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Australian Transport Safety Bureau

Runway incursion – Perth airport safety vehicle

Perth Airport, Western Australia, 15 June 2012

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Final

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What happened

Perth airport

Source: Airservices Australia

From 0252 Western Standard Time[1] on 15 June 2012, Perth Airport, Western Australia, was operating on runway 21 under low visibility procedures, due to fog. Under these procedures, an airport operations officer (AOO) measured the runway visibility using published techniques and provided the information to air traffic control (ATC)[2].

To calculate the visibility, the AOO was required to drive along the runway that was in use, from the threshold of runway 21 (Figure 1) to a documented intermediate observation point (position 4[3] for runway 21). The AOO then reported the number of runway edge lights observed from each location. When not measuring the runway visibility, the AOO was required to park the vehicle at a designated position (position 9) away from the runway monitor the Perth Tower (Tower) radio frequency on 120.5 MHz.

At 0545 the AOO, using the callsign Safety 2, entered runway 21 and conducted a runway visibility check before returning to position 9 on the airfield. At about 0550, a handover was conducted between AOOs at position 9. The taking-over AOO had contacted Perth Ground (Ground) on 121.7 MHz prior to first entering the airfield then switched the radio to the Tower frequency as part of the handover.

At about 0555, the air traffic controller (Tower) instructed a Piper PA-42 aircraft, registered VH-BUW (BUW), to line up on runway 21. The controller, using non-standard phraseology (Table 1), then instructed Safety 2 to provide a count of runway edge lights. At 0557, during the exchange between Tower and Safety 2, Safety 2 entered runway 21 without a clearance at taxiway J. When instructed by Tower, Safety 2 immediately vacated runway 21 via taxiway J.

Low visibility procedures ceased at 0605 when the visibility improved to greater than 10 km in fog patches.

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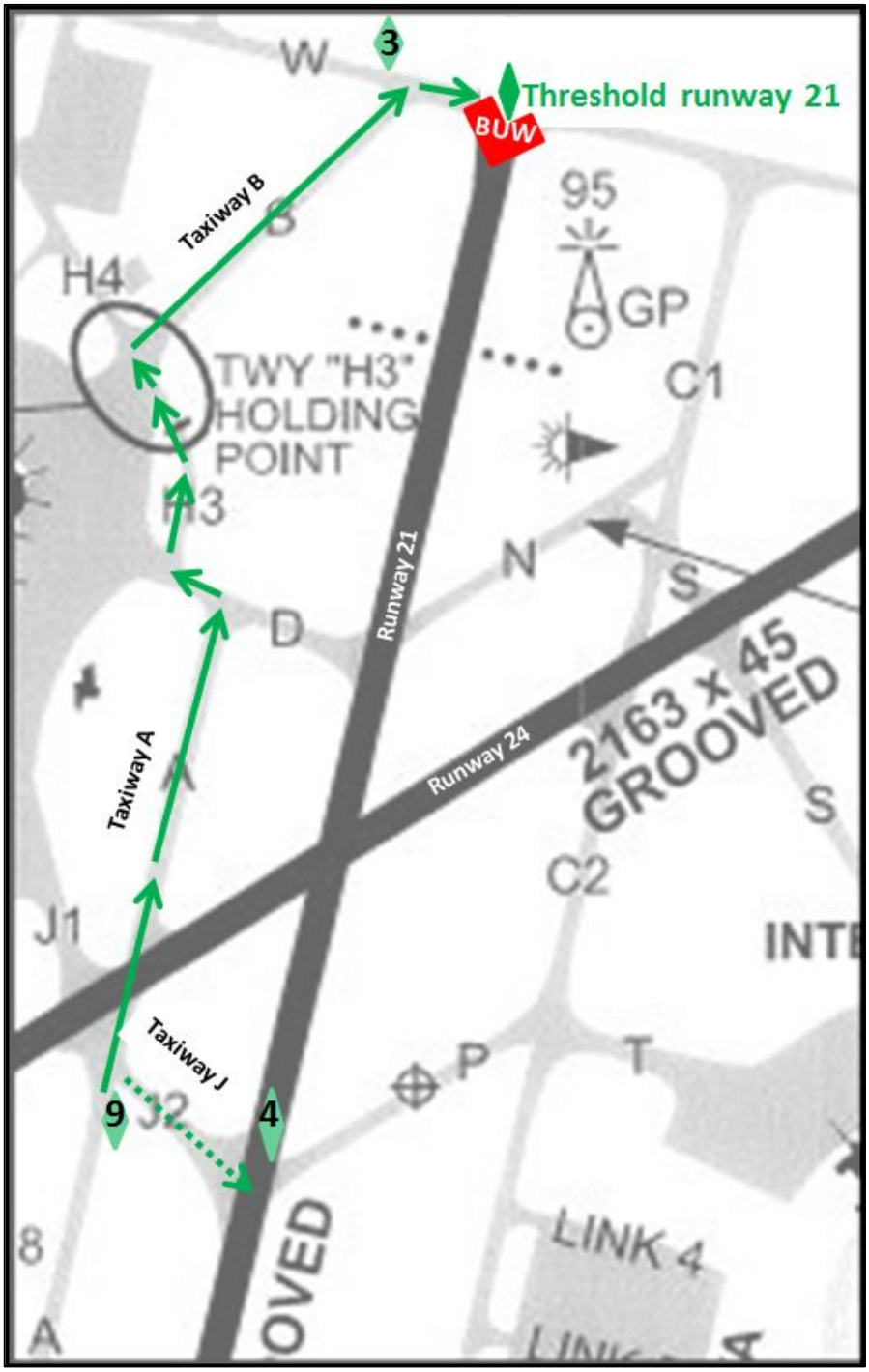
1 Western Standard Time (WST) was Coordinated Universal Time (UTC) + 8 hours.

