NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

February 3, 2020

Group Chairman's Factual Report

AIR TRAFFIC CONTROL

CEN19LA074

Table Of Contents

A. ACCIDENT

Location: Grand Prairie, Texas
Date: January 29, 2019
Time: 1330 central standard time (CST)[1]
1930 coordinated universal time (UTC)
Airplane: N565SP, Cessna C172S and N52243, Cessna C172S

B. AIR TRAFFIC CONTROL GROUP

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C. SUMMARY

On January 29, 2019, about 1330 central standard time, a Cessna 172S, N565SP, and a second Cessna 172S, N52243, collided in midair about 6 miles south of the Grand Prairie Municipal Airport (GPM), Grand Prairie, Texas. Both airplanes sustained substantial damage. The flight instructor and student pilot onboard each airplane were not injured. The first airplane, N565SP, was registered to LLP Leasing Group, LLC, and the second airplane, N52243, was registered to Skymates, Inc. Both airplanes were operated by Skymates Flight Academy as Title 14 *Code of Federal Regulations* Part 91 instructional flights. Day visual meteorological conditions prevailed and neither flight was operated on a flight plan. The local flights both originated from GPM about 1230.

D. DETAILS OF THE INVESTIGATION

The air traffic control (ATC) work group convened at the GPM ATC facility on Monday, February 4, 2019. The group met with the GPM air traffic manager (ATM) for an inbrief. Others present were the Robinson Aviation safety manager and National Transportation Safety Board (NTSB) investigator in charge. The inbrief provided by the ATM included a playback of the handling by GPM ATC for the accident flights and discussion focused on the mitigation efforts being taken by GPM ATC as a result of this accident.

On Tuesday, February 5, 2019, the workgroup reconvened at the GPM ATC facility and conducted interviews with the local controller (LC) who had been relieved just prior to the accident, the LC who was working during the accident, and the ground controller (GC) who was working during the accident.

[1] All times for the report will be CST.

On Wednesday, February 6, 2019 the group reconvened at the hotel and completed the onsite portion of the investigation and departed the area.

E. FACTUAL INFORMATION

1.0 History of Flight

At 1327:54, the pilot of N565SP contacted the GPM LC stating "grand prairie tower this is five six five sierra papa … ah with information echo[2] … reporting at the tip of Joe Pool". Joe Pool was a lake located south of GPM and used by pilots and air traffic controllers as a visual flight rules (VFR) reporting point for entry into the GPM class D airspace. The GPM LC instructed the pilot to enter a left downwind for runway 17 and to squawk 0457. The pilot read back the instructions. N565SP was transmitting a mode C[3] indicating 2,300 feet mean seal level (msl). At that time, N52243 was about 0.3 nautical miles (NM) east of N565SP at an altitude of 2,400 feet msl.

At 1328:39, the pilot of N52243 contacted the GPM LC stating "Grand Prairie tower Cessna five two two four three with echo seven miles to ah from the south and inbound for a full stop". The GPM LC instructed the pilot to squawk 0435 and to enter a left downwind for runway 17. The pilot read back the instructions. At that time, N565SP was about 0.1 NM west of N52243 at 2,400 feet msl.

At 1329:05, the pilot of N565SP asked the GPM LC if the assigned beacon code was 0457 or 0417. The GPM LC responded the assigned code was 0457. While transmitting, an audible conflict alert could be heard in the background. At that time, N565SP was indicating a mode C altitude of 2,500 feet msl (subsequent radar data indicated the aircraft descended back to 2,400 feet). N52443 was located off the left wing of N565SP indicating a mode C altitude of 2,400 feet msl.

At 1329:28, the GPM LC instructed the pilot of N52243 to start a turn to the northeast corner of the lake. About 10 seconds later, the pilot of N52243 responded they were declaring an emergency; the nature was unintelligible. The GPM LC responded "understand you are declaring an emergency and say the uh nature of the emergency please". The pilot of N565SP responded "…just had an airplane uh hit us from the back". The GPM LC responded by asking the pilot of N52243 for the nature of the emergency. The pilot of N565SP responded the engine was still operating and they would report in the downwind. The GPM LC responded "I keep stepping on you who is declaring the emergency five two four three correct". About 7 seconds later, the pilot of N565SP asked the GPM LC to inspect the aircraft landing gear. The GPM LC instructed the pilot of N565SP to make a straight in for runway 35. The pilot acknowledged and read back the instructions.

