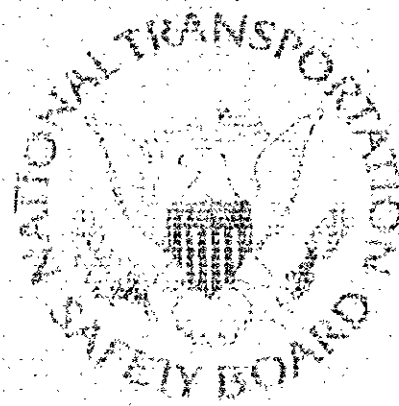


PB86-910410



**NATIONAL
TRANSPORTATION
SAFETY
BOARD**

WASHINGTON, D.C. 20594

**AIRCRAFT ACCIDENT/INCIDENT
SUMMARY REPORTS**

DETROIT MICHIGAN - APRIL 25, 1986

NTSB/AAR-86/03/SUM

UNITED STATES GOVERNMENT

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Detroit, Michigan
April 25, 1985 1



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

File No.:	5008
Aircraft Operator:	United Air Carrier, Inc. dba National Airlines dba Overseas National Airways
Aircraft Type and Registration:	Boeing 747-123, N9663
Location:	Wayne County Detroit Metropolitan Airport, Detroit, Michigan
Date and Time:	April 25, 1985, 1045 eastern standard time
Persons On Board:	481
injuries:	41 Minor, 440 None
Aircraft Damage:	None
Other Damage or Injury:	None
First Occurrence:	Smoke (in cabin)
Phase of Operation:	Preflight
Second Occurrence:	Miscellaneous-Evacuation by slide and jetway
Phase of Operation:	Preflight-Before start of engine(s)

On April 25, 1985, at 1015 eastern standard time, National Airlines flight OV302, a Boeing 747-123, N9663, was scheduled to depart gate 61 in the International Terminal, Wayne County Detroit Metropolitan Airport, Detroit, Michigan. The flight was being operated as a charter flight to Las Vegas, Nevada, under the provisions of 14 CFR Part 121. The 481 persons on board included 3 flight crewmembers, 16 flight attendants, an additional flight crewmember who was a flight operations inspector for the Federal Aviation Administration (FAA), and 461 passengers.

The flight was delayed about 30 minutes while the ground crew secured some loose cargo in the aft body cargo compartment. The passengers were seated, the boarding jetway was removed, and the flight crew were at the "start the engines" point on the checklist. The flight attendants in the forward cabin detected a faint odor before closing door 1 left (1L). They could not determine the source of the odor and closed door 1L in preparation for pushback. The in-flight supervisor flight attendant at door 1L went to the cockpit and advised the flight engineer of the smell. She returned to her station and noticed that the smell "had gotten stronger." Shortly thereafter, smoke was discovered in the vicinity of the overhead bin at row 16. The in-flight supervisor started to return to the cockpit when she encountered the flight engineer on the stairs. She told him of the smoke, and on her way back to the cabin, she heard the captain announce on the public address system, "evacuate, if there is a fire onboard."

The jetway was brought back to door 1L, which was reopened. Because the smoke had started to dissipate, the flight attendants at doors 1R, 2L, and 2R did not open their doors. However, the flight attendants at doors 3L, 3R, 4L, 4R, 5L, and 5R were not aware that the smoke was dissipating and opened the doors. Doors 3L and 3R opened properly, but the ramps mounted to the doors, while deploying properly, failed to inflate. The wing slide, which was packed in the fuselage/wing fairing, deployed and inflated properly. Door 5R jammed partially open and its evacuation slide did not deploy. The passengers in the forward cabin were evacuated through door 1L using the jetway. The other passengers evacuated the aircraft using the slides at doors 4L, 4R, and 5L. The in-flight supervisor attempted to redirect passengers forward by using the public address system. However, the system did not work because the cockpit crew had removed power from the airplane. According to the flight attendants, the evacuation was calm and orderly.

The airport fire department received the alarm from the control tower at 1045. Four firetrucks and two ambulances with 11 firefighters arrived on scene at 1047. The evacuation was still in progress. The flight attendant at door 5L informed the firefighters that there was no fire on board the aircraft at that time. The officer-in-charge and another firefighter ascended the exterior jetway stairs and entered the aircraft. Other firefighters assisted passengers on the ground. Forty-one passengers received injuries during the evacuation and use of the slides. Several firefighters trained as emergency medical technicians established a triage in the customs area of the terminal. When it became apparent that a large number of passengers were injured, the firefighters requested mutual aid assistance. A private ambulance service responded to the call for mutual aid with four units, which were used to transport the injured to area hospitals.

