Aviation safety investigations & reports

Boeing Co 747SP-38, VH-EAA

Investigation number:
200101866
Status: Completed

During door disarming of the Boeing 747SP aircraft after landing, the cabin crew notified the flight crew that although the levers of main cabin doors L3 and L4 had been moved to the disarm position, the doors failed to disarm. The captain directed the flight attendants to remain at the doors and advised ground engineering to limit catering access. The flight engineer was directed to ensure a safe disarm. The flight engineer found the door slide girt bars still partially engaged into the girt bar receivers. He then used tools to safely disengage the girt bars and disarm both doors.

Line maintenance personnel examined the doors and, after repeated arm/disarm cycles, were unable to duplicate the anomaly. The flight crew elected to continue operations with additional precautions, referred to as "girt bar disengagement inspection", taken to ensure the operational status of the doors. That action included the flight engineer confirming arming of the doors before departure and disarming following arrival. That precaution was taken to prevent inadvertent activation of the slide during normal door opening.

Following landing at the next sector airport, the cabin crew again could not disarm main cabin doors L3/L4. The flight engineer again used tools to physically disengage the girt bars from the girt bar receivers in order to disarm both doors. A maintenance entry was made in the aircraft technical log requiring visual confirmation of the door arming/disarming during each transit. The Master Minimum Equipment List (MMEL) was reviewed and the aircraft returned to service without restrictions.

Over the next three days, the aircraft completed twelve sectors with the girt bars of main cabin doors L3/L4 requiring the girt bar disengagement inspection. Following the last of those twelve sectors, the operator's maintenance department issued an Authority To Proceed (ATP), stating a requirement that the doors not be opened from the outside or left unattended until maintenance personnel confirmed the girt bar was completely disengaged from the girt bar receiver. The ATP was applicable for two sector overwater flights only. Upon completion of those sectors, maintenance personnel corrected the girt bar discrepancy by adjusting the escape slide skirts and returned the slides and doors to normal operation.

B747SP main cabin door configuration

The aircraft's main cabin was configured with four doors per side. The doors were arranged in sequential order, with numbering starting at the nose of the aircraft. The doors were identified by lettering indicating `L' for the left side of the cabin looking towards the nose, and `R' for right.

Discrepancy history of main cabin doors L3/L4

Five days prior to girt bar disengagement inspection implementation, the technical log noted an entry that said, "L4 unable to move mode select to auto". Corrective action stated that an obstruction was found in the girt bar and had been removed, with door operations now normal.

Four days prior to disengagement inspection implementation, the technical log noted an entry, "Door L4 selector switch handle will not engage arm position or sweep seal is remaining outside the door sill". Corrective action stated that the lower skirt aft side was found fouling the girt bar, and

that the skirt appeared to be distorted. The skirt was repositioned and operations reported as normal.

Two days prior to girt bar disengagement inspection implementation, the technical log noted an entry, "L4 lower bustle has skirt damage". Corrective action stated that the lower bustle sweeper seal was trimmed.

Door mounted escape slide normal operation

When the crew selected the door to the armed mode (automatic), the girt bar mechanism positioned the girt locks into the floor brackets. As the door handle was moved towards the open position (at approximately 45 degree's of rotation) it lifted the lower gate and girt lift mechanism. When the girt lift mechanism separated from the girt lock, the girt bar springs protruded, locking the girt bar to the floor brackets. The escape pack was then attached to the floor. The door was then forced open by use of an emergency pressure cylinder. That opening of the door, with the girt still attached to the aircraft, caused the slide to release from the door and initiate the inflation sequence of the slide.

Authority to proceed

The Civil Aviation Safety Authority (CASA) issued authorisation under Civil Aviation Regulation (CAR) 37 to delegates of the operator permitting those individuals to authorise continued operation of aircraft with known discrepancies. That authorisation was designed to address aircraft discrepancies not covered by the MMEL or other documentation and was subject to the conditions outlined in the ATP. Such discrepancies must not constitute a concession against an operational requirement of a CAR nor conflict with the design standard of the aircraft. An authorised delegate of the operator who annotated the discrepancy, signed the ATP. A copy of that ATP was provided to the local CASA office.

As the doors could be armed correctly, and the girt bars were engaged in the girt bar floor brackets following door closure, no application of the aircraft MMEL was required. In the event of an emergency, the slides of doors L3/L4 would have been capable of activation and the doors capable of emergency opening.

Initial interviews with maintenance personnel indicated that the escape slide skirt strap had been misrouted on the girt bar carrier, 180 degrees opposite of the correct routing. That condition may have caused skirt strap interference with the bustle access cover and restricted girt bar travel of doors L3/L4.

However, the operator's Maintenance Error Decision Aid report stated that during recent maintenance to the aircraft, the main cabin doors were adjusted while the aircraft was on jacks. That was an acceptable practice according to the maintenance manual, if certain weight restrictions were adhered to during the operation. Those restrictions were met. Additionally, it was reported that while the doors were being adjusted, the jacks might have been raised and lowered to relieve skin stresses in order to implement structural repairs. That action may have lead to the door misalignment and girt bar travel restrictions.

The Bureau was unable to conclusively determine the reason for the girt bar anomalies.

Local safety action

The operator conducted a review of maintenance practices and documentation but could not identify any significant discrepancies.

RECOMMENDATIONS

As a result of this investigation, and occurrence investigation number 200101606, the Australian Transport Safety Bureau has identified a safety deficiency related to Boeing jet aircraft cabin door

escape slide maintenance documentation. The ATSB issued the following recommendation with occurrence report 200101606.

R20010168

The Australian Transport Safety Bureau recommends that the Civil Aviation Safety Authority conduct a review of maintenance documentation for the Australian Boeing jet aircraft fleet to ensure completeness of cabin door escape slide deactivation and reactivation maintenance procedures.

General details

Date:	22 April 2001	**Investigation status:**	Completed
Time:	0930 hours CST		
Location (show map):	Darwin, Aero.		
State:	Northern Territory		
Release date:	16 November 2001	**Occurrence class:**	Technical
Report status:	Final	**Occurrence category:**	Incident
		Highest injury level:	None

Aircraft details

Aircraft manufacturer	The Boeing Company
Aircraft model	747
Aircraft registration	VH-EAA
Serial number	22495
Type of operation	Air Transport High Capacity
Damage to aircraft	Nil
Departure point	Singapore
Destination	Darwin, NT

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