PRELIMINARY ACCIDENT REPORT

Accident and Incident Investigations Division

Accident
- Preliminary Report -
AIID Ref No: CA18/2/3/9946

Figure 1: The ZS-TCJ aircraft. (Source: Social Media)

Description:

An Air Tractor AT-402B aircraft was engaged in a commercial Part 137 crop-spraying operation on a farm and was expected to land back at home base in Hoopstad area at approximately 1600Z. At around 1600Z, the search for the missing aircraft was initiated through social media. Aeronautical Rescue Coordination Centre (ARCC) was contacted at approximately 1800Z and an official search and rescue was activated through the police air wing in Bloemfontein. The aircraft, which had crashed, was located by the police the next morning in a crop farm at approximately 0350Z. All relevant parties were informed of the accident.

INTRODUCTION

Reference Number	**:** CA18/2/3**/** 9946
Name of Owner/Operator	**:** Proman Lugbespruiting (PTY) LTD
Manufacturer	**:** Air Tractor Inc
Model	**:** AT-402B
Nationality	**:** South African
Registration Marks	**:** ZS-TCJ
Place	**:** Private farm in Sardinia, Bultfontein, Free State Province at GPS co-ordinates: S 28º 04' 56", E 026º 05' 37" and at a field elevation of 4214ft
Date	**:** 21 January 2021
Time	**:** 1545Z

Purpose of the Investigation:

In terms of Regulation 12.03.1 of the Civil Aviation Regulations (CAR) 2011, this report was compiled in the interest of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and ***not to apportion blame or liability****.*

All times given in this report are Co-ordinated Universal Time (UTC) and will be denoted by (Z). South African Standard Time is UTC plus 2 hours.

Investigation Process:

The accident was notified to the Accident and Incident Investigations Division (AIID) on 22 January 2021 at about 0400Z. The investigators went to the private farm in Sardinia, Bultfontein, on 22 January 2021 to conduct an on-site (full scope) investigation. The investigators co-ordinated with all authorities on site by initiating the accident investigation process according to CAR Part 12 and investigation procedures. The AIID is leading the investigation as the Republic of South Africa is the State of Occurrence.

Notes:
1. Whenever the following words are mentioned in this report, they shall mean the following:

- *Accident — this investigated accident*
- *Aircraft — the Air Tractor 402B involved in this accident*
- *Investigation — the investigation into the circumstances of this accident*
- *Pilot — the pilot involved in this accident*
- *Report — this accident report*

2. Photos and figures used in this report were taken from different sources and may have been adjusted from the original for the sole purpose of improving clarity of the report. Modifications to images used in this report were limited to cropping, magnification, file compression; or enhancement of colour, brightness, contrast; or addition of text boxes, arrows or lines.

Disclaimer:

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ABBREVIATION	DESCRIPTION
AIID	Accident and Incident Investigations Division
º	Degree
ºC	Degree Celsius
'	Minutes
"	Seconds
AG ratings	Agricultural Ratings
AGL	Above Ground Level
AMSL	Above Mean Sea Level
AMO	Aircraft Maintenance Organisation
ATPL	Airline Transport Pilot Licence
CoA	Certificate of Airworthiness
CoR	Certificate of Registration
CPL	Commercial Pilot Licence
CRS	Certificate of Release to Service
CVR	Cockpit Voice Recorder
CAR	Civil Aviation Regulations 2011
C of A	Certificate of Airworthiness
C of R	Certificate of Registration
CPL	Commercial Pilot Licence
CRS	Certificate of Release to Service
CVR	Cockpit Voice Recorder
FAKS	Kroonstad Airfield
FAPY	Parys Airfield
FATP	New Tempe Airport
FDR	Flight Data Recorder
ft.	Feet
GPS	Global Positioning System
hPa	Hectopascal
Kts	Knots
METAR	Meteorological Terminal Aviation Routine Weather Report
MHz	Megahertz
Mph	Miles per Hour
MPI	Mandatory Periodic Inspection
MSB	Mandatory Service Bulletin
No.	Number
PIC	Pilot-in-Command
POH	Pilot Operating Handbook
QNH	Query Nautical Height
SB	Service Bulletin
SI	Service Instruction
UTC	Co-ordinated Universal Time
VHF	Very High Frequency
Z	South African Standard Time is UTC plus 2 hours

