

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead scrap produced	
	English units—pounds per billion pounds of lead scrap produced	
Antimony.....	94.22	40.38
Arsenic.....	935.47	383.61
Lead.....	67.30	60.57
Zinc.....	686.46	282.66
Ammonia (as N).....	0.0	0.0

(b) Subpart M—Blast and Reverberatory Furnace Wet Air Pollution Control PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead produced from smelting	
	English units—pounds per billion pounds of lead produced from smelting	
Antimony.....	365.4	156.6
Arsenic.....	3,627.9	1,487.7
Lead.....	261.0	234.9
Zinc.....	2,662.2	1,096.2
Ammonia (as N).....	0	0

(c) Subpart M—Kettle Wet Air Pollution Control PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead produced from kettle furnaces	
	English units—pounds per billion pounds of lead produced from kettle furnaces	
Antimony.....	0	0
Arsenic.....	0	0
Lead.....	0	0
Zinc.....	0	0
Ammonia (as N).....	0	0

(d) Subpart M—Casting Contact Cooling PSNS.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead cast	
	English units—pounds per billion pounds of lead cast	
Antimony.....	3.09	1.33
Arsenic.....	30.72	12.60
Lead.....	2.21	1.99
Zinc.....	22.54	9.28
Ammonia (as N).....	0.0	0.0

§ 421.137 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology.

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollution control technology:

(a) Subpart M—Battery Cracking.

BCT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead scrap produced	
	English units—pounds per billion pounds of lead scrap produced	
Total Suspended Solids.....	38,540.0	18,800.0
pH.....	(¹)	(¹)

¹ Within the range of 7.5 to 10.0 at all time.

(b) Subpart M—Blast and Reverberatory Furnace Wet Air Pollution Control.

BCT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead produced from smelting	
	English units—pounds per billion pounds of lead produced from smelting	
Total Suspended Solids.....	138,580.0	67,600.0
pH.....	(¹)	(¹)

¹ Within the range of 7.5 to 10.0 at all times.

(c) Subpart M—Kettle Wet Air Pollution Control.

BCT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead produced from kettle furnaces	
	English units—pounds per billion pounds of lead produced from kettle furnaces	
Total Suspended Solids.....	0	0
pH.....	(¹)	(¹)

¹ Within the range of 7.5 to 10.0 at all times.

(d) Subpart M—Casting Contact Cooling.

BCT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units—mg/kg of lead cast	
	English units—pounds per billion pounds of lead cast	
Total Suspended Solids.....	9,069.20	4,424.0
pH.....	(¹)	(¹)

¹ Within the range of 7.5 to 10.0 at all times.

[FR Doc. 83-3192 Filed 2-16-83; 8:45 am]

BILLING CODE 6560-50-M

federal register

Thursday
February 17, 1983

Part III

Environmental Protection Agency

**Standards of Performance for New
Stationary Sources: Four Categories of
Sources in the Phosphate Fertilizer
Industry**

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 60

[AD-FRL-2244-7]

Standards of Performance for New Stationary Sources; Phosphate Fertilizer Industry; Wet Process Phosphoric Acid Plants; Superphosphoric Acid Plants; Diammonium Phosphate Plants; Triple Superphosphate Plants

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: Revised standards of performance for fluoride emissions from four categories of sources in the phosphate fertilizer industry were proposed in the *Federal Register* on June 21, 1982. This action, which promulgates these revised standards, is based on comments received from the Tennessee Valley Authority (TVA) that small research facilities have been unable to achieve the existing standards. After investigating the problem, EPA concluded that research facilities should be excluded from the standard. These revisions limit the applicability of standards to plants with a capacity of more than 15 tons of equivalent phosphorus pentoxide (P_2O_5) feed per day. The effect of these revisions is to exempt from the standard small plants used for research and development of production processes.

EFFECTIVE DATE: February 17, 1983.

Under section 307(b)(1) of the Clean Air Act, judicial review of this new source performance standard is available *only* by the filing of a petition for review in the U.S. Court of Appeals for the District of Columbia Circuit within 60 days of today's publication of this rule. Under Section 307(b)(2) of the Clean Air Act, the requirements that are the subject of today's notice may not be challenged later in civil or criminal proceedings brought by EPA to enforce these requirements.

ADDRESS: The docket, number A-81-33, containing supporting information used by EPA in development of the promulgated amendments to the standards, is available for public inspection and copying between 8:00 a.m. and 4:00 p.m., Monday through Friday, at EPA's Central Docket Section, West Tower Lobby, Gallery 1, Waterside Mall, 401 M Street, SW, Washington, DC 20460. A reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: Mr. Robert Ajax, U.S. Environmental

Protection Agency, Standards Development Branch, Emission Standards and Engineering Division (MD-13), Research Triangle Park, North Carolina 27711, telephone number (919) 541-5578.

SUPPLEMENTARY INFORMATION: On August 6, 1975 (40 FR 33152), the Administrator promulgated standards of performance for fluoride emissions for five new affected facilities within the phosphate fertilizer industry: wet-process phosphoric acid plants, superphosphoric acid plants, diammonium phosphate plants, triple superphosphate plants, and granular triple superphosphate storage facilities. The Clean Air Act Amendments of 1977 require that the Administrator of EPA review and, if appropriate, revise established standards of performance for new stationary sources at least every 4 years (Section 111(b)(1)(B)). During 1980 EPA undertook a review of the phosphate fertilizer industry and the associated NSPS. On the basis of this review, the Agency concluded that NSPS revision was not warranted. The findings and conclusions of this review were published for comment in the *Federal Register* on November 21, 1980 (45 FR 77075).

In December 1980, EPA received a comment from the Tennessee Valley Authority (TVA) that small research plants in the phosphate fertilizer industry have been unable to achieve the existing standards for fluorides. TVA provides about 75 percent of the Nation's research in phosphate fertilizers. Although at present TVA's only phosphate fertilizer research facility is a small wet-process phosphoric acid plant, TVA anticipates other phosphate fertilizer research facilities in the future and foresees similar control problems with the three other standards pertaining to phosphate fertilizer.

After investigating the problem, the Administrator has concluded that research facilities should be exempted from the standards. Therefore, the Administrator proposed to amend the NSPS for wet-process phosphoric acid plants, superphosphoric acid plants, diammonium phosphate plants, and triple superphosphate plants to cover only those facilities with a design capacity greater than 15 tons of equivalent P_2O_5 feed per day. This processing rate is less than that of any known existing commercial production facility and no production units of this size are expected to be built in the future.

Comments on the proposed rule change were received from three

organizations: The Fertilizer Institute, the United States Department of the Interior, and the Tennessee Valley Authority. Each commenter fully supported the proposed revisions. The Fertilizer Institute did, however, suggest that expressing the production cutoff in terms of "calendar" day would make the definition clearer. EPA agrees with this suggestion. No objections to the proposed revision were received. Therefore, the revision is being promulgated, as proposed, except that the cutoff is expressed on a calendar-day basis.

Docket: The docket is an organized and complete file of all the information submitted to or otherwise considered by EPA in the development of these amendments. The principal purposes of the docket are: (1) To allow interested parties to readily identify and locate documents so they can effectively participate in the rulemaking process, and (2) to serve as the record in case of judicial review, except for interagency review materials [section 307(d)(7)(A)].

Miscellaneous: The effective date of this regulation is February 17, 1983. Section 111 of the Clean Air Act provides that standards of performance or revisions thereof become effective upon promulgation and apply to affected facilities, construction or modification of which was commenced after the date of proposal, October 22, 1974. Section 317 of the Clean Air Act requires the Administrator to prepare an economic impact assessment of any revision to a new source standard of performance "which the Administrator determines to be (a) substantial revision * * * (section 317(a)). These amendments are not substantial revisions. The revisions will only reduce the economic impacts of the standards. Therefore, no economic impact assessment of the amendment has been prepared * * *.

Executive Order 12291 requires that EPA determine whether a regulation is "major" and therefore subject to the requirements of a regulatory impact analysis (RIA). These amendments to the standards are not major because they would result in none of the adverse economic effects set forth in Section 1 of the Order as grounds for finding a regulation to be major. The only economic change is to lessen the economic impact on research facilities. These research facilities will no longer be required to incur unreasonable costs in order to achieve the NSPS. Because there are no adverse economic impacts associated with these revisions, no RIA has been prepared.

