



National Transportation Safety Board

Washington, D. C. 20594

Safety Recommendation

Date: September 21, 1988

In reply refer to: A-88-106 through -108

Honorable T. Allan McArtor
Administrator
Federal Aviation Administration
Washington, D.C. 20591

At 2300 on February 11, 1987, the crew of a Boeing 747-122, N4718U, registered to and operated in scheduled revenue service by United Airlines as flight UA108, received a bomb threat while en route from Chicago, Illinois, to Newark, New Jersey. Three flightcrew members, 11 flight attendants, and 227 passengers, including 2 infants and 1 nonrevenue passenger, were on board the airplane. An emergency was declared to Cleveland Air Route Traffic Control Center, and the captain decided to divert and land at Detroit, Michigan. The captain notified the No. 1 flight attendant of the threat and directed her to prepare the passengers for an emergency landing and a possible evacuation. The airplane landed successfully on the runway at Detroit, where it was met by airport crash/fire/rescue equipment. Because of the deadline stated in the bomb threat, all airplane occupants were evacuated using the escape slides/rafts. Two passengers sustained injuries (one serious) when the slide/raft located at door 5R detached from the airplane and fell to the ground. During the evacuation, a total of 16 passengers sustained minor injuries, and 3 sustained serious injuries.¹

The flight attendant at door 5R said that the door opened slowly, that a passenger helped her push open the door, and that she did not think the "power assist was operating." She stated that, "The slide seemed to take a long time to inflate and when it finished, it didn't look completely filled to me." The flight attendant pulled a white handle, believing it to be the manual slide inflation handle, as a backup to the automatic inflation system and sent the first two passengers down the slide. The slide separated from the airplane and the two passengers dropped to the runway. One passenger sustained a sprained back, and the other sustained a compression fracture of the L-4 vertebra, a separated right shoulder, and neck contusions.

Examination of the 5R slide revealed that it had detached at the designed separation point between the girt and the slide/raft. The red manual inflation handle with its white and red "PULL" label was found in its proper place in the right

¹For more detailed information, read Field Accident Brief No. 1796 (attached).

side of the girt flap. The white handle with its red "PULL" label that released the slide/raft from the airplane was not present.

The physical evidence and the statement by the flight attendant clearly indicated that the wrong handle was pulled. The error was not recognized until the two passengers had been sent out the door and the slide had separated from the airplane.

The Safety Board found four factors that contributed to the flight attendant pulling the wrong handle: (1) the size of the instruction placard, (2) the location of the placard, (3) the lack of a standard location for the manual inflation handle, and (4) the shape of the manual inflation handle. The instruction placard was located in the center of the girt so that it could be used with a manual inflation handle on either the left or right side of the girt. A red arrow which was located away from the placard pointed to the manual inflation handle. The text on the placard was lengthy, and the placard was not located near the actual handle. Also, the text on the placard was in smaller letters than the instructions for operation of the slide/raft separation handle. Both handles were constructed of a cloth loop which eliminated the ability to make a tactile determination of whether the correct handle had been located. The Safety Board believes that these four problems can be resolved by: (1) increasing the size and simplifying the text of the placard to read "PULL TO INFLATE"; (2) locating the placard closer to the manual inflation handle; (3) locating all inflation handles on slides and slide/rafts in a standard location; and (4) requiring that the manual inflation handle be a standard design and constructed differently than the slide/raft release handle. One type of inflation handle used on evacuation slides has a rigid cross member with luminescent instructions. This type of handle can be differentiated visually or tactilely from the slide/raft separation handle.

Technical Standard Order (TSO) C69a, *Emergency Evacuation Slides, Ramps, and Slide/Raft Combinations*, permits more than one location for the manual inflation handle; consequently, manual inflation handles can be found on the right side, left side, and in the center of the girt depending on the slide manufacturer and airplane type. Obviously, a standard location for manual inflation handles can simplify flight attendant training and eliminate the present situation of multiple locations of inflation handles which makes training confusing and can cause the wrong handle to be pulled.

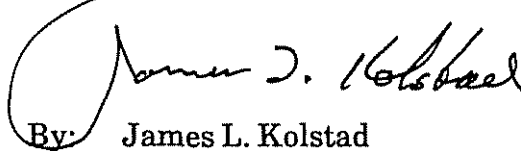
Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Revise TSO-C69a, *Emergency Evacuation Slides, Ramps, and Slide/Raft Combinations*, to require that the manual inflation handle include a rigid cross member with a luminescent placard labeled "PULL" and to require that the slide/raft separation handle be constructed of a flexible cloth loop. (Class II, Priority Action) (A-88-106)

Revise TSO-C69a, *Emergency Evacuation Slides, Ramps, and Slide/Raft Combinations*, to require standard text for emergency handle placards, e.g., "PULL TO INFLATE," and to require that the text on the placard be located as close to the appropriate manual handle as possible. (Class II, Priority Action) (A-88-107)

Revise Section 4.16.3 of TSO-C69a, *Emergency Evacuation Slides, Ramps, and Slide/Raft Combinations*, to require that the manual inflation handle be located in a standard location in all aircraft. (Class II, Priority Action) (A-88-108)

KOLSTAD, Acting Chairman, and BURNETT, LAUBER, NALL, and DICKINSON, Members, concurred in these recommendations.

A handwritten signature in cursive script, appearing to read "James L. Kolstad". The signature is written in dark ink and is positioned above the typed name.