1. FACTUAL INFORMATION

1.1. History of Flight

1.1.1 On 22 January 2021, a pilot on-board an Air Tractor AT-402B aircraft with registration ZS-TCJ took off from New Tempe Airport in the Free State Province to a local agricultural farm located between Hoopstad and Bultfontein for a commercial crop-spraying operation. The operation was conducted under the provisions of Part 137 of the Civil Aviation Regulations (CAR) 2011 as amended. The aircraft was expected to land at the airstrip in the same farm for crop-spraying solution upload, where a ground crew was stationed to help with the operation. The take-off at New Tempe Airport was at approximately 1100Z and the aircraft arrived (landed) at the farm approximately 0.6 hours later and loaded the crop-spraying solution to commence with the operation.

Figure 2: An aerial view of where the aircraft was discovered post-accident. (Source: Google Maps)

1.1.2 The aircraft had commenced with crop-spraying operation at approximately 1150Z with the first full load of crop-spraying solution loaded on-board. According to the ground crew member who was helping the pilot with the loading of the crop-spraying solution and fuel upliftment, the pilot was expected to spray two sectors on the same farm. The aircraft made three landings between crop-spraying operation flights to load the crop-spraying solution; each full load lasted approximately 20 minutes. The last load was undertaken at approximately 1330Z, in which the pilot was to complete the first sector. The aircraft was expected to land back at the farm at approximately 1400Z to load more crop-spray solution for the second sector. The expected landing time passed; however, the aircraft was observed still flying in a pattern used for crop-spraying over the farm. The last sound of the aircraft was heard at approximately 1545Z in the same area where it was last seen flying over the crop field.

1.1.3 According to the ground crew member, the aircraft was expected to land back at home base in Hoopstad area at approximately 1600Z. At around 1600Z, the search for the missing aircraft was initiated through social media. Aeronautical Rescue Coordination Centre (ARCC) was contacted at about 1800Z and an official search and rescue was activated through the police air wing in Bloemfontein. The aircraft, which had crashed, was located by the police helicopter the next morning at approximately 0350Z. All relevant parties were informed of the accident.

1.1.4 The aircraft was found in an inverted position in a maize crop farm. The pilot was trapped inside the cockpit and had succumbed to his injuries. The aircraft was destroyed during the accident. The aircraft accident occurred on a farm during daylight in visual meteorological conditions (VMC) at the following Global Positioning System (GPS) co-ordinates: S 28º 04' 56", E 026º 05' 37" at a field elevation of 4214 feet (ft) above mean sea level (AMSL).

1.2. Injuries to Persons

Injuries	Pilot	Crew	Pass.	Other
Fatal	1	-	-	-
Serious	-	-	-	-
Minor	-	-	-	-
None	-	-	-	-
Total	1	-	-	-

Note: Other means people on ground.

1.3. Damage to Aircraft

1.3.1 The aircraft was destroyed during the impact sequence.

Figure 3: The wreckage post-accident.

1.4. Other Damage

14.1 Damage was limited to the portion where the aircraft had crashed over the maize crops on a farm near where crop-spraying operation was conducted.

1.5. Personnel Information

1.5.1 The pilot had an Airline Transport Pilot Licence (ATPL) and was a former South African Air Force (SAAF) pilot with more than 20 years of experience. His career was in the airline transport sector flying a range of both wide and narrow body airline transport jets aircraft. According to available information, the pilot did not have an Agricultural (AG) rating, and neither was the aircraft type endorsed on his licence. However, the pilot had recently conducted an aircraft type conversion which was signed off by a rated instructor in which he made a submission to the Regulator (SACAA) for the aircraft type endorsement on 20 December 2020, which is pending approval. An aircraft conversion and AG training on a single-seater aircraft type is conducted through supervision by an AG-rated instructor with Grade I level; and the aircraft type rating is conducted using a two-way radio communication for instructions.

