AVIATION OCCURRENCE REPORT

NEAR COLLISION WITH STATIONARY AIRCRAFT

BETWEEN
CANADIAN AIRLINES INTERNATIONAL LTD.
BOEING 737-200 C-FCPN
AND
CARSON AIR LTD.
PIPER PA-42 CHEYENNE C-FWCC
CALGARY INTERNATIONAL AIRPORT, ALBERTA
20 DECEMBER 1995

REPORT NUMBER A95W0234

The Transportation Safety Board of Canada (TSB) investigated this occurrence for the purpose of advancing transportation safety. It is not the function of the Board to assign fault or determine civil or criminal liability.

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Summary

The Piper Cheyenne had landed on runway 34 at Calgary International Airport, Alberta, and was instructed to exit on ice-covered taxiway Uniform. During the turn to exit, the Cheyenne began sliding near taxiway Uniform, and came to rest with the nose gear just off the edge of the runway. A Boeing 737, which had been cleared to land, touched down and the pilot was applying reverse thrust before noticing that the Cheyenne was not clear of the active runway. The flight crew of the Boeing reported passing behind the Cheyenne, with about 15 feet of clearance, at about 100 to 115 knots.

Ce rapport est également disponible en français.

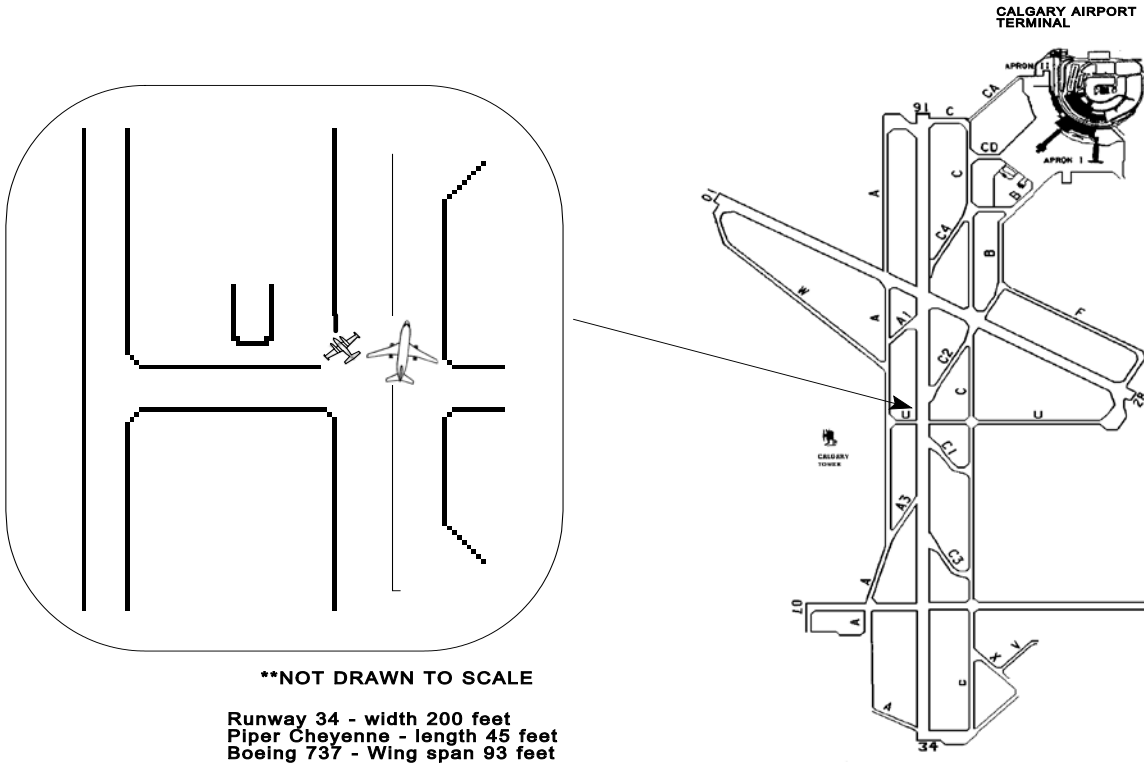
Other Factual Information

The Cheyenne had departed Kelowna, British Columbia, and the Boeing had departed Dorval, Quebec. Both aircraft were inbound to Calgary and arrived during the hours of darkness.