At 1330:50, the GPM LC instructed the pilot of N52243 to make a left 360-degree turn. The pilot responded, "we have a right-wing damage". The GPM LC responded "…understand uh you have a right-wing damage is that correct"? The pilot acknowledged and transmitted

[2] Echo denotes the current automatic terminal information service (ATIS) code.
[3] Mode C is the pressure altitude obtained from an altitude encoder and transmitted as part of the transponder.

"affirmative even the cowling of the nose…can I have a straight in runway 35"? The GPM LC responded "…understand you are declaring an emergency runway 35 you are cleared to land number one". The pilot acknowledged.

At 1331:27, the GPM LC transmitted "N565SP the aircraft ahead and to the left uh is declaring an emergency for a straight-in to runway 35 understand your needing your gear checked did y'all uh did y'all impact"? The pilot of N565SP responded "yeah he ah impacted us from the back I'm going to do a 360 everything is fine for me here I'm just going to do a 360 to give us spacing and I'll come in right behind him". The GPM LC acknowledged and instructed the pilot to make a right 360 and then a straight-in for runway 35. The pilot of N565SP advised it appeared the left main landing gear was impacted but the student pilot thought it was okay.

At 1332:23, the GPM LC advised the pilot of N52243 they were cleared to land, and the wind was calm; the pilot acknowledged. The GPM LC confirmed the number of people on board both aircraft. The GPM LC then cleared the pilot of N565SP for a low approach at or above 500 feet to examine the landing gear; the pilot of N565SP acknowledged.

At 1333:50, the pilot of N565SP advised it appeared it was a flap that was hit and that they would not need a low approach and requested a full stop landing. The GPM LC cleared the pilot to land number one.

At 1334:05 the GPM LC instructed the pilot of N52243 to taxi to parking; the pilot acknowledged.

At 1335:27, the GPM LC asked the pilot of N565SP if they wanted to shut down where they were. The pilot responded he would taxi back to their line and that they had no aileron effectiveness and the flaps were damaged but that they could taxi.

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 GPM.

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. N565SP was assigned a beacon code of 0457, and N52243 was assigned a beacon code of 0435.

Radar data for this report was obtained from the FAA at Dallas Ft. Worth (D10) terminal radar approach control and were derived from ASR sensors. The radar data was displayed in the GPM tower cab via a Terminal Display Workstation (TDW) and had alerting capability for collisions and low altitude. The D10 plot playback (.PPB) data was of good quality and was part of the STARS[4] utilized by ATC. Figure 1 illustrates the location of both aircraft when N565SP first contacted GPM LC and when N52243 first contacted GPM LC. Figure 2 illustrates the likely area of the midair collision based on the time of the GPM LC directed turn for N52243 to the northeast.

[4] 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.

