Aviation Safety Investigation Report 199501706

Boeing Co
B737

07 June 1995

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Aviation Safety Investigation Report

199501706

The Bureau did not conduct an on scene investigation of this occurrence. The information presented below was obtained from information supplied to the Bureau.

Occurrence Number: 199501706 **Occurrence Type:** Incident
Location: Darwin, Aerodrome
State: NT **Inv Category:** 3
Date: Wednesday 07 June 1995
Time: 1623 hours **Time Zone** CST
Highest Injury Level: None

Aircraft Manufacturer: Boeing Co
Aircraft Model: 737-4Q8
Aircraft Registration: VH-TJV **Serial Number:** 25163
Type of Operation: Air Transport Domestic High Capacity Passenger Scheduled
Damage to Aircraft: Nil
Departure Point: Tindal NT
Departure Time: 1550 CST
Destination: Darwin NT

Crew Details:

Role	Class of Licence	Hours on Type	Hours Total
Pilot-In-Command	ATPL	5100.0	10100

Approved for Release: Monday, March 10, 1997

FACTUAL INFORMATION

At approximately 1300 CST, 7 June 1995, a military aircraft suffered a landing gear failure during the landing roll on runway 11 at Darwin. The aircraft groundlooped through 180 degrees, coming to rest on the northern (left) side of the runway between taxiways B2 and E2, with about 0.4 m of its left wingtip overhanging the runway.

Not long after that occurrence, the crew of VH-TJV, which was on descent to Darwin, was advised by Air Traffic Control (ATC) of the accident. They were given the location of the disabled aircraft and informed that runway 11/29 would be closed for an estimated period of 1-2 hours. The crew considered using runway 36 but calculations showed that it would be unacceptable. After calculating the aircraft's endurance the crew decided to divert to Tindal. Both pilots subsequently reported that at the time of the diversion they believed that the accident aircraft was at about the midway point of runway 11/29.

When the aircraft arrived at Tindal the surface movement controller passed a message to the crew from RAAF Darwin, advising that runway 11 now had an available length of 5,500 ft, but with a landing over a displaced threshold and the accident aircraft. Runway 29 was also available with a 15kt downwind component.

RAAF Darwin ATC had advised RAAF Tindal ATC that runway 11 had a landing distance available (LDA) of 1,936 m and a take-off run available (TORA) of 2,036 m. This message was to be passed to the crew of VH-TJV after its arrival at Tindal. The RAAF flight planning officer, who received the message, wrote the LDA and TORA down on a piece of notepad paper and personally delivered it to the aircraft, handing it to the pilot in command. He believed he had advised the pilot in command of the displaced threshold and that the landing would be over the disabled aircraft. The pilot in command remembered being given the handwritten message but stated that he had not been given any information other than the LDA and TORA.

After arranging for the aircraft refuelling and passenger requirements, the pilot in command contacted the company's Operations Department by telephone to report arrival at Tindal, and to arrange for another flight plan to be issued for the Tindal - Darwin sector. A short time later he called Operations again, and was transfered to a dispatcher who arranged the flight plan issue. The pilot in command advised that he did not require another copy of the weather as the information he had was still valid. The dispatcher assumed that since the pilot in command was in the area, and aware of the problem in Darwin, there was no need to send the NOTAM concerning the displaced threshold as this would mean transmitting all the Darwin NOTAM pages, therefore only the flight plan was sent.

VH-TJV departed Tindal for Darwin at approximately 1550 CST.

During approach to Darwin the co-pilot obtained the following landing information from the Automatic Terminal Information Service (ATIS): "Information Juliet, runway 11, displaced threshold, 36, wind 060/10-15, QNH 1009, 29.80, temperature 32, CAVOK, runway 11 LDA 1,936 m, TORA 2,036 m, pedestrians and vehicles operating in the undershoot". The co-pilot annotated the relevent information onto the landing data card, then showed it to the pilot in command who had also been monitoring the ATIS while communicating with ATC. The pilot in command acknowledged but did not confirm the information as required by company policy. Neither pilot could recall noticing the information concerning the displaced threshold.

When the aircraft was on final for runway 11, ATC again advised of the displaced threshold and instructed the crew to report sighting the displaced threshold markers. Then, after a pause of several seconds, the controller advised that the visual approach slope indicator system (VASI) was turned off. The crew subsequently reported that they did not hear the reference to the requirement to sight the markers although they did note that the VASI was not available. ATC did not prompt the crew when they had not reported sighting the displaced threshold markers.

