

Safety Investigation Report

Ref. AAIU-2011-21

Classification: Accident
Level of investigation: Standard
Date and hour: 31 July 2011 at 10:20 UTC
Aircraft: Cessna U206G
Total flight time: Around 6650 FH
Type of engine: One Allison 250-C20S
Accident location: Above the village of Doel, near the airfield of Hoevenen (EBHV) – Belgium
Type of flight: Local
Phase: Dropping of parachutists
Persons on board: The pilot and one parachutist, no one was injured.

Abstract

During a parachute drop operation, when the last parachutist was about to exit the cabin, his reserve parachute opened. The parachutist was violently dragged backward and his parachute hit the right hand stabilizer and elevator, causing damage. The parachutist broke free and landed safely. The pilot temporarily lost control of the aircraft, regained control and managed to land safely.

Conclusion

The accident was caused by the premature deployment of a reserve parachute. The reserve parachute control cable was probably pulled out by an inadvertent contact with a protruding object located on the ceiling of the cabin or on the door frame.

Recommendations

AAIU(Be) considers that the safety actions already taken by the Belgian Parachute Federations are adequate to prevent the reoccurrence of this type of accident. There is therefore no recommendation.

Hazard identified during the investigation ¹:

Premature deployment of a parachute.

Consequence:²

Loss of control–inflight (LOC-I) and parachutist and/or parachute collision with the airplane causing damages to the airplane structure and possible inoperative controls, and possible parachutist injuries & death.

¹ Hazard – Condition or object with the potential of causing injuries to personnel, damage to equipment or structures, loss of material, or reduction of ability to perform a prescribed function.
² Consequence – Potential outcome(s) of the hazard

Factual Information

History of the flight

After climbing up to the dropping altitude at FL120, all the parachutists jumped out of the airplane as per the usual procedure. The last parachutist was moving out of the airplane and placing himself on the side of the fuselage when suddenly he was violently dragged to the rear of the airplane, causing the parachute to hit the horizontal tail. The pilot felt a significant shock and lost the pitch control of the airplane, pitching up and down. After a few seconds the pilot succeeded to regain a stable pitch control, although with a heavy pitch down tendency. It was clear for the pilot that the elevator control had become sloppy and the elevator trim was inoperative. The pilot adjusted the engine power to limit the pitch down tendency and stabilize the airspeed. Thereafter he tried to evaluate the damage before deciding whether to evacuate the airplane (He was equipped with a parachute) or to attempt to land. The pilot took the decision to land, switched the radio to the airfield frequency and announced an emergency. During the descent the pilot saw the parachutist with a properly inflated canopy. The pilot proceeded to land on runway 15 instead of 33 because the final approach of runway 15 was free of obstacles. The landing was uneventful. The skydiver landed also safely, uninjured. First inspection of the airplane after the landing showed the right hand stabilizer was deformed and the right hand elevator was partially torn off and hinged downward.

Airplane information

The aircraft was registered in Belgium and held a Certificate of Airworthiness and a valid Airworthiness Review Certificate (ARC). The airplane was modified for skydiving operations as per STC N° Z 25-20-36 delivered by the Federal Office for Civil Aviation of the Swiss Confederation. The original reciprocating engine had been replaced by a more powerful turbine engine as per FAA STC SA 2353NM "Soloy Turbine Conversion".

Airfield information

EBHN Hoevenen airfield is located 10,5 km NE of the city of Antwerpen.

RWY N°	Dimensions(m)	Strength	Coordinates
15 and 33	600x18 - grass	2000 kg	N 51° 18' 19"- E 004° 23' 26"

Pilot information

Age: 69 years old. Valid Commercial Pilot Licence, first issued 13 March 1998, valid until 10 February 2016. Rating: SEP (land) and Cessna SET valid until 31 March 2013. Medical Certificate: Class 2, valid until 26 March 2013. Total Flight Experience: more than 8000 FH. Large experience as military pilot ending in 1998. From 1998 large experience, amongst other in para dropping flights using Cessna 206 Turbine airplanes.

Meteorological information

Temperature: 20°C. Wind: light and variable. Visibility 8 km. QNH 1019 hP. Ceiling broken at 4000' and clear above 5000'.

Damage: Significant damage to the right hand stabilizer and elevator.



Figure 1: View from rear.



Figure 2: Side view of the R/H stabilizer.