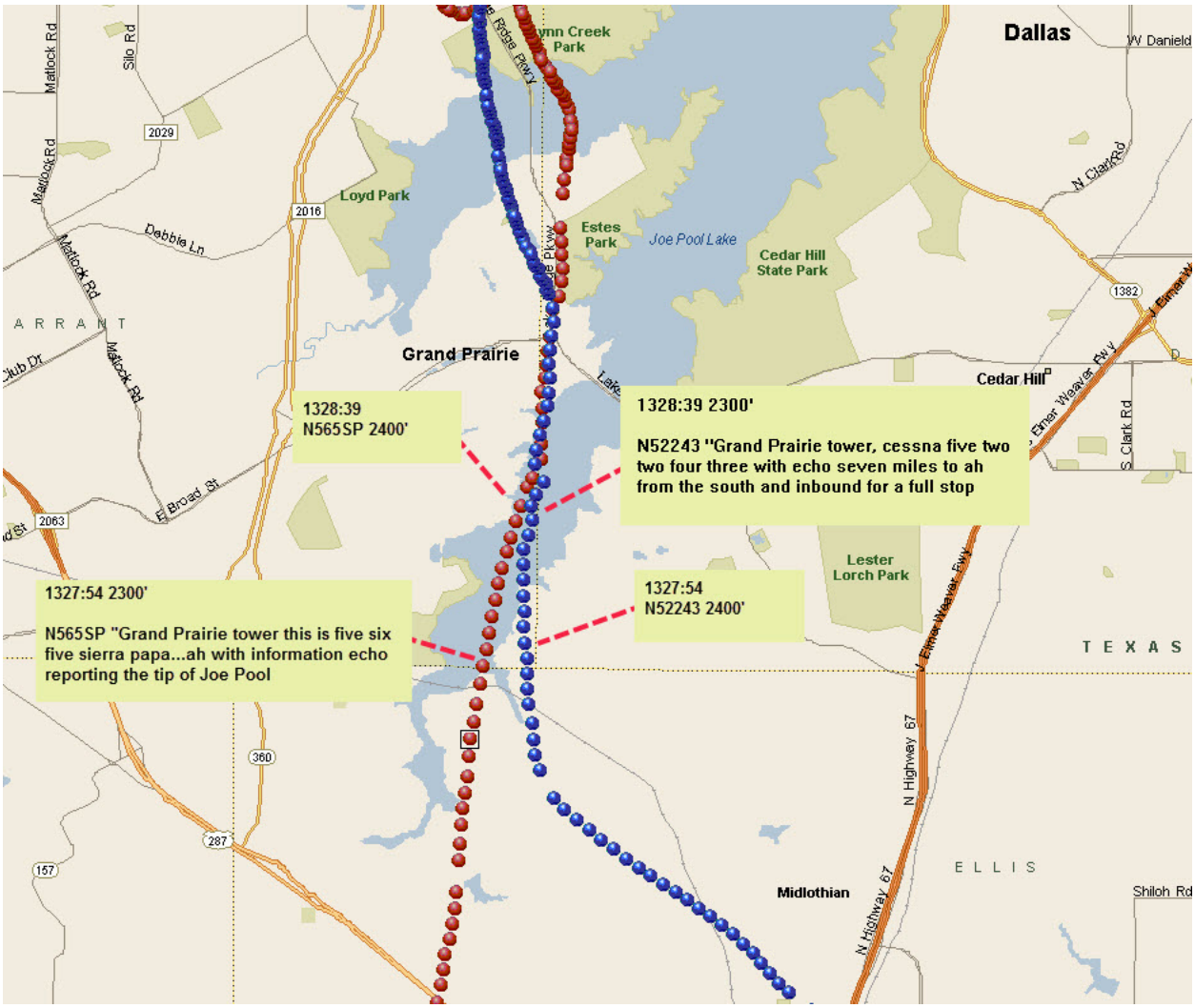

Figure 1 - Illustrates the location of both aircraft when N565SP first contacted GPM LC and when N52243 first contacted GPM LC.

