DEPARTMENT OF TRANSPORTATION

Research and Special Programs Administration

49 CFR Parts 171, 172, and 175

[Docket No. HM–224A]

RIN 2137–AC92

Hazardous Materials: Chemical Oxidizers and Compressed Oxygen Aboard Aircraft

AGENCY: Research and Special Programs Administration (RSPA), DOT.

ACTION: Final rule.

SUMMARY: RSPA is amending the Hazardous Materials Regulations to: Prohibit the carriage of chemical oxidizers in inaccessible aircraft cargo compartments that do not have a fire or smoke detection and fire suppression system; require oxygen cylinders to be placed in an outer packaging when transported aboard aircraft; limit the number of oxygen cylinders that may be stowed on an aircraft in inaccessible cargo compartments that do not have a fire or smoke detection system and a fire suppression system (e.g., a Class D cargo compartment); limit the number of oxygen cylinders that may be stowed in a Class B cargo compartment or its equivalent (i.e., an accessible cargo compartment equipped with a fire or smoke detection system but not a fire suppression system); authorize transportation of a limited number of oxygen cylinders in the passenger cabin of passenger-carrying aircraft; and prohibit the carriage of personal-use chemical oxygen generators on passenger-carrying aircraft and the carriage of spent chemical oxygen generators on both passenger-carrying and cargo aircraft.

This final rule is being issued in consultation with the Federal Aviation Administration (FAA) to enhance air transportation safety.

DATES: *Effective Date:* The effective date of these amendments is March 1, 2000.

Permissive Compliance Date: Compliance with the requirements adopted herein is authorized as of October 22, 1999.

Incorporation by Reference Date: The incorporation by reference of a publication listed in this final rule is approved by the Director of the Federal Register as of March 1, 2000.

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SUPPLEMENTARY INFORMATION:

I. Background

On May 11, 1996, ValuJet Airlines flight No. 596 crashed in the Florida Everglades resulting in 110 fatalities. The National Transportation Safety Board (NTSB) found that chemical oxygen generators initiated and then intensified a fire in a Class D cargo compartment, which caused the crash. Shortly after the crash, NTSB recommended that RSPA, together with FAA, ''prohibit the transportation of oxidizers and oxidizing materials (e.g., nitric acid) in cargo compartments that do not have fire or smoke detection systems.''

In subsequent rulemaking actions, RSPA has prohibited the transportation of chemical oxygen generators as cargo on board passenger-carrying airlines, and issued standards governing the transportation of chemical oxygen generators on cargo-only aircraft. 61 FR 26418 (May 24, 1996); 61 FR 68952 (Dec. 30, 1996); 62 FR 30767 (June 5, 1997); 62 FR 34667 (June 27, 1997). On February 17, 1998, FAA published a final rule that upgraded the fire safety standards for Class D compartments for certain transport-category airplanes. 63 FR 8033. FAA's rulemaking has a compliance date of March 19, 2001.

On December 30, 1996, RSPA published a notice of proposed rulemaking (NPRM) in the **Federal Register** (61 FR 68955) proposing to amend the Hazardous Materials Regulations (HMR; 49 CFR Parts 171–180) to prohibit the carriage of oxidizers, including compressed oxygen, in passenger-carrying aircraft. That proposal also would have had the effect of limiting packages of oxidizers that are allowed on cargo aircraft to locations accessible to crew members (see 49 CFR 175.85(b)). In the December 30, 1996 NPRM, RSPA analyzed the possible prohibition of oxidizers in Class D cargo compartments only, and proposed a new § 175.85(d) to prohibit loading or transporting in a Class D compartment any package containing a hazardous material for which an OXIDIZER or OXYGEN label is required. On August 20, 1997, RSPA published a supplemental notice of proposed rulemaking (SNPRM) (62 FR 44374) further analyzing the possible prohibition of oxidizers aboard passenger-carrying aircraft in Class B and C cargo compartments.

The classification of cargo compartments aboard transport-category aircraft is specified in 14 CFR 25.857 and discussed in RSPA's NPRM and SNPRM. In general, a Class B compartment is one which is accessible to a crew member with a hand-held fire extinguisher and has an approved smoke or fire detection system. Class C and D compartments are not accessible during flight and have means to control ventilation and exclude hazardous quantities of smoke or flames from the passenger compartment and cockpit. A Class C compartment also has an approved smoke or fire detection system and a built-in fire suppression system. In this final rule, when reference is made to Class B, Class C or Class D aircraft cargo compartments, we are also including cargo compartments on non-transport category airplanes that have similar characteristics. The limitations and prohibitions for Class D compartments also apply to non-transport category airplanes that do not have detection and suppression equipment, similar to Class D compartments in transport-category airplanes.

In the NPRM and SNPRM, RSPA also proposed to completely prohibit the transportation of chemical oxygen generators that have been discharged (''spent'') and to prohibit the transportation of personal-use chemical oxygen generators on passenger-carrying aircraft. On August 27, 1998, FAA published an NPRM proposing to ban, in certain domestic operations, the transportation of devices designed to chemically generate oxygen, including devices that have not yet been charged for the generation of oxygen. 63 FR 45913. In response to a request from nine industry associations, on January 14, 1998, RSPA and FAA held a public meeting to more fully explore all the issues relating to the proposals in the NPRM and SNPRM.

The amendments adopted in this final rule respond to the NTSB recommendation and are based on the merits of comments and the assessment of RSPA and the FAA of the hazards posed by oxidizers. In its recommendation, NTSB cited three previous incidents in which oxidizers caused fires aboard aircraft. In each of these incidents, there were apparent or known serious violations of the HMR. RSPA and FAA are not aware of any fire aboard an aircraft having been caused directly by transport of oxidizers in conformance with the HMR. However, RSPA and FAA agree with the NTSB that, in certain circumstances, oxidizers can contribute to the severity of a fire and pose an unreasonable risk when transported in an inaccessible cargo compartment which does not have a fire or smoke detection system and a fire suppression system.

II. Comments and Regulatory Changes

A. General

RSPA received more than 55 written comments, and 14 persons made oral presentations at the public meeting, in response to the NPRM and SNPRM. The commenters included shippers and carriers of oxidizers by air, related trade associations, the NTSB, and persons who need supplemental oxygen during flight for medical reasons. In general, the persons that submitted comments:

(1) Supported the prohibition of oxidizers, other than oxygen, in those cargo compartments that do not have fire or smoke detection and fire suppression systems;

(2) Disagreed with the proposed total prohibition of oxidizers carried in cargo compartments aboard passenger-carrying aircraft and in inaccessible cargo compartments aboard cargo aircraft, including those compartments with detection and suppression systems;

(3) Disagreed with the proposed prohibition of the carriage of compressed oxygen in cargo compartments aboard passenger-carrying aircraft; and

(4) Supported the proposals to prohibit the transportation of spent oxygen generators aboard aircraft and to eliminate the exception provided in 49 CFR 175.10(a)(24) for personal oxygen generators.

