

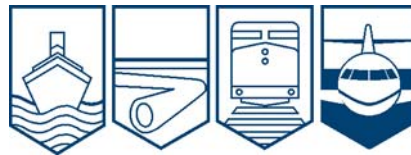
Transportation Safety Board  
of Canada



Bureau de la sécurité des transports  
du Canada

## AVIATION INVESTIGATION REPORT

A05P0143



**AIR PROXIMITY – SAFETY NOT ASSURED**

**NAV CANADA**

**ABBOTSFORD TOWER/VANCOUVER AREA CONTROL CENTRE**

**ABBOTSFORD INTERNATIONAL AIRPORT,**

**BRITISH COLUMBIA, 2 nm S**

**19 JUNE 2005**

**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

### Air Proximity – Safety Not Assured

NAV CANADA  
Abbotsford Tower/Vancouver Area Control Centre  
Abbotsford International Airport,  
British Columbia, 2 nm S  
19 June 2005

Report Number A05P0143

### *Summary*

A Pacific Professional Flight Centre Ltd. Piper PA-44-180 Seminole aircraft (registration C-FHDP, serial number 44-8095022) was on an instrument flight rules flight plan conducting training in the Abbotsford area. The aircraft was cleared for a non-directional beacon (NDB) approach to Runway 07 at Abbotsford International Airport with circling for Runway 01. At the same time, a Canadian Flight Centre Inc. Piper PA-44-180 Seminole aircraft (registration C-FCFZ, serial number 44-7995098) en route from Langley, British Columbia, was transiting the Abbotsford control zone under visual flight rules, southeastbound, at 2500 feet above sea level (asl).

On completion of the circling procedure, C-FHDP commenced the published missed approach procedure, which called for a climb to 1200 feet asl on a track of 068 degrees magnetic, followed by a right climbing turn to a heading of 202 degrees magnetic to 3000 feet asl, and then a right turn to the XX NDB. As C-FHDP was climbing through 2100 feet asl and was 1.3 nautical miles from C-FCFZ, the terminal controller in Victoria, British Columbia, noticed C-FCFZ on radar and saw the impending conflict. He instructed the pilot of C-FHDP to stop the climb at 2000 feet asl and issued traffic information. The pilot of C-FHDP reacted quickly by beginning a descent to 2000 feet. The two aircraft passed with about 0.75 nautical miles lateral and 500 feet vertical spacing, and safety was not assured.

*Ce rapport est également disponible en français.*

## *Other Factual Information*

Visual meteorological conditions existed at the time of the occurrence.

At 1432:22 Pacific daylight time,<sup>1</sup> C-FHDP, with two pilots on board, made initial contact with Victoria terminal. At 1435:08, the Victoria terminal controller cleared C-FHDP direct to the WC non-directional beacon (NDB) and for a straight-in instrument landing system (ILS) or NDB approach to Runway 07 at Abbotsford. C-FHDP read back the clearance correctly and requested clearance for circling to Runway 01. The controller advised C-FHDP to request circling clearance from Abbotsford tower.

At 1439:40, the terminal controller instructed C-FHDP to contact Abbotsford tower. The crew did so, advising that they were on a straight-in approach for Runway 07. The Abbotsford tower controller provided the current altimeter setting of 30.05 and requested that the pilot report when the aircraft was by the XX NDB. C-FHDP acknowledged and requested the circling low approach and overshoot of Runway 01. At 1443:27, the tower controller issued circling clearance for Runway 01. At 1445:25, C-FHDP commenced the circling procedure to the south of Runway 07.

At 1446:20, the pilot of C-FCFZ called Abbotsford tower, advising that he was six nautical miles (nm) northwest at 2000 feet above sea level (asl), climbing to 2500 feet asl. The tower controller cleared C-FCFZ through the control zone southeastbound, and radar-identified the aircraft at 1446:40. At this time, C-FCFZ was 5.8 nm from Abbotsford Airport.

At 1446:43, the terminal controller asked the tower controller on the hotline if C-FHDP was still circling. The tower controller replied in the affirmative and advised that C-FHDP would be in the missed approach at 1448. At the time, C-FHDP was turning final for Runway 01, 1.5 nm from the threshold. At 1447:01, the tower controller cleared C-FHDP for a low approach to Runway 01.

At 1448:00, C-FCFZ advised the tower that they would switch to terminal and request a higher altitude. The controller instructed C-FCFZ to contact Victoria terminal on 132.7 MHz. Section 391.5 of the NAV CANADA *Air Traffic Control Manual of Operations* (ATC MANOPS) requires controllers to “inform aircraft if radar service is terminated.” C-FCFZ was not so informed when changed over to Victoria terminal. The tower controller did not advise the terminal controller of his intention to transfer communication of C-FCFZ to the Victoria terminal frequency. Section 138.1 of the ATC MANOPS advises controllers to “Maintain close coordination at all times between positions of operation within ATC units and between these positions and other ATC units . . .” An unwritten practice existed between Abbotsford tower and Victoria terminal to discourage prior coordination of visual flight rules (VFR) traffic requesting air traffic control (ATC) services from Victoria terminal in order to reduce frequency congestion and workload.

