



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

February 20, 2019

Group Chairman's Factual Report

AIR TRAFFIC CONTROL

WPR18FA141

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A. ACCIDENT

Location: Cascade, Idaho
Date: May 13, 2018
Time: 1230 Mountain Daylight Time (MDT)¹
1830 Coordinated Universal Time (UTC)
Airplane: N2377R, Cessna C182G

B. AIR TRAFFIC CONTROL GROUP

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C. SUMMARY

On May 13, 2018, about 1230 mountain daylight time, a Cessna 182G airplane, N2377R, was destroyed after it collided with mountainous terrain near Cascade, Idaho. The private pilot was fatally injured. The airplane was registered to and operated by the pilot under the provisions of Title 14 *Code of Federal Regulations* Part 91. Visual meteorological conditions prevailed, and no flight plan was filed. The flight originated from Boise Air Terminal/Gowen Field (BOI), Boise, Idaho about 1215 and was destined for McCall Municipal Airport (MYL), McCall, Idaho.

D. DETAILS OF THE INVESTIGATION

The air traffic control group (ATC) convened at the FAA Boise Air Terminal/Gowen Field (BOI), Boise, Idaho air traffic control facility on Monday, May 21, 2018. The group met with the district operations manager/BOI acting air traffic manager (ATM) for an inbrief. Others present were the BOI support specialist, the NATCA facility representative, FAA event investigation manager, and Western Service Area (WSA) Quality Control Group (QCG) representative.

The inbrief provided by the acting ATM included a replay of the air traffic handling by BOI air traffic controllers of the accident flight and discussed the mitigation efforts put in place as a result of the Covered Event Review (CER)². After the inbrief, the workgroup conducted a tour of the terminal radar approach control (TRACON) and the air traffic control tower cab (ATCT). The group reviewed controller training records, standard operating procedures (SOP), and radar equipment logs to ensure the equipment was functional; no anomalies were documented. The

¹ All times for the report will be MDT.

² The intent of a CER is to supplement and document the existing required review of air traffic services rendered during an aircraft accident.

group then conducted interviews³ of the developmental controller working the accident flight, the on the job training instructor (OJTI), and the front-line manager (FLM), that conducted the “look” for the aircraft after it was reported overdue.

On Tuesday, May 22, 2018 the group reconvened at BOI and conducted an interview with the support specialist, the FLM that was working sector proficiency time and relieved the incident controller, and the ATCT CIC who conducted the search for the accident aircraft. The group completed the onsite portion of the investigation and departed the facility.

E. FACTUAL INFORMATION

1.0 History of Flight

At 1201:56, the accident pilot contacted the BOI clearance delivery (CD) controller stating he had automatic terminal information service (ATIS) information “hotel” and requested a visual flight rules (VFR) departure to MYL. The CD controller issued the pilot the departure frequency of 126.9 MHz and the transponder beacon code of 4334. The pilot acknowledged the transponder code and advised the controller that the aircraft transponder was “not coming up may be a little cold I’ll punch it in when it does.” The CD controller generated a flight progress strip (FPS) on N2377R. for use in the control tower by the other operating positions (see attachment 2, figure 1).

At 1205:51, the accident pilot contacted the ground control (GC) controller and advised he was at “Western”⁴ and could accept a taxiway B3 (bravo 3) departure⁵. The GC controller instructed the accident pilot to taxi to runway 10 right (R) via taxiways B and B3; the accident pilot acknowledged and read back the taxi instructions.

At 1207:43, the accident pilot contacted the local control (LC) controller and advised he was holding short of runway 10R at taxiway B3 and was ready for takeoff. The LC controller cleared the accident pilot for takeoff and instructed the pilot, “...no delay for de Havilland DHC-8 traffic on a 3-mile final.” The accident pilot acknowledged the takeoff clearance. The LC controller did not issue airport wind to the pilot as part of the takeoff clearance or subsequent communications.

At 1207:59, the LC controller advised the accident pilot that “...left turn on course McCall approved.” The accident pilot read back the instructions.

At 1208:58, the LC controller instructed the accident pilot to contact BOI departure control, which the pilot acknowledged.