Nationality	South African	Gender	Male	Age	52
Licence Number	0270234339	Licence Type	Airline Transport Pilot		
Licence Valid	Yes	Type Endorsed	No		
Ratings	Night, Instrument, Multi-crew, MNPS/RVSM, RNP-AR-APCH, SEA, MEA				
Medical Expiry Date	30 November 2021				
Restrictions	TML; VDL; SSL				
Previous Accidents	None				

Note: Previous accidents refer to past accidents the pilot was involved in, when relevant.

Flying Experience:

Total Hours	18290.7
Total Past 24 Hours	5.3
Total Past 7 Days	30,7
Total Past 90 Days	TBA
Total on Type Past 90 Days	113.4
Total on Type	113.4

Note: The pilot's logbook could not be recovered at the time of the release of this preliminary report.

1.5.2 A preliminary review of the aircraft type logbooks revealed the following: the pilot had been flying the aircraft solo for crop-spraying operations with no supervision. According to available records, the pilot had conducted a 1-hour aircraft type conversion on 14 December 2020 at Kroonstad Airfield (FAKS) and, later, took off on a 0.6-hour flight to Parys Airfield (FAPY). Between 15 and 16 December 2020, the pilot conducted his Agricultural dual training at FAPY for approximately 5 hours. On 17 December 2020, the pilot flew from FAPY to Koppies area where he continued with AG training, accumulating 7.4 hours of training. Later the same day, the aircraft was flown to New Tempe Airport (FATP) for a Mandatory Periodic Inspection (MPI) maintenance. On 18 December 2020, the pilot flew 0.5 hours conducting an acceptance flight following an aircraft MPI

maintenance. He later flew the aircraft to FAPY where he continued with AG training around the area for approximately 3 hours. The next day, 19 December 2020, the pilot flew from FAPY to FAKS, and then from FAKS to Koppies area for further AG training. The pilot concluded his AG training in about 18.2 hours. On 20 December 2020, the pilot flew from FAPY to home base in Hoopstad area.

The pilot made a submission to the local Regulating Authorities for an AG-rating endorsement on 20 December 2020. The submission consisted of documents relating to the application for an AG pilot rating (CA 61-175 & CA 61-01.0), submitted together with the pilot's logbook endorsed on 19 December 2020. The pilot's logbook showed aircraft conversion and AG training records, as well as the Certification of Registration of Pest Control Operator aerial application and advisory, which were attained on 10 December 2020. The application showed documented flight practise in aerial application of 21.8 hours. According to the submission, the pilot was signed off on 19 December 2020 at FAKS by a Grade I instructor with an Agricultural rating, however, there was no written proof of AG test conducted on the day. Also, there was no indicated person (mentioned) who supervised the pilot during his previous AG training prior to testing, although it showed on the logbook that it was co-ordinated as dual training. The pilot's proficiency checklist completed by the company (operator) was signed off by an AG-rated pilot without the instructor's name or letter of delegation by the Director of SACAA.

1.5.3 On 21 December 2020, the pilot had begun with the actual crop-spraying operation in the areas around Hoopstad, Bultfontein, Makwassie and Witpan in the Free State province. All these areas' crop-spraying operations were a responsibility delegated to the pilot of the ZS-TCJ aircraft; the aircraft was stationed in Hoopstad. The pilot had accumulated a total of 113.4 hours on the aircraft type. The submission further showed the approximate 597.5 actual hours as an agricultural pilot.