The day of the incident, 18 passengers were treated at the airport and released. Another 23 passengers were taken to three area hospitals. Typical injuries for those treated included lacerations, contusions, abrasions, and sprains. The most serious injuries were a knee injury and a cervical spine strain. The only passenger admitted to the hospital was complaining of chest pains and remained hospitalized for observation for over 24 hours.

When Safety Board investigators later arrived on the scene, the aircraft had been secured and was still parked at the gate. The slides that deployed during the emergency evacuation had been detached from the door sills to prevent damage from the wind and were lying on the ramp outside the airplane. Investigators examined the doors, the ramps to the slides, and the slide/raft combinations of the airplane.

Examination of open doors 3L and 3R revealed that the ramp packs were improperly mounted to the doors. The overwing doors of the B-747 are designed with a mechanical rotary drive system that initiates the flow of nitrogen into the ramp packs from the reservoir when the drive plate on the pressure regulator is rotated through an angle of 70 to 90°. When properly installed, the two prongs in the door drive, align with, and insert into the drive plate. As the door is opened in the automatic mode, the prongs rotate and the drive plate opens the regulator to inflate the ramp. Investigators closed and reopened both doors to demonstrate that they operated properly. However, an examination of both drive plates revealed marks where the prongs had rotated on the surface of the drive plates, indicating that the prongs had not inserted into the drive plates.

The airplane doors were equipped with bottles containing a charge of air that were designed to assist in opening the doors. Investigators found that the bottle at door 5R was empty. The slide/raft was still mounted to door 5R, but the cover had been removed and the door handle was in the manual mode. Another door assist bottle was installed and the door was reopened. The assist bottle discharged and the door jammed partially open, duplicating the problem found on flight OV302. The door could not be closed or opened, since pneumatic pressure was forcing the door partially open. Examination of the packboard ^{1/} revealed that it was designed to be installed on a left side door. The aft packboard lanyard was not connected to the aft primary bottom panel pulley. In fact, the pulley was not even installed on the packboard. Had the pulley been installed and the lanyard attached, the slide/raft would have properly released from the packboard. The packboard used for the slide/raft in door 5R should have been modified to conform with Air Cruisers Supplemental Type Certificate (STC) No. SA 1215EA issued on December 18, 1980. Compliance with the STC would allow the packboard to function properly on either a left or right side door.

^{1/} A rack which holds the slide in a compact package for easy installation.

Investigators found that the slide/raft pack at door 1L was mounted to the door and both the inflation bottle and door assist bottle were fully charged. Doors 1R, 2L, and 2R were not opened during the incident, and the mode selector handles were in the manual position. The slide/raft packs were mounted securely to each door and the door assist and inflation bottles were fully charged. All slide/raft assemblies at these locations were within a current inspection cycle.

A mechanic employed by the contract maintenance organization used by Overseas National Airlines in Detroit boarded the airplane after the evacuation and discovered an overheated and slightly deformed ballast unit used for right edge overhead fluorescent lighting above and outboard of the overhead bin at row 14 in zone B on the right side of the airplane. He reported the finding to the airline and was instructed to remove the unit as well as to pull all circuit breakers associated with overhead cabin lighting. The mechanic stated that no circuit breakers were tripped before he pulled them.

Safety Board investigators found no damage to the cabin interior as a result of the overheated ballast unit. A small amount of a black tar-like residue was found on the mounting plate for the ballast. The interconnecting wiring associated with the ballast unit was inspected and no evidence of overheating or discoloration was observed. A later examination of the inside of the encapsulating material in the ballast revealed deformation around the choke. ^{2/} In addition, the internal fuse link, which is enclosed within the encapsulating material, had blown from current overload. The heat from the overload had melted the encapsulating material within the ballast, which produced the odor and dense smoke within the cabin.