The provisions of 5 U.S.C. 605(b) require the Administrator to prepare a

regulatory flexibility analysis (RFA) or to certify that a rule will not have a significant economic impact on a substantial number of small entities. These amendments will not create additional impacts since the only change will be to lessen the economic burdens on research facilities. Therefore, the Administrator certifies that the promulgated rules will have no adverse economic impact on small entities.

The Paperwork Reduction Act of 1980 (Pub. L. 96-511) requires clearance from the Office of Management and Budget (OMB) of certain public reporting/recordkeeping requirements before a rulemaking can be promulgated. There are no reporting/recordkeeping requirements associated with these revisions. A statement to that effect has been submitted to OMB.

List of Subjects in 40 CFR Part 60

Air pollution control, Aluminum, Ammonium sulfate plants, Cement plants, Coal, Copper, Electric power plants, Glass and glass products, Grains, Intergovernmental relations, Iron, Lead, Metals, Motor vehicles, Nitric acid plants, Paper and paper products industry, Petroleum, Phosphate, Reporting and recordkeeping requirements, Sewage disposal, Steel, Sulfuric acid plants, Waste treatment and disposal, and Zinc.

Dated: January 28, 1983.

Anne M. Gorsuch,
Administrator.

PART 60—[AMENDED]

1. For the reasons set out in the preamble, it is proposed to amend 40 CFR Part 60, paragraph (a) of §§ 60.200, 60.210, 60.220, and 60.230 (to read as follows).

§ 60.200 Applicability and designation of affected facility.

(a) The affected facility to which the provisions of this subpart apply is each wet-process phosphoric acid plant having a design capacity of more than 15 tons of equivalent P_2O_5 feed per calendar day. For the purpose of this subpart, the affected facility includes any combination of: reactors, filters, evaporators, and hot wells.

* * * * *

§ 60.210 Applicability and designation of affected facility.

(a) The affected facility to which the provisions of this subpart apply is each superphosphoric acid plant having a design capacity of more than 15 tons of equivalent P_2O_5 feed per calendar day. For the purpose of this subpart, the affected facility includes any

combination of: evaporators, hot wells, acid sumps, and cooling tanks.

* * * * *

§ 60.220 Applicability and designation of affected facility.

(a) The affected facility to which the provisions of this subpart apply is each granular diammonium phosphate plant having a design capacity of more than 15 tons of equivalent P_2O_5 feed per calendar day. For the purpose of this subpart, the affected facility includes any combination of: reactors, granulators, dryers, coolers, screens, and mills.

* * * * *

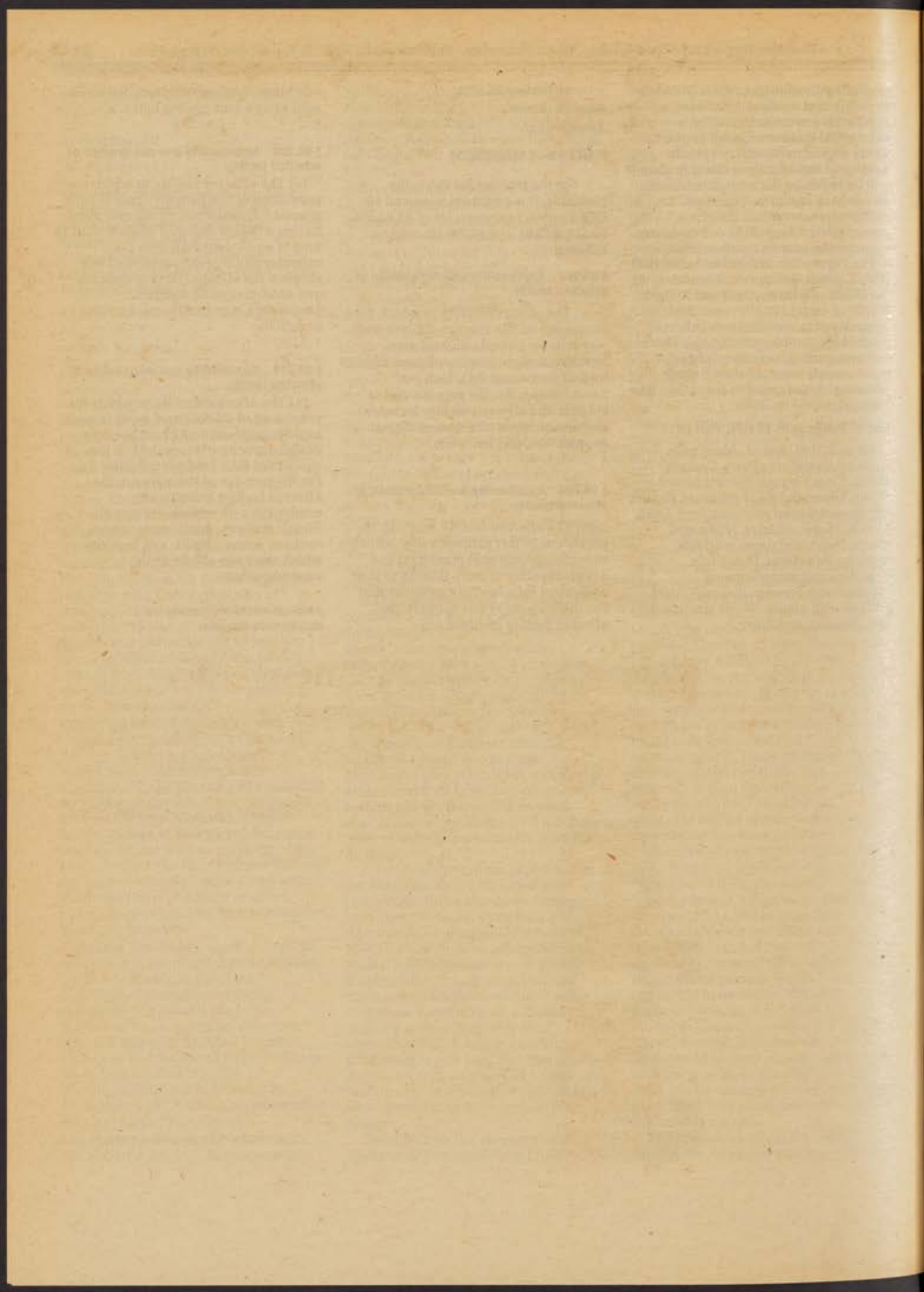
§ 60.230 Applicability and designation of affected facility.

(a) The affected facility to which the provisions of this subpart apply is each triple superphosphate plant having a design capacity of more than 15 tons of equivalent P_2O_5 feed per calendar day. For the purpose of this subpart, the affected facility includes any combination of: mixers, curing belts (dens), reactors, granulators, dryers, cookers, screens, mills, and facilities which store run-of-pile triple superphosphate.

* * * * *

[FR Doc. 83-4007 Filed 2-16-83; 9:45 am]

BILLING CODE 6560-50-M



federal register

**Thursday
February 17, 1983**

Part IV

Department of Transportation

Federal Aviation Administration

**Water Survival Regulations: Denial of Air
Line Pilots Association Petition for
Rulemaking; Proposed Rule**

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 1, 25, 121, and 139

[Docket No. 21222]

Water Survival Regulations; Denial of Air Line Pilots Association Petition for Rulemaking

AGENCY: Federal Aviation Administration, DOT.

ACTION: Denial of petition for rulemaking.

SUMMARY: This notice publishes verbatim the denial of the petition for rulemaking submitted to the Federal Aviation Administration by the Air Line Pilots Association. The denial discusses in detail the FAA's ongoing research and development program on water survival and extends an open invitation to the public to participate in the program.

FOR FURTHER INFORMATION CONTACT:

Concerning the denial of petition for rulemaking: Henri Branting, Aircraft Engineering Division (AWS-120), Office of Airworthiness, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, D.C. 20591; Telephone (202) 426-8382

or

Concerning the research and development program: William T. Shepherd, Ph.D., Biomedical and Behavioral Sciences Division (AAM-550), Office of Aviation Medicine, Federal Aviation Administration, 800 Independence Avenue SW., Washington, D.C. 20591; Telephone (202) 426-3434.

SUPPLEMENTARY INFORMATION:**Background**

In December 1980, the Air Line Pilots Association (ALPA) petitioned to amend various parts of the Federal Aviation Regulations to improve survivability in aircraft accidents involving water contact. As a result of the summary of the petition published in the *Federal Register* on March 30, 1981 [46 FR 19245], numerous comments on the petition were received from the general public, including a wide cross-section of the aviation community. On November 30, 1982, the FAA Administrator issued a denial of the petition (published verbatim herewith) which summarizes the public comments and addresses all issues and recommendations made by the petitioner. The denial discusses in detail the current FAA research and development program on water survival and establishes an open invitation for

any party in the general public to participate in the program by submitting or lending new and improved water survival equipment for testing and evaluation by the FAA.

