



Australian Government

Australian Transport Safety Bureau

Take-off without runway lighting involving, Airbus A320, VH-JQG

Hobart Airport, 14 December 2012

ATSB Transport Safety Report

Aviation Investigation

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Addendum

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Take-off without runway lighting involving Airbus A320, VH-JQG

What happened

At 2327 Eastern Daylight-saving Time¹ on 14 December 2012, an Airbus A320 registered VH-JQG (JQG) operated by Jetstar Airways on a scheduled passenger flight from Hobart, Tasmania to Melbourne, Victoria, took off without the runway lights being activated for the taxi and take-off roll.

Hobart Apron



Source: Hobart International Airport

Airport information and lighting

Outside tower hours, Hobart Airport operated as a non-towered, uncontrolled airport, operating on a common traffic advisory frequency (CTAF).² When operating as a CTAF, the runway lighting was controlled by a pilot-activated lighting (PAL) system that was combined with an aerodrome frequency response unit (AFRU).³ To activate the lights, pilots were required to make a sequence of three transmissions on the CTAF. Each transmission was to have a maximum duration of 1 second, with the break between transmissions being a maximum of 1 second. On receipt of the appropriate transmission, the AFRU would broadcast an automatic message 'Hobart lights ON' on the CTAF.

Once the PAL system was activated, the airport lighting would remain on for 30 minutes. If it was reactivated during this period, the lighting would remain on for 30 minutes from the time of reactivation. At 10 minutes prior to the end of the 30-minute activation period, the wind indicator (windsock) lights would commence flashing to warn users that the airport lighting was about to extinguish. In addition, an automated message would be transmitted on the CTAF to state there was 10 minutes of runway lighting remaining. There was no indication that the system was malfunctioning on the night of the occurrence.

On the night of the occurrence, JQG was parked at gate 4 facing away from the runway and facing into the brightly lit terminal at Hobart Airport. The apron was brightly lit at night and the apron lighting operated independently of the PAL lighting system. Also, alternating flashing amber holding-point lighting operated independently of the runway PAL lighting system.

Aircraft lighting information

The exterior lighting of the A320 included several lights, which illuminated the ground in front of the aircraft. These included the landing lights, nose lights, taxi lights and runway turn-off lights. The combination of these lights provided a substantial amount of illumination in front of the aircraft.

Recorded information

Recordings of radio transmissions made on the CTAF, along with recorded video from a closed circuit television (CCTV) mounted on the passenger terminal, were reviewed by the ATSB. The CCTV video showed movement of the aircraft consistent with the audio recording of the CTAF. In addition, the lighting activation records were obtained from Hobart Airport, which confirmed that the aerodrome lighting was not activated for the departure of JQG.

¹ Eastern Daylight-saving Time was Coordinated Universal Time + 11 hours

² A CTAF is a radio frequency designated for communications between aircraft in the vicinity of aerodromes without a control tower.

³ Aerodrome frequency response unit (AFRU) is a VHF transceiver which provides an automatic response when the pilot transmits on the traffic frequency (normally CTAF) for a particular aerodrome.

Flight crew experience

The Captain had approximately 18,000 hours total flying experience and was a senior check captain with the operator.

The First Officer had approximately 10,000 hours total time and had recently joined the operator. The flight on 4 December was to serve as a final check to line for the First Officer.

Both pilots noted that it had been a number of years since they had operated from a CTAF at night utilising PAL.

Comments from flight crew

The crew had been delayed throughout the day which resulted in the aircraft arriving at Hobart two hours later than scheduled. Consequently, the Hobart Tower had been deactivated and operations were being conducted in accordance with the non-towered aerodrome procedures, which the crew had not originally planned for. The Captain also reported being cognisant of the fact that the delays earlier in the day had the potential to affect his duty time for the following day.

The crew had previously operated the Melbourne to Hobart sector arriving at Hobart at 2230 EDT. The Captain reported making three 3-second transmissions on arrival to activate the runway lighting. On becoming visual with the runway, the crew noted that the runway lights were on and believed that they had activated the runway lighting via the PAL system.

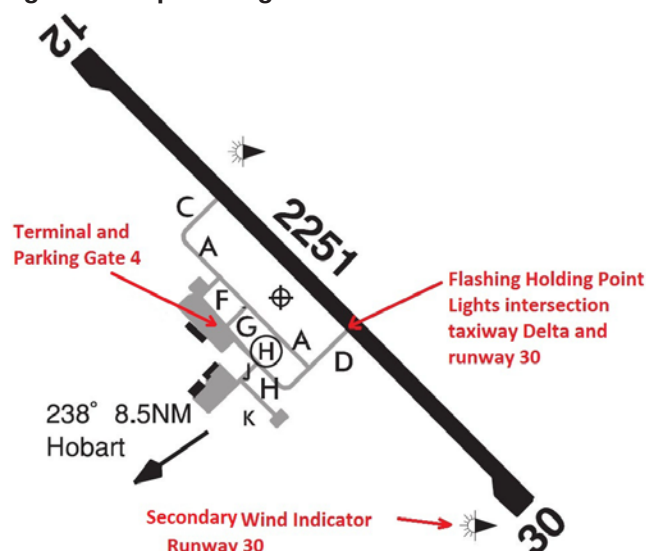
During the turnaround and prior to taxiing for departure, the Captain recalled hearing the “Runway lights 10 minutes remaining warning” and used the same sequence of transmissions that he had used on arrival to reactivate the runway lighting for the departure.