Replacement of the lighting ballast units in model 747 airplanes was the subject of Boeing Service Bulletin No. 33-2029 issued in April 1971. Early model 747 airplanes were delivered with the passenger compartment lighting ballast units enclosed in plastic cases. The service bulletin stated that, "In the event of a ballast failure, the ballast may emit an objectionable amount of smoke for a short period of time. The smoke may unnecessarily alarm passengers and attendants in the passenger cabin." The service bulletin further stated that to reduce smoke emission and improve service life, the plastic encased ballast units could be replaced with improved ballasts in metal cases. N9663 was in the group of airplanes affected by the service bulletin. At the time the service bulletin was issued, N9663 was operated by American Airlines. Compliance with the service bulletin was "recommended" by Boeing; however, no mandatory action was required. In addition to the Boeing service bulletin, on May 4, 1982, the FAA issued Air Carrier Operations Bulletin No. 8-82-1, Cabin Fluorescent Light Ballast Fires, which discussed the degree of hazard associated with the lighting units.

The airline had completed a maintenance "A" check on N9663 the day before the incident. The maintenance log indicated a total of 16 deferred maintenance items that had not been corrected. None of these items involved the cabin fluorescent lighting systems.

The Safety Board believes that the captain's decision to evacuate was in the best interest of the passengers and was based on the best available information provided to him by the crewmembers. However, a review of the flightcrew actions and evacuation procedures disclosed some areas where corrective action was needed. During the evacuation, the captain issued a nonstandard command over the public address system to evacuate the airplane, "(1144:39) Ileen ^{3/} evacuate the passengers right now if we have a

^{2/} The purpose of the choke is to regulate current.

^{3/} Represents the way the voice transmission from the cockpit voice recorder was transcribed. This transmission represents the in-flight supervisor's first name.

fire Ileen ah get the passengers off right now." The captain should have initiated the announcement with the preparatory command "stand by" as stated in the flight attendant's manual (Chapter 7, page 12). This command is issued if the need for evacuation cannot be determined immediately, as in this case. If, in the captain's judgment, evacuation becomes necessary, the captain is to then issue the command "evacuate." The purpose of the preparatory command "stand by" is to ensure that all flightcrew members are in place to effect an orderly evacuation, and also to give the captain (or other flightcrew members, if the captain is incapacitated) time to evaluate the situation properly. Although at the time of the incident, all flight crewmembers were properly certificated and were current in their proficiency checks and training, it is apparent that the captain was not totally familiar with emergency evacuation procedures.

As a result of the incident, the airline immediately inspected its other airplanes to ensure that ramps and slides were installed correctly. The Boeing service bulletin and FAA air carrier operations bulletin that applied to the cabin fluorescent lighting system were brought to the attention of the airline's qualified 747 flightcrews and were made a part of the company's training program. The airline also recertified all of its flightcrews and cabin crewmembers and emphasized emergency evacuation procedures.

The attached brief contains the Safety Board's findings of probable cause(s) relating to this incident.

