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Docket Management Systems
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Washington, DC 20590-001

Subject: Comments on Proposed Rule Making by the Research and Special Programs Administration (RSPA)

Reference: Docket Number RSPA-04-17664 (HM-224B)
RIN 2137-AD33
Hazardous Materials Regulations: Transportation of Compressed Oxygen, other Oxidizing Gases and Chemical Oxygen Generators on Aircraft.

Comments Concerning the RSPA-04-17664 (HM-224B), Transportation of Compressed Oxygen

Scott Aviation, Inc, a subsidiary of Scott Technologies, Inc., is a major supplier of oxygen systems and components to the aviation industry. Scott Aviation has been supplying aviation oxygen devices since World War II. Scott Aviation is one of the two U.S. manufacturers of chemical oxygen generators for aviation use and is a major supplier of oxygen system components, including cylinder and valve assemblies for use with pressurized oxygen, to the aviation community.

Scott Aviation, as a supplier to the aviation community, agrees that there is a legitimate need to transport oxygen cylinders, chemical oxygen generators and assemblies containing oxygen generators, by air, in order to facilitate the maintenance and continued airworthiness of aircraft. Although Scott, as a manufacturer, ships much of its newly manufactured equipment by surface transportation, there is a continuing need to make certain emergency shipments by air in order to minimize the amount of time an aircraft is grounded waiting for replacement components. In addition, in order to maintain a competitive position in the European marked for such equipment, Scott finds itself required by its European customers, from time to time, to ship new product, including chemical oxygen generators and oxygen cylinders, to Europe by air.

In addition to the required shipment of new parts by air, Scott Aviation operates three aviation oxygen repair facilities certified under 14 CFR Part 145, one in Western New York State, one in Kentucky and one in California. These facilities receive, from aircraft operators, a constant stream of aviation oxygen cylinders for repair and maintenance. In many cases, the aircraft operators owning these assemblies, ship them to Scott by air and request return shipment by air in order to minimize the amount of time their aircraft are grounded waiting for parts.

In Response to Request for Comment Numbers 2 and 3

Request for Comment number 2 asks for information on the number of different types of packaging which would be needed for the shipment of oxygen cylinders and oxygen generators. Request for Comment number 3 asks if the oxygen cylinders in service are such that they could be accommodated by a limited number of outer packages. In response to the August 19, 1999, Final Rule on shipping oxygen cylinders by aircraft, Scott determined that a minimum of nine (9) different sized ATA 300 specification containers are required to accommodate all of the high-pressure oxygen cylinders currently supplied by Scott to the aviation industry. It is unknown to Scott how many additional size packages may be required to properly accommodate high pressure oxygen cylinders supplied by other entities or to accommodate cylinder configurations for new aircraft development programs.

The number of different outer containers, which would be required to accommodate chemical oxygen generators, requires a different analysis. Chemical oxygen generators are currently shipped by air either as components or as part of larger assemblies. As components, all chemical oxygen generators currently in use as aircraft parts are fundamentally cylinders, 2 ½ to 4 inches in diameter and 5 to 11 inches in overall length. Therefore, variations in outer package size would depend less on variations between individual chemical oxygen generators and more on whether the shipping requirement is for a single generator or a group of generators.

The proposed rule would reword paragraph 173.168 (d) to require that "...a chemical oxygen generator installed in equipment, (e.g., a PBE) must be placed in a rigid packaging..." that conforms to the requirements that is capable of meeting the flame penetration and thermal resistance requirements of this proposed rule for shipment by air. PBE's, or Personal Breathing Equipment, manufactured by Scott, are all one size and shape and, therefore, one size outer package may suffice for Scott. Other manufacturers offering PBE's will most likely need a different outer package.

PBE's are not the only aviation "equipment" in which oxygen generators are installed. In certain aircraft, it may be practical to replace just the chemical oxygen generator when maintenance is required. However, in other aircraft, it may be safer and more effective to replace what is termed the "dropout box", rather than just the oxygen generator. The dropout box is an assembly which contains one or more oxygen masks, a chemical oxygen generator and the related equipment needed to cause the box to open and the masks to deploy during a depressurization event.

Chemical oxygen generators are often contained in what are termed passenger service units, or PSU's, which are segments of the cabin interior ceiling containing a chemical oxygen generator, several passenger oxygen masks, the reading lights, ventilation ducting, attendant call button and other associated appliances. The great variety of sizes and shapes of these assemblies strongly suggests that a large number of different sized packages may be required or that these items may have to be disassembled, their chemical oxygen generators be removed for shipment in a separate package and the items then be reassembled at their destination. Disassembly for shipment and subsequent reassembly increases cost and increases the possibility of mis-assembly and the subsequent failure of the oxygen equipment to function properly in an emergency.