On departure, the crew taxied via taxiways Golf (G), Alpha (A) and Delta (D) for runway 30 (Figure 1). At the intersection of taxiway Delta (D) and runway 30 there were alternating flashing holding point lights. The Captain reported that the flashing holding point lights confirmed in his mind that the runway lights were on.

The Captain did not recall seeing the windsock adjacent to the runway threshold as they approached the turning node at the end of the runway. However, the First Officer particularly recalled looking to the windsock and confirming the wind direction and that the windsock lights were not flashing. He later concluded that the windsock must have been lit by the aircraft lights as the aircraft turned through the turning node.

Both flight crew commented that they had no difficulties maintaining directional control during the taxi and take-off roll, further noting that at no time did anything seem unusual or out of the ordinary.

Figure 1: Airport Diagram



Source: Airservices Australia

ATSB comment

Two pilot activated lighting systems exist at Australian airports, Pilot Activated Lighting (PAL) and Aerodrome Frequency Response Unit plus PAL (AFRU+PAL). Hobart Airport is equipped with the AFRU+PAL type installation.

The two systems differ in their activation methods. The PAL system requires three 3-second pulses with 1 second between each pulse. The PAL + AFRU system requires three 1-second pulses with 1 second between each pulse and the sequence must be completed within 5 seconds to be effective.

On arrival to Hobart, the Captain reverted to the older, PAL-only activation sequence. On becoming visual on approach to Hobart the crew observed that the runway lights were on and were of the belief that they had activated the lighting via the PAL. However, Hobart Tower had deactivated at about the same time as the crew of JQG became visual and the Tower had switched the runway lighting over to the PAL system, activating the runway lighting. On departure, the crew employed the same incorrect activation sequence when attempting to activate the runway lighting.

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.

Jetstar Airways

As a result of this occurrence, Jetstar Airways advised the ATSB that they have taken the following safety action;

- An internal memo was issued to flight crew reminding them that there were two different systems for activation of PAL in Australia.
- A review of the Quick Reference Handbook to include normal operations that are not regularly applied, including activation of PAL lighting.
- Review of training programs relevant to operations at non-towered aerodromes.

- Company documents to be reviewed to ensure policy is clear in regard to operations from a non-towered aerodrome and provision of an alternate aerodrome.
- Jetstar has raised concerns regarding the reliance on PAL lighting in RPT operations with Airservices Australia and the Civil Aviation Safety Authority.
- A procedure is to be developed to task ground staff in attendance with ensuring lighting has been activated for arrival and departure of company services.

Hobart International Airport

As a result of this occurrence, Hobart International Airport has taken the following safety action;

- Commenced changing the airport lighting program so that the lighting stays on until after the last regular public transport (RPT) aircraft movement.
- Where there is an out of schedule movement, the airport authority will manually activate the lighting, until such time that all RPT movements have been completed.
- All Hobart Airport Senior Operations Officers were briefed and instructed in regard to their expected actions and duty of care in this type of event.

Safety message

Runway and taxiway lighting serves many important functions for a departing aircraft. For example it provides:

- navigational guidance around the airport
- directional guidance during the take-off roll
- an indication of the location of the end of the runway
- necessary guidance for approach and landing if required due to an emergency shortly after takeoff

This incident highlights the potential hazards associated with change blindness, inattention blindness and expectation bias.

Change blindness occurs when a person does not notice that something is different about the visual environment relative to before the change. Research has shown that in some cases, quite dramatic changes are not detected, particularly if changes occur when the observer is not looking at the relevant part of the visual environment.

Inattention blindness occurs when a person does not notice an object which is visible, but unexpected, because their attention is engaged on another task. In this instance, the absence of airport lighting was noticeable, if looked for. However, the crew had an assumption or expectation that the lighting was on.

In simple terms, expectation bias is 'seeing' what you expect to see even when it is not there, in this case, runway lighting being on.

Defining a specific place for PAL tasks in the crew's sequence of procedures, such as when the pre-taxi CTAF call is made and incorporating this into a pre-taxi checklist, could potentially ensure more reliability in performing these tasks.

For similar events involving take-offs without runway lighting refer to:

- ATSB Investigation; AO-2008-020, Procedures-related event, Launceston Airport, Tas., 12 March 2008, VH-VQY, Airbus A320-200
www.atsb.gov.au/publications/investigation_reports/2008/aair/ao-2008-020.aspx
- ATSB Investigation; AO-2012-069, Take-offs without runway lighting, Gladstone Airport – 16 and 17 May 2012
www.atsb.gov.au/publications/investigation_reports/2012/aair/ao-2012-069.aspx

For further information on change and inattention blindness and expectation bias refer to:

- *Deadly Omissions*- Transport Canada
www.tc.gc.ca/eng/civilaviation/publications/tp185-2-10-feature-3718.htm
- Sights unseen – American Psychological Association
www.apa.org/monitor/apr01/blindness.aspx

General details

Manufacturer and model:	Airbus A320	
Registration:	VH-JQG	
Operator:	Jetstar	
Type of operation:	Regular Public Transport	
Occurrence category:	Incident	
Primary occurrence type:	Runway Lighting Event	
Location:	Hobart Airport	
	Latitude: 42° 50.15' S	Longitude: 147° 30.20' E
Damage:	Nil	

About the ATSB

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The Bureau 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.