B. Oxidizers

1. Summary of Comments on Chemical Oxidizers

RSPA proposed to prohibit the transportation of chemical oxidizers aboard passenger-carrying aircraft and in inaccessible cargo compartments of cargo aircraft. Most of the commenters agreed with the proposal to prohibit chemical oxidizers in cargo compartments that are not equipped with fire or smoke detection systems and fire suppression systems, but disagreed with the proposal to ban oxidizers from cargo compartments with fire or smoke detection and fire suppression systems.

Air Products and Chemicals, Inc. supported the rule as proposed. It stated that ''the prohibition of oxidizers and similar materials aboard passenger-carrying aircraft is a sensible approach to improving the safety of passenger flights.'' NTSB stated that it ''supports prohibiting the carriage of oxidizers, including compressed oxygen, in Class D compartments because these compartments do not have smoke and fire detection systems * * *'' In its comments to the SNPRM, NTSB referred to an earlier recommendation that FAA ''consider the effects of authorized hazardous materials cargo in fires for all types of cargo compartments.'' It urged RSPA and FAA to complete a study of the risks associated with the transportation of hazardous materials on aircraft and ''to ban any hazardous materials, including oxidizers, that cannot be safely transported in aircraft cargo compartments.''

Several commenters specifically stated that they did not support the ban of an entire division of hazardous materials aboard passenger-carrying aircraft and that a complete ban of oxidizers would increase the number of undeclared hazardous materials. The Airline Pilots Association (ALPA) stated ''prohibiting the carriage of *all* oxidizers may introduce additional hazards. This may inadvertently force shippers into illegally shipping materials as undeclared * * *'' ALPA went on to say that ''the complete banning of all oxidizers * * * goes beyond the seemingly obvious safety implication and does not appear to be reasonable.''

Many other commenters noted that, to date, incidents involving hazardous materials have been due to lack of compliance with the HMR. They stated that the better course of action would be to increase education and enforcement, rather than ban an entire category of hazardous materials. The Conference on Safe Transportation of Hazardous Articles stated:

> People who ship undeclared hazardous materials do not read the CFRs. You can give all the instructions you like in the regulations, and the people who ignored the instructions in the past will ignore them in the future. Now, in fact, the prohibition will give them greater incentive to embrace ignorance.

The Hazardous Materials Advisory Council (HMAC) stated its belief that:

> * * * the rule's provisions will do nothing to address the known problem of undeclared or misdeclared shipments of hazardous materials and may be counterproductive by increasing such shipments by unscrupulous persons. In our opinion this could present a more dangerous situation to passengers and airline employees than at present.

Several commenters stated that a ban of certain materials on aircraft is no guarantee that those who are unaware of the regulations will not continue to ship undeclared hazardous materials. They suggested that public education and aggressive enforcement (including appropriate penalties for violation of the HMR) would better promote safe transportation. Mallinckrodt, a shipper of oxidizers, stated, ''We ship oxidizers, paying particular attention to complying with these methods and have had no incidents of which we are aware. We do not feel that we should be penalized for incidents as outlined in the Docket, which were clear violations of the law.''

Hach Company manufactures and distributes several hundred products that are or contain oxidizing materials, including laboratory instruments, process analyzers, test kits and analytical reagents some of which are used to analyze the quality and safety of water. It ships the majority of its international orders by air, primarily on passenger-carrying aircraft. Hach stated that it would prefer to ship by cargo aircraft but that cargo aircraft are not available to a large percentage of the end-user locations. It also stated that ocean transportation is not a viable alternative because of location, time and cost constraints. Hach stated that the proposed rule, if promulgated could put it at a significant commercial disadvantage with its foreign competitors. Hach supported a prohibition on transportation of oxidizers in Class D cargo compartments, but opposed a prohibition that would apply to other cargo compartments.

The International Air Transport Association (IATA) stated that cargo aircraft are not a substitute for passenger-carrying aircraft because cargo operations serve only a fraction of airports, international and domestic, and do not have the frequency of service required by shippers. IATA stated ''Typically, a dangerous goods shipment by air is time critical and the facility provided by passenger aircraft service is essential to shipper's requirements.'' Another commenter stated that the safety need for the proposed general prohibition on the transport of all oxidizers aboard passenger-carrying aircraft has not been technically or rationally proven by FAA and RSPA.

Some commenters expressed concern that RSPA and FAA would ban all materials within Division 5.1 from passenger-carrying aircraft without regard to the lesser hazards posed by materials in lower packing groups, or shipped in limited quantities. ATA stated that the proposed rules:

> * * * offer no analysis or rationale to explain how a properly packaged, low-oxidizing potential material would pose such risks. In this regard, the transport, for example, of properly packaged and identified low-oxidizing potential (i.e., Packing Group III) solid oxidizers, is not considered to pose a significant risk to safety in air transport. Such a material would be incapable of spontaneously initiating a fire (even when in contact with organic material) under conditions normally incident to transport.

ATA also stated that ''normal'' oxidizers can only reasonably be

envisioned contributing to a fire originating in adjacent cargo when the fire has progressed to the extent that a packaging containing ''normal'' oxidizers has been substantially degraded. In such a case, ATA stated the fire may be uncontrollable in any event or the contribution to the intensity of the fire of a low-oxidizing potential solid oxidizer may be insignificant. ALPA suggested that RSPA further examine those oxidizing substances presently authorized by the HMR to be carried aboard passenger-carrying aircraft which pose the greatest potential risk to safety and those oxidizers that have caused problems when transported by air. ALPA suggested that, following this re-examination, RSPA should determine whether changes to the current HMR might be necessary concerning these materials, such as decreasing net quantity limitations, increasing the packaging requirements, or prohibiting their carriage by aircraft.

2. Summary of Comments on Compressed Oxygen

RSPA proposed to prohibit the transportation of compressed oxygen as cargo aboard passenger-carrying aircraft, and in inaccessible locations aboard cargo aircraft. RSPA also proposed, based on the provision of an existing exemption, to allow a limited number of airline-owned and passenger-owned oxygen cylinders to be stowed in the cabin of a passenger-carrying aircraft when placed in an overpack. RSPA also proposed to require that the overpack be labeled CARGO AIRCRAFT ONLY but marked with the statement ''Passenger cabin acceptable per 49 CFR 175.10.''

As already mentioned NTSB supported the proposal to prohibit the carriage of compressed oxygen in Class D compartments. Air Products and Chemicals, Inc. also supported the proposal and stated, ''the result of the proposal should improve overall aircraft safety, but, there should also be an effort to improve enforcement of all rules pertaining to hazardous and forbidden materials in airplanes.''

The majority of the commenters opposed the proposal. Most commenters stated that transporting oxygen cylinders in the cargo hold does not present a significant risk. For example, the Regional Airline Association (RAA) stated ''RSPA has failed to show that the transportation of pressurized oxygen is sufficiently hazardous to deny shipment within Class C and Class D compartments.'' RAA went on to say that airlines that operate in remote locations where ground transportation is not available, such as Alaska, will have to either withdraw from operations or fly to their destination knowing that their destination is not equipped to return them to service if they deplete an oxygen bottle during the flight.

