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ENVIRONMENTAL ASSESSMENT

RSPA-04-17664-7

Docket RSPA-04-17664 (HM-224B)

Transportation of Compressed Oxygen, Other Oxidizing Gases and Chemical Oxygen Generators on Aircraft

December, 2003

Environmental Assessment
for
Notice of Proposed Rulemaking (NPRM)
Transportation of Compressed Oxygen, Other Oxidizing Gases and Chemical Oxygen Generators on Aircraft
RSPA-04-17664 (HM-224B)

Background

The National Environmental Policy Act of 1969 (NEPA), as amended (42 U.S.C. 4321-4347) requires Federal agencies to consider the consequences of major Federal actions and prepare a detailed statement on actions significantly affecting the quality of the human environment. We are proposing revisions to the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) to require that cylinders of compressed oxygen and packages of chemical oxygen generators be placed in an outer packaging that meets certain flame penetration and thermal resistance requirements when transported aboard an aircraft. We have prepared this Environmental Assessment document in accordance with section 102(2)(c) of the National Environmental Policy Act (42 U.S.C. Section 4332), the Council on Environmental Quality regulations (40 C.F.R. Sections 1500-1508), and Department of Transportation Order 5610.1c, Procedures for Considering Environmental Impacts. This proposal was developed jointly with the Federal Aviation Administration (FAA).

Purpose of Proposed Action

Transportation of hazardous materials in commerce is subject to requirements in the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180), issued under authority of Federal hazardous materials transportation law, codified at 49 U.S.C. 5101 *et seq.* Therefore, we are proposing to revise the HMR to require that cylinders of compressed oxygen and packages of chemical oxygen generators be placed in an outer packaging that meets certain flame penetration and thermal resistance requirements when transported aboard an aircraft.

The National Transportation Safety Board found that one of the probable causes of the May 11, 1996 crash of ValuJet Airlines flight No. 596 was a fire in the airplane's cargo compartment that was initiated and enhanced by the actuation of one or more chemical oxygen generators that were being improperly carried as cargo. Following that tragedy, in which 110 lives were lost, the Department of Transportation has:

–prohibited the transportation of chemical oxygen generators (including personal-use chemical oxygen generators) on board passenger-carrying aircraft and the transportation of spent chemical oxygen generators on both passenger-carrying and cargo-only aircraft, 61 FR 26418 (May 24, 1996), 61 FR 68952 (Dec. 30, 1996), 64 FR 45388 (Aug. 19, 1999);

–issued standards governing the transportation of chemical oxygen generators on cargo-only aircraft (and by motor vehicle, rail car and vessel), including the requirement for an approval issued by RSPA, 62 FR 30767 (June 5, 1997), 62 FR 34667 (June 27, 1997);

–upgraded fire safety standards for Class D cargo compartments on aircraft to require a smoke or fire detection system and a means of suppressing a fire or minimizing the available oxygen, on certain transport-category aircraft, 63 FR 8033 (Feb. 17, 1998); and

–imposed additional requirements on the transportation of cylinders of compressed oxygen by aircraft and prohibited the carriage of chemical oxidizers in inaccessible aircraft cargo compartments that do not have a fire or smoke detection and fire suppression system, 64 FR 45388 (Aug. 19, 1999).

In the August 19, 1999 final rule (in Docket No. HM-224A), we (RSPA) amended the HMR to: (1) allow a limited number of cylinders containing medical-use oxygen to be carried in the cabin of a passenger-carrying aircraft, 49 CFR 175.10(b); (2) limit the number of oxygen cylinders that may be carried as cargo in compartments that lack a fire suppression system and require that cylinders be stowed horizontally on the floor or as close as practicable to the floor of the cargo compartment or unit load device, 49 CFR 175.85(h) & (i); and (3) require each cylinder of compressed oxygen (in the passenger cabin or a cargo compartment) to be placed in an overpack or outer packaging that meets the performance criteria of Air Transport Association Specification 300 for Type I (ATA 300) shipping containers, 49 CFR 172.102, special provision A52. Based on the comments submitted in that proceeding and our assessment of alternatives, RSPA did not adopt the proposal in the notice of proposed rulemaking in docket No. HM-224A to prohibit all transportation of compressed oxygen on passenger-carrying aircraft.

Rigid ATA 300 shipping containers are resilient, durable packaging that provides protection from shock and vibration and can be reused for at least 100 round trips. In the preamble to the August 19, 1999 final rule, we explained that testing conducted by FAA indicated that the ATA 300 container provides an "incremental" level of thermal protection for oxygen cylinders, by increasing the time before a cylinder exposed to a fire would release its contents. However, FAA's testing also indicated that the risk posed by a compressed oxygen cylinder in a cargo compartment can be further reduced, or even eliminated, if the cylinder is placed in an overpack or outer packaging that provides more thermal protection and flame resistance than the ATA 300 containers presently in use. Accordingly, we announced that we were "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." 64 FR at 45393.