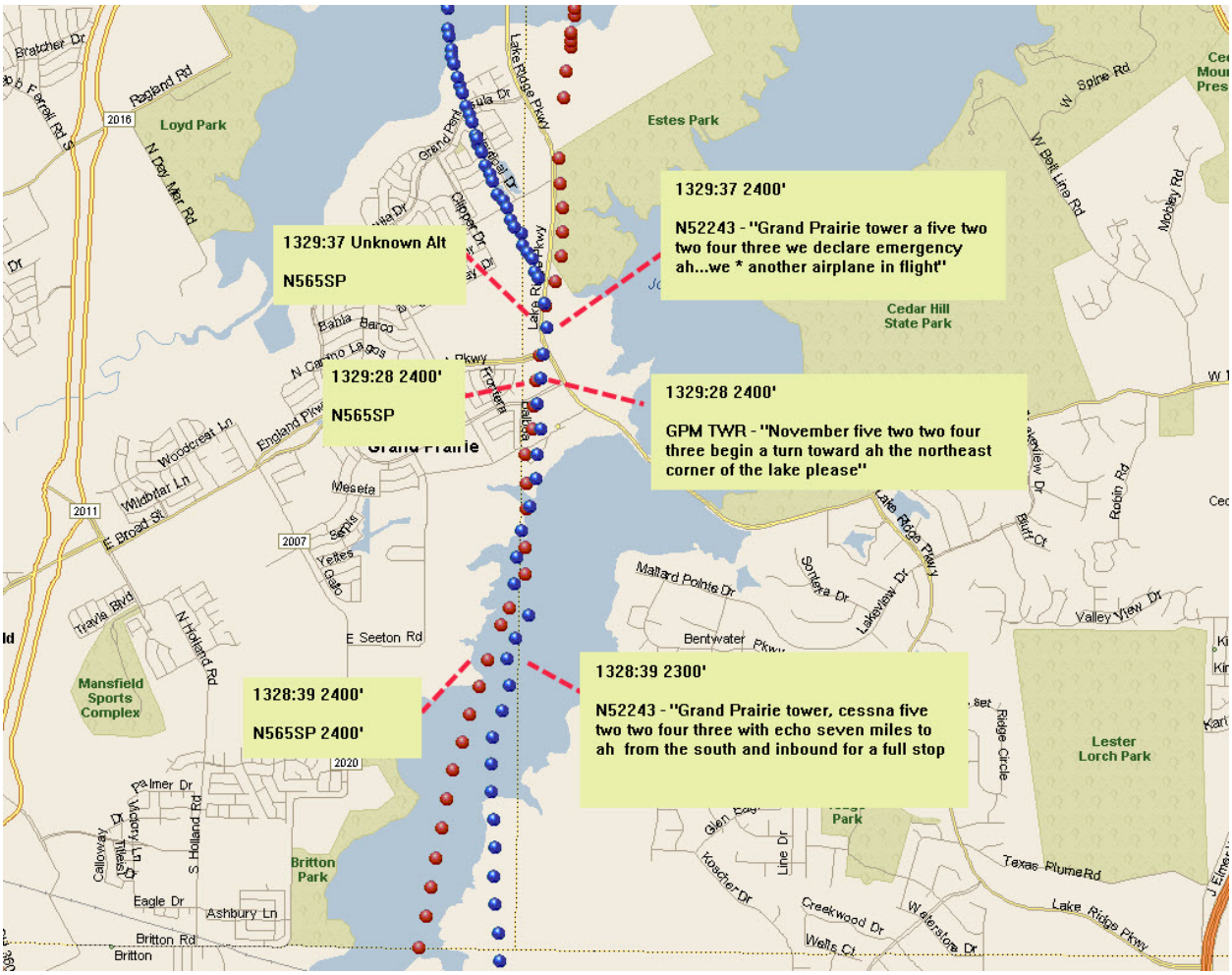

Figure 2 - Illustrates the probable location of the midair collision based on the GPM LC directed turn for N52243 to the northeast.

3.0 Weather Data

The GPM meteorological aerodrome report (METAR) issued on the 29th of January at 1350 CST reported wind from 110° degrees at 6 knots, visibility10 statute miles, clear skies, temperature 5° Celsius (C), dew point -8° C, altimeter 30.32 inHg (1026 hPa).

4.0 Federal Aviation Administration Directives

The FAA Order JO 7110.65 (FAA JO 7110.65[5]), *Air Traffic Control*, prescribes air traffic control procedures and phraseology for use by personnel providing air traffic control services. Controllers are required to be familiar with the provisions of this order that pertain to their operational responsibilities and to exercise their best judgment if they encounter situations not covered by it.

[5] FAA Order JO 7110.65X was current at the time of the accident.

4.1 ATC Service

FAA JO 7110.65 paragraph 2-1-2, addresses the application of ATC service and its purpose when controlling air traffic, and states [in part]:

2−1−1. ATC SERVICE

The primary purpose of the ATC system is to prevent a collision between aircraft operating in the system and to provide a safe, orderly and expeditious flow of traffic, and to provide support for National Security and Homeland Defense.

4.2 Duty Priority

FAA JO 7110.65 paragraph 2-1-2, addresses the application of duty priority for air traffic controllers for prioritizing workload and states [in part]:

2−1−2. DUTY PRIORITY

a. Give first priority to separating aircraft and issuing safety alerts as required in this order. Good judgment must be used in prioritizing all other provisions of this order based on the requirements of the situation at hand.

