

**AVIATION OCCURRENCE REPORT**

**LOSS OF SEPARATION/ RISK OF COLLISION**

**BETWEEN  
CANADIAN REGIONAL AIRLINES  
AEROSPATIALE ATR-42-300 C-FQCP  
AND  
CANADIAN REGIONAL AIRLINES  
AEROSPATIALE ATR-42-300 C-GICY  
TIMMINS AIRPORT, ONTARIO 10 nm SW  
31 MAY 1994**

**REPORT NUMBER A9400137**

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**

Two Canadian Regional Airlines Aerospatiale ATR-42-300 aircraft, Flight 1967 (OEL 1967) and Flight 1968 (OEL 1968), were operating in accordance with instrument flight rules (IFR) on regular scheduled passenger flights at the Timmins, Ontario, airport. OEL 1967 was inbound from Sudbury, Ontario, and had been issued a clearance for an instrument landing system (ILS) arc approach to runway 03. OEL 1968 was outbound to Sudbury and had departed from runway 28 and reported southwest of the airport on the Timmins very high frequency omni-directional range (VOR) 210 degree radial at 4,000 feet above sea level (asl) when the flight was cleared to 17,000 feet asl. At about the same time that OEL 1968 was issued the climb clearance, OEL 1967 was intercepting the ILS localizer final approach course inbound and commenced a descent from 5,000 feet asl. As both aircraft converged towards each other, the crews simultaneously received Traffic Alert and Collision Avoidance System (TCAS) resolution advisory (RA) indications and took evasive action. OEL 1968 descended 500 feet while OEL 1967 climbed 500 feet in accordance with their respective TCAS indications to correct the TCAS RA. Both aircraft were subsequently issued additional IFR clearances and continued to their destinations. There was no damage to either aircraft and there were no injuries to the crew or passengers of either aircraft.

## Other Factual Information

The Timmins airport does not have a control tower, and there is no radar coverage available for traffic operating at lower altitudes. A flight service station (FSS) located on the airport provides traffic advisories on a mandatory frequency to aircraft operating in the vicinity of the airport. Clearances for IFR traffic are issued by the Toronto Area Control Centre (ACC) and passed directly to arriving aircraft by the ACC controller. Departing aircraft receive their clearance from the ACC via the local FSS specialist prior to the aircraft departing IFR. An IFR clearance is not issued to a departing aircraft until the ACC controller releases the aircraft for the take-off which, in part, allows the ACC controller to avoid potential conflicts between any IFR traffic that is arriving and departing in a non-radar environment at the lower altitudes.

The Timmins weather observation at 1000 EDT, about 33 minutes prior to the occurrence, reported a broken cloud layer at 800 feet above ground level (agl), 2,000 feet overcast, with a visibility of seven miles in light rain showers. The wind was from 261 degrees magnetic at six knots.

When OEL 1968 taxied for departure from runway 21, the wind was still from the west but had increased to 10 knots with gusts to 20 knots. The crew advised the Timmins FSS that they would take off from runway 28. The change in the departure runway for OEL 1968 was passed to and approved by the ACC controller at 1022 EDT. After confirming with the crew of the inbound OEL 1967 that they planned to fly an ILS approach to runway 03 and advising them of the departing company traffic, the ACC controller released OEL 1968 for take-off at 1025 EDT. As OEL 1967 proceeded inbound at 5,000 feet asl, the ACC controller queried the crew if they planned to fly the arc approach for runway 03 or proceed directly to the VOR and then outbound. The crew of OEL 1967 responded that they planned to fly the arc and they were cleared to the 12 distance measuring equipment (DME) arc. When OEL 1967 reported on the 12 DME arc, the ACC controller advised OEL 1967 that OEL 1968 was departing and to report the lead radial which was the 200 degree Timmins VOR radial. OEL 1967 reported the lead radial at 1031 EDT, and, when OEL 1968 was queried by the ACC controller, they reported level at 4,000 feet asl on the 210 degree radial outbound at 5.5 DME. At 1032 EDT, the ACC controller then issued an approach clearance to OEL 1967 for a straight-in ILS approach for runway 03 and also cleared OEL 1968 to 17,000 feet asl. The aircraft were converging head on, in cloud, and approaching each other's altitude when their respective TCAS systems warned them of the impending risk of collision.