The Alaska Air Carriers Association (AACA) and Peninsula Airways also opposed the proposed rule, particularly regarding oxygen, due to the adverse consequence on transportation in and through Alaska. Peninsula Airways stated ''implementation of the NPRM's provisions that affect this issue will make it virtually impossible to legally provide medical oxygen for passengers/patients in remote areas of Alaska.'' Peninsula Airways and AACA both pointed out that Section 1205 of Public Law 104–264, Regulations Affecting Intrastate Aviation in Alaska, give FAA the authority to consider Alaska's unique transportation circumstances when conducting rulemaking. Peninsula Airways stated that ''this is clearly a situation where RSPA must reconsider the NPRM's impact on Alaska and modify the proposed rule * * * to make it workable, safe to use and safe to transport medical oxygen cylinders in Alaska.''

Commenters also contended that prohibiting transportation of compressed oxygen on board passenger-carrying aircraft would have significant cost impacts on the airline industry and severely hamper the ability of disabled persons to travel by the air mode. ATA stated that a fire capable of generating enough heat to potentially affect an oxygen cylinder would cause severe structural damage to the aircraft before the cylinder would ever be dangerously involved.

Caledonia Airways disagreed with the proposed exception for transporting compressed oxygen in the passenger cabin. It stated that such transportation is contrary to any training that airline personnel have received and also conflicts with the International Civil Aviation Organization's (ICAO) Technical Instructions for the Safe Transportation of Dangerous Goods. Other commenters noted that adoption of the proposed ban on compressed oxygen, in conjunction with the general ban on carriage of dangerous goods in the passenger cabin set forth in the ICAO Technical Instructions, could effectively prohibit any transportation of oxygen cylinders as COMAT (airline company material) on international flights. Commenters also stated that limiting a carrier to six COMAT cylinders per flight would unnecessarily restrict its ability to pre-position cylinders and to transport cylinders to locations where they are needed to replace used cylinders.

RAA stated that the proposed exception for oxygen cylinders in the cabin is a suitable alternative for transportation of medical oxygen cylinders, but it does not address the needs of regional operators to ship spare oxygen cylinders used in support of aircraft pressurized oxygen systems. ALPA stated that many airplanes do not have available storage locations of adequate size and strength to hold oxygen cylinders contained within their strong outer packagings. ALPA went on to say that for such aircraft, creation of such areas or compartments would require significant investment in engineering development and aircraft retrofitting. Qantas Airlines pointed out that an oxygen cylinder is often an unwieldy and heavy piece of equipment which represents a serious hazard to passengers in the cabin not only in regular handling, but especially during turbulence and other in-flight emergencies.

ALPA specifically disagreed with the statement in the NPRM that it would be safer to carry personal medical oxygen cylinders in the passenger cabin because the crew could quickly remove the cylinders from any fire area of the cabin. It stated that the aircraft crew should not be considered a fire suppression resource. In its view, a member of flight deck crew on a two-person crew would not leave his or her station and enter a compartment that is on fire to attempt to fight the fire, nor move a package containing an oxidizer away from the fire.

Many commenters noted that there has not been any incident involving the transport of compressed oxygen in cylinders designed for and used aboard aircraft in any compartment, including an inaccessible cargo compartment. IATA pointed out that there is no record of any lives having been lost due to properly packaged oxidizers, including oxygen, in the 76 years of commercial aviation history and, in particular, since the implementation of the first air-mode Dangerous Goods Code in 1956. ATA stated that the industry system of COMAT distribution of oxygen cylinders has been safely in place since supplemental oxygen was needed on commercial aircraft between 1946–1948 when the Lockheed Constellation, Douglas DC–6 and Convair aircraft entered service. Air New Zealand, pointing out that there are large quantities of oxygen stored in cylinders behind the sidewalls of cargo compartments, stated that the only protection these cylinders have from a cargo compartment fire is the compartment wall lining which meets the flame penetration requirements of

14 CFR 25.855. Air New Zealand went on to say that ''it would be logical to ship cylinders in the cargo compartment in overpacks meeting the same flame penetration standards.''

Most of the comments opposing the proposals related to the transportation of compressed oxygen aboard passenger-carrying aircraft were from airlines who need to resupply (or deploy) charged oxygen cylinders for compliance with FAA airworthiness requirements and for use by passengers who require supplemental oxygen during flight. Several airlines stated that they store the oxygen cylinders at their hub facilities where they can safeguard their storage and maintenance and then deploy them as needed aboard their aircraft to other operating locations. ALPA pointed out that without the required oxygen for crew and passengers, an aircraft is not considered airworthy and is not authorized to be flown. It stated that one way to restore the aircraft to a flyable status is to remove and replace oxygen cylinders, and the potential for an aircraft being grounded at a non-maintenance station is great if these fully charged cylinders may not be moved by an airline around its system.

Carnival Air Lines stated that it would be forced to rely on other carriers to resupply its cylinders and position its maintenance and replacement parts. Carnival also stated that this forced reliance upon other carriers would inevitably lead to at least occasional cancellations or lengthy flight delays resulting from an aircraft being forced out of service awaiting required oxygen. It stated that the costs associated with these delays would be ''very substantial.''

Several airline commenters stated that if the amendments were adopted as proposed they will be unable to provide the current level of service without incurring significant costs. For example, Continental Airlines stated that it transports approximately 300 oxygen cylinders per month and if the proposal is adopted it would not be able to effectively and efficiently distribute medical oxygen to the places where and when it is needed in order to accommodate passenger needs.

Numerous commenters were concerned about the proposed placement of the Cargo Aircraft Only (CAO) (49 CFR 172.448) label on cylinders of oxygen that would be transported in the cabin of a passenger-carrying aircraft. Some stated that adoption of this proposal would cause unacceptable confusion and would be detrimental to safety. Others stated that allowing one material labeled CAO to be loaded in a passenger-carrying aircraft would dilute the meaning of the label and cause confusion. ALPA stated that placing packages of hazardous materials that are labeled CAO in passenger-carrying aircraft is ''totally unacceptable and will not be tolerated.'' ALPA also stated that if a label must be used, then development of a separate ''accessible while inflight'' label may be warranted. ATA stated that ''misuse'' of the hazard communication system would cause confusion about the true meaning of the Cargo Aircraft Only label, which may well increase the potential for a serious incident involving a passenger-carrying aircraft.

The National Association for Medical Direction of Respiratory Care (NAMDRC) and the American Lung Association (ALA) supported the proposal to allow the carriage of passenger-owned cylinders of compressed oxygen in the cabin of the aircraft. NAMDRC and ALA also stated that this exception would provide patients timely access to their personal oxygen containers upon landing at a layover site or at their final destination. These commenters, however, were under the mistaken impression that this exception would allow passengers to transport their cylinders in the aircraft by relinquishing the cylinders to the flight crew. These commenters also asked: (1) Will the airlines have an option or will they be required to transport the oxygen cylinders? (2) Will the airlines be able to charge for the service? (3) What documentation or security measures will be required for transport of the oxygen cylinders? and (4) What types of oxygen cylinders will be allowed to be stowed in the cabin and what type of testing will be required before a cylinder is allowed on the aircraft?

