



Australian Government

Australian Transport Safety Bureau

Runway undershoot involving a Cessna 404, VH-HAZ

Darwin Airport, Northern Territory, 29 October 2013

ATSB Transport Safety Report
Aviation Occurrence Investigation
AO-2013-197
Final – 20 January 2014

Released in accordance with section 25 of the *Transport Safety Investigation Act 2003*

Publishing information

Published by: Australian Transport Safety Bureau
Postal address: PO Box 967, Civic Square ACT 2608
Office: 62 Northbourne Avenue Canberra, Australian Capital Territory 2601
Telephone: 1800 020 616, from overseas +61 2 6257 4150 (24 hours)
Accident and incident notification: 1800 011 034 (24 hours)
Facsimile: 02 6247 3117, from overseas +61 2 6247 3117
Email: atsbinfo@atsb.gov.au
Internet: www.atsb.gov.au

© Commonwealth of Australia 2013



Ownership of intellectual property rights in this publication

Unless otherwise noted, copyright (and any other intellectual property rights, if any) in this publication is owned by the Commonwealth of Australia.

Creative Commons licence

With the exception of the Coat of Arms, ATSB logo, and photos and graphics in which a third party holds copyright, this publication is licensed under a Creative Commons Attribution 3.0 Australia licence.

Creative Commons Attribution 3.0 Australia Licence is a standard form license agreement that allows you to copy, distribute, transmit and adapt this publication provided that you attribute the work.

The ATSB's preference is that you attribute this publication (and any material sourced from it) using the following wording: *Source:* Australian Transport Safety Bureau

Copyright in material obtained from other agencies, private individuals or organisations, belongs to those agencies, individuals or organisations. Where you want to use their material you will need to contact them directly.

Addendum

Page	Change	Date

Runway undershoot involving a Cessna 404, VH-HAZ

What happened

On 29 October 2013, at about 0645 Central Standard Time,¹ the pilot of a Cessna 404 aircraft, registered VH-HAZ, was preparing for a return flight from Darwin to Garden Point and Snake Bay, Northern Territory. The pilot reviewed the applicable Notices to Airmen (NOTAMs)² and noted that the runway 11 threshold at Darwin would be displaced due to works in progress. He reported that, on reading the NOTAM, he paid attention to the usable runway length and included the runway distance calculations in his pre-flight planning.

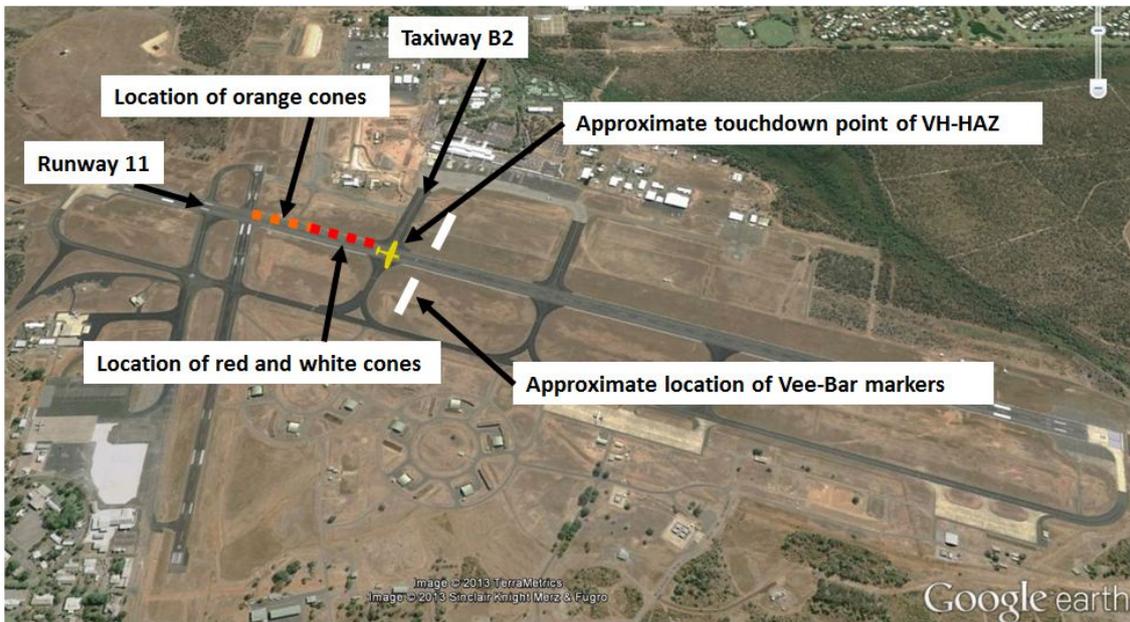
At about 0745, the aircraft departed from the 'Bravo 2' intersection on runway 11 and the pilot reported that he did not observe any markings indicating the location of the displaced threshold.

On return to Darwin, at about 1000, the pilot received the automatic terminal information service (ATIS), which advised of the displaced threshold. He received a clearance from air traffic control (ATC) to land on runway 11.

While on approach, at about 200 ft above ground level (AGL), the pilot observed orange cones (works limit markers) and red and white cones (unserviceability markers) on the runway. He adjusted the aircraft's descent profile, aiming to be over the red and white cones at about 50 ft AGL. He then focused his attention on landing. The aircraft touched down near the 'Bravo 2' intersection (Figure 1).

The pilot reported that, after completing his flying duties at about 1830, he was notified by his company that ATC had advised that the aircraft had landed before the displaced threshold.

Figure 1: Location of runway works markings



Source: Google earth and pilot recollection

¹ Central Standard Time (CST) was Coordinated Universal Time (UTC) + 9.5 hours.