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<sup>1</sup> All times are Pacific daylight time (Coordinated Universal Time minus seven hours).

At 1448:10, the tower controller instructed C-FHDP to contact Victoria terminal on 132.7 MHz. At this time, the two aircraft were 3.2 nm apart. The missed approach procedure being followed by C-FHDP would take the aircraft through the altitude of C-FCFZ (2500 feet asl) while C-FHDP climbed to the missed approach altitude of 3000 feet asl. As per the unwritten practice, the tower controller had not made any prior coordination with the terminal controller about C-FCFZ, and did not pass traffic information to either aircraft or provide conflict resolution. Both aircraft were flying in Class D airspace.

Section RAC 2.8.4 of the *Aeronautical Information Publication* (A.I.P. Canada) defines Class D airspace as airspace in which "ATC separation is provided only to IFR aircraft. Aircraft will be provided with traffic information. Equipment and workload permitting, conflict resolution will be provided between VFR and IFR aircraft, and upon request between VFR aircraft."

At 1448:13, C-FCFZ called Victoria terminal; however, the terminal controller did not hear the call because he was talking on the hotline with the tower at Bellingham, Washington, United States. At 1448:19, just six seconds later, C-FHDP also called Victoria. It is likely that, if the controller heard part of the first call while he was on the hotline, he might then have assumed that it was the same aircraft calling again a short time later.

The terminal controller instructed C-FHDP to fly heading 201 and climb to 4000 feet asl. The terminal controller did not notice C-FCFZ's radar target on his radar display. The radar situation (RSiT) display showed the radar return of C-FCFZ as a digital target with mode C altitude, but with no registration or speed. The Victoria terminal controller works primarily with aircraft targets that have additional data (such as registration and speed) linked from a flight plan. This presents a more compelling visual cue to the controller. He also was controlling aircraft in different parts of the sector; this placed additional demands upon his attention.

Section 502.1, A. Note, of the ATC MANOPS states that

Uncorrelated targets [for example non-jurisdictional targets] are displayed to ensure that [the controller] will have a target if decorrelation occurs or to display aircraft on which no flight plan has been entered into RDPS.

Section 502.1, Note, of the ATC MANOPS tells controllers that

In addition to the items listed [above], other features of the system may be used at the controller's discretion.

Shortly after instructing C-FHDP to contact Victoria terminal, the Abbotsford tower controller recognized that a conflict between the two aircraft was possible. He called them both in turn on the tower frequency but got no response. He also dialed in the Victoria terminal frequency on his standby radio and listened to the terminal controller to determine whether both aircraft were in communication with Victoria terminal. The Victoria terminal controller was occupied with a series of communications, and a decision was made by the tower controller that activating the hotline would aggravate, not assist, the situation.

At 1449:15, C-FCFZ called Victoria terminal a second time, but again got no response. At 1449:18, the Victoria terminal controller noticed C-FCFZ's radar target, recognized there was a conflict, instructed C-FHDP to stop the climb at 2000 feet asl, and advised of traffic at one thirty position at one mile, indicating 2500 feet. At the time this instruction was received, C-FHDP was 1.3 nm from C-FCFZ, climbing through 2100 feet asl. C-FHDP reached 2400 feet asl before starting to descend. C-FHDP was at 2000 feet asl when it passed under C-FCFZ.

In a subsequent discussion between the Victoria terminal controller and the pilot of C-FHDP, the controller advised that the traffic was VFR and not in communication with him, and the pilot confirmed that Abbotsford tower had not advised him of this traffic.

Abbotsford tower is authorized to provide radar service in the Abbotsford control zone. Radar service is defined as a service provided directly by means of radar and it comprises either radar advisory or radar monitoring. Radar advisory is the provision of advice and information based on radar observations, while radar monitoring is the use of radar for the purpose of providing aircraft with information and advice relative to significant deviations from their normal flight path. The document *Arrangement between the Vancouver area control centre and the Abbotsford control tower*, effective 15 July 2004, states in Section D.2.1 (b) (iv) "Abbotsford tower shall ensure VFR aircraft are separated from IFR aircraft on instrument approach or missed approach." However, there was an understanding between Victoria terminal and Abbotsford tower that VFR aircraft desiring flight following from Victoria terminal were not to be the subject of coordination with Victoria terminal before a communication transfer.

## *Analysis*

Weather was not considered to have been a factor in this occurrence.