3. RSPA Response to Comments

i. Chemical Oxidizers. Oxidizers currently authorized for carriage aboard passenger aircraft in inaccessible cargo compartments will not spontaneously initiate a fire. The potential hazard posed by these oxidizers is that, if a fire were to occur elsewhere in the compartment, such as in luggage or other cargo, and if there were no means to suppress or extinguish the fire, the fire might burn long enough to involve the oxidizer. The oxidizer, even in Packing Group III, could potentially provide an oxygen source which could intensify the fire to an extent that the limited safety features of the compartment would be ineffective. For these reasons, and based on its review of comments received to the NPRM, SNPRM and at the public hearing, RSPA believes that there is a need to prohibit the transportation of chemical oxidizers (i.e., oxidizers other than compressed oxygen) in inaccessible cargo compartments that do not have fire or smoke detection and fire suppression systems. Therefore, consistent with the NTSB recommendation, RSPA is prohibiting the transportation of chemical oxidizers in inaccessible cargo compartments that do not have fire or smoke detection and fire suppression systems.

Based on evaluation of comments and the hazards posed by chemical oxidizers, RSPA does not believe that chemical oxidizers should be completely forbidden aboard passenger-carrying aircraft. RSPA is confident that chemical oxidizers can be safely transported in Class B, and Class C compartments when transported in accordance with the HMR. RSPA is also confident that the safety features of a Class B compartment (i.e., an accessible compartment with fire or smoke detection equipment) and those of a Class C compartment (i.e., an inaccessible cargo compartment that has both a fire or smoke detection system and a fire suppression system) counter the risk posed to an aircraft from the carriage of chemical oxidizers that are transported in accordance with the HMR. Therefore, RSPA is not adopting the proposal to prohibit the carriage of chemical oxidizers aboard passenger-carrying aircraft in Class B or Class C aircraft cargo compartments.

ii. Compressed Oxygen. The potential hazard posed by compressed oxygen is that it will intensify a fire. Thus, if a fire, from any source, were to occur in an aircraft cargo compartment containing an oxygen cylinder, the fire might burn long enough to heat the cylinder sufficiently to cause the pressure relief mechanism on the cylinder to open. The released oxygen could then intensify the fire to an extent that the safety features of the compartment would be ineffective, potentially resulting in the loss of the aircraft.

Under the HMR, compressed oxygen must be packaged in a DOT specification cylinder, constructed of steel or aluminum. The cylinder is required to incorporate a pressure relief device that will release its contents if the internal pressure in the cylinder approaches the test pressure of the cylinder. If the cylinder incorporates a valve, sufficient protection must be provided to prevent operation of, and damage to the valve during transportation, such as by boxing or crating the cylinder or by equipping it with protective caps or head rings (see 49 CFR 173.27(g)). Some types of

cylinders may only be shipped in strong outside packagings, regardless of whether or not the cylinder incorporates a valve (see 49 CFR 173.301(k)). An overpack or outer packaging commonly used by the airlines to transport their oxygen cylinders is the ATA Specification No. 300, Packaging of Airline Supplies, Category I. An ATA Specification No. 300 Category I (ATA 300) overpack or outer packaging is a resilient, durable overpack intended to be reused for a minimum of 100 round trips which meets specified performance standards, as demonstrated by design tests (e.g., drop test and puncture resistance). The overpack or outer packaging must also provide protection from shock and vibration.

Numerous commenters pointed out the long safety record that oxygen cylinders have had in commercial aviation and expressed the view that RSPA and FAA had no basis for proposing to prohibit the transportation of oxygen cylinders aboard passenger-carrying aircraft. Commenters requested that RSPA and FAA reevaluate the proposal regarding oxygen cylinders. After the ValuJet accident, RSPA and FAA began evaluating the risks associated with the transport of hazardous materials by aircraft. This rule reflects the agency's decisions regarding oxidizers and compressed oxygen cylinders and is based on written comments, information from the public hearing and FAA testing.

At the public hearing, the FAA asked whether any of the attendees were aware of any testing results that would support assertions by some commenters that a fire capable of generating enough heat to potentially affect an oxygen cylinder would cause severe structural damage to the aircraft before the cylinder would ever be dangerously involved. No one cited any tests. In an effort to establish whether these assertions were valid, the FAA conducted oven, fire, and overpack tests on compressed oxygen cylinders. These tests were conducted at the FAA Technical Center. A copy of the test report is available for review in the public docket. As discussed below, the FAA found that oxygen cylinders release their contents at temperatures well-below those that would be needed to damage aircraft cargo compartment liners and structures. However, an outer packaging or overpack will lengthen the time for a cylinder to release its contents at these temperatures.

Oven Test

The purpose of the first test series was to determine the approximate time and rate of release when an unprotected cylinder is exposed to high temperatures, as might be experienced in a cargo compartment fire. For this test, cylinders normally used for compressed oxygen were filled with nitrogen to 1,800 p.s.i. This test was performed on three cylinders of different capacity (i.e., 11, 76.5 and 115 cubic foot capacity). Each cylinder was placed in an industrial-type electric conduction oven and the temperature of the oven was increased to 400°F. On average, the cylinders released their contents within 14 minutes, when the temperature inside the oven was approximately 370°F. The average external temperature of the cylinder at the time of release was 300°F.

Fire Tests

During the second test series, FAA attempted to determine the effect of releasing oxygen during a fire. For this test, an empty cylinder was placed in a steel frame receptacle constructed in the shape of a LD–3 container which is typically used in the lower deck of a wide-body aircraft. Cardboard boxes filled with shredded paper were loaded into the LD–3 container and a small fire initiated. When the temperature of the cylinder reached the temperature obtained during the first (oven) test, the oxygen was vented into the container through piping. This test was performed three times using the contents of an 11 cubic foot cylinder and once using about 22 cubic feet of oxygen. The first time a slight increase in temperature in the LD–3 container was observed, but the oxygen release had little overall impact on the fire. The second time the smoldering fire erupted violently with visible flames appearing at one edge of the container. Although violent, the eruption was short in duration and the fire was contained. The third time the release of oxygen again caused a violent reaction inside the container, which produced enough pressure to force open taped seams on the container. However, it was again very short in duration much like the previous test. The fourth time, the temperature in the LD–3 container increased dramatically immediately following the oxygen release and the fire completely burned through the ceiling and part of the front side of the container, totally destroying it.

Overpack Tests

During the third test series the level of thermal protection provided by a variety of overpack or outer packagings was examined. First, currently available overpack or outer packagings meeting ATA 300, Category I and containing a 76.5 cubic foot cylinder filled with nitrogen were placed in an oven and the temperature was increased to 400 °F. This test was repeated numerous times. The first time, after sixty minutes, the cylinder's surface temperature ranged from 230 °F to 280 °F, below the temperature at which the pressure relief mechanism usually actuates to relieve the pressure within the cylinder. The test was terminated after 69 minutes with the maximum surface temperature of the cylinder reaching 300 °F. The second time, after 60 minutes the surface temperature of the cylinder reached 300 °F (the temperature at which the pressure relief mechanism usually actuates). The third time the surface temperature of the cylinder reached 300 °F after 90 minutes, at which time the test was terminated.

Then, in an effort to evaluate the increase in thermal protection offered by a modified overpack case, additional tests were performed on overpacks specifically designed for this purpose and having an exterior made of a flame retardant thermoplastic known as Kydex. In addition, a one inch thick fiberglass insulation was sandwiched between the exterior layer of Kydex and an inner layer of foamed plastic. The test was allowed to progress for approximately 60 minutes without the cylinder surface temperature exceeding 100 °F.