In Response to Request for Comment Number 5

Request for Comment number 5 asks, "What would be the estimated cost for an outer packaging that meets the proposed thermal and flame penetration resistance requirements?" Scott has attempted to answer this question and, to date has been unable to. Scott has contacted the major container suppliers offering packaging for oxygen cylinders and has been unable to locate a company willing to offer such containers. Therefore, Scott has been unable to determine an estimated cost for these packages.

Request for Comment number 5 also asks the average cost of currently used outer packages. In response to Request for Comment number 2, above, Scott noted that it currently requires nine different ATA 300 specification containers to accommodate the various high pressure oxygen cylinders supplied by Scott. These containers range in price from approximately $300 to approximately $500 each in small quantities.

Comments Concerning the Number of Reusable Packages Required by Small Entities and Others

Scott notes that, in its analysis, RSPA has attempted to analyze the impact of this rule on small aviation entities and determined that only a very few such entities will require flame and heat protective reusable packaging. RSPA apparently reached this conclusion by attempting to determine how many small aviation entities transport oxygen cylinders as freight, rather than in the aircraft cabin. Scott believes that this inquiry overlooks the major potential impact of this rule on small entities. Scott believes that a better inquiry is the number of small entities that rely on the ability to ship oxygen cylinders by air, even though the actual transportation may be provided by a large entity such as a major aircraft operator.

As mentioned above, Scott operates three aviation oxygen repair stations across the country. Scott receives approximately five oxygen cylinders, shipped to it by air, each workday at its New York facility and approximately two oxygen cylinders shipped

by air each day at each of its facilities in Kentucky and California. In virtually all cases, when the cylinder was shipped to the repair station by air, the cylinder owner has requested return shipment by air. Therefore, between them, three Scott repair stations receive and initiate approximately 2,800 shipments of oxygen cylinders by air each year.

Many small aircraft operators do not provide their own oxygen system maintenance or have extensive spare part inventories but, rather, rely on the shipping of these components to specialized oxygen repair stations, by air, in order to maintain their aircraft in a timely manner. Under the proposed rule, these entities would have to obtain outer packages meeting the requirements of this proposed rule in order to ship oxygen cylinder and valve assemblies and oxygen cylinder and regulator assemblies to oxygen service shops for maintenance. These outer packages would then be used to return these items back to the operator in the same manner that the present rule has required the operators to purchase ATA 300 specification containers for that purpose. Therefore, Scott believes the economic impact on small operators may be greatly understated.

In Response to Request for Comment Number 7

Request for Comment number 7 asks if a one-year implementation period will provide sufficient time to implement the proposed rule and whether it could be implemented in less than one year. As stated above, Scott believes that the need to transport oxygen cylinders and oxygen generators by air in order to support the maintenance requirements of United States aircraft operators extends beyond aircraft operators transporting their own oxygen cylinders and generators on their own aircraft and includes the air shipment of aviation oxygen components to and from repair stations. There are over fifty aircraft repair stations certified by the FAA under Part 145 as capable of maintaining aircraft oxygen systems. Although many such certified repair stations are "captive", in that they are operated by major airlines for the purpose of maintaining that operator's air fleet, Scott is aware of at least twenty independent aviation oxygen repair stations in addition to the three stations operated by Scott. Therefore, Scott believes that the demand for reusable flame and heat-resistant packages, required by the proposed rule, may be much higher than RSPA currently envisions. This fact, taken together with the lack of response by suppliers of reusable packaging mentioned in the response to Request for Comment Number 5 above, strongly indicates that the process of developing, manufacturing and staging these packages may take longer than the proposed one year implementation period.

Comments Concerning the Need to Ship Composite Cylinders by Air

Scott notes the proposed rule limits the oxygen cylinders which may be transported by aircraft to DOT Specification 3A, 3AA, 3AL and 3HT cylinders. RSPA relies on the fact that these four types of cylinders account for the "majority" of the cylinders used in aviation oxygen systems today. In actuality, the bulk of the oxygen cylinders in aviation service today are DOT specifications 3AA and 3HT cylinders. These two types of steel cylinders represent the majority of oxygen cylinders in aviation

service because, for many years, steel cylinders were the only option for aviation service. Starting ten to fifteen years ago, composite cylinders manufactured under Exemption and in accordance with DOT Specification DOT-FRP-1, began to be used in aviation oxygen systems. More recently, composite cylinders manufactured under DOT-CFFC began to be widely used in aviation service.

