

## OCCURRENCE REPORT: 104855

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FSIS 104855 12 JUL 2001 AIR ACCIDENT

Status: supplemental sent

WFS 1229 13/JUL/2001 14:17  
WFS 1229 17/JUL/2001 19:49  
WFS 1229 07/JAN/2003 19:00  
WFS 1229 SR 07/JAN/2003 19:10

Unclassified

1. Injury Level: Nil - No Injury
2. Aircraft/Operated By: CC130344 / 426 SQN / 2520 / 8 WG /
3. Aircraft Ownership: 8 AMS / 3231 / 8 WG /
4. A. Location: RUNWAY TRENTON
4. B. Date/Time: 121810Z JUL 2001
4. C. Phase of Flight: LANDING - TOUCHDOWN
5. Damage Level: Serious - Major component / 3rd line maint
7. Mission Type: OPERATIONAL TRAINING UNIT, OTU OR MTS

**8. Description:** TAIL STRIKE - The accident aircraft, a "stretch" Herc, was conducting a practice minor emergency and touch-and-go landing during a student pilot Operational Training sortie. After it touched down on runway 24 at 8 Wing Trenton, the crew initiated the "go" portion of the touch-and-go and became airborne shortly thereafter. The control tower then notified the crew that they might have struck the aircraft's tail on the runway. The Instructor Pilot (IP) took control and proceeded to carry out a right-seat flap 50 landing. The aircraft was taxied off the runway and inspected by the Instructor Flight Engineer. The IP decided to taxi to the ramp and shut down the aircraft after some scratches were detected on the skid plate.

The aircraft sustained "C" category damage.

CONDITIONS: Weather 3,000 broken CB, Vis 16, Wind 3210G17, light wind shear.

RWY dry. A/C AUW 125,000 lbs, flaps 50.

13. Flight/Ground Conditions: NOT REPORTED

16. Aircrew Information: Pilot CAPTAIN (INSTRUCTING); Time on Duty Last 48 Hrs: hrs, Day of Occurrence: 6 hrs; Flying Hours Last 48 hrs: hrs; Past 30 Days: 19 hrs; Total on Type: 2680 hrs; Grand total: 2950 hrs.

Pilot STUDENT (ABOVE WING STANDARD) OTU TRG. CODE 32A; Time on Duty Last 48 Hrs: hrs, Day of Occurrence: 6 hrs; Flying Hours Last 48 hrs: hrs; Past 30 Days: 11 hrs; Total on Type: 11 hrs; Grand total: 315 hrs.

Flt Engr FLIGHT CREW (OTHER THAN PILOT); Time on Duty Last 48 Hrs: hrs, Day of Occurrence: 6 hrs; Flying Hours Last 48 hrs: hrs; Past 30 Days: 20 hrs; Total on Type: 20 hrs; Grand total: 6500 hrs.

22. A. Investigation: The aircraft was flying in support of the CC130 Basic Course 0102. The operating crew consisted of an Instructor Pilot (IP) in the right seat, a Student Pilot (P1) in the left seat and a Student Flight Engineer (FE) in the FE seat. A second Student Pilot (P2) was sitting on the lower bunk and an Instructor Flight Engineer (IFE) was standing behind P1. The mission was LP7, the aim of which is to ensure that the student is ready to complete the proficiency check and instrument-rating test. The crew briefed the mission at 0800 hrs for a planned take-off time of 0900 hrs. Due to unserviceabilities on the other CC130s at 8 Wing, only one aircraft was available for training, a CC130H-30, which is a stretched version of the CC130. As this aircraft was scheduled to participate in a practice flypast for the Wing Commander's change-of-command parade plus two other training missions, 40,000 lbs of fuel was loaded vice the normal single-mission training fuel load of 26,000 lbs. Minor unserviceabilities with the accident aircraft delayed, and then finally cancelled, the practice flypast. The training mission was planned to last 3 hours, with 1.5 hours per student, and was to be conducted within the Trenton terminal area. The accident crew walked to the aircraft at approximately 1300 hrs and was airborne at approximately 1355 hrs. The first manoeuvre was a flap 100 touch-and-go to runway 24, flown without incident. The second circuit was planned as a flap 50 touch-and-go to runway 24, with a simulated emergency on the downwind portion of the circuit.

The simulated emergency, an A/C Bus "Off" light, was initiated abeam the control tower. The crew carried out the emergency checklist procedure, extended downwind slightly and began the landing checklist after the simulated emergency was secured. The crew briefed a flap 50 "option" (either a touch-and-go or a stop-and-go) with a landing weight of 125,000 lbs.

The student rolled-out onto Final slightly above the normal 3 degree glide path. He then reduced power from approximately 5000 in/lbs to 3500 in/lbs and shortly after, approximately 1 NM from the threshold, the aircraft began to descend below the glide path.

At a distance of ½ NM to ¾ NM from the threshold, with 4 red lights on the PAPI, the student reduced power again, from 3500 in/lbs to 2000 in/lbs, and raised the nose of the aircraft, crossing the threshold below glide path but at the briefed threshold crossing speed of 132 knots.

At 150 feet AGL and 15 seconds from landing, while correcting for a right crosswind, with right wing down and left rudder input, the student reduced power to flight idle. Approximately 5 seconds later the IP pulled back on the control column. The student matched the IP's pull and kept the same control input until the landing.

According to FDR data, the aircraft touched down at approximately 1412 hrs with a pitch attitude of 8° and an indicated airspeed of 114 kts. The crew initiated the "go" portion of the touch-and-go and became airborne shortly after. The control tower then notified the crew that it appeared that they had struck the aircraft's tail on the runway.

