



DUTCH
SAFETY BOARD

Investigations

Within the Aviation sector, the Dutch Safety Board is required by law to investigate occurrences involving aircraft on or above Dutch territory. In addition, the Board has a statutory duty to investigate occurrences involving Dutch aircraft over open sea. Its investigations are conducted in accordance with the Safety Board Kingdom Act and Regulation (EU) no. 996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation. If a description of the events is sufficient to learn lessons, the Board does not conduct any further investigation.

The Board's activities are mainly aimed at preventing occurrences in the future or limiting their consequences. If any structural safety shortcomings are revealed, the Board may formulate recommendations to remove these. The Board's investigations explicitly exclude any culpability or liability aspects.

Quarterly Aviation Report

October - December 2018



Those familiar with the aviation industry know that the Dutch Safety Board investigates not only actual accidents, but that it also examines serious incidents that did not lead to an accident. The importance of such investigation is self-evident, as it often leads to recommendations with an eye to further enhancing safety. It is for this reason that the Netherlands is indeed required, under the Chicago Convention, to investigate such incidents.

In this quarterly report, the Dutch Safety Board looks back at the serious incidents that occurred in 2018. Such investigations generally start with a report from within the aviation industry, not necessarily because reporting incidents is mandatory, but because pilots and airlines are well aware of the vital importance of safety. In this respect, the aviation industry is clearly ahead of other industries in the Netherlands.

We will never cease to emphasise how much the aviation industry benefits from thoroughly investigating the direct and indirect causes of incidents. As such, this year – as in previous years – the Dutch Safety Board would like to draw attention to incident reporting, in both commercial and general aviation.

Tjibbe Joustra

Chairman of the Dutch Safety Board



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Overview of occurrences investigated in 2018

The Dutch Safety Board is required by law to investigate all serious incidents and all accidents involving civilian aircraft in the Netherlands. In 2018, in this connection, eighteen serious incidents and thirteen accidents were reported to the Board. The majority of investigations into the course of events is still ongoing.

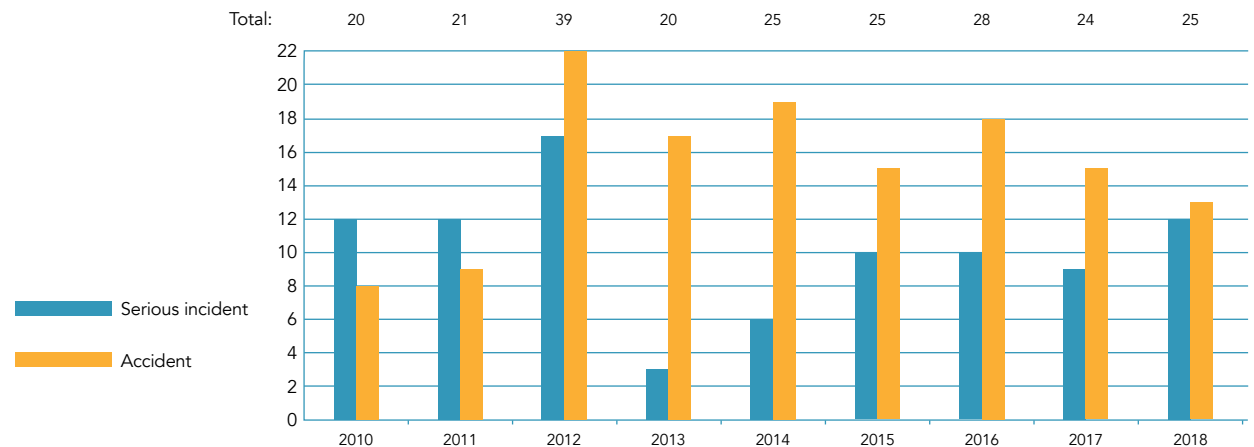
During the calendar year of 2018, the Dutch Safety Board also assisted foreign investigation bodies on eighteen occasions. This concerned investigations into occurrences that took place in the respective country with Dutch involvement, for example an incident involving a Dutch-registered aircraft or an aircraft from a Dutch manufacturer.

In the Netherlands, almost all accidents and twelve out of eighteen serious incidents involved aircraft from the category general aviation. The other six serious incidents were occurrences in passenger aircraft and one incident involving a business jet and a helicopter. Of the six serious incidents, five took place close to or at Amsterdam Airport Schiphol:

- Runway incursion;
- Non-stabilised approach;
- Insufficient thrust during take-off: a take-off with insufficient engine power;
- Loss of separation between two aircraft: situation in which two aircraft approached one another too closely at the moment that one aircraft was performing a go-around and the other aircraft was taking off from another runway, with permission from air traffic control;
- Minimum separation between aircraft exceeded in the ILS area of runway 22 at Schiphol (business aircraft and helicopter).