National Transportation Safety Board
Washington, D.C. 20594

Brief of Incident

File No. - 5008	4/25/85	DETROIT, MI	A/C Reg. No. N9663	Time (Lcl) - 1045 EST			
-----Basic Information-----							
Type Operating Certificate	-AIR CARRIER - SUPPLEMENTAL		Aircraft Damage	Injuries			
Name of Carrier	-UNITED AIR CARRIERS		NONE	Fatal	Serious	Minor	None
Type of Operation	-NON SCHED, DOMESTIC, PASSENGER		Fire	0	0	0	20
Flight Conducted Under	-14 CFR 121		ON GROUND	Crew	0	0	42
Incident Occurred During	-STANDING			Pass	0	0	419
-----Aircraft Information-----							
Make/Model	- BOEING 747-123		Eng Make/Model	- P&W JTP		ELT Installed/Activated - UNK/NR	
Landing Gear	- TRICYCLE-RETRACTABLE		Number Engines	- 4		Stall Warnins System - YES	
Max Gross Wt	- 110000		Engine Type	- TURBOFAN			
No. of Seats	- 495		Rated Power	- 14500 LBS THRUST			
-----Environment/Operations Information-----							
Weather Data			Itinerary		Airport Proximity		
ON AIRPORT			Last Departure Point		ON AIRPORT		
Wx Briefins - UNK/NR			DETROIT, MI		Airport Data		
Method - UNK/NR			Destination		Runway Ident - UNK/NR		
Completeness - UNK/NR			LAS VEGAS, NV		Runway Lth/Wid - UNK/NR		
Basic Weather - VMC			ATC/Airspace		Runway Surface - UNK/NR		
Wind Dir/Speed - 280/013 KTS			Type of Flight Plan - IFR		Runway Status - UNK/NR		
Visibility - 10.0 SM			Type of Clearance - UNK/NR				
Lowest Sky/Clouds - 2300 FT			Type Apch/Lnds - NONE				
Lowest Ceilins - 2300 FT BROKEN							
Obstructions to Vision - NONE							
Precipitation - NONE							
Condition of Light - DAYLIGHT							
-----Personnel Information-----							
Pilot-In-Command		Age - 46	Medical Certificate - VALID MEDICAL-NO WAIVERS/LIMIT				
Certificate(s)/Rating(s)		Biennial Flight Review	Flight Time (Hours)				
ATP		Current - YES	Total - 12000	Last 24 Hrs - UNK/NR			
SE LAND, ME LAND, SE SEA		Months Since - 1	Make/Model - 600	Last 30 Days - UNK/NR			
		Aircraft Type - 747	Instrument - UNK/NR	Last 90 Days - UNK/NR			
			Multi-Eng - UNK/NR	Rotorcraft - UNK/NR			
Instrument Rating(s) - AIRPLANE							
-----Narrative-----							
<p>THE FLT CREWMEMBERS OF THE JUMBO JET WERE PREPARING TO START THE ENGS WHEN FLT ATTENDANTS (F/A'S) IN THE FORWARD LABIN DETECTED A FAINT ODOR PRIOR TO CLOSING DOOR 1L. THE SOURCE COULD NOT BE DETERMINED, SO THE DOOR WAS CLOSED IN PREPARATION FOR A PUSHBACK. SHORTLY THEREAFTER, SMOKE WAS DISCOVERED IN THE VICINITY OF THE OVERHEAD BIN AT ROW 16. THE CAPTAIN WAS NOTIFIED & HE ORDERED THAT "OCCUPANTS EVACUATE, IF THERE IS A FIRE ONBOARD." THE JETWAY WAS BROUGHT BACK TO DOOR 1L. THE SMOKE DISSIPATED; THUS, THE F/A'S AT DOORS 1R, 2L & 2R DID NOT OPEN THEIR DOORS. HOWEVER, THE F/A'S AT THE OTHER 6 DOORS WERE UNAWARE OF THE SITUATION & CONTINUED THE EVACUATION. THE RAMPS AT DOORS 3L & 3R DID NOT INFLATE & DOOR 5R JAMMED HALFWAY OPEN. THE RAMP PACKS FOR 3R & 3L WERE IMPROPERLY MOUNTED. THE 5R PACK BOARD WAS MADE FOR A LEFT HAND DOOR & THE LANYARD WAS NOT CONNECTED TO THE BOTTOM PANEL PULLEY. AN EXAM REVEALED A BALLAST FOR AN OVERHEAD FLOURESCENT LIGHT, PN 69-33C, HAD OVERHEATED & MELTED THE PLASTIC CASE.</p>							

Brief of Incident (Continued)

File No. - 5008

4/25/85

DETROIT, MI

A/C Res. No. N9663

Time (Lcl) - 1045 EST

Occurrence AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation STANDING - PRE-FLIGHT

Findings(s)

1. PASSENGER COMPARTMENT LIGHTS - OVERTEMPERATURE
2. MAINTENANCE, SERVICE BULLETINS - NOT FOLLOWED - COMPANY/OPERATOR MBMT
3. FUSELAGE, CABIN - SMOKE
4. EMERGENCY PROCEDURE - PERFORMED -
5. MISC EQPT/FURNISHINGS, SLIDES - INOPERATIVE
6. MAINTENANCE, INSTALLATION - IMPROPER - COMPANY MAINTENANCE PSNL
7. DOOR, EMERGENCY EXIT - IMPROPER
8. MAINTENANCE, INSTALLATION - IMPROPER - COMPANY MAINTENANCE PSNL
9. DOOR, EMERGENCY EXIT - JAMMED

--- Probable Cause ---

The National Transportation Safety Board determines that the Probable Cause(s) of this incident is/are finding(s) 1

Factor(s) relating to this incident is/are finding(s) 2, 5, 6, 7, 8, 9