The runway conditions for the Calgary International Airport were reported as bare and dry within 50 feet either side of the centre line. The runway sides and some of the taxiways were ice-covered. Taxiway Uniform was ice-covered. The weather was ceiling and visibility okay (CAVOK).

The Boeing was about three miles behind the Cheyenne on final approach to runway 34. The Cheyenne was instructed to plan a left exit, onto runway 25, after landing. Following touchdown, the Cheyenne was unable to exit onto runway 25, and the airport controller instructed the pilot to continue and exit on taxiway Uniform, with minimum delay, as there was a Boeing on a one-mile final. The Cheyenne crew was also advised that the closer taxiway, Alpha 3, was extremely slippery and

Calgary International Airport



undergoing maintenance by snow removal and chemical spreading equipment. The Boeing was advised to expect landing clearance on extremely short final. At about 2100 mountain standard time (MST),

All times are MST (Coordinated Universal Time minus seven hours) unless otherwise noted.

the Cheyenne crew advised the tower that they were "slipping here at Uniform." During the left turn to exit runway 34, the Cheyenne skidded and came to rest about 200 feet north of taxiway Uniform. The aircraft's nosewheel was just off the edge of the runway asphalt, in about six inches of snow. The main gear remained on the runway. The captain attempted to free the Cheyenne from its snowbound location using reverse power, but was unable to do so.

On short final, the Boeing crew were advised that the twin (Cheyenne) would be clearing on Uniform. A few seconds later, when the Boeing was descending through about 250 feet above ground level (agl), the flight crew received landing clearance, and were told to plan exiting on Charlie 4. At about 150 feet agl, the Boeing crew observed the navigation lights of the Cheyenne moving toward taxiway Uniform, and it appeared that the Cheyenne would be clear of the active runway before their touchdown. However, shortly after touchdown, the Boeing crew were surprised by the presence of the Cheyenne still partially on the active runway. With limited choices, because of the snow- and ice-covered sides of the runway, the crew took evasive action to avoid a collision. In doing so, they manoeuvred their aircraft as far as possible to the right and passed behind the Cheyenne with about 15 feet of clearance. The Cheyenne crew then advised the airport controller that they were still on the runway, requested a tow vehicle, and shut down the engines. The Boeing taxied to the ramp without further incident, and the Cheyenne was subsequently towed off the runway to a hangar facility.

The Boeing captain later reported that, after touchdown, the navigation lights of the Cheyenne were nearly impossible to distinguish as they intermingled with the runway lights.

The Transport Canada (TC) *Air Traffic Control Manual of Operations (MANOPS)*, section 352.2, states:

> Separate an arriving aircraft from a preceding aircraft using the same runway by ensuring that the arriving aircraft does not cross the landing threshold until one of the following conditions exists:
>
> A. The preceding aircraft has landed and taxied off the runway.
> B. The preceding aircraft has landed or is over the landing runway; and
> 1. is at a distance from the threshold sufficient to allow the arriving aircraft to complete its landing roll without jeopardizing safety; and
> 2. The arriving aircraft is advised of the preceding aircraft's position and intentions.

Section 352.2 B. 1. Note 1, states: "Controllers are cautioned to take into consideration the aircraft types, their performance, the runway condition and other factors that may impact on the operation."

Section 352.2 B. 1. Note 2, states: "The sufficient distance... need not be equal to the anticipated stopping of the second aircraft,

provided the second aircraft is a light aircraft and you are satisfied no danger of collision exists."

A controller is expected to use the best judgement in handling a situation not specifically covered in MANOPS.