The other occurrence involved the return of a passenger aircraft to Schiphol after several hours when the cabin crew and passengers indicated that they felt unwell.

In the Netherlands, five people were killed and one was injured as a result of an accident involving an aircraft, all in general aviation. One Dutch national died in an accident abroad, when a twin-engined aircraft crashed at Münster-Osnabrück airport in Germany.

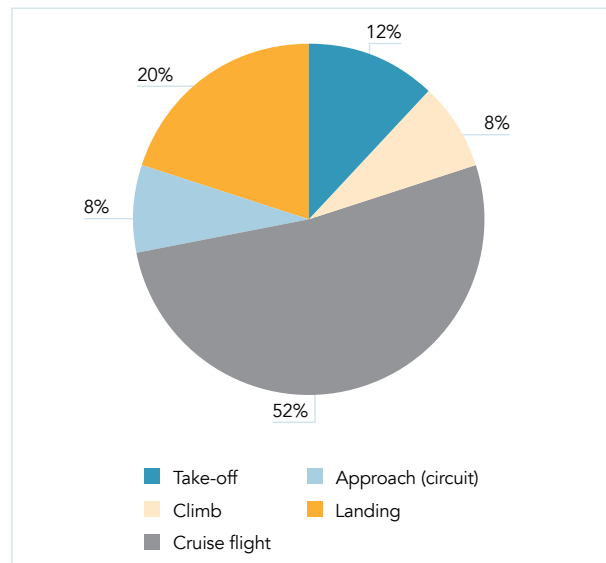


Number of serious incidents and accidents in general aviation in the Netherlands reported to the Dutch Safety Board.

Reports general aviation

Following a slight rise in the number of serious incidents and accidents reported in general aviation in the Netherlands in 2016, the number in 2018 remained almost identical to the numbers in previous years. Given the limited number of serious incidents and accidents, a trend analysis is not possible. Moreover, a very wide variety of aircraft (ranging from paramotors to turbine-engined aircraft) are flown in general aviation.

Of the occurrences reported in general aviation to the Dutch Safety Board in 2018, 52% occurred during cruise flight, 20% during landing and 12% during take-off. The remaining occurrences took place during climb and approach (circuit). No serious incidents or accidents occurred during engine start-up, taxiing and descent.



Phases in which incidents occurred in flight, in general aviation in 2018.

In 2018, three types of incidents were most frequently reported. These were airprox¹/near-miss² (10x), loss of control during flight (6x) and engine failure followed by an emergency landing (3x).

Airprox/near-miss

In 2018, an airprox/near-miss was reported on ten occasions, whereby in five cases, one of the pilots (and in one case a parachutist) undertook an evasive manoeuvre. This makes this the most frequently reported type of occurrence in 2018. Of the occurrences in which an evasive manoeuvre was undertaken, four took place during (cruise) flight and one during the final approach leg. On two occasions an airprox occurred close to the new Noordkop glider airfield (see elsewhere in this quarterly report). In both of these incidents a motorised aircraft and a glider were involved. The other occurrences involved motorised aircraft, an RPAS (drone), a helicopter and a parachutist.

Loss of control during flight

Loss of control during flight (in the air) was reported on six occasions in general aviation, in 2018. Three occurrences took place shortly following take-off, two during flight and one in the circuit area. Five motorised aircraft (4 x a single piston engine and 1 x electrically powered) and one paramotor were involved in these occurrences. Four of these occurrences resulted in a total of five deaths.

Engine failure followed by emergency landing

In 2018, three emergency landings were reported after the pilot had experienced engine failure. These occurrences resulted in no injuries. In all cases, the aircraft suffered minor damage.

¹ An airprox is an occurrence in which in the opinion of a pilot or an air traffic controller, the separation between aircraft and their relative positions and speed were such that the safety of the aircraft involved was potentially threatened.

² A near-miss refers to an airprox situation in which one or more of the pilots involved undertook an evasive manoeuvre to avoid the collision.

Occurrences into which an investigation has been launched

Two airproxes between a glider and a motorised aircraft close to the Noordkop glider centre

The Dutch Safety Board received two reports of an airprox between a glider and a motorised aircraft close to the Noordkop glider centre. Both occurrences have been classified as serious incidents.

Airprox, ASW 24 and RV-12, close to Noordkop, 5 October 2018

The ASW 24, a single-person glider, had taken off from the Noordkop glider airfield for a local flight and thermal turns. The pilot suddenly saw a motorised aircraft flying at a height of approximately 30 metres below him. This motorised aircraft, a RV-12, was en route from Texel International Airport to Breda International Airport, and was flying at an altitude of approximately 1300 feet. The pilot of the RV-12 declared that he only saw the glider at the last moment, when coming out of a turn. The pilot of the motorised aircraft was not aware of the presence of a glider airfield to the south of Den Oever.

