

Transportation Safety Board
of Canada



Bureau de la sécurité des transports
du Canada

AVIATION INVESTIGATION REPORT
A00P0090



LOSS OF SEPARATION

NAV CANADA
VANCOUVER AREA CONTROL CENTRE—WEST SECTOR
TOFINO, BRITISH COLUMBIA 17 NM E
30 MAY 2000

Canada

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.

Aviation Investigation Report

Loss of Separation

Nav Canada

Vancouver Area Control Centre—West Sector

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Summary

An Alaskan Airlines MD-80 (ASA131) was maintaining flight level 310 en route from Seattle, Washington, to Anchorage, Alaska. At the same time, a Canadian Airlines Boeing 747-400 (CDN4) was inbound to Vancouver, British Columbia, from Tokyo, Japan, at flight level 350. The air traffic controller cleared CDN4 for the CASDY ONE Standard Terminal Arrival procedure and instructed the pilot to descend to 17 000 feet. Shortly thereafter, a loss of separation occurred when the spacing between the two aircraft was reduced to 700 feet vertically and 1 nautical mile horizontally, in an area where the minimum allowable separation between aircraft is 2 000 feet vertically or 5 nautical miles horizontally.

Ce rapport est également disponible en français.

Other Factual Information

The incident took place in airspace controlled by the west sector of the Vancouver Area Control Centre. At the time of the incident, the west sector radar controller was working a combined radar and data position and was controlling four aircraft (including ASA131 and CDN4). He had commenced his shift at 0600 Pacific daylight time (PDT)¹ and had been working in the west sector position for approximately 45 minutes. The traffic was considered light, with low complexity. Runway 26 was in use for arrivals at Vancouver.

At 0940:00, CDN4 was cleared to descend from flight level (FL) 350 to 17 000 feet; the crew reported leaving FL350 at 0941:35. The descent clearance made no reference to ASA131. At 0942:27, CDN4 was near the INHAM intersection, in a descending left turn to intercept the CASDY ONE arrival track, when the crew sighted ASA131. (See Figure 1.) Shortly thereafter, the crew of CDN4 received a traffic alert and collision-avoidance system (TCAS) traffic advisory (TA), followed by a TCAS resolution advisory (RA) to climb. Because the intruder aircraft was in sight and there was no chance of collision, the captain of CDN4 chose not to comply with the TCAS RA and continued to descend. This decision is in accordance with the *Canadian Airlines Flight Operations Manual*. CDN4 then initiated contact with the west sector controller to advise him of the situation. At approximately the same time, the crew of ASA131 received a TCAS TA, visually confirmed that the descending Boeing 747 would cross behind their aircraft, and took no further action. Radar data indicate that, at 0943:20, CDN4 passed approximately 1 nautical mile behind and 700 feet above ASA131.