SUBPART 25: AGRICULTURAL PILOT RATING

Requirements for Agricultural Pilot Rating

61.25.1 (1) An applicant for an Agricultural Pilot Rating must –

(a) hold a valid pilot licence issued in terms of Part 61 or Part 62 in the category aeroplane or helicopter, as applicable, and in the event of acting for remuneration, hold at least a valid CPL (Aeroplane or Helicopter) or a valid Part 96 authorisation, as applicable;

(b) hold the appropriate class or type rating;

(c) hold a current Pest Control Operator's Certificate issued in terms of the Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947);

(d) have acquired the experience that include at least completion of not less than 300 hours of flight time, which must include not less than 30 hours in the case of aeroplanes and 10 hours in the case of helicopters, of flight experience in aerial application under supervision; and

(e) have undergone the skills test referred to in regulation 61.25.2. (2) At least 2 hours of the flight experience referred to in sub-regulation (1) must be dual instruction

conducted by the holder of an appropriately rated Grade I or a Grade II flight instructor who shall be the holder of the appropriate category, class or type rating and the Agricultural Pilot Rating. The balance of the prescribed flight experience may be conducted under the supervision of the holder of a valid CPL or ATPL (Aeroplane or Helicopter, as the case may be) with an Agricultural Pilot Rating, designated by the Director in writing for the purpose.

Privileges of Agricultural Pilot Rating

61.25.4 (1) The holder of an Agricultural Pilot Rating may act as PIC of an agricultural aircraft, engaged in agricultural aerial applications, in respect of which he or she is the holder of the appropriate class rating or type rating by name.

(2) The holder of an Agricultural Pilot Rating may not exercise the privilege in sub-regulation (1) unless such pilot has –

(a) within the 12 months immediately preceding the flight, conducted at least 5 hours of agricultural flight time; or

(b) successfully undergone a skills test as contemplated in regulation 61.25.2 and which has been endorsed in the pilot's logbook.

1.6. Aircraft Information

Airframe:

Manufacturer/Model	Air Tractor Inc/ AT-402B	
Serial Number	402B-1297	
Year of Manufacturer	1997	
Date of Manufacture	5 January	
Total Airframe Hours (At Time of Accident)	2225,2	
Last MPI (Date & Hours)	21 January 2021	2225
Hours Since Last MPI	2225.2	
C of A (Issue Date)	01 March 2020	
C of A Expiry Date	31 March 2021	
C of R (Issue Date) (Present Owner)	10 July 2020	
Type of Fuel Used in the Aircraft	Jet A1	
Operating Categories	Part 137	
Previous Accidents	None	

Note: Previous accidents refer to past accidents the aircraft was involved in, when relevant.

Engine:

Manufacturer/Model	Pratt and Whitney PT6-15G
Serial Number	PCE-PD 0164
Part Number	PT6A-15AG
Hours Since New	2225.
Hours Since Overhaul	Modular engine type

Propeller:

Manufacturer/Model	Hartzell/ HC-B3 TN-3D
Serial Number	BUA 32722
Part Number	T1028ZNS+4
Hours Since New	2225.2
Hours Since Overhaul	TBO not reached

This information was extracted from *AT-402B Airplane Flight Manual*: FAA Approved Issued: February 25, 2008

1.6.1 *The Air Tractor 402B is an all-metal cantilever low-wing monoplane designed specifically for agricultural purposes. It is a single-seater equipped with one Pratt and Whitney PT6-15G turbo prop engine. Its landing gear configuration tricycle consist of two fixed main landing gear combination of a tail dragger wheel gear. The aircraft is fitted with a constant speed type three-bladed propeller regulated by a governor with reversible and fathering ability. The fuel system consists of wet wing tanks ranging between 120 and 290 gallons each. A 400-gallon single piece fibreglass hopper is equipped with an emergency dump gate controlled by a lever in the cockpit. A cockpit warning placard reading: "A stall during skidding turns will cause the nose to pitch down sharply and result in a significant loss of altitude" is displayed.*

1.6.2 Aircraft maintenance records were reviewed. According to the records, all manufacturer's published service bulletins (SB), service instructions (SI), etc for both engine and airframe 'were complied with by the aircraft owner and the aircraft maintenance organisation (AMO). On 9 January 2021, the aircraft was involved in a bird-strike incident and sustained damages to the left-wing tip whilst engaged in a crop-spraying operation in Witpan area. The incident was not reported to the Regulating Authority. The aircraft repairs were carried out and the aircraft was flown back to home base on 14 January 2021 and was ready to resume operations around the area.