Classification: Serious incident
Reference: 2018109

Airprox, Discus and Cessna 182RG, close to Noordkop, 21 October 2018

The Discus, a single-person glider, had taken off from the Noordkop glider airfield for a local flight and thermal turns. The Cessna 182RG was en route from Texel International Airport to Breda International Airport and was flying at an altitude of approximately 1000 feet. Close to the glider airfield, the two aircraft passed one another at an estimated vertical separation of 40 metres. The pilot of the glider saw the engine aircraft fly below him. The pilot of the motorised aircraft did not observe the glider.

Noordkop glider centre is a new glider airfield that has been operational since 22 September 2018. The field with coordinates 52°53'43"N 005°00'18"E is approximately 3.5 kilometres south of Den Oever, to the west of the A7 motorway, close to the southwestern corner of the Robbenoordbos woodland. The glider centre is located slightly to the west of the extension of the corridor above the Wadden Sea. As a result, air traffic flying from and to Texel International Airport can closely approach gliders flying in the vicinity of the gliding centre. In the period between 1 March and 1 November, daily glider flights are organised with the assistance of a take-off winch. Starting from the season 2019, tow starts will also be possible on a restricted scale.

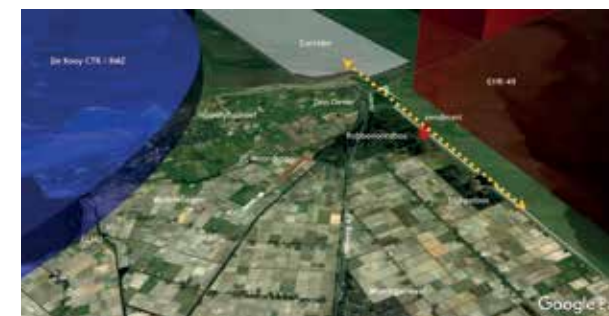
On 22 September 2018, a NOTAM was published to warn pilots of gliding activities at and around this new glider airfield, and the winch cable that can rise to a maximum altitude of 1800 feet AAL. The new glider airfield was reported in the AIP on 11 October 2018.

In an information notice drawn up by the glider centre, motorised aircraft passing De Kooy CTR/RMZ³ on the eastern side are advised to follow the coastline of the IJsselmeer and not the A7 motorway between Wieringerwerf and Den Oever.

Classification: Serious incident
Reference: 2018118



The location of the new glider airfield. (Source: SkyDemon)



The recommended route (yellow dotted line) along the coastline of the IJsselmeer. (Source: Noordkop glider centre)

³ Control zone/radio mandatory zone.

Crash, Pipistrel Alpha Electro, close to Onstwedde, 13 October 2018

The Pipistrel Alpha Electro, an electrically powered microlight aeroplane (MLA), crashed while the aircraft was in the circuit of Stadskanaal airfield. The pilot, the only person on board, was killed as a result. The MLA completely burned out following the accident.

Classification: Accident
Reference: 2018110



Accident location. (Source: Aviation Police)

Loss of propeller during flight, Topsy Nipper, Weesp, 18 October 2018

During the flight, the pilot occasionally felt mild vibration in the aircraft. At a certain point, he observed a rise in engine speed. The pilot closed the throttle. When power was reselected, the pilot no longer felt any thrust from the engine. He then noticed that the propeller had disappeared, whereupon he executed an emergency landing in a field. The pilot suffered no injuries. The aircraft suffered no further damage.

Classification: Serious incident
Reference: 2018113



The Topsy Nipper following the emergency landing.

Crash, Europa Aviation Limited Europa, Hilversum Airfield, 15 December 2018

The pilot – the only person on board – intended to take off from grass runway 13 at Hilversum airfield. Shortly after leaving the ground, the aircraft crashed. The pilot was killed.

Classification: Accident
Reference: 2018125



Archive photograph of the Europa AL Europa. (Source: H. Wadman)

Occurrences abroad with Dutch involvement into which an investigation was launched by a foreign authority

Flat tyres during take-off run, Embraer ERJ-170, Rome Fiumicino Airport (Italy), 15 September 2018

During the take-off run, the crew felt heavy vibration in the right-hand landing gear. The crew decided to continue the take-off and return to Rome Fiumicino Airport, where a safe landing was made. Parts of the tyres were found on the runway. Damage was observed to the right-hand side landing gear and the flap mechanism of the right wing. No one was injured during the incident

The Italian Agenzia Nazionale per la Sicurezza del Volo (ANSV) has started an investigation into this incident. The Netherlands is both the State of Manufacture and State of Design of the tyres (Goodyear). The Dutch Safety Board has offered its assistance.