At 1209:22 the accident pilot contacted the Boise Big Sky departure⁶ controller and reported, “transponder still not up but I am with ya.”

³ All interviews contained in attachment 1.

⁴ Western refers to Western Aircraft, a fixed base operator (FBO) located on the south side of runway 10R at the BOI airport.

⁵ B3 departure is an intersection departure from taxiway B3 and runway 10R.

⁶ Big Sky denotes BOI approach/departure control.

The departure control position was staffed with a developmental controller and an on the job training instructor. The departure controller asked who was calling and the accident pilot responded “Skylane 2377R ah the transponder still hasn’t come up for the squawk, but I am with ya to McCall.” The departure controller acknowledged the accident pilot. At 1209:44, the LC controller called departure control and advised the primary target “just to the right of Saint Als⁷ [sic] is.” The departure controller replied “2377R roger.” Use of FPS’ are optional for Big Sky radar positions and was not created for this flight.

At 1209:54 the departure controller informed the accident pilot that the flight was “radar contact”. The pilot acknowledged and there were no further communications with the accident pilot.

At 1211:16 the oncoming departure controller was provided a routine relief from the position. As part of the position relief briefing (PRB)⁸ the off going departure controller provided the oncoming controller with information on traffic, weather, and additional position information. The off going departure controller did not include information on N2377R during the recorded PRB for the oncoming departure controller

There was no further action by the departure controller relating to the accident aircraft. After several hours, concerned parties began making inquiries to BOI operations and BOI ATCT regarding N2377R after the flight did not arrive at McCall airport.

At 1758:11, ATC recording indicated the CD controller contacted the BOI operations office to inform them that ATC had checked records and computer systems and “no aircraft with that callsign had departed BOI today” referring to N2377R. The CD controller also stated that they had received a call from St. Luke’s hospital, reporting that one of their nurses was on or flying N2377R and that they had not arrived at the McCall airport. The caller from St. Luke’s hospital further advised that the nurse’s truck was at the Western FBO, but the aircraft (N2377R) was not there. The CD controller added there was no record that N2377R departed from BOI ATCT that day.

At 1800:06, the CD controller contacted Boise Radio⁹ and asked if they had been in communication with the pilot of N2377R. Boise Radio advised the pilot had not contacted them.

At 1830:31, the CD controller contacted Salt Lake air route traffic control center (ZLC ARTCC) and advised the area D supervisor that BOI ATCT had received phone calls from concerned parties about N2377R and that the flight had not arrived at the destination. The CD controller informed ZLC that N2377R would have left about 1100, and although BOI ATCT had checked the “tape data”¹⁰ the automated system had not captured the flight information because it was a primary target aircraft. The area D supervisor transferred the CD controller’s call to the ZLC operations watch desk for the initiation of an alert notice (ALNOT).¹¹

⁷ Saint Als is short for Saint Alphonsus hospital.

⁸ A step-by-step process for conducting a position relief briefing and transferring position responsibility from one specialist to another.

⁹ Boise Radio is the flight service station (FSS) that services the area.

¹⁰ Refers to CountOps and radar data.

¹¹ An ALNOT will be issued at the end of the information request (INREQ) or when the estimated time that the missing aircraft's fuel would be exhausted or when there is serious concern regarding the safety of the aircraft and its

The CD controller advised the ZLC operations watch supervisor (OM) of the pertinent information for N2377R. The watch supervisor asked if BOI had terminated radar services with the accident pilot. The CD controller replied, “I believe we terminated services with him north of ah the Charlie airspace, yes going northbound.”

At 1840:56, Boise Radio contacted the CD controller and requested the telephone numbers of the concerned parties. The CD controller advised Boise Radio that the pilot had contacted the CD controller at 1801 and the flight had started taxiing at 1805. The CD controller added “we are still tracking the data but ah he never acquired on radar, was a primary only departure and right around Horseshoe Bend, up that way is where we lost, um, or the latest radar where we were able to see on him, but we are still looking right now.”

2.0 Radar Data

In general, two types of radar are used to provide position and track information for aircraft cruising at high altitudes between airport terminal airspaces, and for those operating at low altitude and speeds within terminal airspaces such as BOI.