1.6.3 Following the left-wing tip repairs, the pilot conducted an acceptance flight of approximately 0.2 hours check on the aircraft. The pilot contravened the CAR Part 61. Subpart 19 as he did not have the test flight rating endorsed on his licence.

1.6.4 According to the MPI work pack submitted, at the time of the bird-strike repairs, some of the MPI tasks were carried out during that period when the aircraft was in the workshop and were signed off. On 21 January 2021, the ZS-TCJ was in the workshop where a few tasks which were remaining (from its prior workshop visit) were conduct at 2225.0 airframe hours and the aircraft was released to service later the same day. The aircraft was issued a Certificate of Release to Service on 21 January 2021 at 2225.0 airframe hours, which would lapse at 2325 or expire on 21 January 2022 calendar period, whichever comes first.

According to CAR's Part 61 Subpart 19: Post maintenance test flight rating

61.19.1 (1) An application for a Class II test pilot rating shall

a) Be the holder of a valid PPL or higher-grade licence;
b) Have completed not less than 500-hours flight time of which not less than 300-hours were as PIC;
c) Be the holder of the appropriate aircraft category rating;

d) Be the holder of the appropriate aircraft class rating; and
e) Satisfy the Director that he has adequate knowledge of test flying techniques

61.19.3: General privileges of test pilot ratings state that:

61.19.3 (2) No person shall act as a test pilot of an aircraft requiring a test flight, as defined below, unless he or she is the holder of a valid pilot licence with a test pilot rating.

1.6.5 Aircraft Agricultural Operations

This information was extracted from AT-402B Airplane Flight Manual: FAA Approved Issued: February 25, 2008

Turns:

The previous training and experience will influence the operator flying the AT-402B. All conversional types of turns may be performed in the AT-402B.

Flaps may be used as a turning aid providing small deflections are used (5 to 8 degrees). The usual method of using flaps is to make the pull-up and initial bank with flaps retracted. As the aircraft is being banked to turn back into the field, touch the flap switch briefly and let off a little back pressure on the stick, as the flaps cause a slight pitch up tendency. Continue the turn, and as you line up for your pass, retract the flaps.

Make coordinated turns. Use the slip indicator as a means of determining whether or not you are carrying bottom rudder. The AT-402B has excellent stall characteristics and if the aircraft is inadvertently placed in an impending stall situation, it is only necessary to relax some back pressure on the stick to make recovery, and little altitude is lost, providing the turn is co-ordinated. A stall from a skidding turn will result in the nose dropping sharply with a significant loss of altitude.

In addition to being hazardous, a skidding turn can transfer fuel from one tank to another, which will result in flameout if one tank runs dry. Monitor the fuel level in each tank when the fuel level reach ½ tank and leave the selector switch on the low tank. Fuel transfer can occur when flying a racetrack pattern if the turns are not coordinated.

1.7. Meteorological Information

1.7.1 The meteorological weather information was provided by the South African Weather Service (SAWS) for the period 21 January 2021 at 1530Z. The METAR information was obtain from the weather station at Bloemfontein Airport (FABL) which is situated approximately 100km from the accident site.

Wind Direction	Variable	Wind Speed	02kt	Visibility	9999
Temperature	30°C	Cloud Cover	Few	Cloud Base	045
Dew Point	14°C	QNH	Q1019		

1.8. Aids to Navigation

1.8.1 The aircraft was equipped with standard navigational equipment as approved by the Regulator (SACAA) for the aircraft type. There were no recorded defects with the navigation system prior to the flight.