Participation Invited

Interested persons are invited to participate in this research and development program by submitting to the FAA, on a voluntary or loan basis, any new or improved water survival equipment. This equipment will be tested and evaluated by the FAA and considered for use in water-contact situations. Favorable results obtained during the test and evaluation program may, at some future date, lead to a notice proposing the use of such devices. Inquiries regarding the test and evaluation program may be made to the individual listed under the caption "**FOR FURTHER INFORMATION CONTACT.**"

The Denial

Accordingly, the Federal Aviation Administration publishes verbatim the following denial of petition issued to the Air Line Pilots Association on November 30, 1982.

Issued in Washington, D.C. on February 10, 1983.

M. C. Beard,

Director of Airworthiness.

United States of America, Department of Transportation, Federal Aviation Administration, Washington D.C. 20591

In the matter of the petition of Air Line Pilots Association for rulemaking to amend Parts 1, 25, 121, and 139 of the Federal Aviation Regulations, Regulatory Docket No. 21222.

Denial of Petition

By letter dated December 17, 1980, Mr. John E. O'Brien, Manager, Engineering and Operations, Engineering and Air Safety Department, Air Line Pilots Association (ALPA), 1625 Massachusetts Avenue, NW., Washington, D.C. 20036, petitioned to amend various sections of Parts 1, 25, 121, and 139 of the Federal Aviation Regulations (FAR) to improve the survivability of aircraft in accidents resulting from intentional or unintentional water contact. The supporting information in the petition was supplemented by a letter dated June 3, 1981, from Mr. Joseph M. Schwind, Deputy Manager—Engineering, ALPA.

Sections of the FAR affected:**FAR Part 1—**

The petitioner proposes to redefine the term "extended over-water operation," with respect to aircraft other than helicopters, as an operation over water outside coverage of air traffic control (ATC) radar or over water in areas where search-and-rescue efforts could not ensure removal of accident survivors from the water in less than 1 hour. Part 1 currently defines this term as an operation over water at a horizontal distance

of more than 50 nautical miles from the nearest shoreline. The petitioner also proposes to establish in Part 1 the new term, "restricted over-water operation," defined as an operation over water within ATC radar coverage or operation from airports bounded by significant bodies of water.

FAR Section 25.801—

The petitioner proposes to change the title of § 25.801 from "Ditching" to "Controlled water contact". The petitioner also proposes to revise § 25.801(b) to read: "Each practical design measure, compatible with the general characteristics of the airplane, must be taken to minimize the probability that in a planned emergency landing on water or unplanned controlled water contact, the behavior of the airplane * * * [unchanged] * * *". Section 25.801(b) currently reads: "Each practicable design measure, compatible with the general characteristics of the airplane, must be taken to minimize the probability that in an emergency landing on water, the behavior of the airplane would cause immediate injury to the occupants or would make it impossible for them to escape."

In addition, the petitioner proposes to revise § 25.801(c) to read: "The probable behavior of the airplane in a planned or unplanned water landing must be investigated by model tests or by comparison with airplanes of similar configuration for which the water landing characteristics are known * * * [unchanged] * * *". Section 25.801(c) currently reads: "The probable behavior of the airplane in a water landing must be investigated by model tests or by comparison with airplanes of similar configuration for which the ditching characteristics are known. Scoops, flaps, projections, and any other factor likely to affect the hydrodynamic characteristics of the airplane, must be considered."

FAR Section 25.1411—

The petitioner proposes to revise § 25.1411(d)(1) to read: "The storage provisions for the water survival equipment described in § 25.1415 must accommodate enough rafts for the maximum number of occupants for which certification for planned and unplanned water landing is requested." Section 25.1411(d)(1) currently reads: "The stowage provisions for the liferafts described in § 25.1415 must accommodate enough rafts for the maximum number of occupants for which certification for ditching is requested."

The petitioner also proposes to revise § 25.1411(d)(2) to reflect certification for both planned and unplanned water landings. Section 25.1411(d)(2) currently reads: "Liferafts must be stowed near exits through which the rafts can be launched during an unplanned ditching."

In addition, the petitioner proposes to revise § 25.1411(f) to reflect use of life preservers in planned and unplanned water landings and to require storage of life preservers in a location above the seat bottom cushion which would permit donning of the life preserver in 15 seconds by a seated passenger.

Section 25.1411(f) currently reads: "The stowage provisions for life preservers described in § 25.1415 must accommodate

one life preserver for each occupant for which certification for ditching is requested. Each life preserver must be within easy reach of each seated occupant."

FAR Section 25.1415—

The petitioner proposes to retitle § 25.1415 as "Water survival equipment" and substitute this terminology throughout the section in place of the currently used title and term "Ditching equipment."

The petitioner also proposes to revise § 25.1415(e) to read: "For airplanes certificated for restricted overwater operation and not certificated in accordance with § 25.801, there must be approved life preservers and secondary flotation equipment to permit each occupant to keep the trunk of the body out of the water. These means must be within easy reach of each seated occupant and must be readily removable from the airplane." Section 25.1415(e) currently reads: "For airplanes not certificated for ditching under § 25.801 and not having approved life preservers, there must be an approved flotation means for each occupant. This means must be within easy reach of each seated occupant and must be readily removable from the airplane."

FAR Section 121.339—

The petitioner proposes to delete the term "extended" in the title and align the text of the section with the overwater operation definitions proposed as amendments for Part 1. Equipment for extended overwater operation would remain the same, and all references to "ditching" would be changed to "planned or unplanned water landing."

The petitioner also proposes to revise § 121.339 to require that air carrier airplanes operating in restricted overwater operations (as defined in the proposed amendments of Part 1) be equipped with water survival equipment adequate to keep occupants out of the water when operating in areas, and at times, when the water temperature is known to be below 53 degrees F.

In addition, the petitioner proposes to revise § 121.339(a)(3) to describe pyrotechnic signaling devices suitable for use in rafts in the water. Section 121.339(a)(3) currently requires that at least one pyrotechnic signaling device be carried in the airplane for each liferaft.

FAR Section 121.340—

The petitioner proposes to revise § 121.340 to eliminate the option for either a life preserver or an approved flotation means and to require the carriage of both a life preserver and an approved flotation means for each occupant. Also, the petitioner proposes to revise § 121.340 to require that life preservers be located above the level of the seat bottom cushion, and that life preservers be supplemented with rafts or flotation platforms when the water temperature is known to be below 53 degrees F.

FAR Section 139.49—

The petitioner proposes to revise § 139.49 by adding a new paragraph to read: "Airports located adjacent to significant bodies of water must maintain or have available adequate water rescue equipment to retrieve the occupants of the largest aircraft operating

from that airport and to permit response of 50 percent of this equipment to a water area within 2,000 feet of the active runway threshold within 10 minutes of dispatch."

FAR Section 139.55—

Section 139.55 requires that an emergency plan be established that ensures prompt response to emergencies and unusual conditions on the airport. This section requires, in part, that the emergency plan provide, to the extent practicable, for transportation and medical assistance for the maximum number of persons that can be carried on board the largest air carrier aircraft the airport reasonably can be expected to serve. The emergency plan must contain a list of surface vehicles and aircraft that are intended to provide transportation for injured and deceased persons following an airport disaster. The petitioner proposes to revise § 139.55 to require that the emergency plan ensure prompt response both on the airport and in water areas adjacent to the airport. Also, the petitioner proposes to revise § 139.55(b)(2)(iii) to require that water vehicles be added to the list of surface vehicles and aircraft designated for medical transportation.

In addition to the changes to the above sections, the petitioner seeks the following actions:

Establish a technical standard order (TSO) describing requirements for pyrotechnic signaling devices intended for use in rafts or in the water.

Revise existing TSO's on escape slides to include design features making slides suitable as rudimentary rafts for flights conducted in restricted overwater operations.

Revise the existing TSO on lifevests to require simplified retaining systems permitting donning by a seated passenger within 15 seconds.

Develop an advisory circular describing coastal surface water temperatures and establishing water survival zones based upon water temperatures less than 53 degrees F.