As demonstrated by these tests, when the surface temperature of a cylinder of compressed oxygen reaches approximately 300 °F, the increase in pressure causes the cylinder's pressure relief mechanism to open and release oxygen. If oxygen vents directly into the fire it could cause a potentially catastrophic event. However, these tests also show that an outer packaging that provides greater flame penetration resistance and thermal protection can increase the level of safety in the transportation of compressed oxygen aboard aircraft. Some thermal protection, up to 60 minutes or more, is provided by overpacks or outer packagings meeting the ATA 300 specification. Even more protection would be provided by an improved overpack that provides thermal protection and satisfies flame protection criteria.

The tests performed by FAA demonstrate that there is an increased risk posed by the presence of compressed oxygen in the event of a fire in a cargo compartment. This risk is due to the fact that, if the temperature of an oxygen cylinder reaches approximately 300 °F, the cylinder will vent oxygen into the cargo compartment and intensify the fire. Consequently, action can and should be taken to reduce or eliminate this risk. At this time, RSPA

does not believe that a complete prohibition on the transportation of oxygen cylinders aboard passenger-carrying aircraft will be necessary. Thus, RSPA is permitting oxygen cylinders to be loaded into and transported on passenger-carrying aircraft and in inaccessible locations on cargo-only aircraft subject to restrictions. Furthermore, RSPA and FAA are developing additional standards for protection of oxygen cylinders to be proposed in a separate future rulemaking. RSPA is not adopting the proposal to require the ''Cargo Aircraft Only'' label on cylinders of compressed oxygen because it is continuing to allow compressed oxygen to be carried in cargo compartments of passenger aircraft.

Based on the merits of comments, past shipping experience, FAA testing and its own evaluation, in this final rule, RSPA is amending requirements for the packaging, stowage and transport of oxygen cylinders on aircraft, summarized as follows:

- For transportation aboard a passenger-carrying aircraft or in an inaccessible cargo location on a cargo-only aircraft, each cylinder must be placed in an overpack or an outer packaging that satisfies the performance criteria in ATA Specification 300.
- Each cylinder must be stowed horizontally on or as close as practicable to the floor of the cargo compartment or unit load device.
- No more than a total of six cylinders may be stowed on an aircraft in inaccessible cargo compartments that do not have a fire or smoke detection system and a fire suppression system (e.g., a Class D cargo compartment).
- No more than six cylinders may be stowed in a Class B cargo compartment or its equivalent (i.e., an accessible cargo compartment equipped with a fire or smoke detection system but not a fire suppression system), except that one additional cylinder containing medical-use oxygen may be carried per passenger needing the oxygen at destination.
- A limited number of oxygen cylinders, each with a capacity no greater than 850 liters (30 cubic feet), may be carried in the passenger cabin of a passenger-carrying aircraft. This authorization is limited to no more than six airline-owned cylinders and one additional cylinder containing medical-use oxygen per passenger needing the oxygen at destination.

For transportation aboard a passenger-carrying aircraft or in an inaccessible cargo location on a cargo-only aircraft, RSPA is requiring that each cylinder of compressed oxygen be placed in an overpack or outer packaging meeting the performance criteria in ATA Specification 300. (See Special Provision A52 in the amendment to Section 172.102 of this final rule.) RSPA believes requiring cylinders of compressed oxygen to be placed in these overpacks or outer packagings provides an incremental level of safety in the interim until new overpack standards are developed and are in production.

Based on the FAA testing, RSPA believes that any increase in risk posed by the presence of a compressed oxygen cylinder in a cargo compartment can be significantly reduced, or even eliminated, if the oxygen cylinder is placed in an outer packaging or overpack that provides more thermal protection and flame resistence than the ATA 300 overpacks currently in use. To this end, RSPA is developing proposed enhanced standards for outer packagings or overpacks to further protect cylinders from heat and fire. RSPA anticipates publishing an NPRM later this year to invite comments on enhanced standards for these outer packagings or overpacks, including a proposed date for their implementation. At present, RSPA is considering a requirement that an oxygen cylinder may be carried in an inaccessible cargo compartment on an aircraft only when the cylinder is placed in an outer packaging or overpack meeting certain flame penetration resistance, thermal protection, and integrity standards. The flame penetration standards would likely be similar to those specified for Class C cargo compartment liners in 14 CFR part 25, appendix F, part III.

If RSPA adopts enhanced standards for outer packagings or overpacks, we would require use of an enhanced outer packaging or overpack as soon as practicable. On the other hand, if RSPA ultimately concludes that enhanced standards will not provide significantly more thermal protection and heat penetration resistence than the ATA 300 overpacks currently in use, RSPA may prohibit the carriage of oxygen cylinders in inaccessible cargo compartments that do not have appropriate fire or smoke detection systems and fire suppression systems.

RSPA is also adopting stowage requirements and numerical limitations with regard to oxygen cylinders in aircraft cargo compartments—rather than completely prohibiting the transportation of oxygen cylinders in cargo compartments of passenger aircraft and in inaccessible cargo compartments on all-cargo aircraft. The temperatures of a fire in a cargo compartment are, for the most part, much higher at the top of the compartment than at the bottom. RSPA believes that stowing the cylinders horizontally on the floor of the compartment may decrease the likelihood that a cylinder exposed to a cargo compartment fire will vent. Therefore, RSPA is requiring that cylinders of compressed oxygen be placed horizontally on or as close as practicable to the floor of the cargo compartment or unit load device. RSPA also believes that only a limited number of cylinders should be transported in Class B and D cargo compartments in order to decrease the aggregate risk to the aircraft. Therefore, RSPA is limiting to six the number of cylinders that can be stowed in an aircraft in Class B compartments (accessible, no fire suppression systems) and Class D compartments (no fire or smoke detection or fire suppression systems). RSPA believes that the concerns expressed by foreign aircraft operators and aircraft operators in remote locations (e.g., Alaska) are addressed by continuing to allow oxygen cylinders to be transported aboard passenger-carrying aircraft.

As proposed in the SNPRM, this final rule will allow for the carriage of a limited number of oxygen cylinders, as cargo, in the passenger cabin of an aircraft, under certain conditions. This authorization is limited to no more than six airline-owned cylinders and one additional cylinder containing medical-use oxygen per passenger needing the oxygen at destination. However, consistent with the exemption on which the proposal was based (see SNPRM; 62 FR 44377), RSPA is limiting this allowance to small ''medical-use'' oxygen cylinders with capacities no greater than 850 liters (30 cubic feet). Consistent with the outer packaging requirements for other cargo compartments, RSPA is requiring that these cylinders be placed in an overpack or outer packaging that meets the requirements of ATA 300. This exception is provided to ensure that cylinders of medical oxygen owned by an airline or a passenger—requiring oxygen at destination—can continue to be transported aboard passenger-carrying aircraft.

