw each TSO authorization for automatic type ELTs with a proposed effective date of (a date 6 months after the effective date of this amendment) and for survival type ELTs with a proposed effective date of (a date 2 years after the effective date of this

amendment) to the extent that it authorizes the holder to identify or mark ELTs with TSO–C91.

Issued in Washington, DC, on March 23, 1990.

David W. Ostrowski,

Acting Director, Aircraft Certification Service.

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