1.9. Communication

1.9.1 The aircraft was equipped with standard communication equipment as approved by the Regulator for the aircraft type. There were no recorded defects with the communication equipment prior to the flight.

1.10. Aerodrome Information

1.10.1 The aircraft accident occurred on a private farm in Sardinia between Hoopstad and Bultfontein regions in the Free State province at GPS: S 28º 04' 56", E 026º 05' 37" at a field elevation of 1540ft AMSL. All other aerodromes surrounding the accident site were 10km (5.4nm) further away.

1.11. Flight Recorders

1.11.1 The aircraft was neither equipped with a cockpit voice recorder (CVR) or a flight data recorder (FDR), nor was it required by regulation to be fitted to this aircraft type.

1.12. Wreckage and Impact Information

Figure 4: The area where the aircraft was operating (left); the wreckage as it was found at the accident site (right).

1.12.1 The aircraft accident occurred on a farm during a crop-spraying operation. The pilot, who was expected to land back at the home base in Hoopstad at approximately 1600Z, was reported missing as the aircraft never made it to Hoopstad. The aircraft was located by the SAPS search and rescue helicopter the next morning, crashed, in a crop farm. The aircraft was found in an inverted position facing west. Figure 4, left, (phone device image) shows the area where the aircraft was operating. Figure 4, right, shows aerial photos taken by the police at the time of discovery of the crashed aircraft. The aircraft was located approximately 900 metres from the section it was working over. The position where it was found could be defined as a turning point of the aircraft.

1.12.2 The observation of the aircraft wreckage as it was found at the accident site:

- The crater of the ground scars where the aircraft impacted the ground was limited to where the aircraft was found. This is indicative of an aircraft which was at a high angle of impact when it made contact with the ground with its left-wing tip and the nose at an inverted attitude.

- The aircraft impacted the ground with the top part of the left-wing leading-edge, the left top part of the nose section and the left fuselage part of the cockpit section. These damages are indicative of an aircraft that stalled while in a turn and impacted the ground in an inverted attitude.

- The left-wing damage indicated a downward folding of the leading-edge with more damage on the wing tip. Impact with the ground was from the top front part of the wing.

- The left-side of the cockpit, towards the top of the nose section, was affected by impact forces. The top left-side of the nose section also showed damages caused by hard impact with the ground, creating a crater. The nose section had some downwards twist deformation.

Figure 5: The damaged left wing due to impact.

- The aircraft was found in an inverted position with its body slightly leaning towards the left-side where the crater was more pronounced. The damage on the right wing was due to kinetic energy, resulting from the gravity pull following impact in a low left-wing attitude. Damages were also observed on the wing tip, spray nozzle mounting bars and the root attachment. The wing was also found lying on its top part (inverted position).

- The cockpit bottom part had collapsed, pushing the cockpit instruments up towards the top (of the cockpit).

1.12.3 The nose section and the damaged engine observation:

- The propeller hub was destroyed due to impact with the ground. One of the three propeller blades had broken off. The propeller hub and the blade that broke off were found lodged into the soil. The damage on the propeller indicated that the engine was turning with power at the time of impact.

Figure 6: The damaged propeller.

- The nose section was destroyed with damages extending to the engine. The engine was destroyed, with three separated sections. The damages were extensive on the nose section, which caused the compressor section to separate.