The petitioner's supportive information is as follows:

There has been controversy concerning requests of some air carriers to delete liferafts from emergency equipment for operation beyond 50 nautical miles from shore. There were survival problems common to the unintentional water contact of a B-727 in Escambia Bay near Pensacola, Florida, on May 8, 1978, and a planned ditching of a DC-9 near St. Croix, Virgin Islands, on May 2, 1970. A review of available information on water survival provisions for occupants of transport aircraft indicates that existing requirements and terminology in FAA safety regulations do not meet the water survival needs of current transport aviation as reflected by service experience. Several areas which are critical to survival following intentional or unintentional water contacts are not addressed by FAA requirements. The FAR should be revised to address both intentional and unintentional water contact since the term "ditching," now used in the FAR, refers only to intentional water contact. Public interest will be served by a comprehensive FAA program aimed at revision of water survival equipment requirements.

Since the advent of turbine-powered air carrier airplanes, from the standpoint of occupant survival in water, the threat of an unplanned landing in water relatively close to rescue resources has become the predominant consideration as compared to the threat of a landing in the open ocean far from land. The current airworthiness and operational requirements for extended overwater operations are necessary to ensure the self-sufficiency needed for open-ocean survival. Accident trends and increased pressure for change by operators make it necessary to revise water survival equipment requirements for restricted operations near shore or during departure from or approach to airports located near significant bodies of water. (The petitioner does not indicate the nature of the change on the part of operators.)

The petitioner contends that experience has shown that most air carrier accidents occur during either the takeoff or approach/landing phase of flight. About 15 percent occur en route. There has been only one planned ditching of an air carrier jet transport, which was the St. Croix accident.

Four charts submitted with the petition indicate the potential of transport airplanes making an unplanned water landing close to the arrival or departure airport. One chart depicts accident locations relative to the hypothetical 10,000-foot runway and direction of flight for the period 1964 through 1977. Two charts depict the potential water hazards in the runway overrun areas and the approach and departure areas of U.S. terminal airports. One chart compiles brief descriptions of 42 jet transport accidents worldwide involving water contact during the period 1959 through 1979.

There is much literature on immersion hypothermia and human survival in water. Submitted with the petition is the current research report, "Physiological Response of Human Subjects Wearing Thermal Protective Clothing Assemblies in Varying Environments," prepared by the Naval Air Development Center. In summary, current research indicates that if human body core temperature drops to 30-35 degrees C, death is likely due to the subject's inability to participate in his or her own rescue. Some dexterity of the hands is retained at 10 degrees C. In one research project, a lightly clothed male subject in 11 degrees C water had a 2.3 degree C per hour drop in rectal temperature. At this rate, after 1 to 2 hours, the subject's temperature could be expected to become critically low. Thinner, smaller, or less healthy subjects would have a decreased survival time.

The U.S. Coast Guard National Search and Rescue Manual indicates the "safe" border is 1 hour in 11 degree C (53 degree F) water. When correlated with the Air Force System Command Design Handbook DH 2-8 table on probability of water survival, this temperature-time combination offers a probability of 1.0 of survival for 1 hour (for healthy, young males).

The petitioner submitted a survivability chart reportedly agreed on by most members of the Society of Automotive Engineers Committee S-9, Cabin Safety Provisions. This chart shows: at 32 degree F water

temperature, 50 percent of the survivors die within 10 minutes and 99 percent of the survivors are dead within 1 hour and 20 minutes; at 41 degrees F, 50 percent die within 20 minutes and 99 percent are dead within 2 hours and 15 minutes; at 50 degrees F, 50 percent die within 30 minutes and 99 percent are dead within 3 hours and 20 minutes; above 68 degrees F, likelihood of shark attack increases.

The information above is presented in context with the number of U.S. airports located near water at or below 53 degrees F during winter or longer periods. Several U.S. air carriers operate over water which is often below this temperature. The above temperature/time criterion is conservative, and public comment may suggest a higher temperature criterion based upon better knowledge of physiology or survival experience.

In water accidents, kerosene might be released and float on the water near survivors. Kerosene ingestion is just as dangerous as hypothermia. Following the accident in Escambia Bay, the Civil Aeromedical Institute experimented with white rats and found that under certain experimental conditions kerosene on water reduced the time of survival to one-fourth to one-sixth that of rats swimming in clear water. Kerosene might have caused the deaths of three victims in Escambia Bay, all of whom were expert swimmers.

Planning and regulations for water survival must account for search and rescue (SAR). Submitted with the petition is a description of the Coast Guard's airborne SAR capabilities and the location of its aircraft. These aircraft can rescue a limited number of people, primarily by dropping rafts. Coast Guard aircraft can be expected to need 1 to 2 hours to reach an accident scene. Coast Guard SAR is augmented somewhat by Navy patrol aircraft, which can drop 2 seven-person rafts on a 2- to 4-hour notice, and by H-46 helicopters at a few naval air stations. In areas close to the shore of the continental United States and in certain other areas, ATC radar would permit direction of rescue to a transport aircraft operating under positive radar control prior to an accident. In such case, airborne water survival equipment can be selectively minimized based upon the required ability to locate an accident site and airdrop supplemental equipment within 1 hour of the accident. Minimum equipment must include flotation platforms to keep the body out of the water to delay hypothermia and protect survivors from aggressive marine life.

Though some U.S. airports near water have water rescue plans and equipment, such is not the general case. Submitted with the petition is the Washington National Airport emergency plan, as an example of a typical good plan. This plan contains one short section on contacting harbor police in the event of unspecified need. Telephone numbers or radio frequencies for harbor police are not listed. Planning maps illustrate land areas adjacent to the airport. Water areas are excluded. This deficiency in the emergency plan is reflected in the water rescue capability of the airport. The 1978 water rescue drill at National Airport

contrasted with the well-planned and coordinated 1977 land rescue drill. Airport water rescue equipment and training were minimal and ineffective, and there was little coordination with nearby rescue resources such as the harbor police. National Airport is typical since it complies with current regulations. Part 139 entirely overlooks water rescue.

Part 25 requires that an airplane not equipped with life preservers be equipped with flotation devices. These devices are generally seat cushions and are inadequate for survival. Cushions lose buoyancy in about 15 minutes. An improved device should be developed, through FAA research, if necessary. Submitted with the petition is a photograph of an average male subject in still water using a device similar to those used by air carriers. The photo shows the subject assuming the natural chest-up reclining position, holding the device to his chest, with the back of his head submerged and his nose and mouth barely above water. This reclining position is insecure and critical from the standpoints of hypothermia and water ingestion. Also submitted with the petition are photographs of newly designed possible alternative devices. One is an inflatable one-person flotation platform to keep the upper torso out of water. The other is a quick-donning lifevest.

Virtually no passenger information card used by air carriers illustrates the inclined position a survivor will naturally assume when using a flotation cushion. Generally, cards show the passenger floating vertically with shoulders out of the water. One card shows a passenger floating on her stomach with the cushion beneath her chin, with head and shoulders fully out of water. Passenger information cards should be changed to reflect experience and minimize passengers' surprise at their inability to float according to expectation.

Many air carriers stow lifevests under seats. During water impact, these seats tend to collapse and make lifevests inaccessible. Lifevests should be stowed in seat backs. Submitted with the petition is a photograph of a possible seat back stowage compartment. Seat back stowage would improve accessibility and help prevent pilferage, which is reported as very frequent in air carrier service.

The most logical solution to the water survival problem is to equip all aircraft with slide rafts or rapidly deployable flotation equipment to keep everyone out of the water, especially the handicapped and the aged. The slide raft does add weight to the aircraft; however, to offset this weight, the emergency pack currently required for life rafts could be eliminated since it is of little use except for an extended period of survival. The pack of course would be required for extended overwater flight.

Although the FAA requires the use of approved pyrotechnic signaling devices, no FAA guidance exists on design or operation of these devices. Due to this, one operator equipped its aircraft with highway flares labeled with prohibitions against holding in the hand and which could not be ignited in water. Though this is an example of skirting regulatory intent, no regulatory guidelines

have been established. This particular case was corrected. There are more than 40 years of military experience with pyrotechnic signaling devices, and specifications exist for their design and use. A TSO should be established for these devices.