Composite cylinders are basically thin, lightweight aluminum liners, reinforced with high-tensile strength fibers wound onto the exterior of the cylinder and set with epoxy-type resins. These cylinders, manufactured under individual Exemption numbers, or "E" numbers issued by RSPA, allow for the same amount of oxygen to be carried in a cylinder weighing far less that its steel counterpart. This reduction in weight for the same purpose performed is extremely valuable to those who operate aircraft, but is especially valuable to the operators of the new, small, regional jet aircraft and to operators of general aviation aircraft equipped with oxygen systems.

Five years ago, in 1999, 17.7% of all oxygen cylinders shipped by Scott were composite-type cylinders while the remaining 82.3% were steel. In 2002 and 2003, composite type oxygen cylinders made up approximately 25% of all the new oxygen cylinders shipped by Scott. Further, in the last two or three years, virtually all the requests for quotation concerning oxygen equipment for new aircraft, currently being designed, have specified that composite-type cylinders be included in the equipment.

Scott believes that in failing to provide for the transportation by air of composite cylinders, RSPA is taking a step which will cause hardship in the aviation community. If rapid shipment of oxygen cylinders for maintenance and emergency repairs is not possible, aircraft operators, especially operators of small transport and general aviation aircraft, will be reluctant to include composite cylinders in their aircraft and the advantages of weight reduction and associated fuel burn reduction, offered by the use of composite-type cylinders, will be foregone. Scott believes that the proposed rule needs to be revised to include the transportation by air of composite oxygen cylinders, in order to avoid stifling innovation in aircraft oxygen system design.

Comments Requesting Clarification of Proposed Rule

Request for Comment number 11 asks for information on the number of cylinders affected by the proposal to require pressure relief devices (PRD) with a rating between test pressure and minus ten percent of test pressure. Even though the May 6, 2004 Notice states RSPA's intention is to leave the PRD at 90% of test pressure for specification 3HT cylinders, the proposed wording of the rule appears to contradict this. In the last sentence of the second paragraph of Subsection B Section III of the May 6, 2004 Notice, on page 25472, the statement is made "For oxygen transported in DOT 3HT specification cylinders, we propose that the PRD have a rated burst pressure of 90% of the cylinder test pressure with allowable tolerances of -10 to plus zero percent." However, the wording of the proposed paragraph 173.302a, appearing on page 25477 of the May 6, 2004 Notice, states, in part:

"(e)...

"(1)...
"(2)...and DOT 3HT cylinders must be equipped with a rupture disk type PRD only. The allowable tolerance of a PRD must be -10 to zero percent of the cylinder minimum test pressure."

Taken literally, zero percent of cylinder minimum test pressure is zero but, more importantly, this subparagraph requires DOT 3HT cylinders to be equipped with a PRD and then states that PRD's must be related to the "cylinder minimum test pressure".

Scott believes, but cannot be certain, that RSPA meant to state in the proposed wording of paragraph 173.302e (2) "the allowable tolerance of a PRD must be the rated burst pressure of the PRD plus 0% to minus 10%". Scott believes this subparagraph must be rewritten for clarity.

Comments Recommending Revision of the Changes Proposed to Paragraph 173.302a

On August 8, 2002, RSPA promulgated a final rule which, among other things, revised 173.301(f)(3) to require certain DOT specification 3-series cylinders to be equipped with a PRD set at test pressure +0/-10% at the time of their first requalification after October 1, 2002. After various appeals, the rule now requires these cylinders to be so equipped at their first requalification after December 31, 2003. This rule applies to all cylinders offered for transportation in the United States and filled with gases other than Division 2.2 gases. Oxygen, compressed, is considered a Division 2.2 gas under paragraph 172.101.

The rule proposed in the May 6, 2004 Notice, essentially requires that cylinders filled with oxygen, which were exempt from the August 8, 2002 rule, now be equipped with a PRD set at test pressure +0/-10%. A major difference between the currently proposed rule and the rule promulgated on August 8, 2002, is that the rule promulgated on August 8, 2002 provided for an orderly transition process and included a mechanism to positively identify cylinders which comply with the new rule. The currently proposed rule, with a proposed compliance date of one year after promulgation, provides neither the time necessary for an orderly process of insuring compliance nor with a mechanism by which compliance can be readily determined.