The exception does not eliminate or waive any of the current packaging, maintenance, or use requirements of the HMR related to cylinders of compressed oxygen, or any of the FAA or airline security requirements. If an airline elects to accept for transportation passenger-owned oxygen cylinders in accordance with 175.10(b), the passenger will have to offer the cylinder to the airline in accordance with the

established procedures of the airline. These procedures may require passengers to tender their cylinders at airline cargo facilities or at passenger check-in counters. In addition, the passengers will not have access to their cylinders until they are returned to them by the airlines. Again, these procedures will be established by the airlines. RSPA notes that none of DOT's requirements require airlines to accept passengers' cylinders of compressed oxygen, nor do they require or preclude airlines from charging fees for this service. In addition, RSPA also notes that nothing in this rulemaking mandates that an airline supply the ATA 300 overpack. If an airline elects not to supply the ATA 300 overpack or outer packaging, its passengers will be responsible for obtaining the overpack or outer packaging.

New paragraph § 175.10(b) allows six oxygen cylinders owned or leased by the aircraft operator or a passenger to be transported as cargo in the cabin of the aircraft. These oxygen cylinders are hazardous materials, subject to all applicable HMR requirements. See the RSPA's ''Advisory Notice: Transportation of Air Carrier Company Materials (COMAT) by Aircraft,'' 61 FR 65479 (December 13, 1996). Air carriers who do not elect to accept or transport hazardous materials (and have not developed the manuals and trained their employees as required by 14 CFR) must offer their company-owned oxygen cylinders to a carrier of another mode (e.g., highway) or to another air carrier that has an established program for transportation of hazardous materials.

C. Spent Chemical Oxygen Generators

In the SNPRM, RSPA proposed to prohibit the transportation of spent chemical oxygen generators (i.e., generators in which the means of initiation and the chemical core have been expended) and to regulate them as Class 9 materials when transported by other means of transportation. All commenters supported this proposal. The NTSB stated that ''it is difficult to determine whether all of the oxidizing material in a spent generator has been depleted, since a generator is a closed container, and both the oxidizer within the generator before the reaction and the materials remaining in the generator after the reaction are solids with similar weights.''

RSPA believes that lessening the possibility that this type of human error may occur outweighs any interest in, or need for, transporting spent chemical oxygen generators by aircraft. Accordingly, RSPA is prohibiting the transportation by aircraft of spent chemical oxygen generators and to regulate them as Class 9 materials when transported by other than aircraft.

Based on the foregoing, RSPA is adding to the Hazardous Materials Table (HMT) the new shipping description, ''Oxygen generator, chemical, spent, 9, NA3356, III.'' The entry is preceded by a plus sign (''+'') in Column 1 to fix the proper shipping name, hazard class and packing group for the entry without regard to whether the material meets the definition of a Class 9 hazardous material. Special provision 61 is added in Column 7 to specify the conditions under which an oxygen generator is considered ''spent.'' In addition, ''None'' is added to Column 8A of the HMT because RSPA believes that spent oxygen generators should not be eligible for limited quantity exceptions or to be reclassified as a consumer commodity. RSPA is also amending §§ 171.11, 171.12 and 171.12a, consistent with the proposals, to indicate that there are no exceptions from HMR requirements for classification, description, and packaging of spent chemical oxygen generators when shipping to, from or within the U.S. under the provisions of international or Canadian regulations.

D. Personal Oxygen Generators

RSPA proposed to eliminate the exception in 49 CFR 175.10(a)(24) that allows the transportation of small personal oxygen generators in checked baggage. There was no opposition and a number of commenters, including the NTSB, expressed support for this proposal. The NTSB stated that this exception currently permits the placement of oxidizers in cargo compartments that do not have fire or smoke detection systems and that are designed to suppress a fire by limiting the oxygen available to support combustion and, therefore, it supports the proposal.

As proposed in the December 30, 1996 NPRM, RSPA is removing the exception provided in § 175.10(a)(24) for small personal chemical oxygen generators in checked baggage.

E. Other Materials

The NPRM and the SNPRM proposed to prohibit the transportation of packages required to be labeled OXIDIZER or OXYGEN on passenger aircraft and in inaccessible cargo compartments aboard cargo aircraft. Therefore, the proposed prohibition did not apply to an oxidizer classed as a consumer commodity, ORM–D, under the provisions of 49 CFR 173.152. The ICAO Technical Instructions do not allow Division 5.1 materials (oxidizers) to be reclassified as a consumer commodity. RSPA specifically requested comments regarding whether it would be appropriate to extend the prohibition to consumer commodities that are oxidizers or whether quantity limits should be imposed on these materials in 49 CFR 175.75.

In its comments, NTSB stated that it was concerned that the proposals did not include a prohibition on those oxidizers that are shipped as consumer commodities. It also stated that the exception in 49 CFR 173.152 allows the placement of oxidizers in cargo compartments that do not have fire or smoke detection/suppression systems and, therefore, urged that the consumer commodity exception for oxidizers be eliminated. NTSB also requested that RSPA include organic peroxides in its study of the effects of hazardous materials in cargo compartments fires and to ban them from transportation by air if they cannot be transported safely.

Other commenters stated that they opposed extending the prohibition to consumer commodity oxidizers. These commenters stated that these materials are adequately regulated under ICAO and 49 CFR 173.152. HMAC stated that penalizing those who comply with the regulations does not address the issues of untrained and undertrained personnel and undeclared and misdeclared hazardous materials nor does it improve safety for the general public. HMAC urged RSPA to focus on aggressively enforcing current regulations, educating the regulated community, and taking appropriate penalty actions against those that do not comply.

RSPA believes that those oxidizers authorized to be reclassed as ORM–D (i.e., consumer commodities) are of a form and quantity that would not pose an unacceptable risk to the safety of an aircraft, even in cargo compartments that lack a fire and smoke detection system. Therefore, RSPA is not prohibiting oxidizers that have been reclassed as an ORM–D from being transported in Class D cargo compartments. RSPA also believes that NTSB's request to include organic peroxides in the prohibition is outside the scope of this rulemaking and, therefore, has not been adopted. However, as noted in the December 30, 1996 NPRM, RSPA has initiated a study to assess the risks associated with the transportation of hazardous materials in aircraft cargo compartments that may result in RSPA publishing another rulemaking to ban additional hazardous materials. As part of that study, RSPA is reviewing the hazards posed by materials similar to oxidizers, such as organic peroxides.

IV. Regulatory Analyses and Notices

Executive Order 12866 and DOT Regulatory Policies and Procedures

This final rule is considered a significant regulatory action under section 3(f) of Executive Order 12866 and was reviewed by the Office of Management and Budget. The rule is considered significant under the regulatory policies and procedures of the Department of Transportation (44 FR 11034). A regulatory evaluation is available for review in the public docket.

Executive Order 12612

This final rule has been analyzed in accordance with the principles and criteria contained in Executive Order 12612 (''Federalism''). The Federal hazardous materials transportation law (49 U.S.C. 5101–5127) contains an express preemption provision that preempts State, local, and Indian tribe requirements on certain covered subjects. Covered subjects are:

(A) The designation, description, and classification of hazardous material;

(B) The packing, repacking, handling, labeling, marking, and placarding of hazardous material;

(C) The preparation, execution, and use of shipping documents pertaining to hazardous material and requirements respecting the number, content, and placement of such documents;

(D) The written notification, recording, and reporting of the unintentional release in transportation of hazardous material; and

(E) The design, manufacturing, fabrication, marking, maintenance, reconditioning, repairing, or testing of a package or container which is represented, marked, certified, or sold as qualified for use in the transportation of hazardous material.