An illustration of water rescue complexity and survival is the recent rescue of the passengers and crew of the cruise ship *Prinsendam*. A fire occurred on board the ship. Submitted with the petition are the telegraphic status reports of the fire and rescue efforts which lasted several hours. These reports summarize delays in mounting an air/sea rescue and the resources that were needed in rescuing 510 people from Alaskan coastal waters. All of the *Prinsendam's* complement left the ship in boats and were airlifted to rescue vessels. All survived and no one entered the 57 degree F water. This would not be the case in an aviation accident due to existing deficiencies in planning, preparation, and equipment.

A summary of the ALPA petition was published in the *Federal Register* on March 30, 1981 (46 FR 19245).

Comments on the petition:

Numerous commenters support the general objective of improving both airborne and waterborne rescue capability to increase survivability in aircraft water accidents. Many support the ALPA regulatory proposals or a comprehensive program to improve survivability, or both. Numerous comments are from individuals, indicating broad popular support from the general public.

Concerning the proposal to amend Part 1, numerous commenters support, without substantial comment, the revision of basic definitions proposed in the petition.

Regarding accident experience as it pertains to basic definitions and objectives in the petition, several commenters agree that an unplanned accident near land is much more probable than a planned ditching in open sea. No commenter opposes this basic position.

Several commenters point out that in the 42 accidents cited, the petitioner fails to distinguish between the survivable and the nonsurvivable and to identify those in which the proposals would have affected survivability.

One commenter analyzes the 14 accidents involving U.S. carriers and concludes: 2 involved turboprops not comparable to turbojets; 3 involved runway overruns, not extended overwater flight; 3 involved uncontrolled impacts and were not survivable; 3 involved inadvertent controlled descent with destruction on impact; 1 did not come to rest in water; and 2 had some type of water survival gear which was relatively ineffective. The commenter states that the accidents verify that only on rare occasions may there be a need for flotation equipment and that they do not establish a need for flotation equipment for extended overwater flight. The commenter states that since the early 1950's, jet transports of the free world have flown approximately 175 million hours, 91 million by U.S. carriers, and that there has never been a case in which a commercially operated jet transport has attempted an intentional controlled ditching. The

commenter states that in 22 years of jet operation, the need for all of the emergency equipment for extended overwater operations specified in § 121.399 has not been verified.

Another commenter similarly discusses the absence of planned ditchings. The commenter states that in jet airline operations there have been over 40 water-impact accidents and that, except for the St. Croix accident, all have been unintentional water contacts within 14 miles of land. The commenter contends that FAA regulations require airlines to prepare for a type of accident which has never occurred in jets and not to prepare for the type which has occurred.

One commenter states that no data base is shown for the accident location chart in the supporting data and that there is no definition of a "significant" body of water.

One commenter, opposed to the changes in basic definitions of Part 1, agrees with the petitioner that existing requirements and terminology on water survival do not reflect the needs of transport aviation and should be refined.

In opposition to the petition, the commenter states that the present definitions regarding extended over-water operation were developed 30 years ago based on airplanes at that time and do not reflect the improved safety and reliability of aircraft, engines, systems, and equipment in current service over that which existed when the regulations were developed.

The commenter states that the revised definition of "extended over-water operation" would be imprecise and difficult to administer and that although the present definition is outmoded, it is definable and usable by a crew in flight. The commenter questions how to present to a pilot information on the flight area falling within ATC radar coverage and how this information would be updated if a radar system becomes inoperative. The commenter questions the definition of search and rescue organizations. The commenter estimates that the new definition would increase the number of air carrier operations defined as "extended overwater" with the accompanying equipment requirements and points out that ICAO permits operation up to 400 nautical miles or 120 minutes at cruising speed, whichever is less, offshore without the carriage of liferafts. The commenter states that the definition of "restricted over-water operation" is imprecise and that no definition of "significant bodies of water" is offered. The commenter states that the proposed changes could require every airplane to have life preservers, approved flotation means, and, depending on airport location and time of year, liferafts or flotation platforms, because there is no practical way to schedule only certain airplanes for operation over water and into specific stations.

One commenter states that the major proposals should require separate rulemaking because of the impact on fleet operation. The commenter states that current regulations provide for takeoff over water and extended overwater flight and are adequate for safe operation and that the use of ATC radar coverage as a means of distinguishing between the two types of operations may introduce undesirable variations in compliance.

One commenter states that the definitions would be beneficial since they recognize both rescue resources and the threat to survival. The commenter states that distance from shore is an arbitrary criterion and a matter of custom but bears little on survival needs.

One commenter in favor of the proposed regulatory changes states that unspecified small changes are needed to achieve consistent terminology.

Concerning the proposal to amend Part 25, numerous commenters support, without substantial comment, the revisions of the various sections.

One commenter, supporting the proposed revision of § 25.801, states that the revision would orient the regulations to both unplanned as well as planned water contact. The commenter contends that this is preferable since most accidents have been unplanned.

One commenter, opposing revision of § 25.801, states that there is no substantiation for the revision. The commenter states that structural consequences of ditching depend on airplane configuration, attitude, and orientation with water waves and that in a planned ditching the pilot can follow procedures to minimize damage. The commenter points out that in unplanned water contact, airplane configuration, attitude, and orientation are undefined and that the term "unplanned controlled water contact" is open to a multitude of interpretations which will result in confusion. The commenter points out that inadvertent contact with water can occur, for example, as a result of loss of control during climb-out or extensive overrun following an attempted rejected takeoff and that these conditions cannot be designed for structurally and would be potentially non-survivable accidents.

One commenter states that the requirements in current § 25.801 envisage an emergency landing on water and that the proposed changes go beyond the "unplanned controlled water contact" when taken in context with the list of 42 accidents submitted by the petition. The commenter states that an airplane cannot withstand impacts at speeds higher than normal touchdown and with the gear either up or down. The commenter states that accident history shows any successful water landing must be preplanned and precisely controlled. The commenter states that it would be impossible to prepare an airplane for "unplanned controlled water contacts" and that such a requirement is not supportable from the record.

Several commenters in favor of the proposed revision of § 25.1411 state that the term "mass flotation devices" would be more descriptive than the word "rafts."

One commenter in favor of the proposed revision of § 25.1411 states that the provisions pertaining to life preservers meet the needs of water survival and are in agreement with the Society of Automotive Engineers Aeronautical Recommended Practice on water survival equipment. The commenter states that some life preservers on a specific wide-body aircraft are mounted above the seat pan in the seat backs and that another transport, currently being designed,

may have life preservers stowed in the bottoms of the overhead passenger service units. The commenter states that such locations are preferable for emergency access and likely would reduce pilferage.

One commenter favors the proposed revision of § 25.1411 regarding the stowage and donning of life preservers, stating that this is important because the size and amount of passenger carry-on baggage has doubled in the past 5 years, and this baggage, which is forced under seats, restricts passenger access to the life preservers and causes passengers to waste precious time in retrieving the life preservers.

One commenter opposes the proposed revision of § 25.1411, stating that there is no documentation in the petition to substantiate the need to don a life preserver in 15 seconds, which appears to be an arbitrary time. The commenter states that the petitioner, in proposing to locate life preservers above seat bottoms, presents no data to substantiate that the traditional location under the seat bottom does not meet the purpose of the proposed new location. The commenter states that this location requirement would be unduly restrictive because it dictates a location in the back of the seat in front of the passenger, in the back of the passenger's own seat, or in the area above the seat where automatically deployed oxygen masks are stowed. The commenter states that study and testing of alternatives should be performed before the traditional service-tested location beneath seats is prohibited as proposed.

One commenter opposes the proposed revision of § 25.1411 regarding stowage of life preservers, stating that it would require the relocation of every life vest now installed. The commenter states that the traditional underseat location was selected to make the life preserver readily available, removable, and within easy reach, as is required. The commenter states that the underseat location protects the life preserver from damage and pilferage. The commenter points out that at one time vests were stowed in seat backs and, besides being pilfered, were frequently punctured by sharp objects and rendered unusable. The commenter advises that there is a new life preserver being purchased by many air carriers which can be donned in less than 15 seconds and that FAA should consider revising the life preserver TSO in this regard.

One commenter opposes the proposed revision of § 25.1415 regarding secondary flotation equipment to permit each occupant to keep the trunk of the body out of water. The commenter states that no such equipment now exists which would meet the proposed requirements of being within easy reach of each seated occupant and being readily removable from the airplane.

Concerning the proposal to amend Part 121, numerous commenters support, without substantial comment, the revisions of the various sections. Several commenters indicate that comments on related proposed revisions of Part 25 apply in principle to the proposed Part 121 revisions.