The August 8, 2002 rule, by requiring that cylinders, incorporating PRD's which do not, or may not comply with the new rule, be fitted with compliant PRD's at the next requalification date after the promulgation of the rule, has the result that a cylinder which bears a valid requalification mark dated after the compliance date is known to comply with the rule. The requalification interval for specification 3AA cylinders is five years and for specification 3HT cylinders is three years.

Scott recommends that the rule proposed in the May 6, 2004 Notice be revised to indicate that the requirement for PRD, with a burst pressure of 100% of test pressure plus zero minus ten percent for specification 3A, 3AA, 3AL cylinders and 90% of test

pressure plus zero minus ten percent for specification 3HT cylinders, apply to cylinders beginning with each individual cylinder's requalification date at some point after the promulgation date of the new rule. This will provide for a positive identification, in the form of the presence of a valid requalification mark on the cylinder, so the person offering the cylinder for transport can be certain that the cylinder complies with the rules for transport.

There is another compelling reason to consider an orderly and time-phased process for assuring that the oxygen cylinders transported by air fully comply with the proposed rule. As stated above, the majority of the oxygen cylinders in aviation service today are DOT specification 3AA and DOT specification 3HT cylinders. Historically, the 3AA specification cylinders were placed into service before the 3HT specification cylinders. In many instances, the 3HT specification cylinders, when they became available, were utilized in applications where the heavier 3AA specification cylinders were previously used. In those cases, the neck threads of the 3AA specification cylinders and the 3HT specification cylinders are identical and the same valves or regulators can be attached to either the 3AA or the 3HT specification cylinders.

The 3AA specification cylinders and the 3HT specification cylinders used in aviation service do not have the PRD mounted in the cylinder itself. The PRD, in such cylinders, is housed in the valve or regulator attached to the cylinder. The 3AA specification cylinders used in aviation oxygen service have a rated pressure of 1800 psi and, therefore, a test pressure of 3000 psig. The 3HT specification cylinders in aviation oxygen service have a rated pressure of 1850 psi and, therefore have a test pressure of 3083 psi. The regulations in force up to now require that the PRD in a 3AA specification aviation oxygen cylinder actuate before test pressure (3000 psi) is exceeded with no specified lower limit. The regulations in force up to now require that the PRD in a 3HT specification aviation oxygen cylinder actuate before 90% of test pressure (3083 x .9 = 2775 psi) is exceeded with no specified lower limit.

Based on the above, Scott has, over the last forty years, provided in excess of 50,000 valves and regulator assemblies for use with 3AA and 3HT specification aviation oxygen cylinders incorporating a PRD that actuates between 2500 psi and 2775 psi. When mounted on a 3HT specification cylinder, such valves and regulator assemblies would comply with the proposed rule but, when mounted on 3AA specification cylinders, such valves and regulator assemblies would not comply with the proposed rule. It is not known how many of these valves and regulator assemblies are mounted on 3AA specification cylinders. However, a check of Scott's records indicates that approximately one hundred of these valves or regulators, mounted on 3AA specification cylinders, have been supplied each year as new or replacement assemblies in the last seven years.

In order to comply with the proposed rule, all 3AA specification aviation oxygen cylinders, which are equipped with such valves or regulators, will have to be identified and the PRD changed to one that actuates between 3000 psi and 2700 psi. This change of PRD will mean that the valves and regulator are no longer interchangeable

between 3AA specification cylinders and 3HT specification cylinders and, therefore these valves and regulators will be required to be identified with a new and distinct part number.

Because these valves and regulator assemblies are intended for installation in aircraft certified by the FAA, the new valve and regulator part numbers will have to be approved for use in the aircraft by the aircraft certificate holder. This will require changes to the aircraft parts list and maintenance documents. All the required changes can certainly be made, as long as sufficient time is allowed to implement them. Scott believes that the time necessary to implement the various changes required would be a year at the very least.

Scott requests that the proposed changes to paragraph 173.302a include the following language:
173.302a
* * *
(e)
* * *
(1) Only DOT Specification 3A, 3AA, 3AL, 3HT and [the appropriate reference to composite cylinders approved under DOT Exemptions] cylinders are authorized.
(2) Cylinders must be equipped with a pressure relief device (PRD) in accordance with §173.301(f), except that, beginning with the first requalification due [date one year after the promulgation of this regulation], the rated burst pressure of a rupture disk for DOT 3A, 3AA and 3AL cylinders must be 100% of the cylinder minimum test pressure and DOT 3HT cylinders must be equipped with a rupture disk type PRD only. The allowable tolerance of a PRD must be the rated burst pressure of the PRD plus zero % to minus 10%.

Scott would like to thank the agency for considering these comments on the proposed rule.

Sincerely,

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