4.3 Safety Alert

FAA JO 7110.65 paragraph 2-1-6, addresses the application of safety alerts when aircraft are in close proximity as detected by radar or if in the controllers judgement, they are close to one another and states [in part]:

2−1−6. SAFETY ALERT

Issue a safety alert to an aircraft if you are aware the aircraft is in a position/altitude that, in your judgment, places it in unsafe proximity to terrain, obstructions, or other aircraft. Once the pilot informs you action is being taken to resolve the situation, you may discontinue the issuance of further alerts. Do not assume that because someone else has responsibility for the aircraft that the unsafe situation has been observed and the safety alert issued; inform the appropriate controller.

NOTE−

1. *The issuance of a safety alert is a first priority (see para 2−1−2, Duty Priority) once the controller observes and recognizes a situation of unsafe aircraft proximity to terrain, obstacles, or other aircraft. Conditions, such as workload, traffic volume, the quality/limitations of the radar system, and the available lead time to react are factors in determining whether it is reasonable for the controller to observe and recognize such situations. While a controller cannot see immediately the development of every situation where a safety alert must be issued, the controller must remain vigilant for such situations and issue a safety alert when the situation is recognized.*

4.4 Spacing and Sequencing

FAA JO 7110.65 paragraph 3-8-1, addresses the application of sequencing and spacing of multiple aircraft landing at an airport and states [in part]:

3−8−1. SEQUENCE/SPACING APPLICATION

Establish the sequence of arriving and departing aircraft by requiring them to adjust flight or ground operation, as necessary, to achieve proper spacing.

PHRASEOLOGY−
MAKE SHORT APPROACH.

NUMBER (landing sequence number),

FOLLOW (description and location of traffic),

or if traffic is utilizing another runway,

TRAFFIC (description and location) LANDING RUNWAY

(number of runway being used).

CIRCLE THE AIRPORT.

MAKE LEFT/RIGHT THREE−SIXTY/TWO SEVENTY.

GO AROUND (additional instructions as necessary).

CLEARED TO LAND.

4.5 Landing Information

FAA JO 7110.65 paragraph 3-10-1, addresses the application of providing landing information to aircraft inbound to an airport and states [in part]:

3−10−1. LANDING INFORMATION
Provide current landing information, as appropriate, to arriving aircraft. Landing information contained in the ATIS broadcast may be omitted if the pilot states the appropriate ATIS code. Runway, wind, and altimeter may be omitted if a pilot uses the phrase “have numbers.” Issue landing information by including the following:

NOTE−

Pilot use of “have numbers” does not indicate receipt of the ATIS broadcast.
a. Specific traffic pattern information (may be omitted if the aircraft is to circle the airport to the left).

PHRASEOLOGY−

ENTER LEFT/RIGHT BASE.

STRAIGHT−IN.

MAKE STRAIGHT−IN.

STRAIGHT−IN APPROVED.

RIGHT TRAFFIC.

MAKE RIGHT TRAFFIC.

RIGHT TRAFFIC APPROVED.

CONTINUE.

NOTE−

Additional information should normally be issued with instructions to continue. Example: "continue, report one mile final"; "continue, expect landing clearance two mile final"; etc.

b. Runway in use.
c. Surface wind.
d. Altimeter setting.

4.6 Collision Alerts

FAA JO 7110.65 paragraph 3-10-1, addresses the application of providing collision alerts when a "CA" is active on a radar display and states [in part]:

5−15−6. CA/MCI
a. When a CA or MCI alert is displayed, evaluate the reason for the alert without delay and take appropriate action.

REFERENCE−
FAAO JO 7110.65, Para 2−1−6, Safety Alert.

5.0 Grand Prairie Standard Operating Procedures

The Grand Prairie 7210.3, *Grand Prairie Tower Standard Operating Procedures* implements the standard operating procedures for Grand Prairie Tower and establishes position binders and reference files for maintaining a safe and efficient operation. Chapter 12 addresses the STARS TDW settings and states [in part]:

12-5. Aural Alarm Volume. The MSAW/CA shall not be inhibited.

F. LIST OF ATTACHMENTS

ATC Factual Report attachment 1 - Interview Summaries.

Submitted by:

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