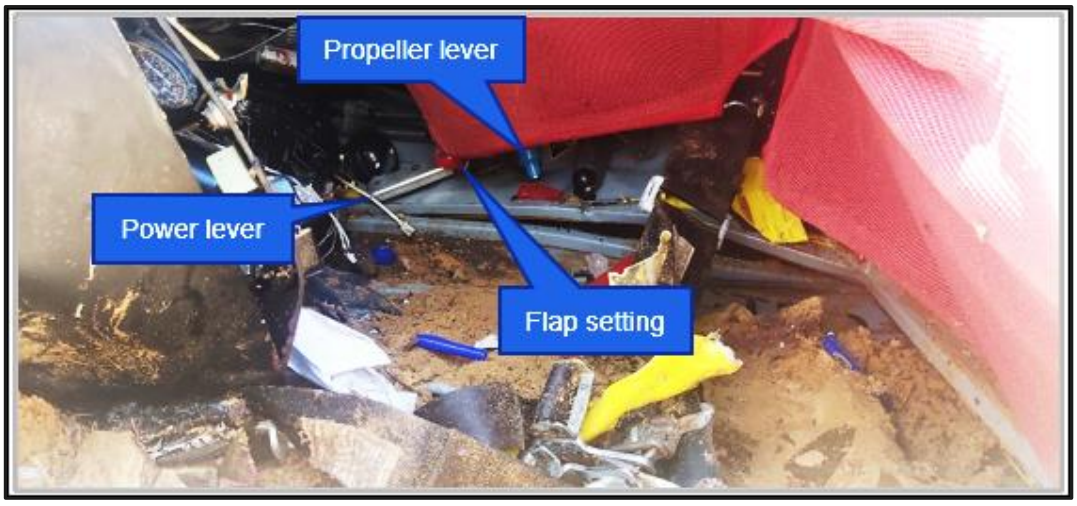

Figure 7: The aircraft's engine, propeller and flaps controls.

- All engine controls were still connected, and continuity was established. The throttle control was found in a full forward position. The propeller pitch control lever was found in a rear position and the propeller mechanism was found engaged in a flight mode position of the propeller settings.

Figure 7: The engine damage post-accident.

- Turbine blades were found protruding from the exhaust pipes. Also, there was damage observed on the compressor blades in the compressor section that had separated from the engine due to impact sequence. Damages on both the compressor and the turbine blades were consistent with damages caused while the engine was turning with power during the impact sequence.

Figure 8: The hooper gate of the aircraft.

1.12.4 The hooper emergency dumb gate (door) was found in a “close” and “locked” position. This door is used in emergency situation/drills in case of an engine failure to help reduce the aircraft’s weight by dumping the crop-spraying solution.

1.12.5 The aircraft wreckage pattern was associated with an aircraft that had stalled during a turn. The wreckage direction indicated that the aircraft was engaged in a right-turn, however, it stalled to the left and impacted the ground at a high angle with its left wing and nose-low attitude.

1.13. Medical and Pathological Information

1.13.1 To be discussed in the final report

1.14. Fire

1.14.1 There was no evidence of a pre- or post-impact fire during the accident sequence.

1.15. Survival Aspect

1.15.1 Damages in the cockpit compromised the safety of the occupant, with a high possibility of causing serious damage that may lead to fatal injuries. The cockpit area had collapsed from the bottom, causing the cockpit instruments to move upwards, limiting room/space for the occupant in the cockpit.

1.16. Tests and Research

1.16.1 To be discussed in the final report.

1.17. Organisational and Management Information

1.17.1 The aircraft operator is base in the Northern Cape province. The aircraft was based in Hoopstad area as the pilot was responsible for crop-spraying operations around that region. The operation was conducted under the provisions of Part 137 of the Civil Aviation Regulations (CAR) 2011 as amended.

1.17.2 The operator was in possession of an Air Service Licence issued by the Department of Transport on 15 May 2015. The operator was issued an Operating Certificate on 12 February 2020 under the provisions of Part 135 of the CAR with an expiry date of 28 February 2021. The Operating Certificate had an operating specification with the accident aircraft endorsed on it.

1.17.3 The aircraft maintenance organisation that serviced the aircraft was approved by the Regulator and was issued an Aircraft Maintenance Organisation Certificate by the Regulator on 5 October 2020, with an expiry date of 30 September 2021.