2 ATC at Perth Airport is provided by Airservices Australia.

3 The positions are designated in the Perth Airport Runway Visual Range Assessment Chart

Figure 1: Location of safety vehicle positions (green diamonds), actual path of Safety 2 (dotted green line), path of Safety 2 as intended by ATC (solid green line) and location of BUW at the threshold of runway 21 (red)



Source: Airservices Australia

Table 1: Relevant radio transmissions from 0555 to 0558

Agency	Text of transmission	Notes
Tower	Safety 2 can you go to the threshold again and give us a count?	1
Safety 2	Enter runway 21 cross runway 24, Safety 2.	2
Tower	Is that Safety 2, I can barely hear you?	
Safety 2	Radio check please.	
Tower	Safety 2 read you 5.	3
Safety 2	...cross runway 24...	4
Tower	Safety 2 cross runway 24 and proceed to the threshold runway 21.	1
Safety 2	(unintelligible) ... runway 21, cross runway 24 Safety 2.	
Tower	Bravo Uniform Whiskey I didn't want you to enter runway 21. I wanted you to cross runway 24 and proceed up Alpha to the threshold.	1 and 5
Tower	Safety 2 I didn't want you to enter runway 21. I wanted you to proceed up Alpha to the threshold runway 21.	1
Safety 2	Confirm that was for Safety 2 and not Bravo Uniform Whiskey?	
Tower	Safety 2 affirm, vacate runway 21, and proceed up Alpha, cross runway 24 to the threshold runway 21.	1
Safety 2	Vacate runway 21, proceed up Alpha to, ah, just confirm the threshold of runway 03?	1
Tower	Negative, threshold runway 21.	1
Safety 2	Proceed up Alpha, cross runway 24 and proceed to the threshold of runway 21, Safety 2.	1

Notes:

1. Non-standard phraseology.
2. Safety 2 responded to the non-standard phraseology with what he thought the Tower controller meant.
3. '… read you 5' meant that the radio transmission was perfectly readable.
4. Safety 2's response was over-transmitted by a radio call from an aircraft.
5. The Tower controller inadvertently used BUW's callsign instead of Safety 2

Airport operations officer comments

In response to the non-standard phraseology, the AOO had read back what he believed the controller wanted him to do, expecting the Tower to respond with a correction or a confirmation (see Note 2 in Table 1). Although he was not cleared to enter runway 21, the AOO noted that to '… go to the threshold …' would require Safety 2 entering the runway. In the two and a half years the AOO had been employed by the Perth Airport Pty Ltd (Perth Airport) to conduct these duties, he had not been required to track via the taxiways for a runway visibility check.