Staffing in the tower met TC unit standards, and the controller's workload was assessed as moderate and fairly complex. The tower supervisor was performing the duties of the airport controller. He was highly experienced in this position and was following procedures as outlined in MANOPS based on aircraft performance factors. All necessary tower equipment was serviceable and in operation. Runway 34 was in use for arrivals, and standard runway 34 and 28 co-active operation was used for departures. Traffic was arriving and departing normally in a "one in and one out" basis with no spacing restrictions given to arrivals.

Although taxiway Uniform was ice-covered, other aircraft had used this exit just prior to the occurrence without reporting any problems. After landing, the Cheyenne slowed to taxi speed by taxiway Alpha 3; at this time, the Boeing was about two miles on final. The airport controller observed the Cheyenne start its turn toward taxiway Uniform, and he then directed his attention to the landing Boeing and other departure traffic. As the Boeing was touching down, the controller noticed that the Cheyenne had become stuck in the snow and was still partially on the runway. He realized, however, that there was space for the Boeing to manoeuvre past the Cheyenne. As the Boeing passed behind the Cheyenne, the tower controller apologized for the inconvenience, and issued exiting instructions. The Boeing crew responded in an ordinary tone that the Cheyenne was off to the side.

The flight crew of both aircraft were certified and qualified for flight in accordance with existing regulations. The aircraft were certified, equipped, and maintained in accordance with existing regulations and approved procedures.

Expectancy describes the state of a person who expects to perceive certain environmental cues and tends selectively to search for those cues more actively than others. Channelized attention exists when a person's full attention is focused on one stimulus to the exclusion of all others.

Analysis

The Boeing crew and the airport controller observed the Cheyenne turning to exit on taxiway Uniform, and were satisfied that the landing could be completed safely. However, when the unexpected happened, there were minimal available safety options. In this case, the airport controller's expectancy, based on the habitual pattern of aircraft exiting the active runway without problems, may have been so strong that he perceived aircraft exiting cues that were misinterpreted. Channelized attention may have existed when the controller's full attention was focused on the landing Boeing and departing traffic. Rather than process information of a higher or more immediate priority, he focused his attention on the landing and departing traffic; thus, he had little time to respond to cues requiring immediate attention. Although it is impossible to detail procedures for all situations because of the many different circumstances that may arise, a controller is expected to use his or her best judgement in handling a situation not specifically covered in MANOPS. The icy runway exits compromised the after-landing efficiency of the crew and their ability to expeditiously exit their aircraft from the active runaway. The icy sides of the runway also compromised the ability of the Boeing to manoeuvre and to pass behind the Cheyenne with an extra margin of safety. This situation would have been prevented had the controller ensured that there was the minimum required separation as detailed in Section 352.2 of MANOPS; however, it is recognized that the controller thought that the runway was clear for the landing aircraft. In addition, the Cheyenne crew did not assertively and explicitly communicate the importance of their not being clear of the active runway. The advisory statement made by the Cheyenne crew that they were slipping at Uniform was misleading, in that it implied that they were clear of the active runway and on taxiway Uniform. Further potential for a runway collision would have existed had the Cheyenne crew been able to free their aircraft from the snowbound location using reverse power and subsequently backed into the landing path of the Boeing.

Findings

1. Both flight crews were certified and qualified, and both aircraft were certified, equipped, and maintained in accordance with existing regulations and approved procedures.

2. Staffing in the tower was in accordance with Transport Canada unit standards.

3. All necessary tower equipment was serviceable and being used.

4. Icy runway sides and exit conditions prevailed, and the lighting conditions were conducive to poor traffic detection.
5. Considering the airport surface conditions, the spacing between the arriving and the preceding aircraft was insufficient.

6. The Cheyenne crew did not explicitly (assertively and accurately) communicate that they were not clear of the active runway.

Causes and Contributing Factors

The spacing provided between an arriving and a preceding aircraft did not allow for unforeseen contingencies during unfavourable airport conditions. Contributing to the occurrence was the unexplicit traffic advisory by the Cheyenne crew that they were not clear of the active runway.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson, Benoît Bouchard, and members Maurice Harquail and W.A. Tadros, authorized the release of this report on 27 August 1996.