1.18. Additional Information

1.18.1 To be discussed in the final report

1.19. Useful or Effective Investigation Techniques

1.19.1 None.

2. Findings

2.1 General

From the available evidence, the following preliminary findings were made with respect to this accident. These shall not be read as apportioning blame or liability to any particular organisation or individual.

To serve the objective of this investigation, the following sections are included in the conclusions heading:

- **Findings —** are statements of all significant conditions, events or circumstances in this accident. The findings are significant steps in this accident sequence, but they are not always causal or indicate deficiencies.

2.2

2.2.1 The pilot had an Airline Transport Pilot Licence issued by the Regulator on 30 November 2020 with an expiry date of 30 November 2021. He conducted his licence revalidation skills test on 30 November 2020. The pilot was issued a medical certificate by the Regulator with an expiry date of 31 November 2020.

2.2.2 The aircraft type was not endorsed on his licence; however, the pilot had conducted an aircraft conversion to the aircraft type on 14 December 2020 and had since made a submission to the Regulator on 20 December 2020 for aircraft type rating endorsement, which was pending approval at the time of the accident.

2.2.3 The pilot did not have an AG rating endorsed on his licence at the time of the accident. However, the pilot had made a submission to the Regulator for the AG rating application for endorsement on 20 December 2020 which was pending approval.

2.2.4 The pilot's AG training was conducted inappropriately without dual supervision by a relevant rated instructor or by a person designated by the Director in writing for the purpose as stipulated in Part 61.25.1. of the requirements of the Agricultural rating that state: *The balance of the prescribed flight experience may be conducted under the supervision of the holder of a valid CPL or ATPL (Aeroplane, as the case may be) with an Agricultural Pilot Rating, designated by the Director in writing for the purpose.*

2.2.5 The pilot had accumulated approximately 113.4 flying hours consisting of 18.2 hours of training and 95.2 hours which were on actual crop-spraying operations. The pilot had been the only person flying the aircraft since 14 December 2020 until the day of the accident. He was given a responsibility of crop-spraying operations using ZS-TCJ aircraft in the areas of Hoopstad, Bultfontein, Witpan and Makwassie.

2.2.6 The aircraft was issued a Certificate of Airworthiness by the Regulator on 1 March 2020 with an expiry date of 31 March 2021.

2.2.7 The aircraft was issued a Certificate of Registration by the Regulator on 10 July 2020.

2.2.8 The AMO which conducted the maintenance on the aircraft was approved by the Regulator. The AMO was in possession of an AMO approval certificate issued by the Regulator on 5 October 2020 with an expiry date of 30 September 2021.

2.2.9 On 13 January 2021, the aircraft was involved in a bird-strike incident while conducting a crop-spraying operation around the area of Hoopstad. The incident was never reported to the local Regulator's Accident and Incident Investigations Division by either the operator or the maintenance organisation which conducted the repairs.

2.2.10 The pilot had performed the duties of a test pilot on the aircraft on three occasions, including two MPI maintenance acceptance checks and wing repairs following a bird-strike incident. The pilot had contravened CAR Part 61. Subpart 19, post maintenance test flight general privileges of test pilot ratings 61.19.3 (2) state that "*No person shall act as a test pilot of an aircraft requiring a test flight, as defined below, unless he or she is the holder of a valid pilot license with a test pilot rating*."

2.2.11 An Air Tractor was engaged in a commercial Part 137 crop-praying operation in a private farm. The aircraft was expected to land back at home base in Hoopstad area at approximately 1600Z. At around 1600Z, the search for a missing aircraft was initiated through social media. ARCC was contacted at approximately 1800Z and an official search and rescue was activated through the police air wing in Bloemfontein. The aircraft, which had crashed, was located the next morning by the police helicopter in a crop farm at approximately 0350Z. All relevant parties were informed about the accident.

3. On-going Investigation

3.1 The AIID investigation is on-going and the investigator/s will be looking into other aspects of this occurrence which may or may not have safety implications.

This report is issued by:

Accident and Incident Investigations Division
South African Civil Aviation Authority
Republic of South Africa