Because RSPA lacks discretion in this area, preparation of a federalism assessment is not warranted.

Title 49 U.S.C. 5125(b)(2) provides that DOT must determine and publish in the **Federal Register** the effective date of Federal preemption. That effective date may not be earlier than the 90th day following the date of issuance of the final rule and not later than two years after the date of issuance. This rule requires oxidizers to be transported in certain types of cargo compartments aboard aircraft and specifies overpacking requirements for cylinder of compressed oxygen. RSPA determined that the effective date of Federal preemption for the requirements in this rule concerning covered subjects is March 1, 2000.

Regulatory Flexibility Act

The Regulatory Flexibility Act of 1980 (the Act) establishes ''as a principle of regulatory issuance that agencies shall endeavor, consistent with the objective of the rule and of applicable statues, to fit regulatory and informational requirements to the scale of the business, organizations, and governmental jurisdictions subject to regulation.'' To achieve that principle, the Act requires agencies to solicit and consider flexible regulatory proposals and to explain the rational for their actions. The Act covers a wide-range of small entities, including small businesses, not-for-profit organizations and small governmental jurisdictions.

Agencies must perform a review to determine whether a proposed or final rule will have a significant economic impact on a substantial number of small entities. If the determination is that it will, the agency must prepare a regulatory flexibility analysis (RFA) as described in the Act.

However, if an agency determines that a proposed or final rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the Act provides that the head of the agency may so certify and an RFA is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be clear.

This rule will prohibit the carriage of oxidizers onboard aircraft in inaccessible cargo compartments that do not have a fire or smoke detection system and a fire suppression system. This rule will affect persons who ship oxidizers by air and the airline operators that transport oxidizers as cargo. However, it is assumed that shippers will not have to pay more to ship oxidizers by alternative means: on all-cargo aircraft that have accessible cargo compartments or cargo compartments with a fire or smoke detection system and a fire suppression system, on passenger-carrying aircraft that have cargo compartments with a fire or smoke detection system and a fire suppression system, or by other modes of transportation. It is also assumed that there will be no loss of revenue for all-cargo operators because they can transport oxidizers in class E cargo compartments or (if the aircraft is so equipped) in class C cargo compartments.

Accordingly, this rule will only reduce the freight revenues of an operator of passenger-carrying aircraft that also carry oxidizers as cargo in compartments that do not have a fire or smoke detection system and a fire suppression system. The effect of this rule on an operator certificated under 14 CFR part 121 will only last until March 19, 2001, because the class D compartments on their aircraft (i.e., those compartments without a fire or smoke detection system and a fire suppression system) must meet the standards for a class C or class E compartment by that date.

In the SNPRM, RSPA evaluated the effect of its proposed rule on part 121 operators under FAA Order 2100.A and stated that it lacked sufficient data to determine the proposed rule's economic impact on entities other than those operating under 14 CFR part 121 (e.g., part 135 operators). Although RSPA requested comments ''on the economic impact, if any, of this proposed rule on other entities,'' no comments were submitted that would assist RSPA's evaluation of the impact of this rule on small entities.

Because the FAA no longer uses the criteria in its Order 2100.A to determine who are small entities, RSPA considers that an airline operator with fewer than 1,500 employees is a small entity, under the Small Business Administration's criteria in 13 CFR part 121. RSPA reviewed air carrier traffic and revenue statistics complied by DOT's Office of Airline Information and information provided by FAA as to the air carriers approved to transport hazardous materials. These sources indicate that there is only one part 121 air carrier with fewer than 1,500 employees that carries passengers and accepts oxidizers for transportation as cargo.

There are many air carriers certificated under 14 CFR part 135 that are approved by FAA to carry hazardous materials. Many of these carriers transport only cargo. In general, they provide on-demand, rather than schedule service, and the inaccessible cargo compartment on these aircraft are small. (Most of the cargo is carried in the main compartment when there are no passengers.) RSPA does not have information on which part 135 carriers carry passengers or, more importantly, whether any of them carry passengers and hazardous materials on the same flight. Because of their limited cargo capacity and lack of schedule service, however, RSPA assumes that the passenger-carrying aircraft operated by part 135 carriers are not utilized for the transportation of oxidizers.

Accordingly, RSPA certifies that this rule will not have a significant economic impact on a substantial number of small entities.

Executive Order 13084

RSPA believes that this final rule will have no significant or unique effect on the communities of Indian tribal governments when analyzed under the principles and criteria contained in Executive Order 13084 (''Consultation and Coordination with Indian Tribal Governments''). Therefore, the funding and consultation requirements of this Executive Order do not apply.

Unfunded Mandates Reform Act of 1995

This final rule does not impose unfunded mandates under the Unfunded Mandates Reform Act of 1995. It will not result in costs of $100 million or more, in the aggregate, to any of the following: State, local, or Native American tribal governments, or the private sector. This final rule is the least burdensome alternative that achieves the objective of the rule.

Impact on Business Processes and Computer Systems (Year 2000)

Many computers that use two digits to keep track of dates may, on January 1, 2000, recognize ''double zero'' not as 2000 but as 1900. This Year 2000 problem could cause computers to stop running or to start generating erroneous data. The Year 2000 problem poses a threat to the global economy in which Americans live and work. With the help of the President's Council on Year 2000 Conversion, Federal agencies are reaching out to increase awareness of the problem and to offer support. We do not want to impose new requirements that would mandate business process changes when the resources necessary to implement those requirements would otherwise be applied to the Year 2000 problem.

This final rule does not impose business process changes or require modification to computer systems. Because the final rule does not affect organizations' ability to respond to the Year 2000 problem, we do not intend to delay the effectiveness of the requirements in the final rule.

Paperwork Reduction Act

This final rule does not impose any new information collection requirements.

Regulation Identifier Number (RIN)

A regulation identifier number (RIN) is assigned to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. The RIN number contained in the heading of this document can be used to cross-reference this action with the Unified Agenda.

List of Subjects

49 CFR Part 171

Exports, Hazardous materials transportation, Hazardous waste, Imports, Incorporation by reference, Reporting and recordkeeping requirements.

49 CFR Part 172

Education, Hazardous materials transportation, Hazardous waste, Labeling, Marking, Packaging and containers, Reporting and recordkeeping requirements.

49 CFR Part 175

Air carriers, Hazardous materials transportation, Radioactive materials, Reporting and recordkeeping requirements.

In consideration of the foregoing, 49 CFR Parts 171, 172, and 175 are amended as follows:

PART 171—GENERAL INFORMATION, REGULATIONS, AND DEFINITIONS

1. The authority citation for part 171 continues to read as follows:

Authority: 49 U.S.C. 5101–5127; 49 CFR 1.53.

2. In 171.7, in the Table of material incorporated by reference in paragraph (a)(3), a new entry is added in appropriate alphabetical order to read as follows:

§ 171.7 Reference material.