As a precautionary measure when aircraft were landing, all vehicles and personnel were removed from the undershoot area. Only personnel working on the disabled aircraft remained in position.

Although the weather was fine and clear, the crew reported that from the air there was a certain amount of haze and sun glare which made objects on the ground appear to blend into their surroundings They advised that during the approach they were concentrating on maintaining the correct speed and profile to arrive as close as possible to the threshold in order to utilise all of the available runway length, and did not see the white runway unserviceable crosses located in the undershoot area.

The controllers reported that when they noticed the aircraft on short final, about 150-200 ft above ground level (AGL), it appeared about to land in the undershoot area. The controllers believed that RAAF policy precluded turbo-jet aircraft from going around below 200 ft AGL due to slow engine response time, and therefore considered it safer to allow the aircraft to continue. The crew's first awareness of landing in the undershoot area was when the aircraft passed over one of the white crosses.

The information supplied to the crew by ATC prior to their diversion to Tindal concerning the location of the disabled aircraft, and the available runway length situation, appeared to have allowed both pilots to develop a mindset that the western end of runway 11, that is the normal threshold, was the serviceable area.

The airport operator, who had arranged the displaced threshold, advised that all markings were in accordance with the Rules and Practices for Aerodromes (RPA) standards. The temporarily displaced threshold was marked with Vee-Bars, and the white crosses in the undershoot area were twice the standard size, i.e. 12 m x 0.9 m. RPAs also require runway threshold identification lights (RTIL) to be in place, marking a displaced threshold at aerodromes serving international regular public transport jet aircraft, e.g. Darwin. These lights were not available.

Prior to the occurrence the pilot in command had been rostered for two days on reserve duty, preceded by one day off, and the co-pilot had been off duty for three days. They had completed a 10 hour tour of duty, having flown four sectors including the diversion.

Since 1981 there have been 25 reported occurrences of pilots failing to see runway displaced threshold or unserviceable markings, six occurring since 1990. Anecdotal evidence suggests that this figure may be much higher. In many cases poor contrast of the markings with the surrounding surface may have been the problem.

SIGNIFICANT FACTORS

1. Information flow available for the crew at the Tindal diversion point was inadequate.

2. Information provided to the crew by RAAF Tindal was inadequate.

3. The company flight dispatcher failed to provide a hard copy of the NOTAM to the crew.

4. The Darwin ATIS was misleading; however, enough information was available for the crew to seek clarification.

5. The co-pilot did not take note of the ATIS comments about the displaced threshold, and the pilot in command, contrary to company policy, did not confirm the ATIS information.

6. The crew developed a mindset regarding the serviceable runway and the disabled aircraft location, and did not clarify information available to them.

7. ATC did not verify that the crew understood the instruction to sight the displaced threshold markers.

8. ATC did not issue go-around instructions.

9. Light conditions may have made the runway displaced threshold markings difficult to see.

SAFETY ACTION

The Bureau of Air Safety Investigation issued interim recommendation IR950176 to the Civil Aviation Safety Authority.

"The Bureau of Air Safety Investigation recommends that the Civil Aviation Safety Authority:

"(i) review "runway displaced threshold" and "runway unserviceable" markings to improve the visibility to pilots under all conditions. This review should consider the use of different colours, shapes and backgrounds to increase the contrast and distinguishability of such runway markings; and

"(ii) ensure that airport owners and operators have the correct portable runway lighting available for identifying unserviceable areas of the runway where required."

The following response was received from the Civil Aviation Safety Authority on 17 October 1995:

"I refer to Interim Recommendation IR950176 concerning the displaced threshold incident involving a Boeing 737, VH-TJV, at Darwin on 7 June 1995.

"Summary

"(i) The Authority has no plans to review the standards for runway displaced threshold and runway unserviceable.

"(ii) Work is currently being undertaken on the production of a Civil Aviation Order on Aerodrome Lighting.

"Background to Response

"Displaced Threshold and Unserviceability markings depicted in Rules and Practices for Aerodromes, Chapters 11 and 20, are consistent with ICAO standards and recommended practices. The Authority has no plans to review these standards.

"Work is currently being undertaken on the production of a CAO on Aerodrome Lighting which will include the standards for displaced threshold lighting and temporary runway end lighting. It is considered that, in the interim, the requirements of the lighting section of the Rules and Practices for Aerodromes is an adequate and acceptable standard. It is not anticipated that these requirements will be changed significantly with the making of the CAO."

Response status: CLOSED NOT ACCEPTED.