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to

Docket Management System
U.S. Department of Transportation
400 Seventh Street, SW.
Nassif Building
Room PL402
Washington DC 20590-001
U S A

Comment on NPRM concerning HMR
Ref. RSPA-04-17664 (HM-2248 / RIN 2137-AD33)

Dear Madam, Dear Sir,

Intertechnique thanks the RSPA Administration for offering the opportunity to comment on the subject matter.

As you know, Intertechnique, member of Zodiac, is a world leader in the supply of oxygen systems and equipment.

Please find hereafter our comments on your proposed amendments.

PART 173

§ 173.302a

(e) (1) Should not be limited to steel cylinders. Today, for mass reduction of aircraft, many cylinders are made of composite material (DOT exemptions). Restricting transportation to steel cylinders will create many logistics issues among the aviation community using composite cylinders.

(2) Increasing the pressure relief device setting does not drastically change the safety level. The leaking of the cylinder will be delayed until the temperature is higher (as the pressure), but the energy released at the moment of bursting of the device will be higher, thus propelling oxygen with a higher flow and a larger velocity to a larger area.

For cost reasons and ease of maintenance, most PRD are standard items. Changing the PRD's to match the new requirements will create cost increase and delay the operation of cylinders. Reliability of PRD with a smaller tolerance needs to be addressed

Proof pressure varies from steel to composite cylinders. Today, the same PRD can be used for both types. Changing the tolerance will lead to duplicating the PRD part numbers, leading to cost increase, and creating confusion in the workshops (risk of mounting the high proof pressure PRD on a low proof pressure cylinder).

(3) It must be stated that the packaging should include a pressure balancing device (PBD) (be it a simple hole covered with metal fabric to stop the flames), to prevent packaging burst due to pressure change within the cargo compartment both upon climb and descent. The PBD must be designed to cope with the high flows induced by a rapid decompression. The PBD must be designed to prevent the packaging burst upon bursting of the cylinder PRD. (This appears to be a very challenging issue, as the oxygen flow is very high, and the packaging burst pressure very low).

In case of rapid descent of a burning compartment, high temperature gas will enter the packaging through the PBD, increasing the internal temperature of the packaging. Calculation should be performed to check if it is still compatible with the internal temperature requirements.

In case of small cylinder leak, oxygen will accumulate inside the packing, rather than being vented to the cargo compartment atmosphere, where it is readily diluted in a large volume of air. The oxygen concentration within the packing might become hazardous in case of a fire.

Cost Impact

Introduction such a packaging will lead to cost increase of the shipment of cylinders from the cylinder manufacturer to the aircraft manufacturer, to the airline and to and from the maintenance sites.

It is estimated that our costs will be highly impacted.

Our company delivers about 500 new cylinders per year that will need a container.

Those containers delivered to aircraft manufacturers may be sent back for future shipment (with an estimated loss of 20 % per year).

The containers of cylinders shipped to airlines will be kept and used by the airlines for their own shipment of repair, and we will have to buy new ones for each shipment.

Cylinders coming back for repair will often have containers out of order. We estimate a replacement rate of 10% per year.

Our best estimate is a need of 300 new containers per year, leading to an average cost increase of the oxygen cylinders and repairs of 10 to 15 % depending on the final cost of containers that are not available on the market yet.

(7) Should be added : Paragraph (e) (3) does not apply to cylinders that are transported with a residual pressure of oxygen lower than 100 psi.

Many cylinders are shipped before filling (new cylinders, or repaired cylinders) or after being emptied (for maintenance). They only contain a limited quantity of pure oxygen to prevent contamination of the cylinder. The hazards created by such “empty” cylinders are negligible. They could be carried with no restriction.

(8) Should be added ? : Equipment containing an oxygen cylinder that is not readily apparent must be considered as an oxygen cylinder.
This is the case of a large number of PBE.

PART 175

§ 175.10 Exceptions

(b)

(2) The oxygen cylinders used for carrying supplemental oxygen on board often have a large capacity (up to 213 cubic feet). They have to be transported from their manufacturing site to the aircraft manufacturing facility, to and from the maintenance facilities. Transportation by ground or sea would increase the turn around times, thus increasing operation cost.

Cylinder with oxygen residual pressure lower than 100 psi should be excepted from this rule.

PART 178

Appendix D to Part 178

A procedure to fight against fire consists in depressurizing the aircraft. Test should include a rapid pressure change of the test chamber to simulate rapid decompression followed by a rapid descent of the burning aircraft. This decompression should not lead to bursting the packaging.

The ingestion of hot gas into the packaging during descent may lead to a rapid increase of the internal temperature that should be evaluated before the introduction of this regulatory change.

Conclusion

The cost impact of this amendment has to be reviewed in light of the number and of the nature of cylinders carried on board aircraft today. The large number of large cylinders (up to 213 cubic feet) and of composite cylinders used by the airlines has not been taken into account. The transportation of PBE that contain oxygen cylinders has to be included in the cost impact evaluation as well.

The impact of cylinders design changes on safety has to be addressed considering the marginal safety gain due to the pressure range versus the risk introduced by new PSD's on cylinders in maintenance operation as well as in a fire environment. The cost and reliability of PSD with smaller tolerance has to be evaluated. The cost of inventory for a larger variety of PSD has to be evaluated.

A safe packing has to be vented both ways to cope with cargo compartment pressure changes with altitude. Therefore, its protection against the ingestion of hot gas becomes a real issue that has to be addressed.

Cylinders shipped with residual pressure should be excluded from the outer packing requirement.

Best regards.

Michel Bardel
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Intertechnique