The Abbotsford tower controller cleared C-FCFZ through the control zone southeastbound, but this route was unusual and rarely used. However, there was no requirement to direct overflights away from the airport, and no potential conflict with other traffic was apparent to the tower controller at the time. At the time he instructed the two aircraft to contact Victoria terminal, the tower controller did not recognize a potential conflict between C-FCFZ flying VFR through the control zone at 2500 feet asl and C-FHDP climbing to 3000 feet asl while conducting a missed approach under IFR. He did not take any action with respect to C-FCFZ. Had the Abbotsford tower controller, once he recognized the impending conflict, employed a more aggressive tactic to alert the Victoria terminal controller, the conflict would likely have been resolved before immediate evasive action was necessary.

When the tower controller cleared C-FCFZ to Victoria terminal frequency, he believed C-FCFZ would climb above 2500 feet asl and thus leave the Abbotsford control zone, but this did not happen. No communication took place between Abbotsford tower and Victoria terminal regarding C-FCFZ. Consequently, although C-FCFZ had been changed over to Victoria terminal and was no longer in communication with Abbotsford tower, the tower still retained responsibility for C-FCFZ because:

- C-FCFZ was still in the Abbotsford control zone;
- C-FCFZ had not been advised that radar services had been terminated; and
- no coordination/handover from Abbotsford tower to Victoria terminal had taken place.

When C-FHDP began the missed approach for Runway 07 after a low approach to Runway 01, and the tower controller instructed the pilot to contact Victoria terminal frequency, both aircraft were flying in Class D airspace. The ATC service requirements to be provided to aircraft flying in Class D airspace had not been met because:

- no traffic information had been passed to either aircraft;
- no prior coordination had been made with Victoria terminal with respect to C-FCFZ; and
- conflict resolution was not provided.

The Victoria terminal controller did not detect the conflict until the last moment. The reason for this may have been that C-FCFZ's radar return was displayed on his RSiT as a digital target with mode C altitude. No registration or speed was shown with the aircraft target. This made C-FCFZ's target less conspicuous than aircraft targets associated with jurisdictional data tags. Due to the local practice that discouraged Abbotsford tower controllers from coordinating VFR aircraft with Victoria terminal before a communication transfer, the Victoria terminal controller was not aware of C-FCFZ. As well, the Victoria terminal controller did not hear two calls from C-FCFZ attempting to establish radio contact. These two factors combined likely contributed to the terminal controller not seeing the conflict immediately after C-FHDP contacted him on the missed approach. The timely intervention by the Victoria terminal controller immediately on seeing the conflict was effective.

### *Findings as to Causes and Contributing Factors*

1. The Abbotsford tower controller released the visual flight rules (VFR) aircraft, C-FCFZ, transiting the control zone, and the instrument flight rules (IFR) aircraft, C-FHDP, conducting a missed approach at the Abbotsford Airport, from his frequency without having a plan in place to ensure their flight paths did not conflict.
2. No traffic information was passed to either aircraft by the Abbotsford tower controller, as is a requirement in Class D airspace. This reduced the likelihood of one aircraft detecting the other, and increased the possibility of a mid-air collision.
3. C-FCFZ did not climb above 2500 feet above sea level (asl) as the tower controller expected. As a result, the aircraft remained in the control zone and was the responsibility of the Abbotsford tower controller.
4. When the Abbotsford tower controller became aware that a conflict was imminent, he was unable to contact either aircraft because both were on Victoria terminal frequency. He did not take aggressive action to contact the Victoria terminal controller to safely resolve the conflict.

5. Due to local practices, no handover of C-FCFZ from the Abbotsford tower controller to the Victoria terminal controller occurred. As a result, the Victoria terminal controller was unaware of the presence of C-FCFZ, and did not notice the traffic conflict this posed until the two aircraft were very close, both laterally and vertically.

## *Findings as to Risk*

1. A local practice discouraged Abbotsford tower controllers from coordinating VFR aircraft with Victoria terminal before a communication transfer coming into effect, in conflict with Section 138.1 of NAV CANADA's *Air Traffic Control Manual of Operations* (ATC MANOPS). This practice, while reducing frequency congestion and workload, increased the risk of a lack of coordination between air traffic control units.
2. C-FCFZ's radar return showed as a digital target with a data tag displaying only altitude, making the target less conspicuous than targets associated with a jurisdictional data tag (registration, altitude, speed, etc.). Without coordination before a communication transfer, the receiving controller may not, therefore, see or perceive aircraft targets not displaying full jurisdictional data tags and may miss a potential conflict.

## *Safety Action Taken*

NAV CANADA amended its document *Arrangement between the Vancouver area control centre and the Abbotsford control tower*, effective 01 September 2005. Operations Bulletin 05-10 was also issued by Abbotsford tower. In summarizing the pertinent changes, the Bulletin states that these changes are intended "to clearly indicate that prior co-ordination with terminal is required (or) positive control action is to be taken to ensure VFR aircraft being provided service by Abbotsford Tower do not conflict with IFR aircraft activity."

*This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board authorized the release of this report on 01 March 2006.*

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# Appendix A – Sequence of Events

