UNITED STATES OF AMERICA

NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C.

ISSUED: April 12, 1971

Adopted by the NATIONAL TRANSPORTATION SAFETY BOARD
at its office in Washington, D. C.
on the 24th day of March 1971

FORWARDED TO:
Honorable John H. Shaffer
Administrator
Federal Aviation Administration
Washington, D. C. 20590

SAFETY RECOMMENDATION A-71-18

The National Transportation Safety Board is currently investigating a ground-fire incident involving a United Air Lines 737. This incident occurred during oxygen replenishment while the aircraft was parked on the loading ramp at National Airport on December 31, 1970.

The facts thus far developed indicate that a flash fire originated in the fuselage interior area near the external oxygen-charging panel during the servicing operation. The loss of oxygen system integrity in the vicinity of the oxygen bottles caused a complete depletion of the system. As a result of this failure, oxygen under high pressure entered the aircraft interior and accelerated the flame propagation.

Extensive smoke and fire damage resulted as the oxygen-fed fire spread through the first-class and crew compartments. The smoke and fire damage were very similar to those resulting from other oxygen-fed aircraft fires that have occurred during the past several years.

Although this particular incident was not associated with flight, and there was no passenger involvement, the Board is concerned with the possible tragic consequences which could occur under similar circumstances should passengers be on board. The dangers of a fire intensified by an oxygen-enriched atmosphere are well known. It is conceivable that such an incident could result in injuries and fatalities to passengers.

The National Transportation Safety Board is cognizant of the General Notice published by Flight Standards on January 5, 1971, relative to oxygen system servicing and system area cleanliness. We agree that continued awareness of cleanliness on the part of the operator is essential

in alleviating risks associated with high-pressure oxygen systems, and we believe that your staff should be complimented on the prompt issuance of the notice. However, because of the relatively high risks involved, we believe that the servicing of such systems should be prohibited while passengers are on board. Accordingly, it is recommended that:

> The Federal Aviation Administration institute appropriate regulatory action to prohibit the servicing of oxygen systems while passengers are on board.

It is worthy of note that the operator involved in this incident has taken steps to prohibit oxygen service on the B-727 and DC-8-61, as well as the B-737 aircraft, while passengers are on board.

Moreover, although the past record pertaining to ground fuel fires appears to be good, the subject incident brings to mind that current operating procedures might present a similar potential for a fueling ground fire. For this reason, it is suggested that you reappraise the risks inherent in the current practice of refueling aircraft with passengers on board.

Members of our Bureau of Aviation Safety Staff will be available for consultation in this matter if desired.

This recommendation will be released to the public on the issue date shown above. No public dissemination of the contents of this document should be made prior to that date.

Reed, Chairman, Laurel, McAdams, Thayer and Burgess, Members, concurred in the above recommendation.

By: John H. Reed
Chairman

ATTACHMENT 2

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

[14 CFR Part 91]

[Docket No. 10[illegible]; Notice 71-21]

REPLENISHING AND MAINTENANCE OF OXYGEN SYSTEMS

Notice of Proposed Rule Making

The Federal Aviation Administration is considering amending Part 91 of the Federal Aviation Regulations to prescribe safety requirements governing the presence of persons on board a civil aircraft of U.S. registry when certain work is being performed on the oxygen system of the aircraft.

Interested persons are invited to participate in the making of the proposed rule by submitting such written data, views, or arguments as they may desire. Communications should identify the regulatory docket or notice number and be submitted in duplicate to: Federal Aviation Administration, Office of the Chief Counsel, Attention: Rules Docket, AGC-24, 800 Independence Avenue, SW, Washington, D.C. 20591. All communications received on or before September 9, 1971, will be considered by the Administrator before taking action on the proposed rule. The proposals contained in this notice may be changed in the light of comments received. All comments submitted will be available, both before and after the closing date for comments, in the Rules Docket for examination by interested persons.