By: James L. Kolstad
Acting Chairman

National Transportation Safety Board
Washington, D.C. 20594

Brief of Accident

File No. - 1796 | 2/11/87 | DETROIT, MI | A/C Reg. No. N4718U | Time (Lcl) - 2317 EST

-----Basic Information-----

Type Operating Certificate-AIR CARRIER - FLAG/DOMESTIC
Name of Carrier - UNITED AIRLINES
Type of Operation - SCHEDULED, DOMESTIC, FAX/CARGO
Flight Conducted Under - 14 CFR 121
Accident Occurred During - STANDING

Aircraft Damaged	None	Fatal	0	Minor	0	Injuries	None
Fire	NONE	Crew	0	Pass	3	Serious	14
							208

-----Aircraft Information-----

Make/Model - BOEING 747-122
Landing Gear - TRICYCLE-RETRACTABLE
Max Gross Wt - 733000
No. of Seats - 445
Eng Make/Model - P&W JT9D
Number Engines - 4
Engine Type - TURBOFAN
Rated Power - 46250 LBS THRUST
ELT Installed/Activated - NO -N/A
Stall Warning System - YES

-----Environment/Operations Information-----

Weather Data
Wx Briefings - COMPANY
Method - IN PERSON
Completeness - FULL
Basic Weather - VMC
Wind Dir/Speed- 080/009 KTS
Visibility - 10.0 SM
Lowest Sky/Clouds - 4500 FT
Lowest Ceiling - 4500 FT BROKEN
Obstructions to Vision- NONE
Precipitation - NONE
Condition of Light - NIGHT(DARK)
Itinerary
Last Departure Point
CHICAGO, IL
Destination
NEWARK, NJ
ATC/Airspace
Type of Flight Plan - IFR
Type of Clearance - IFR
Type Appch/Lnds - FULL STOP
PRECAUTIONARY LANDING
Airport Proximity
ON AIRPORT
Airport Data
DETROIT METRO WAYNE CO
Runway Ident - 03R
Runway Lth/Wid - 10000/ 150
Runway Surface - CONCRETE
Runway Status - DRY

-----Personnel Information-----

Pilot-In-Command
Certificate(s)/Rating(s)
ATP
ME LAND
Ase - 58
Biennial Flight Review
Current - YES
Months Since - UNK/NR
Aircraft Type - UNK/NR
Medical Certificate - VALID MEDICAL-NO WAIVERS/LIMIT
Flight Time (Hours)
Total - 14997
Last 24 Hrs - 6
Make/Model - 7043
Last 30 Days - UNK/NR
Instrument - UNK/NR
Last 90 Days - UNK/NR
Multi-Eng - UNK/NR
Rotorcraft - UNK/NR

Instrument Rating(s) - AIRPLANE

-----Narrative-----

DRG FLT, UNITED FLT 108 RECD INFO OF A BOMB THREAT, DUE TO A SHORT TIME LIMIT, SPECIFIED IN THE THREAT, THE FLT DIVERTED TO DETROIT & THE SLIDES WERE USED TO EVACUATE THE ACFT; 8 OF 10 SLIDES DEPLOYED NMLY & WERE USED, THE SLIDE AT DOOR 4R DIDN'T INFLATE & WASN'T USED, THE FLT ATTENDANT (F/A) AT DOOR 5R PERCEIVED THAT THE SLIDE (SLIDE/RAFT) AT THAT LCTN WAS INFLATING SLOWLY, SHE PULLED WHAT SHE THOUGHT WAS THE MANUAL INFLATION HANDLE (M/H) & HEARD A HISSING SOUND, SHE THEN SENT 2 HELPERS (PAX) DWN THE SLIDE, AS THEY EGRESSED, THE SLIDE SEPR FM THE ACFT & FELL TO THE GND; 1 OF THE 2 RECD A SERIOUS BACK INJURY, AS OTR SLIDES WERE USED, 2 OTR PAX RECD SERIOUS LEG INJURIES & 16 PAX RECD MINOR INJURIES, AN INV REVEALED THE F/A AT DOOR 5R INADVERTENTLY PULLED THE RELEASE HANDLE (RH) WHEN SHE ATHTD TO USE THE M/H, BOTH HANDLES WERE MADE OF CANVAS MTRL & WERE ABOUT THE SAME SIZE, THE M/H WAS RED WITH A PIECE OF WHITE MTRL MARKED "FULL" IN RED LTRS; THE RH WAS WHITE & WAS ALSO MARKED "FULL" IN RED LTRS, NO REASON WAS FND FOR THE SLIDE AT DOOR 4R NOT TO ENFLATE,

Brief of Accident (Continued)

File No. - 1796 2/11/87 DETROIT, MI A/C Reg. No. N4718U Time (LCL) - 2317 EST

Occurrence #1 MISCELLANEOUS/OTHER
Phase of Operation STANDING - ENGINE(S) NOT OPERATING

Findings(s)

1. UNSAFE/HAZARDOUS CONDITION WARNING - INTENTIONAL - OTHER PERSON
2. PRECAUTIONARY LANDING - PERFORMED -
3. EMERGENCY PROCEDURE - INITIATED -
4. LIGHT CONDITION - DARK NIGHT
5. MISC EQPT/FURNISHINGS, SLIDES - DISCONNECTED
6. EMERGENCY EQUIPMENT - IMPROPER USE OF - FLIGHT ATTENDANT
7. AIRCRAFT/EQUIPMENT, INADEQUATE DESIGN(STANDARD/REQUIREMENT), CONTROL SHAPE/SIZE - MANUFACTURER

-----Probable Cause-----

The National Transportation Safety Board determines that the Probable Cause(s) of this accident is/are findings(s) 1,5,6

Factor(s) relating to this accident is/are findings(s) 7