Several commenters favor the proposed revision of § 121.339, provided it requires that equipment for extended overwater operations

be demonstrated as being suitable for both planned and unplanned water landings.

Several commenters favor the proposed revision of § 121.339 regarding required equipment for operation over water at 53 degrees F, except that they favor specifying a higher water temperature to allow a margin of safety. One commenter recommends 60 degrees F as the limit. Several recommend that flotation equipment be required on all overwater flights, regardless of water temperature, explaining that as water temperature increases, the risk of hypothermia decreases, but the risk of shark attack increases. One commenter briefly cited the results of three accidents to support the recommendation, and one commenter submitted two technical articles on hypothermia.

One commenter opposes the revision of § 121.339, as proposed in the petition, pointing out that it is difficult to comment without specific realignment of the text.

One commenter states that the proposed requirement for both life preservers (stowed above seat bottoms) and secondary flotation equipment is excessive. The commenter recommends requiring lifevests for all overwater operations and rudimentary raft capability for inflatable evacuation slides.

One commenter favoring the petition submitted a list of recommendations made by a panel of experts following the St. Croix accident, which included, in part: use of slide rafts, automatically deployed supplementary flotation devices, and quick-donning lifejackets. Another commenter cautions that escape slides should be evaluated to determine the feasibility of using them as flotation equipment without major modifications and that slides are critical in size and weight.

One commenter states that in an unplanned controlled water contact, reliance on lifevests and complex individual flotation devices would cause confusion. That commenter also states that it would be better to rely on multipassenger rafts, operated by trained personnel, as the primary flotation means and to use lifevests and seat cushions to ensure safe transport to the raft.

One commenter states that the inflatable one-person flotation platform cited in the petition as an example is impractical. The commenter states that stowage would be extremely difficult and that each passenger would have to retrieve and don a lifevest and retrieve and carry the platform at the same time. The commenter states that this would delay evacuation and cause more problems than it would solve. The commenter states that the Escambia Bay accident indicates evacuation time is minimal in a water landing.

Regarding the pyrotechnic device, one commenter states that, in lieu of a new TSO, the FAA should develop an advisory circular on the various types acceptable for use by air carriers and FAA inspectors. The commenter points out that the primary ocean locator is the locator beacon and that dye markers are used for daytime location and flares for night.

Concerning the proposal to amend Part 139, one commenter favors the revision of § 139.49, stating that this would allow airport operators flexibility in meeting water survival

needs with airport equipment or through cooperative arrangements with local operators.

One commenter favors the revision of §§ 139.49 and 139.55 and stresses the importance of waterborne rescue. The commenter points out that wide-body aircraft can carry 400 passengers and that the required 8 flight attendants plus 3 flightcrew cannot handle 400 people in the water. The commenter states that it is likely that some crewmembers will be incapacitated and that the crew and passengers will need water rescue.

One commenter questions the need and justification for proposed § 139.49. The commenter suggests an advisory circular on existing rescue capabilities. The commenter questions whether the few accidents which occurred justify a substantial change in regulations.

One commenter favors the revision of § 139.55, citing a renewed interest at the FAA-operated Washington National Airport in water rescue and stating that this is a noteworthy improvement over the situation described by the petitioner.

One commenter opposes the changes to §§ 139.49 and 139.55, stating that it is not economically feasible to require an airport to provide adequate waterborne capability to serve its largest aircraft. The commenter explains this could entail the provision, operation, and maintenance of up to 20 watercraft for airports served by wide-body aircraft. The commenter states that the facts presented by the petitioner do not support the need and do not justify the huge cost that would be placed on the air transportation industry. The commenter states that the petitioner failed to identify in the supporting data those accidents in which waterborne rescue would have affected survivability. The commenter stated that in 14 of the accidents cited by the petitioner, the accident was not fatal, occurred far from an airport, or was unsurvivable. The commenter states that a survey of 36 airports near water indicated that 80 percent were provided waterborne rescue service, wholly or in part, by government and 17 percent had an inhouse capability.

In commenting on the possible economic impact of the proposal, one commenter submitted a summary of the costs that would be incurred by six U.S. airlines if the proposed regulations were adopted. Briefly, this summary indicates a typical liferaft costs \$3,500 and weighs 130 pounds, and that the added fuel cost for 1 pound of added weight is \$25 per year per airplane. One airline operating about 32,000 seats would spend \$1 million for lifevest retrofit. One airline would spend \$9 million for 900 new flotation escape slides and \$8 million for individual flotation platforms, if available, and added fuel would cost \$5.5 million per year. The commenter estimates first-year cost to the U.S. fleet at about \$42 million for equipment and maintenance plus \$38 million yearly for added fuel, a total of \$80 million for the first year. The commenter states this does not include the cost of waterborne rescue under the proposed Part 139 changes, which could be significant.

The FAA's analysis is as follows:

The petitioner clearly states the significance and the principal aspects of the unplanned water-contact type of accident. The information submitted in support of the petition and that provided by various commenters emphasize that unplanned water contact, with the associated post-impact water survival environment, should be viewed as the predominant water accident threat as compared to the planned ditching. It indicates that a broad cross-section of the aviation community and general public perceives the potential for this type of accident as a problem which calls for action on the part of the FAA. Considerable airport and accident data are cited by the petitioner. Although several commenters question the value of these data and the relevance to specific aircraft configurations and accident scenarios, the FAA believes these data reinforce well the premise that a clear potential exists for the occurrence of an unplanned water-contact type of accident in the vicinity of certain airports in the United States. The data on hypothermia submitted by the petitioner provides an insight into one of the more critical factors of short-term water survival. Although some commenters suggest different water temperatures as the baseline for criteria addressing hypothermia, no commenter, nor the FAA, disputes the implications of the petitioner's data or the consequences of cold water immersion in survival.

Contrary to the view of one commenter that current regulations do not address unplanned water contact, the regulations contain requirements intended to account for the full range of crash-landing situations, including the crash landing on land, the planned ditching associated with extended overwater flight, and the unplanned crash landing on water. Most of these current regulations are intended to address all three types of accidents collectively, with requirements on seat retention, occupant head protection, emergency exit marking, emergency lighting, exit access, aisle width, emergency equipment, and cabin interior materials. The objective of these regulations is to provide occupants protection against the crash-landing impact sequence, whether it occurs on land or water, and to ensure quick escape after the airplane has come to rest.

In addition to these collective requirements, certain regulations aim specifically at the crash landing on land, with requirements on evacuation slides, emergency exits, fire protection, and evacuation demonstration. Because a survivable accident on land is more probable than on water, these requirements have added importance and, consequently, are frequently upgraded as technology and economic considerations permit.

Of the regulations pertaining to the two types of water contact accidents discussed in the petition, planned ditching and unplanned water contact, those for the planned ditching associated with extended overwater flight are the more extensive. These include requirements on aircraft impact behavior, flotation characteristics, ditching, emergency exits, liferafts, life preservers, extended survival and emergency locator equipment,

and demonstration of ditching evacuation capability. As one commenter points out, these ditching regulations were developed before the advent of civil jet transports and have not been revised substantially since then, even though the improved reliability of multiengine jet transports has greatly reduced the likelihood of a planned ditching. The petitioner seeks to retain these regulations essentially intact to provide for the self-sufficiency and endurance necessary for extended survival in open sea. The FAA concurs in this.

The airworthiness regulations the petitioner proposes to revise are those pertaining to the unplanned water-contact accident. These have been in effect about 25 years and apply to the certification of all transport category airplanes. Although these regulations are less extensive than those on the planned ditching, they clearly envisage the special circumstances which could arise if the airplane were to contact a body of water without warning. They require that each airplane were to contact a body of water without warning. They require that each airplane, whether or not intended for extended overwater flight, be equipped with a prescribed number of exits located above the flotation water line and with an approved individual flotation device, readily removable from the airplane, located within each reach of each seated occupant. These regulations, of course, are in addition to those mentioned above on occupant head protection, emergency lighting, and other features designed to protect the occupants against crash landings in general, whether they occur on land or water. The individual flotation devices required by regulations are defined by TSO-C72b and are generally foam flotation seat cushions, although in many cases inflatable life preservers are used.

The FAA is in full accord with the thrust of the petitioner's presentation. The FAR recognize that extended endurance time is critical to survival following a planned ditching far from land and rescue; similarly, it is clear that short-term endurance is critical to survival in cold water following an unplanned crash landing in water close to land and rescue, as might occur during an approach or departure at an airport adjacent to a body of water. The FAA believes a program for improvement of water survival provisions, as advocated by the petitioner, is warranted to establish, as soon as practicable, a basis for identifying feasible and cost-effective requirements pertaining to the unplanned water-contact type of accident and, if appropriate, to bring these requirements into closer balance with the existing requirements regarding planned ditching. The FAA has such a program underway at this time.