The Federal Aviation Regulations do not prohibit the replenishment or maintenance of oxygen systems with persons on board the aircraft. The oxygen system of [illegible] is for the [illegible] distribution of oxygen to crewmembers and passengers. The oxygen is stored in cylinders that require replenishment of the oxygen by cylinder replacement, or by on-board recharging of the cylinders through an oxygen external fill system. Problems involving the procedures for replenishment or maintenance of the oxygen systems were brought to public attention as a result of a ground fire on December 1[illegible] involving a B-707 aircraft. As a result of the National Transportation Safety Board's investigation of the incident, the Board recommended [illegible] on board, unless certain conditions are met. In addition the proposal would prohibit the recharging of an oxygen cylinder installed in an aircraft while persons other than those performing maintenance are on board the aircraft. The proposed amendment would apply to all civil aircraft of U.S. registry equipped with an oxygen system.

(Sec. 313(a), 601, 603, and 605 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1424, and 1425), and section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)))

In consideration of the foregoing, it is proposed to amend Part 91 of the Federal Aviation Regulations by adding a new § 91.169 after § 91.167 to read as follows:

§ 91.169 Replenishing and maintenance of oxygen systems.

No person may perform the following while any person is on board an aircraft whose presence is not necessary for performing maintenance on that aircraft:

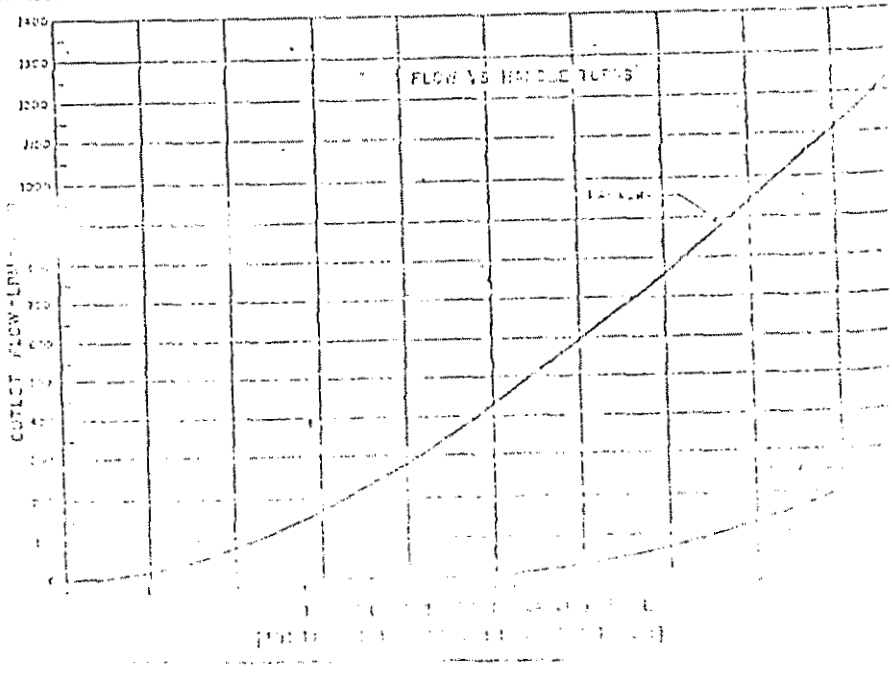
(a) Replenish the oxygen system by recharging an oxygen cylinder while it is installed in the aircraft.

(b) Replace an oxygen cylinder in the aircraft, or perform other maintenance on the oxygen system, unless the following conditions exist:

(1) An evacuation route and personnel to supervise an evacuation are provided by the operator for each aircraft occupant.

(2) The aircraft oxygen pressure following the oxygen cylinder is limited to a maximum of 450 p.s.i. by pressure reduction or by flow limiting valves directly connected to the oxygen supply cylinder outlet, or both.

(3) All oxygen supply cylinders installed in the aircraft are equipped with manual slow opening type valves. For purposes of this section a slow opening type valve is defined as a valve in which the flow characteristics for any number of turns of the valve handle do not exceed the limits shown in the following chart at any inlet pressure from [illegible] to 2,150 p.s.i.g.:



Issued in Washington, D.C., on [illegible], 1971.

C. R. Manders, Jr.
Acting Director,
Flight Standards Service