Air route surveillance radars (ARSRs) are long range (250 nm) radars used to track aircraft cruising between terminal airspaces. ARSR antennae rotate at 5 to 6 rotations per minute (rpm), resulting in a radar return every 10 to 12 seconds. Airport surveillance radars (ASRs) are short range (60 nm) radars used to provide air traffic control services in terminal areas. ASR antennas rotate at 13 to 14 rpm, resulting in a radar return every 4.6 to 5 seconds.

A radar detects the position of an object by broadcasting an electronic signal that is reflected by the object and returned to the radar antenna. These reflected signals are called primary returns. Knowing the speed of the radar signal and the time interval between when the signal was broadcast and when it was returned, the distance, or range, from the radar antenna to the reflecting object can be determined. Knowing the direction, the radar antenna was pointing when the signal was broadcast, the direction (or bearing, or azimuth) from the radar to the object can be determined. Range and azimuth from the radar to the object define the object’s position.

To improve the consistency and reliability of radar returns, aircraft are equipped with transponders that sense beacon interrogator signals broadcast from radar sites, and in turn broadcast a response signal. Even if the radar site is unable to sense a weak reflected primary return, it will sense the response signal broadcast by the transponder and be able to determine the aircraft position. The response signal can also contain additional information, such as the identifying “beacon code” for the aircraft, and the aircraft’s pressure altitude (also called “Mode C” altitude). Transponder signals received by the radar site are called secondary returns. The accident aircraft was assigned a beacon code of 4334.

occupants.

Radar data for this report was obtained from the FAA at BOI and were derived from ASR sensors. The BOI plot playback (.PPB) data was of good quality and was part of the STARS¹² utilized by air traffic control. Attachment 2, figure 2 illustrates the first radar target of the accident flight after departing BOI runway 10R. Figure 3 illustrates the last identified radar target of the accident aircraft as it traveled northbound toward McCall airport. Figure 4 is an unidentified radar target of an aircraft that appears to end near the reported accident site.

3.0 Weather Data

The Boise Airport meteorological aerodrome report (METAR) issued on the 13th of May at 17:53 UTC was reporting wind from 320° degrees at 4 knots, visibility 10 statute miles, ceiling broken clouds at 7,000 feet, broken clouds at 10,000 feet, temperature 14°C (57°F), dew point 7°C (45°F), altimeter 30.02 inHg (1017 hPa). Remarks, station automated with a rain/snow precip. Sensor pressure at sea level was 1015.6hPa (29.99 inHg). Precipitation in last 6 hours was 0 inch (0 mm). Temperature 13.9°C (57°F), dew point 7.2°C (45°F), max temperature in last 6 hours was 14.4°C (58°F), min temperature in last 6 hours was 9.4°C (49°F), pressure tendency is 1000.6hPa (29.55 inHg).

METAR KBOI 131753Z 32004KT 10SM BKN070 BKN100 14/07 A3002 RMK AO2 SLP156 60000 T01390072 10144 20094 52006

4.0 Boise Air Traffic Control Standard Operating Procedures (SOP)

4.1 ATCT Strip Marking

The BOI N 7110.57, *Boise Air Traffic Control Tower Notice*, provides an interim amendment to BOI Order 7110.2I, *Standard Operating Procedures (SOP)*, and addresses the use of flight progress strips by air traffic control tower operating positions. The change stipulates what size of flight progress strip shall be used by tower controllers and changes the subsequent paragraph identification. The Notice was effective March 15, 2018 and states [in part]:

4-1-1. GENERAL

a. Use of Flight Progress Strips is mandatory for CD, GC, LC, and LC2. In the following manner:

1. IFR a full strip will be used
2. VFR a half strip will be used.

b. Use national or locally authorized designators and abbreviations.

c. When a Preferential Departure (PAR) / Arrival Route (ADRIP ADR) is printed on an FDIO¹³ generated flight progress strip, the ADR/PAR must be issued unless otherwise coordinated.