In July 1981, the FAA initiated a research, development, and evaluation program of the scope, and for the objectives, described in the petition. One of the first tasks in this program was the assessment of the feasibility of the petitioner's proposals in light of the prerequisites for any such comprehensive upgrading of the civil fleet's water crash survivability. This program, Survivability in Unplanned Crash Landings in Water, is under the direction of the Office of the Associate

Administrator for Aviation Standards and involves development programs at the Civil Aeromedical Institute at Oklahoma City and the FAA Technical Center at Atlantic City. Inquiries regarding this program may be made to Dr. William T. Shepherd, Office of Aviation Medicine, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, D.C. 20591, telephone (202) 426-3434. Details and the time frame of this program are discussed in several of the following paragraphs.

While the FAA concurs with the petitioner on the significance of the unplanned water-contact type of accident and the general objectives of the petition, it is apparent that certain problems confront the establishment of new requirements in the immediate future. There is not sufficient information in the petition and comments to permit the development and identification of effective options. There is a substantial technical area which must be explored and issues to be resolved before reasonable judgment can be exercised as to how to handle this general matter of water survival. The wide range of comments and conflicting viewpoints expressed in response to the petition are indicative of this.

As is generally the case in establishing new requirements, the basic issue is one of defining the hazard and the exposure to the hazard, developing countermeasures, and defining the circumstances which would call for these countermeasures. The hazard in this case is the unplanned water-contact accident scenario. The exposure is the potential for occurrence. Although the information in the petition and comments addresses this problem and appears to offer some specific solutions, it does not equip the FAA to analyze the numerous possible water contact scenarios, derive the baseline scenario, and proceed with development of equipment and design criteria to counter that scenario. At this time, there are too many different accident situations, types of emergency equipment, and design configurations which have not been evaluated, to reach a valid conclusion as to the proper way to handle the problem. The FAA program aims to resolve these issues. We believe it should be completed as expeditiously as possible to establish a sound technical basis for identifying options. The program is concentrating on the unplanned water-contact type of accident and is taking into consideration the crash-impact sequence, the evacuation process, immersion hypothermia, and any other factors found significant in determining survival. It will entail an assessment of airworthiness design and aircraft emergency equipment vis-a-vis the crash-landing scenario and post-crash survival environment. The program will consider all of the proposals and supporting information submitted by the petitioner.

There are several technical areas in which there is a particular need for information. One of these is in the determination of the hazard exposure and the definition of the circumstances, or airport locales, which warrant consideration of the possibility of an unplanned water-contact accident. The petitioner has proposed new definitions in FAR Part 1 as the means of specifying

applicability of the proposed equipment requirements for both "extended overwater operation" and "restricted overwater operation" based, in part, on the location of the flight route relative to ATC radar coverage and on the location of the airport relative to a significant body of water. While several commenters support these proposals, others cite problems which might arise and object to the lack of definition of the term "significant" as used in the petition. The FAA believes a criterion more definitive than that proposed by the petitioner is necessary. One of the key parts of the FAA program is the development of a rational reference criterion which can be used to identify those airport locales for which consideration of the possibility of an unplanned water-contact accident is reasonably practical and those for which consideration is not practical. This is to provide a basis for an efficient and cost-beneficial application of whatever findings or conclusions may be developed in the program. Until this aspect of the problem has been explored and some definitive rationale is available for determining applicability, we do not believe criteria should be established, as proposed in the petition. As one commenter points out, the proposed new definition of "extended overwater operation" would require a number of carriers to upgrade airplanes and carry a full complement of ditching equipment over existing routes. The information and data submitted by the petitioner in this regard is limited, and we find that it does not support such a general upgrading, especially in view of the favorable service experience on ditchings.

Another key area in which information and data are needed is in the development of the baseline accident scenario. The scenario must account for the condition of the survivable space within the cabin from the time the airplane initially contacts the water to the time it comes to rest and the evacuation process is underway. This is necessary to provide the baseline against which various cabin and equipment configurations can be evaluated and their effectiveness and efficiency determined. In regard to a baseline scenario, the petitioner proposes to revise § 25.801 (b) and (c) to require that unplanned controlled water contact and unplanned water landing be accounted for in the airplane design, in addition to the emergency landing on water, as currently required for ditching certification. The petitioner does not propose parameters on other means of identifying the specific design impact conditions envisaged in the proposal, such as aircraft speed, attitude, or descent rate. Commenters point out that this lack of definition of scenario could result in various interpretations and confusion in design and that some unplanned controlled water-contact accidents essentially are non-survivable.

The FAA program recognizes the importance of a valid and practicable baseline scenario and the complex aspects of establishing and adequately defining the scenario for design purposes. An unplanned crash landing in water might result from various events, such as runway overrun or

controlled descent into water. Contact could be made at many combinations of aircraft speed, attitude, weight, fuel loading, and center of gravity, all of which could greatly affect the impact behavior of the aircraft. While the research and development program cannot account for all of the details of the numerous possible sequences of structural behavior in crash landings, there should be some general indication as to what to expect in unplanned water contacts for various types of aircraft and various impact conditions. For instance, if an airplane contacts the water at a given speed, weight, attitude, etc., can that airplane be expected to remain relatively intact, or is massive breakup probable? Will the airplane come to rest upright or inverted? What is the expected flotation time and attitude?

These scenario factors are critical since the efficacy of the required emergency systems and equipment is dependent on the scenario the systems and equipment are intended to counter. For example, if the airplane is expected to undergo an impact sequence which would leave the cabin intact with emergency exits above water and all passengers and crew in sound condition and ambulatory, the proper survival equipment might consist of a few well-placed high-capacity liferafts or flotation platforms which would be deployed by trained crewmembers and able-bodied assistants. If, on the other hand, the airplane is expected to undergo major breakup which would leave some of the passengers and crewmembers incapacitated, the survival equipment configuration might entail a number of readily accessible individual flotation devices dispersed throughout the cabin which would be usable by untrained passengers without the assistance of crewmembers.

The program being carried out by the FAA will include an investigation of the behavior of typical transport airplanes in unplanned water-contact type accidents and the resulting general condition of the cabin, structural damage, flotation time and attitude, availability of exits, and any other factors found relevant to survival. This will provide necessary insight into what to expect in water crash landings of various types of airplanes so that emergency equipment and procedures can be configured accordingly. Much of the work required for this scenario study has been completed under a research program concerned with crash impact scenarios in general and the structural behavior of airplanes involved in accidents. The results of this research program were published recently in three FAA/NASA reports: No. DOT-FAA-CT-82-69, Transport Aircraft Crash Dynamics, dated March 1982; No. DOT-FAA-CT-82-70, Transport Aircraft Accident Dynamics, dated March 1982; and No. DOT-FAA-CT-82-68, Commercial Jet Transport Crashworthiness, dated April 1982—all of which are available from the National Technical Information Service, Springfield, Virginia 22161.

Considerable technical information concerning performance capabilities of various types of water-survival equipment and cabin design features is still needed. This information is necessary to identify those equipment items and design features which

effectively and efficiently counter the design accident scenario and increase survivability. The petitioner favors use of specific types of survival equipment, much of which is the type currently used in service, and proposes revisions of §§ 25.1411, 25.1415, 121.339, and 121.340 to establish new requirements pertaining to liferafts, life preservers, individual flotation devices, and secondary flotation equipment. Secondary flotation equipment is a relatively new concept in survival gear, not mandated or otherwise referenced in current regulations. Essentially, it is a simple and lightweight flotation device which can keep the survivors out of the water but is not intended or equipped for extended survival in open sea as is the liferaft.

The FAA is particularly interested in new ideas and concepts in water survival equipment and in ways of making existing equipment more effective. We do not believe selection of equipment and design features should necessarily be limited to those currently available since some new concept might be found the most effective. The one-person flotation platform cited by the petitioner is an example of the type of new equipment which should be considered. Although commenters contend this particular device is impractical and not available on the general market, it might be found to have sufficient merit to warrant further design refinement and commercial production. Any such new equipment item volunteered by a manufacturer, individual, or other party early enough in the program to allow its consideration, or otherwise obtained by the FAA, will be tested and evaluated. The FAA program is looking into many aspects of survival equipment and design features including quick-donning life preservers, life preserver stowage and access, emergency evacuation slides/rafts, flotation seat cushions, advanced lightweight portable liferafts, and secondary flotation equipment. This will entail thorough evaluations by survival pool tests and, if necessary, open-sea tests to determine the capabilities and performance levels which can be expected.