Staffing at the Toronto ACC for the specialty area and unit sector involved with the occurrence aircraft was in accordance with unit policies, and there were no equipment malfunctions. Although there were several discussions between the ACC controller and OEL 1967 about the crew's intention to fly an ILS approach to runway 03, the controller's plan for procedural traffic separation was based on the

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All times are EDT (Coordinated Universal Time minus 4 hours) unless otherwise noted.

premise that OEL 1967 would be proceeding to the northeast for an approach to runway 21 while OEL 1968 departed to the south. After departing Timmins, OEL 1968 and the ACC controller established radio contact on the same frequency as OEL 1967 about 45 seconds prior to the TCAS RA warnings.

TCAS II is an aircraft-installed device that functions independently from the air traffic control system and provides collision avoidance information to the crew. Traffic advisories (TAs) and resolution advisories (RAs), which contain recommended vertical escape manoeuvres, are displayed to assist pilots in avoiding traffic conflicts.

The RA information is provided to the crew by visual and aural alerts and is displayed on a modified vertical speed indicator (VSI) that indicates the RA vertical speed rate required for safe separation from a threatening aircraft. The RA aural alert must be annunciated at a volume adequate for understanding in high noise level cockpits, and the message should be clear and unambiguous, and avoid the use of negative commands.

Both aircraft were equipped with TCAS II traffic alert and collision avoidance equipment, and the crews took their respective evasive action in response to a corrective RA which requires positive action by the crew. The crew of OEL 1968 did not hear the aural alert generated by the RA. Audio signals from the TCAS II equipment were not routed through the crew headsets on the company ATR-42 aircraft. This, combined with ATS communications at the time of the occurrence, likely prevented the crew from hearing the TCAS II aural alert.

The TCAS II equipment is not required by Transport Canada for the operation of aircraft in Canadian airspace. As of December 1993, functioning TCAS II equipment is required for the operation of this category of aircraft in United States airspace.

The Timmins VOR is located on the airport approximately 900 feet from the right edge of runway 03. The 210-degree radial is closely aligned to the runway 03 localizer final approach course which has an inbound track of 031 degree magnetic.

### **Analysis**

The ACC controller based his traffic separation plan on the mistaken premise that OEL 1967 was going to proceed northeast of the airport on the 12 DME arc approach for runway 21, and therefore would not conflict with OEL 1968 departing the area to the southwest. Given that OEL 1968 had originally planned to depart on runway 21 and an approach to runway 03 would be downwind, it would not have been abnormal for the crew of OEL 1967 to plan an approach to runway 21 as the ACC controller thought. Despite several conversations with the crew of OEL 1967 concerning their intention and subsequent instructions to fly the ILS arc approach to runway 03, the ACC controller did not recognize the severity of the developing traffic conflict. Since there was no radar coverage, he did not have any visual radar target cues on his indicator module (IM) to assist him in recognizing the risk of collision scenario developing. In addition, neither crew were able to anticipate the impending traffic conflict since they shared a common radio frequency with the ACC

controller for only about 45 seconds prior to the TCAS warnings. Consequently, when OEL 1967 was cleared to the Timmins airport for a straight-in ILS approach to runway 03 and commenced a descent from 5,000 asl while inbound and in close proximity to the 210-degree VOR radial, a significant risk of collision existed with OEL 1968 which was outbound on the 210-degree VOR radial and cleared from 4,000 to 17,000 feet asl. In effect, the two aircraft were closing head on in cloud at six miles and transiting through each other's flight path until their TCAS II RA warnings were activated. The immediate and prompt action by both crews to follow their respective TCAS II commands alleviated the risk of collision that existed between the two commuter aircraft.

The OEL 1968 crew reacted to the RA visual indication on the VSI instrument since they did not hear the aural alert, which was not routed through their headsets.

### **Findings**

1. The ACC controller based his non-radar traffic separation plan on the incorrect premise that the arrival aircraft would be proceeding to the northeast and be well clear of the aircraft departing to the southwest.
2. A loss of separation and significant risk of collision occurred between OEL 1967 and OEL 1968.
3. Both crews took immediate evasive action in accordance with TCAS II information, which may have prevented a mid-air collision.
4. The OEL 1968 crew did not hear the TCAS II aural warning.

### **Causes and Contributing Factors**

The ACC controller based his non-radar traffic separation plan on the incorrect premise that the arrival aircraft would be proceeding to the northeast and be well clear of the aircraft departing to the southwest. The traffic plan executed by the ACC controller resulted in the departing and arriving company aircraft flying in the same vicinity without lateral or vertical separation.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson, John W. Stants, and members Gerald E. Bennett, Zita Brunet, the Hon. Wilfred R. DuPont and Hugh MacNeil, authorized the release of this report on 28 February 1995.

Approximate Flight Paths of OEL 1967 and OEL 1968