Analysis

The parachutist explained that the reserve parachute suddenly deployed when he was moving out of the airplane. The wind pulled him violently out of the airplane causing the parachute to hit the tail of the airplane. By chance the parachutist himself didn't hit any part of the airplane and the parachute did not stay attached to the airplane structure. Moreover, the reserve parachute remained sufficiently operational up to the ground, despite the damage to one section of the canopy and one broken steering line. Careful examination of all the parachute parts did not find any pre-existing anomaly. The cause of this premature deployment of the reserve parachute could not be determined with certainty. However examination of the parachutes container shows an inadvertent activation of the reserve parachute control cable could have occurred due to a raised protection Velcro strap at the upper part of the parachutes container. When the protection is raised, the control cable is dangerously exposed to any kind of friction with the airframe structure. The possibility exists that the Velcro and the cable were caught by a protruding object located on the ceiling or at the door frame. The Australian Parachute Federation published a warning poster, enclosed at the end of this report, showing different scenarios of premature opening.



Figure 3: Rear upper view of the container with the Velcro strap open.

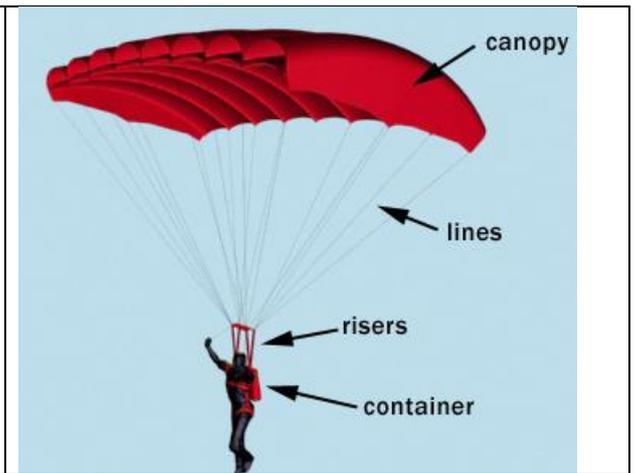


Figure 4: Drawing of a typical parachute

Findings

- The airplane was in airworthy condition, which means properly certified, registered, equipped to perform skydiving activities.
- The pilot was duly qualified and experienced to perform parachutist dropping operations.
- The reserve parachute of the last parachutist to jump deployed prematurely in the cabin.
- Examination of the parachute did not find any pre-existing anomaly.

Conclusion

The accident was caused by the premature deployment of a parachutists reserve parachute. The reserve parachute control cable was probably pulled out by an inadvertent contact with a protruding object located on the ceiling of the cabin or on the door frame.

Safety recommendation

Safety actions taken by the two Belgian federations:

During the first instructors meeting organized after the accident the instructors of both the concerned parachute club and the VVP federation (Vlaams Verbond van Paraclubs) discussed about this accident. It was decided to use some pictures of the damaged airplane as didactical material for the training of future instructors and a mutual check of the parachutist equipment before getting on the plane was again encouraged. VVP federation also stated they will use the poster³ originating from the Australian Parachute Federation to promote this safety action.

The FWCP federation (Fédération Wallonne des Clubs de Parachutisme) stated that possible premature deployment of a parachutists reserve parachute was already considered as a major event the time before the accident and that the instructors were already very sensitized to this potential danger. FWCP stated also that a “pin check” was a standard safety practice in the parachute clubs. This “pin check” is performed inside the airplane, immediately before the beginning of the jumps.

AAIU(Be) considers that the safety actions already taken by both Belgian parachute federations are adequate to prevent the reoccurrence of this type of accident. For this reason, no recommendation was made by AAIU(Be).