² A Notice to Airmen advises personnel concerned with flight operations of information concerning the establishment, condition or change in any aeronautical facility, service, procedure, or hazard, the timely knowledge of which is essential to safe flight.

Displaced threshold markings

The Aeronautical Information Publication (AIP) Part 3 – Aerodromes, 1.1 paragraph 3.5 subparagraph 3.5.4 states that, when a threshold is temporarily displaced, it will be shown by lights or by the following:

- a. a series of inverted 'V' markings (white) painted across the runway; or
- b. one or two white Vee-Bar markings located on both sides of the runway (Figure 2); or
- c. at military controlled aerodromes (such as Darwin), for short periods and dependent on military operational requirements, four white cones situated on both sides of the runway.

Figure 2: Displaced threshold markings

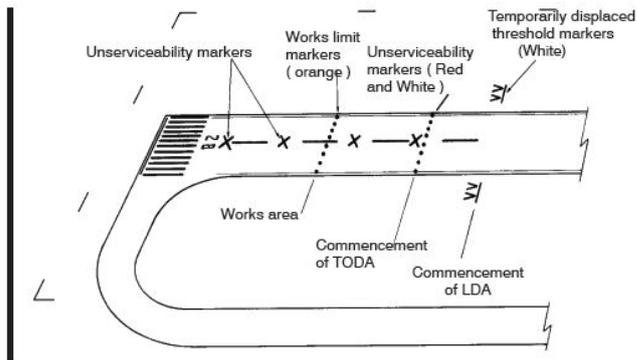


Figure 9 – Markings for a temporarily displaced threshold due to works on the runway for a period of 30 days or less.

Source: Airservices Australia

Pilot comments

The pilot provided the following comments:

- when reviewing the NOTAM, he did not observe the description stating that the displaced threshold would be marked by Vee-Bars
- during the approach, he looked for the runway threshold identification lights, but they were not operational at that time
- the runway works had been underway for the previous three weeks, with the threshold regularly displaced during that period
- there was a hump in the runway, just before 'Bravo 2', and the Vee-Bars were located on the downhill side of the hump; he did not see them at any stage during the landing
- after sighting the cones, he was conducting his finals checks, looking down the runway at his aiming point, and then assessing where he would vacate the runway
- when the displaced threshold lights and precision approach path indicator (PAPI) were previously used to indicate the location of the displaced threshold, they were visible from over 2 NM away and provided valuable guidance to pilots.

Darwin air traffic control comments

Darwin ATC provided the following comments:

- the displaced threshold lights were only activated during periods of darkness or reduced visibility
- a temporary PAPI was activated during routine maintenance on the runway arrestor cables. Local pilots operating at Darwin may have seen these in operation many times. On the day of this occurrence, the displaced threshold was in place for airfield works and at a different location to that used for cable maintenance. As the displaced threshold in use on the day had not been pre-surveyed, the temporary PAPI was not able to be used.

Safety action

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may proactively initiate safety action in order to reduce their safety risk. The ATSB has been advised of the following proactive safety action in response to this occurrence.

Aircraft operator

As a result of this occurrence, the aircraft operator has advised the ATSB that the following email was sent to all company pilots advising:

With current and ongoing works to the airfield in Darwin particularly runway 11/29 and 18/36, the activation of the temporary PAPI guidance system is used when cable maintenance is required or requested by airlines for compliance reasons. This does not include when the threshold is displaced for any other reason i.e. current works in progress. The chevron or vee-bar markings denote the displaced threshold. Pilots may with approval back-track inside the displaced threshold however pilots are required to land outside of this area. Typically red and white cones are positioned a significant distance from the displaced threshold, providing guidance boundaries for men and hand tools to operate in. These cones are not to be mistaken for the displaced threshold markings. Remember to carefully review all NOTAMs and maintain good situational awareness. If in doubt, ask the question. As per the Manual of Standards 139, the PAPI system is not required if there is sufficient displaced markings displayed.

Safety message

A report prepared for the ATSB, The Clarity and Accessibility of NOTAM Information for the Aviation Industry, www.atsb.gov.au/media/761312/clarity_accessibility_notam.pdf, found that there was a significant potential for oversight of critical information in the NOTAM system. This incident highlights the importance of thorough pre-flight planning and the use of all available information in preparing for flight.

General details

Occurrence details

Date and time:	29 October 2013 – 0830 CST	
Occurrence category:	Incident	
Primary occurrence type:	Runway undershoot	
Location:	Darwin Airport, Northern Territory	
	Latitude: 12° 24.88' S	Longitude: 130° 52.60' E

Aircraft details

Manufacturer and model:	Cessna Aircraft Company 404	
Registration:	VH-HAZ	
Serial number:	404-0046	
Type of operation:	Charter – passenger	
Persons on board:	Crew – 1	Passengers – 4
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

About the ATSB

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The ATSB is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through excellence in: independent investigation of transport accidents and other safety occurrences; safety data recording, analysis and research; and fostering safety awareness, knowledge and action.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to fare-paying passenger operations.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, relevant international agreements.

The object of a safety investigation is to identify and reduce safety-related risk. ATSB investigations determine and communicate the safety factors related to the transport safety matter being investigated.

It is not a function of the ATSB to apportion blame or determine liability. At the same time, an investigation report must include factual material of sufficient weight to support the analysis and findings. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

About this report

Decisions regarding whether to conduct an investigation, and the scope of an investigation, are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, a limited-scope, fact-gathering investigation was conducted in order to produce a short summary report, and allow for greater industry awareness of potential safety issues and possible safety actions.