The IP took control, called for the post-take-off checklist, and elected to keep the flaps at 50%. The IFE inspected the rear area of the aircraft but detected no visible signs of damage. The IP then proceeded to carry out a right-seat flap 50 landing, after which the aircraft was taxied off the runway and onto taxiway "P" in preparation for an external visual inspection by the flight engineers. The IFE and FE had some initial difficulty exiting the aircraft, as the crew door could not be opened. A communications cord was discovered wedged between the door and its frame and could not be removed. Both flight engineers exited through the left paratroop door and began their inspection of the aircraft's tail.

Following their inspection, the flight engineers were able to re-enter the aircraft through the crew door from the outside and resumed their original positions on the flight deck. The IP decided to taxi to the ramp and shut down the aircraft after some scratches were detected on the skid plate.

The initial damage was assessed as "D" category however further examination of the aircraft's structure resulted in the damage being upgraded to "C" category.

## Findings

3.1.1 - Toxicology examinations were not carried out due to the delay in determining the category of aircraft damage.

3.1.2 - At the time of the accident, there were no restrictions to using the CC130H-30 during ab-initio training.

3.1.3 - The crew was assigned a CC130H-30 for the Basic CC130 Conversion Course mission LP7, as it was the only serviceable aircraft available at 8 Wing.

3.1.4 - While the IP had flown a stretch Herc the day before, his awareness of the CC130H-30's increased tail strike potential had degraded due to a lack of proficiency on that model of CC130.

3.1.5 - At the time of the accident there were no specific lesson plans for the CC130H-30.

3.1.6 - The accident aircraft had a landing weight of approximately 125,000 lbs at the time of the accident, about 15,000 lbs more than for normal student training trips.

3.1.7 - This landing was the student's first above 105,000 lbs, and thus the first where his normal practice, reducing power prior to the flare, would have had such counterproductive results.

3.1.8 - The IP's pre-mission briefing to the students did not address the landing technique for heavy or near-heavy weight landings as this was not a standard briefing item at the time of the accident.

3.1.9 - The student flew the aircraft to a 'red over red' indication on the PAPI.

3.1.10 - Both the student and the IP had a false perception of an extra 10Kts airspeed. This was due to the crew initially recognizing that they had an extra 10Kts IAS once the Tower revised the winds downward from 10Kt gusts to 0Kt gusts. The crew maintained their mental model of excess airspeed even though they were in fact on airspeed in the final 40 seconds of the approach.

3.1.11 - The student reduced power towards flight idle prior to the flare. This increased the aircraft's rate of descent beyond the aircraft's fuel distribution limits.

3.1.12 - The Instructor Pilot, without formally taking control, attempted to reduce the rate of descent by pulling back on the control column without adding power.

3.1.13 - The increased pitch succeeded in decreasing its rate of descent to within fuel distribution based limits, but brought the aircraft attitude to the point of tail strike.

3.1.14 - The aircraft struck the ground in a 3 degree right wing down attitude with a pitch attitude of 8°, an indicated airspeed of 114 Kts, and power at flight idle. The internal structures of the aircraft around the right side of the ramp hinge area sustained "C" category damage.

3.1.15 - The crew did not notice anything unusual about the landing and continued the "go" portion of their touch-and-go manoeuvre.

3.1.16 - The crew was notified of a possible tail strike by the control tower after the aircraft was airborne. The IP carried out an uneventful right-seat landing. The student then taxied the aircraft off the runway where the crew carried out a visual inspection of the aircraft.

3.1.17 - The Flight Engineers were unable to exit the aircraft via the crew door, as a communications cord was jammed between the door and its frame. They exited the aircraft through the left paratroop door, and re-entered the aircraft through the crew door.

3.1.18 - The 426 Sqn Flying Instructor Course did not specifically address the issue of personal limits and when to take over aircraft control from a student.

3.1.19 - At the time of the accident, 426 Sqn Instructor Pilots received much less hands-on time than other CC130 pilots at 8 Wing. As a consequence, their proficiency levels were estimated to be much lower than those of other CC130 pilots.

23. Cause Factors: PERSONNEL STUDENT PILOT 32A OR 32U TECHNIQUE The student pilot, using techniques appropriate only for

much lighter aircraft, reduced power prior to the landing flare and allowed the aircraft's rate of descent to increase beyond the aircraft's fuel distribution limits.

24. Preventive Measures: (AMEND AOI) TRSET message 021717Z Feb 00 should be incorporated into the CC130 AOI.

(SEE DETAILED DESCRIPTION - 1) Specific check ride requirements should be developed to independently verify an individual's ability to operate the CC130H-30.

25. Comments: DFS: As is almost always the case with accidents, it took a number of links in a chain of events to cause this one. Absent any one of the links, the accident would not have happened, but perhaps one to focus on here is variability in procedures or numbers based on variations in configuration, weight or aircraft model. Adjusting procedures is not instinctive when these variations are not obvious in the cockpit, so very positive methods of doing so must be used. These methods should include, but not be limited to, requiring that these variations be addressed in pre-flight briefings, and verbalizing the variations and the resultant procedures at times during the flight when they are important. This sort of procedural safeguard is even more important when experience levels are relatively low as they currently are. Certainly, improving IPs' proficiency would reduce the likelihood of them missing or misreacting to critical mistakes, as would increasing their awareness of intervention strategies, so taking steps toward those goals is warranted.

The decision to use or not use stretch Hercs for OTU training should consider not just the requirement for flexibility, but whether this is a complication that students fresh from earning their Wings can comfortably handle.