About this report

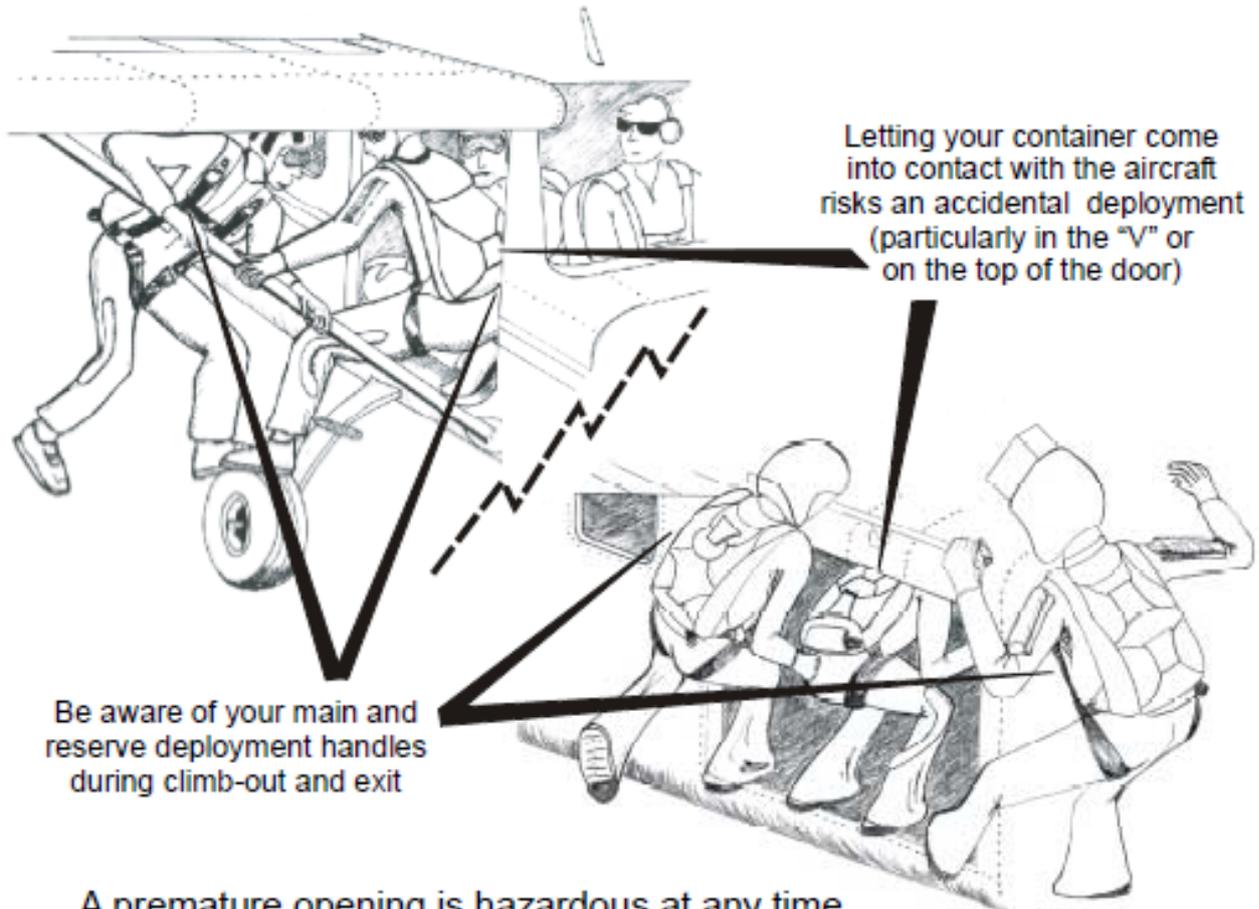
As per Annex 13 and EU regulation EU 996/2010, each safety investigation shall be concluded with a report in a form appropriate to the type and seriousness of the accident and serious incident. For this occurrence, a limited-scope, fact-gathering investigation and analysis was conducted in order to produce a short summary report.

It is not the purpose of the Air Accident Investigation Unit to apportion blame or liability. The sole objective of the investigation and the reports produced is the determination of the causes, and, where appropriate define recommendations in order to prevent future accidents and incidents.

³ This poster is enclosed on next page and can be found at the following address: <http://www.apf.asn.au/Docs-Forms/Safety-Posters/default.aspx>

ATTENTION!

A PREMATURE OPENING CAN PROVE FATAL



Letting your container come into contact with the aircraft risks an accidental deployment (particularly in the "V" or on the top of the door)

Be aware of your main and reserve deployment handles during climb-out and exit

A premature opening is hazardous at any time. It can be extremely hazardous if it occurs with an open door or during exit. The result can be major aircraft damage and serious, if not fatal, injury to the jumper.

SOME OF THE CAUSES OF PREMATURE DEPLOYMENT ARE:

- | | |
|---------------------------------------|-------------------------|
| Excessive movement in the aircraft | Loose closing loops |
| Poorly planned or careless climb outs | Worn velcro |
| Badly maintained equipment | Worn pack closing loops |

**THE SAFETY OF EVERYONE ON BOARD
DEPENDS ON YOUR CARE & AWARENESS**