Further, as Safety 2 was on the Tower frequency, the AOO would not have been aware of aircraft or vehicle movements on the taxiways as they would be operating on the Ground frequency. The AOO also noted that when he arrived at position 9 for the handover, the visibility was such that he could see both ends of runway 21, although low visibility procedures were still in operation.

Tower controller comments

The Tower controller did not know that there had been a handover between AOOs and thought that Safety 2 was the same person as had been operating earlier. The controller noted that the visibility at the time of the runway incursion was good and he observed Safety 2 entering runway 21.

The controller had asked Safety 2 to provide the runway visibility measurement so that the low visibility procedures could be formally ended.

ATSB Comment

The Aeronautical Information Publication (AIP)[4] stated:

> *Use of standard phrases for radio telephony communication … is essential to avoid misunderstanding the intent of messages and to reduce the time required for communication.*

An airside driver's guide to runway safety, published by Airservices Australia, also emphasised the need for standard phraseology. The use of non-standard phraseology by the Tower controller resulted in Safety 2 misunderstanding an instruction and entering the active runway.

Safety actions

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.

Perth Airport Pty Ltd

As a result of this occurrence, Perth Airport has advised the ATSB that they are taking the following safety actions:

Perth Airport held workshops for all AOOs that reiterated the following:

- Identify what is an implied or unclear instruction from ATC;
- Ensure that the unclear instruction is positively clarified (corrected by ATC, not clarified in the read back);
- Reiterate that implied clearances are not a clearance to enter or cross a runway; and
- Reaffirm that the words "cross" or "enter" must be given and understood before entering or crossing a runway.

Perth Airport is also working with ATC in relation to non-standard phraseology.

Training for AOOs and other airside drivers will be enhanced with modules on human factors, AOO procedures for handovers on the airfield are being reviewed and Perth Airport is reviewing recent runway incursions to enable any trends identified to be addressed.

Airservices Australia

As a result of this occurrence, Airservices has advised the ATSB that they are taking the following safety actions:

To further enhance airport safety, Airservices will issue a Standardisation Directive to remind controllers of the importance of using standard phraseology for interaction with ground vehicles.

Airservices will also review the industry communications document *Airside Driver's Guide to Runway Safety – Safe surface operations* at controlled aerodromes to ensure that the document continues to be accurate and relevant for the promotion of runway safety performance.

Safety message

This incident is a reminder that in safety critical situations all radio communications phraseology should be clear, concise and unambiguous. It is also a reminder to drivers operating on an airfield to seek clarification of ATC instructions should there be any doubt as to the content or intent of the instruction.

The following ATSB investigation report provides further reading on runway incursions:

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[4] A package of documents that provides the operational information necessary for the safe and efficient conduct of national (civil) and international air navigation throughout Australia and its Territories.

AO-2010-011 – Runway incursion - PK-GMG, Perth Aerodrome WA, 24 February 2010 is available at:
www.atsb.gov.au/publications/investigation_reports/2010/aair/ao-2010-011.aspx

An Airside driver's guide to runway safety (3rd edition – June 2012) is available at:
www.airservicesaustralia.com/wp-content/uploads/airside_drivers_guide.pdf

Airport safety vehicle details

Manufacturer and model:	Not applicable	
Operator:	Perth Airport Pty Ltd	
Registration:	Safety 2	
Type of operation:	Airport safety vehicle - low visibility operations	
Location:	Perth airport, Western Australia	
Occurrence type:	Runway incursion	
Persons on board:	Crew – 1	Passengers – nil
Injuries:	Crew – nil	Passengers – nil
Damage:	None	

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.