¹² Standard Terminal Replacement System (STARS) is a digital automation system capable of tracking all aircraft within the defined airspace using information from available FAA and U.S. Department of Defense (DoD) surveillance systems

¹³ Flight Data Input Output; facility computer terminal that interfaces with the National Airspace System (NAS)

4.2 Radar Strip Marking

The BOI *SOP* addresses the use of flight progress strips by radar personnel. Chapter 4, Flight Progress Strips, addresses the use of flight progress strips by BOI radar air traffic controllers and states [in part]:

4-1-1. GENERAL

- a.** Use of flight progress strips is mandatory for CD, GC, LC, and LC-2. Use national or locally authorized designators and abbreviations. When a Preferential Departure / Arrival Route (ADR/PAR) is printed on an FDIO generated flight progress strip, the ADR/PAR must be issued unless otherwise coordinated.
- b.** Except when an aircraft is an arrival/departure to/from a satellite airport, strip marking procedures for Arrival/Departure Radar South (ARS), Arrival/Departure Radar North (ARN), and Arrival/Departure Radar Bozeman (APB) are optional. Use national or locally authorized designators and abbreviations.
- c.** Altitudes shall be written in hundreds of feet (i.e.: 50 = 5000 feet).
- d.** Significant Meteorological Information (SIGMET)/Pilot Weather Reports (PIREP) issued by CD or GC must be noted on strip along with a check mark to indicate information has been given.

4.3 Transfer of Position Responsibility

The BOI *SOP* addresses the transfer of position responsibility and relief briefings and identifies required information controllers shall accomplish when being relieved from position. Appendix N addresses radar primary targets with no associated alphanumeric data. Section 2-1-4 and appendix N state [in part]:

2-1-4 TRANSFER OF POSITION RESPONSIBILITY

- a.** All positions of operation must maintain operational continuity through Transfer of Position Responsibility. Specific relief briefing checklists are posted at each position. The specialist being relieved from a position of operation must physically locate and use the position-specific checklist before responsibility for that position is transferred (See Appendix N).
- b.** The controller being relieved must ensure the proper Automated Radar Terminal System (ART) status has been achieved through an ART entry or STARS sign on / sign off.
- c.** All position relief briefings must be recorded on the Digital Audio Legal Recorder (DALR) and be conducted using Appendix N, Transfer of Position Responsibility Checklist. Relieving specialist must verbally state that the position has been previewed and the verbal briefing may begin. This may be accomplished by stating that a self-brief is complete. After giving the required position relief briefing, on any operational position, the relieving specialist must make a statement to the specialist being relieved that the position responsibility has been assumed. The controller being relieved must remain plugged in for a minimum of two minutes to make sure all pertinent information and traffic situations are communicated and understood.

Appendix N

April 27, 2017

BOI 7110.2I

Appendix N. Transfer of Position Responsibility Checklist

ARN/ARS	
SELF-BRIEFING CHECKLIST	RELIEF BRIEFING CHECKLIST
SIA	SIA/SELF BRIEFING COMPLETE
ATIS	VERBALLY STATE RUNWAY STATUS(Open / Closed / Unavailable / Occupied)
WEATHER	AIRPORT ACTIVITIES: snow removal, sweeping, etc.
APPROACH IN USE	EQUIPMENT: IVSR, EFSTs, Nav aids, Radar, NIDS, etc)
FLOW CONTROL	RADAR MODE if non-standard (Fusion, Multi, ADS-B, etc.)
NOTAMS	ALTIMETER/TRENDS
RESTRICTED AIRSPACE	WEATHER/TRENDS
MOUNTAIN HOME AIRSPACE	SATELLITE AIRPORT STATUS
POSITIONS STAFFED	SPECIAL ACTIVITIES: Restricted areas, TFRs, Flight Check, PAJA etc.
TOWER VISUAL	SPECIAL INSTRUCTIONS/RESTRICTIONS; e.g., adjacent position trainings, nonstandard staffing/configurations, etc.
	PERTINENT NOTAMS
	TRAFFIC AND COMMUNICATION STATUS
	(a) Special Activity Aircraft: Aircraft operating in special use area/airspace, photo missions, etc.
	(b) Point out aircraft.
	(c) Holding aircraft.
	(d) Primary targets with no associated alphanumeric.
	(e) Handoff Aircraft still in airspace.
	(f) Satellite airport aircraft released but not yet airborne.
	(g) Non-radar operations.
	(h) VFR advisory aircraft.
	(i) Aircraft standing by for services.
	(j) Coordination agreements with other positions.
	(k) Special problems, requests, or instructions.
	(l) Arrival Sequence.