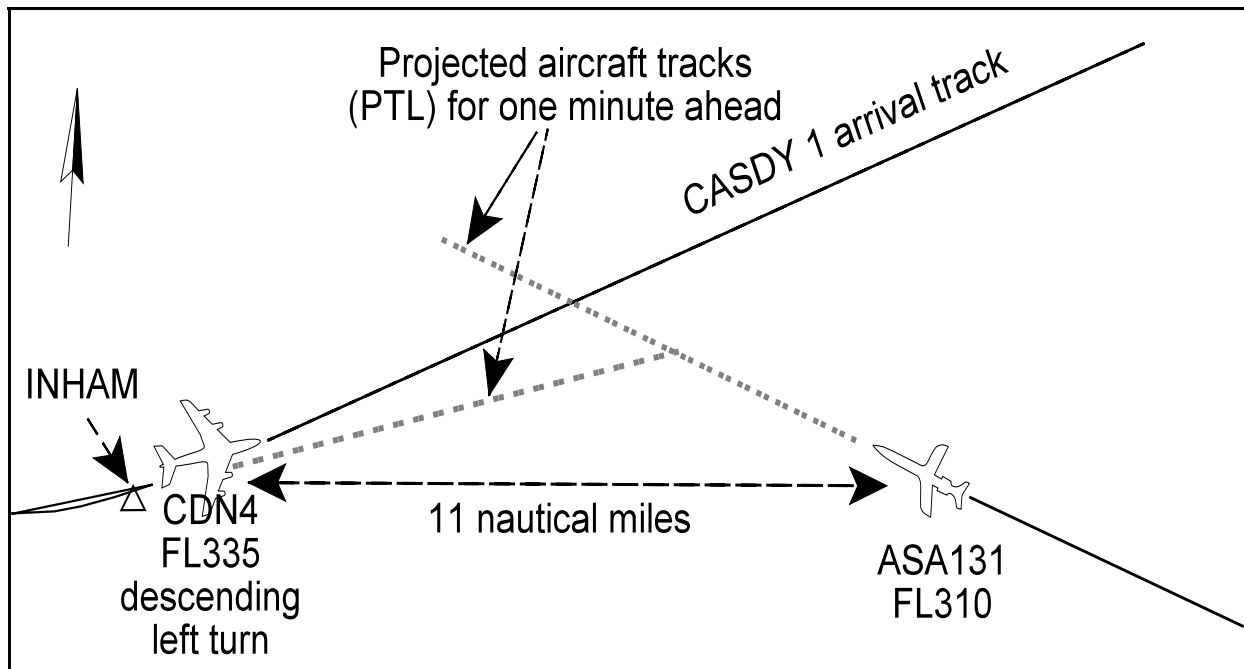


Figure 1 - Approximate position of CDN4 when ASA131 sighted

In addition to radar, air traffic controllers use a flight progress board to monitor the passage of aircraft through their sector. The flight progress board typically contains headers, which

¹ All times are PDT (Coordinated Universal Time minus seven hours).

correspond to fixed points, and flight progress strips (strips), which contain information about individual aircraft. As an aircraft progresses from one fix to another, strips are posted under the appropriate fix designators to facilitate identification of potential conflicts. This often requires more than one strip per aircraft. In the west sector, only two headers were in use at the time of the incident, Victoria and Tofino. Multiple strips for the same aircraft are not used in the west sector.

The west sector controller indicated that although he normally scans the flight progress board and the radar before issuing a descent clearance, he did not do so when he cleared CDN4 to descend to 17 000 feet. Neither did he mark the strip to indicate that CDN4 had left FL350, as required by the *Air Traffic Control Manual of Operations* (ATC MANOPS). The west sector controller could not recall noticing the progress of CDN4 and ASA131 after issuing the descent clearance to CDN4. During this time, the west sector controller was involved in a non-operational conversation with another controller sitting adjacent to him.

The west sector controller was using a radar data-processing system situational display. To visualize potential conflicts between aircraft, a predicted track line (PTL) can be generated for targets on the radar display, and their separation can be computed. The radar modernization project (RAMP) radar-processing system is not equipped with an automated conflict-alerting system.

Analysis

Human performance studies have demonstrated that the potential for human error increases when task loading is heavier or lighter than normal. At the time of the incident, traffic in the west sector was light, with low complexity, involving regular flight routes. It is therefore possible that the relatively benign traffic environment contributed to the west sector controller being less vigilant than normal. The controller did not follow his normal practice of scanning the flight progress board and the radar before issuing a descent clearance, nor did he use the radar display to monitor the separation between CDN4 and ASA131. In other words, the west sector controller did not use available conflict-identification tools and procedures to maintain the required separation minima between aircraft under his control.

When CDN4 reported in descent from FL350, the west sector controller did not annotate the flight progress strip for CDN4, as required by ATC MANOPS. As well, the strip for ASA131 did not indicate a time for abeam Victoria, although it was customary for west sector controllers to include this information on an aircraft strip. These omissions complicated the task of correctly interpreting the flight progress board, since the location of ASA131 and the altitude of CDN4 were less precisely defined. The local practice of using only one strip for each aircraft may have further undermined the utility of the flight progress board. The ASA131 strip appeared under the Victoria header, whereas the CDN4 strip appeared under the Tofino header, thus making a conflict between the two aircraft less apparent. In short, the west sector controller did not properly annotate the flight strips for CDN4 and ASA131, thereby reducing the probability of a conflict being detected by reference to the flight progress board.

The controller responsible for the west sector was engaged in a non-operational conversation with a controller sitting adjacent to him. There is no policy limiting non-essential activities by active controllers, and the supervisor did not intervene to stop the two controllers from conversing. However, because participating in a conversation involves a cognitive workload, it

follows that the west sector controller was less able to attend to his primary task. It is significant that the west sector controller could not recall noticing the progress of CDN4 and ASA131 after issuing the descent clearance to CDN4. For these reasons, it is probable that the conversation distracted the west controller from his primary tasks and compromised his ability to monitor the progress of traffic under his control.

Findings as to Causes and Contributing Factors

1. The west sector controller did not use available conflict-identification tools and procedures to maintain the required separation minima between aircraft under his control.
2. The west sector controller did not properly annotate the flight strips for CDN4 and ASA131, thereby reducing the probability of a conflict being detected by reference to the flight progress board.
3. The west sector controller was engaged in a non-essential conversation with another controller. This conversation probably distracted him from his primary task and compromised his ability to monitor the progress of traffic under his control.

Findings as to Risk

1. There is no policy to prevent air traffic controllers from engaging in non-essential and potentially distracting activities while controlling aircraft.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board authorized the release of this report on 30 August 2001.