(a) * * *

(3) * * *

Source and name of material	49 CFR reference
Air Transport Association of America, 1301 Pennsylvania Avenue, N.W., Washington, DC 20004–1707	.....
ATA Specification No. 300 Packaging of Airline Supplies, Revision 19, July 31, 1996	172.102
* * * * *	

* * * * *

3. In § 171.11, paragraph (d)(15) is revised and paragraph (d)(16) is added to read as follows:

§ 171.11 Use of ICAO Technical Instructions.

* * * * *

(d) * * *

(15) A chemical oxygen generator is forbidden for transportation aboard a passenger-carrying aircraft and must be approved, classed, described and packaged in accordance with the requirements of this subchapter for transportation on cargo-only aircraft. A chemical oxygen generator (spent) is forbidden for transportation on aircraft.

(16) A cylinder containing Oxygen, compressed, may not be transported on a passenger-carrying aircraft or in an inaccessible cargo location aboard a cargo-only aircraft unless it is packaged as required by Part 173 and Part 178 of this subchapter and is placed in an overpack or outer packaging that satisfies the requirements of Special Provision A52 in § 172.102.

4. In § 171.12, paragraph (b)(18) is revised to read as follows:

§ 171.12 Import and export shipments.

* * * * *

(b) * * *

(18) A chemical oxygen generator must be approved in accordance with the requirements of this subchapter. A chemical oxygen generator and a chemical oxygen generator (spent) must be classed, described and packaged in accordance with the requirements of this subchapter.

* * * * *

5. In § 171.12a, paragraph (b)(17) is revised to read as follows:

§ 171.12a Canadian shipments and packagings.

* * * * *

(b) * * *

(17) A chemical oxygen generator must be approved in accordance with the requirements of this subchapter. A chemical oxygen generator and a chemical oxygen generator (spent) must be classed, described and packaged in accordance with the requirements of this subchapter.

PART 172—HAZARDOUS MATERIALS TABLE, SPECIAL PROVISIONS, HAZARDOUS MATERIALS COMMUNICATIONS, EMERGENCY RESPONSE INFORMATION, AND TRAINING REQUIREMENTS

6. The authority citation for part 172 continues to read as follows:

Authority: 49 U.S.C. 5101–5127; 49 CFR 1.53.

7. In the § 172.101 Hazardous Materials Table, one entry is added in appropriate alphabetical order and one entry is revised to read as follows:

§ 172.101 Purpose and use of hazardous materials table.

* * * * *

§ 172.101.—HAZARDOUS MATERIALS TABLE

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or division	Identification numbers	PG	Label codes	Special provisions	(8) Packaging authorizations (§ 173.***)			(9) Quantity limitations		(10) Vessel stowage requirements	
							Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only	Location	Other
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
	[Revised]												
	*	*		*		*		*		*		*	
	Oxygen, compressed.	2.2	UN1072		2.2, 5.1 ..	A52	306 ...	302	314, 315.	75 kg	150 kg	A	
	*	*		*		*		*		*		*	
	[Added]												
	*	*		*		*		*		*		*	
+	Oxygen generator, chemical, spent.	9	NA3356	III	9	61	None	213	None	Forbidden	Forbidden	A	
	*	*		*		*		*		*		*	

8. In § 172.102, special provision ''61'' is added in appropriate numerical sequence to paragraph (c)(1) and special provision ''A52'' is added in alphanumeric sequence to paragraph (c)(2), to read as follows:

§ 172.102 Special provisions.

* * * * *

(c) * * *

(1) * * *

Code/Special Provisions

* * * * *

61 A chemical oxygen generator is spent if its means of ignition and all or a part of its chemical contents have been expended.

* * * * *

(2) * * *

Code/Special Provisions

* * * * *

A52 A cylinder containing Oxygen, compressed, may not be loaded into a passenger-carrying aircraft or in an inaccessible cargo location on a cargo-only aircraft unless it is placed in an overpack or outer packaging that conforms to the performance criteria of Air Transport Association (ATA) Specification 300 for Type I shipping containers.

* * * * *

PART 175—CARRIAGE BY AIRCRAFT

9. The authority citation for part 175 continues to read as follows:

Authority: 49 U.S.C. 5101–5127; 49 CFR 1.53.

10. In § 175.10, paragraph (b) is added to read as follows:

§ 175.10 Exceptions.

* * * * *

(b) A cylinder containing medical-use compressed oxygen, owned or leased by an aircraft operator or offered for transportation by a passenger needing it for personal medical use at destination, may be carried in the cabin of a passenger-carrying aircraft in accordance with the following provisions:

(1) No more than six cylinders belonging to the aircraft operator and, in addition, no more than one cylinder per passenger needing the oxygen at destination, may be transported in the cabin of the aircraft under the provisions of this paragraph (b);

(2) The rated capacity of each cylinder may not exceed 850 liters (30 cubic feet);

(3) Each cylinder and its overpack or outer packaging (see Special Provision A52 in § 172.102 of this subchapter) must conform to the provisions of this subchapter;

(4) The aircraft operator shall securely stow the cylinder in its overpack or outer packaging in the cabin of the aircraft and shall notify the pilot-in-command as specified in § 175.33 of this part; and

(5) Shipments under this paragraph (b) are not subject to—

(i) Subpart C and, for passengers only, subpart H of part 172 of this subchapter;

(ii) Section 173.25(a)(4) of this subchapter.

(iii) Section 175.85(i).

§ 175.10 [Amended]

11. In addition, in § 175.10 paragraph (a)(24) is removed and reserved.

12. In § 175.85, paragraphs (h) and (i) are added to read as follows:

§ 175.85 Cargo location.

* * * * *

(h) Compressed oxygen, when properly labeled Oxidizer or Oxygen, may be loaded and transported as provided in paragraph (i) of this section. No person may load or transport any other package containing a hazardous material for which an OXIDIZER label is required under this subchapter in an inaccessible cargo compartment that does not have a fire or smoke detection system and a fire suppression system.

(i) In addition to the quantity limitations prescribed in § 175.75, cylinders of compressed oxygen must be stowed in accordance with the following:

(1) No more than a combined total of six cylinders of compressed oxygen may be stowed on an aircraft in the inaccessible aircraft cargo compartment(s) that do not have fire or smoke detection systems and fire suppression systems.

(2) When loaded into a passenger-carrying aircraft or in an inaccessible cargo location on a cargo-only aircraft, cylinders of compressed oxygen must be stowed horizontally on the floor or as close as practicable to the floor of the cargo compartment or unit load device. This provision does not apply to cylinders stowed in the cabin of the aircraft in accordance with § 175.10(b).

(3) When transported in a Class B aircraft cargo compartment (see 14 CFR 25.857(b)) or its equivalent (i.e., an accessible cargo compartment equipped with a fire or smoke detection system but not a fire suppression system), cylinders of compressed oxygen must be loaded in a manner that a crew member can see, handle and, when size and weight permit, separate the cylinders from other cargo during flight. No more than six cylinders of compressed oxygen

and, in addition, one cylinder of medical-use compressed oxygen per passenger needing oxygen at destination—with a rated capacity of 850 liters (30 cubic feet) or less of oxygen—may be carried in a Class B aircraft cargo compartment or its equivalent.

Issued in Washington, DC on August 11, 1999 under the authority delegated in 49 CFR part 1.

Kelley S. Coyner,

Administrator.

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