This rulemaking proposes requirements for such an outer packaging for the transportation of compressed oxygen cylinders and chemical oxygen generators aboard an aircraft because additional testing by FAA indicates that additional protection is necessary for both. The proposed flame penetration standards for this outer packaging are those contained in Part III of

Appendix F to 14 CFR part 25 (Test Method to Determine Flame Penetration Resistance of Cargo Compartment Liners). This flame penetration standard specifies that the test specimen be exposed to a flame temperature of 1,700° F for five minutes. In order to pass the test there must be no flame penetration and the peak temperature 4 inches above the specimen must not exceed 400° F. The proposed thermal protection standards, to be added in Appendix D to 49 CFR part 178, would specify that, when exposed to a temperature of at least 400° F for three hours, a cylinder must remain below the temperature at which its pressure relief device (PRD) would activate, and a chemical oxygen generator must not actuate. If the requirements for improved outer packagings are adopted, we would remove the present limitation on the number of cylinders of compressed oxygen that may be transported in a cargo compartment that is not equipped with a fire suppression system, in 49 CFR 175.85(i)(1) and (3). This proposal would increase the level of safety associated with transportation of these materials aboard aircraft. This proposal was developed jointly with the Federal Aviation Administration (FAA).

Description of Action

We are proposing the following changes to the HMR:

- Amendment to require that cylinders of compressed oxygen and packages of chemical oxygen generators be placed in an outer packaging that meets certain flame penetration and thermal resistance requirements when transported aboard an aircraft.

- Amendments to: (1) revise the pressure relief device setting limit on cylinders of compressed oxygen transported aboard aircraft to better prevent a cylinder from releasing its contents when exposed to a fire; (2) limit the types of cylinders in which compressed oxygen may be transported aboard an aircraft to minimize the number of pressure relief device settings; (3) prohibit the transportation of cylinders containing other oxidizing gases aboard passenger-carrying and cargo aircraft, because a fire in a cargo compartment could overcome a fire suppression system when intensified by these materials, and (4) incorporate into the HMR many of the current provisions RSPA includes in approvals authorizing the transportation of chemical oxygen generators aboard cargo-only aircraft.

Alternatives Considered

As discussed above, revising the HMR with the proposed amendments would: (1) reduce the risk of a catastrophic fire due to the release of oxygen from an oxygen cylinder or from an oxygen generator during an on-board fire in one of the cargo compartments; and (2) increase the level of safety, resulting in the protection of people, property and the environment. In developing this rule, we considered two alternatives:

(1) Do nothing.

(2) Adopt a modified version of the changes proposed in the NPRM.

(3) Adopt the applicable changes as proposed in the NPRM.

Alternative (1). Because our goal is to further facilitate the safe and efficient transportation of hazardous materials in international commerce, we rejected the do-nothing alternative.

Alternative (2). The modification of changes as proposed in the NPRM is not sufficient to adequately protect against the risks inherent in the transportation of hazardous materials in commerce. In such instances, we believe more stringent regulations for the transportation of hazardous materials are necessary. Therefore, we rejected Alternative (2).

Alternative (3). This is the selected alternative. After a comprehensive review of the possible effects that heat from a cargo compartment fire would have on a package of properly prepared and transported chemical oxygen generators, RSPA and the Federal Aviation Administration (FAA) determined that if exposed to the heat and/or flame associated with a cargo compartment fire, a properly prepared and transported oxygen chemical generator could release oxygen and intensify the fire to the extent that the fire would overcome the compartment's halon fire suppression system and cause severe damage to the aircraft. Therefore, we will adopt the amendments to the HMR as proposed to increase the level of safety associated with the transportation of these materials aboard aircraft.

Environmental Consequences

Hazardous materials are transported by aircraft, vessel, rail, and highway. The potential for environmental damage or contamination exists when packages of hazardous materials are involved in accidents or en route incidents resulting from cargo shifts, valve failures, package failures, or loading, unloading, or handling problems. The ecosystems that could be affected by a release include air, water, soil, and ecological resources (for example, wildlife habitats). The adverse environmental impacts associated with releases of most hazardous materials are impacts that can be greatly reduced or eliminated through prompt clean-up of the accident scene.

The hazardous material regulatory system is a risk management system that is prevention-oriented and focused on identifying a hazard and reducing the probability and quantity of a hazardous material release. Hazardous materials are categorized by hazard analysis and experience into hazard classes and packing groups. The regulations require each shipper to classify a material in accordance with these hazard classes and packing groups; the process of classifying a hazardous material is itself a form of hazard analysis. Further, the regulations require the shipper to communicate the material's hazards through use of the hazard class, packing group, and proper shipping name on the shipping paper and the use of labels on packages and placards on transport vehicles. Thus the shipping paper, labels, and placards communicate the most significant findings of the shipper's hazard analysis. A hazardous material is assigned to one of three packing groups based upon its degree of hazard, from a high hazard, Packing Group I to a low hazard, Packing Group III material. The quality, damage resistance, and performance standards of the packaging in each packing group are appropriate for the

hazards of the material transported.

Revisions to the Hazardous Materials Regulations (HMR). In this NPRM, we are proposing to amend the HMR Amendment to require that cylinders of compressed oxygen and packages of chemical oxygen generators be placed in an outer packaging that meets certain flame penetration and thermal resistance requirements when transported aboard an aircraft. We are also proposing to revise the pressure relief device setting limit on cylinders of compressed oxygen transported aboard aircraft; limit the types of cylinders authorized to transport compressed oxygen aboard aircraft; prohibit the transportation of all oxidizing gases, other than compressed oxygen aboard cargo and passenger aircraft; and convert most of the provisions of an oxygen generator approval into the HMR. Overall, the revisions to the HMT will result in an increased level of safety associated with transportation of these materials aboard aircraft.

Conclusion

Based on the foregoing analysis, we have determined that there are no significant environmental impacts associated with this NPRM.

List of Agencies and Persons Consulted

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