Appendix N-1

5.0 FAA Air Traffic Control Procedures

5.1 Flight Progress Strips

FAA JO 7110.65X, *Air Traffic Control*, prescribes the use of flight progress strips in FAA air traffic control facilities unless authorized by a facility directive. Paragraph 2-3-1 states [in part]:

2-3-1. GENERAL

Unless otherwise authorized in a facility directive, use flight progress strips to post current data on air traffic and clearances required for control and other air traffic control services. To prevent misinterpretation when data is hand printed, use standard hand-printed characters.

5.2 Radar Identification

FAA JO 7110.65X, *Air Traffic Control*, Chapter 5, section 3, addresses the application of radar identification and establishes the requirement to establish and maintain radar identification of an aircraft before providing a radar service. Paragraph 5-3-1 states [in part]:

5-3-1. APPLICATION

Before you provide radar service, establish and maintain radar identification of the aircraft involved, except as provided in Paragraph 5-5-1, Application, subparagraphs b2, b3 and in Paragraph 8-5-5, Radar Identification Application.

5.3 Identification Status

Air traffic controllers providing a radar service to aircraft shall inform an aircraft when radar contact is lost. FAA JO 7110.65X, *Air Traffic Control* Paragraph 5-3-7 addresses identification status and states [in part]:

5-3-7. IDENTIFICATION STATUS

a. Inform an aircraft of radar contact when:

1. Initial radar identification in the ATC system is established.
2. Subsequent to loss of radar contact or terminating radar service, radar identification is reestablished.

PHRASEOLOGY– RADAR CONTACT (position if required).

b. Inform an aircraft when radar contact is lost.

PHRASEOLOGY– RADAR CONTACT LOST (alternative instructions when required).

5.4 Class C Service Application

FAA JO 7110.65X Chapter 7, section 8 addresses VFR services provided to aircraft in Class C terminal areas. It outlines to air traffic controllers the purpose of the Class C service and the aircraft equipment requirements to operate VFR in Class C airspace. Paragraph 7-8-1 states [in part]:

7-8-1. APPLICATION

Apply Class C service procedures within the designated Class C airspace and the associated outer area. Class C services are designed to keep ATC informed of all aircraft within Class C airspace, not to exclude operations. Two-way radio communications and operational transponder are normally required for operations within Class C airspace, but operations

without radio communications or transponder can be conducted by LOA, facility directive, or special arrangement with Class C airspace controlling facility.

5.5 Termination of Class C Service

Class C service procedures shall be applied to aircraft while in the Class C airspace and should be applied in associated outer areas. FAA JO 7110.65X, *Air Traffic Control* Paragraph 7-8-8 addresses the termination of service in the outer area and states [in part]:

7-8-8. TERMINATION OF SERVICE

Unless aircraft are landing at secondary airports or have requested termination of service while in the outer area, provide services until the aircraft departs the associated outer area. Terminate Class C service to aircraft landing at other than the primary airport at a sufficient distance from the airport to allow the pilot to change to the appropriate frequency for traffic and airport information.

5.6 Overdue Aircraft Alert Notice (ALNOT)

FAA JO 7110.65X Chapter 10, section 3, addresses the air traffic controller responsibility for an overdue aircraft. When in receipt of an ALNOT or information request (INREQ), air traffic controllers shall check position records to determine if the aircraft had been in contact with the facility. Paragraph 10-3-4 ALNOT addresses requirements and states [in part]:

10-3-4. ALNOT

b. Upon receipt of an INREQ or ALNOT, check the position records to determine whether the aircraft has contacted your facility. Notify the originator of the results or status of this check within one hour of the time the alert was received. Retain the alert in an active status, and immediately notify the originator of subsequent contact, until cancellation is received.

F. LIST OF ATTACHMENTS

Air Traffic Control Factual Report attachment 1 - Interview Summaries.

Air Traffic Control Factual Report attachment 2 - Graphics.

Submitted by:

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