The FAA issued a notice regarding water-survival equipment in the November 16, 1981, *Federal Register* (46 FR 56292). This notice announced publication and invited public comment on the proposed comprehensive upgradings of three TSO's on inflatable equipment: TSO-C13d, Life Preservers; TSO-C69a, Emergency Evacuation Slides, Ramps, and Slide/Raft Combinations; and TSO-C70a, Liferafts (reversible and nonreversible). These proposed upgradings are based on research, development, and testing and on the experience in recent aircraft type certification programs. Proposed TSO-C13d would establish a new requirement that a life preserver be demonstrated capable of being donned within 15 seconds by an unassisted seated adult, who has received only the customary preflight briefing. This is consistent with the proposal made by the petitioner.

The equipment testing and evaluation portion of the FAA program has a special bearing on the petitioner's proposal that inflatable evacuation slides serve as rudimentary flotation platforms for unplanned water-contact accidents and that

the TSO be revised to require this. Obviously, this concept has merit although its feasibility has not been established for slides in general. If a slide could be inflated, released from the airplane, and boarded by survivors, it would be invaluable in a water-survival situation. Proposed TSO-C69a would foster this concept to some extent. This TSO would establish a new criteria package for the certification of slide/raft combination devices and contain provisions in evacuation slide criteria for optional design features which would permit slides to be usable as rudimentary flotation platforms. Not all slides, however, may be suitable as flotation platforms. Some slides have flotation and water-stability characteristics which have not been evaluated and demonstrated to be appropriate for the purposes of survival equipment. The FAA program is to investigate this matter of slides as flotation equipment, including open-water testing of typical slides, and identify those characteristics and design features which are necessary to ensure that a slide can serve adequately as a flotation platform. This basic work is necessary to place the FAA in a position to develop guidelines and criteria regarding the design of slides for use as water-survival equipment.

As a result of a reported service difficulty, in February 1981 the FAA initiated a program to investigate the buoyancy of flotation seat cushions used in airline service. This program is germane to the petitioner's contention that flotation cushions lose buoyancy after a short time in water. Cushions which have been in long service are being obtained from various air carriers and subjected to cyclical submersion testing in a manner simulating the wave action of an actual survival situation. The objective of this program is to determine if there is some deficiency in current flotation criteria for cushions and, if so, the appropriate means to correct it.

Several of the petitioner's proposals would revise sections of Part 139 to require that each airport which is adjacent to a significant body of water maintain an extensive water-rescue capability. Apropos of the petitioner's proposals, the National Transportation Safety Board (NTSB) recently recommended to the FAA that it "Amend 14 CFR 139.55 to require adequate water rescue capabilities at airports having approach and departure flight-paths over water which are compatible with the range of weather conditions which can be expected." (Recommendation A-82-89.)

The FAA is reviewing all of Part 139 to update its provisions and ensure that, in compliance with Executive Order 12291, the benefits to society of each requirement outweigh the potential costs to society and to maximize the net benefits to society of the airport certification and operating rules as a whole. The FAA recognizes that there are emergency situations in which ground-based water rescue could be effective, and the FAA sees the positive benefits of planning and preparedness by local governments and jurisdictions for all types of emergencies and accidents, regardless of whether on water or on land. In reviewing Part 139, the FAA will consider the information provided in the petition; however, to adopt the petitioner's

proposed revisions while all of Part 139 is under review would be premature.

The NTSB has also recommended to the FAA that it "Survey all certificated airports having approach and departure flightpaths over water and evaluate the adequacy of their water rescue plans, facilities, and equipment according to the guidance contained in Advisory Circular 150/5210-13 and make recommendations for improvement as necessary to appropriate airport authorities." (Recommendation A-82-88.) In response to this recommendation, the FAA is surveying over 200 airports to inventory their water-rescue capabilities. This information will be used, not only in formulating recommendations to these airports, but also in determining what revisions of Part 139 would be appropriate.

The petitioner specifically proposes that the FAA revise § 139.55(b)(2)(iii) to require that water vehicles be added to the list of surface vehicles and aircraft designated for medical transportation. The FAA, however, interprets "surface vehicles" to include vehicles that travel on water as well as those that travel on land and, while a clarification of this and other provisions may be proposed during the review of Part 139, it is unnecessary at this time.

The petitioner has recommended several actions to complement and facilitate its package of regulatory proposals, among which is the development of a TSO on pyrotechnic devices. The FAA issued Advisory Circular C 91-58, Use of Pyrotechnic Visual Distress Signaling Devices in Aviation, dated May 27, 1982, which describes the approval basis and appropriate uses of various types of devices for both day and night rescue. This satisfies the objective of the petitioner's recommendation, and development of a TSO is not necessary.

The other actions recommended by the petitioner are revision of passenger information cards on individual flotation devices and publication of advisory material regarding survival zones and coastal water temperatures.

There is merit in these recommendations and they will be taken into consideration along with the results of the FAA program.

In summary, the petitioner has identified a safety matter which, as indicated by the comments, many parties in the aviation

community and general public see as a problem calling for corrective action. Although the petitioner proposes a number of specific actions and regulatory changes there is no supporting information indicating that these proposals are the appropriate means for countering the problem from practical and cost-beneficial standpoints. The petitioner and commenters make clear the possible consequences of cold-water immersion on the survival of occupants following an unplanned water-contact type of accident. The FAA recognizes this critical aspect of water survival and has a comprehensive program underway which is similar to that advocated by the petitioner for the improvement of water survival provisions.

Considerable progress has been made in the FAA program to date, and we expect this program to continue without major problem to its completion which is estimated to be in later 1983. The analysis of water impact accident scenarios and the development of the airport reference criterion on threat exposure are nearing completion. We expect the preliminary reports on these two subprograms to be completed by December 1982. The three proposed TSO's on water survival equipment which were published in the Federal Register drew supportive response from a wide section of the aviation community. More than 60 individual responses containing valuable information and constructive suggestions were submitted. These responses are currently being evaluated. Issuance of the finalized TSO's is expected in later 1982.

In the subprogram regarding the buoyancy of individual flotation devices, more than 70 flotation seat cushions from inservice transport airplanes have been subjected to cyclical submersion testing. We plan to continue this testing as additional cushions become available from service and to complete this subprogram well ahead of the completion of the overall program in later 1983.

The major subprogram in terms of cost and significance is the performance testing and evaluation of various emergency equipment items and design features and the evacuation slides intended for flotation use. This work is taking a critical look at the capabilities and feasibility of equipment and seeking practical and cost-effective solutions to the problem of

water survivability. The outcome of this subprogram will depend in large part on the availability for FAA testing of a wide range of state-of-the-art emergency equipment, particularly those new models and experimental prototype which might offer new and innovative approaches to water survivability. Except in a very few circumstances, the FAA does not have the resources or the responsibility for product development. As a result, the new ideas and equipment being sought in this program must come from the private sector. The FAA takes this opportunity to invite the petitioner and any other party, especially those parties the petitioner deems well-qualified, to cooperate and assist in obtaining items of emergency equipment for testing and evaluation under the FAA program. This, in effect, is an open invitation for any party, finding it to its competitive advantage, to volunteer or loan equipment items to the FAA and to call attention to the merits of their equipment through an objective and impartial evaluation.

In view of the progress made to date, we believe the FAA program should be completed to develop requirements pertaining to survival before specific actions, such as those proposed, are taken. Any action taken before completion of this program would be premature and could waste time and money in addressing an issue which has not been evaluated thoroughly. We also believe that the petitioner's proposals should be taken into consideration to enhance the scope and effectiveness of the FAA program.

In consideration of the foregoing, I find that rulemaking, as proposed, is not appropriate at this time. Therefore, in accordance with rulemaking procedures of Part 11 of the Federal Aviation Regulations, the petition of the Air Line Pilots Association to amend Parts 1, 25, 121, and 139 of the Federal Aviation Regulations is hereby denied.

Issued in Washington, D.C., on November 30, 1982.

J. Lynn Helms,
Administrator.

[FR Doc. 83-4100 Filed 2-16-83; 8:45 am]

BILLING CODE 4910-13-M