Classification: Serious incident
Reference: 2018112



Damage to the landing gear. (Source: ANSV)

Emergency landing, ATEC Faeta 321, Xanten (Germany), 9 October 2018

During a flight from Kempen Airport to Münster Osnabrück Airport, just outside the control zone of Niederrhein airport, the microlight aeroplane experienced engine problems. The pilot decided to carry out an emergency landing. The 'grass field' selected by the pilot for the emergency landing subsequently turned out to be a plot of arable land planted with a green manure crop. The soil of the field was too soft to support the aircraft which as a result overturned and came to a standstill on its back. Both persons on board were able to leave the aircraft independently. The pilot and his passenger suffered minor injuries.

The German Bundesstelle für Flugunfalluntersuchung (BFU) decided not to start an investigation into this accident.

Classification: Accident
Reference: 2018108



The aircraft following the emergency landing. (Source: Kreispolizeibehörde Wesel)

Airprox, Boeing 777, Boeing 777, Boeing 747-400, Delhi airspace (India), 21 December 2018

In Delhi controlled airspace, the minimum separation limits were exceeded between three aircraft including one aircraft flown by a Dutch airline.

The Indian Aircraft Accident Investigation Bureau (AAIB India) has started an investigation into this incident. The Dutch Safety Board has offered its assistance.

Classification: Serious incident
Reference: 2018132

Published reports

Misaligned take-off from runway 24, Embraer EMB-120ER, EC-JBD, Amsterdam Airport Schiphol, 18 January 2016

The Embraer EMB-120ER "Brasilia" was carrying out a cargo flight from Amsterdam Airport Schiphol to London Stansted Airport in the United Kingdom. On board were two pilots. The aircraft flew to and landed at its destination. After engine shutdown, the ground crew discovered holes in the right-hand side of the fuselage. Furthermore the right-hand propeller blades were damaged and in one propeller blade a metal wire was found embedded in the leading edge. According to the flight crew there had had been no unusual occurrences during flight.

The investigation concluded that the EMB-120 made a misaligned take-off from runway 24 at Amsterdam Airport Schiphol. The pilot had interpreted the right-hand side runway edge lights as the runway centre line lights. During take-off, the nose landing gear had collided with several runway edge lights. As a result the lights broke free and came into contact with parts of the aircraft causing damage to the aircraft. Neither of the pilots noticed this occurrence. Despite the damage suffered, the aircraft was capable of taking off and reaching its destination.

Misaligned take-offs occur throughout the world, and investigations by various authorities have revealed that there are a number of common causes. It was concluded in this investigation that a combination of operational and infrastructural factors contributed to the occurrence. The large turning circle required to align the aircraft on the centre line of the runway, in combination with the interruption of the centre line by taxiway S5 and the absence of centre line lighting on the taxiway contributed to this misaligned take-off. In addition, during the turn from taxiway B to S5 and runway 24, the air crew might have been distracted by the clearance they received from air traffic control.

The Dutch Safety Board has recommended the International Civil Aviation Organization (ICAO) to initiate the process, within Annex 14 Volume 1 'Aerodrome Design and Operations', to develop a standard for runway edge lights that would allow pilots to identify them, without reference to other lights or other airfield features. Amsterdam Airport Schiphol is recommended to proactively take measures, in line with the above recommendation to the ICAO, which prevent pilots from interpreting the runway edge lights as the runway centre line lights. Air Traffic Control the Netherlands is recommended, outside the uniform daily period, to allow air traffic access to the runway for take-off only when intersections are used that are equipped with centre line lighting.

The Dutch Safety Board published [the report](#) on 7 November 2018 on its website, from where it can also be downloaded.



The damaged fuselage of the Embraer EMB-120ER. (Source: AAIB)

Runway incursion with tug combination, Amsterdam Airport Schiphol, 28 February 2016

EA tug combination, comprising an aircraft tug and a Boeing 787 'Dreamliner', was en route from Schiphol East to Schiphol Centre. On approaching runway intersection E3 of runway 18L-36R, the driver of the tug combination requested permission to cross this runway from the 'north apron' controller at Amsterdam Airport Schiphol (AAS). The apron controller incorrectly granted this permission; runway 36R was being used by landing aircraft and was under the control of Air Traffic Control the Netherlands (LVNL).

The tug driver and his instructor, who was sitting in the aircraft, did not notice the illuminated warning lights, orange flashing runway guard lights and red stop bar lights at the intersection. Neither of them realised that the runway was currently being used by landing aircraft. The tug combination drove onto the landing runway to cross it. Air traffic control ordered an aircraft that was approaching for a landing on the runway to abort its approach and to initiate a go-around.

The investigation revealed that a number of factors contributed to this runway incursion. Although human errors played a role, safety management measures that should have prevented this runway incursion did not work satisfactorily, either.

Partly as a result of this incident, since 20 May 2016, all runway crossings of both active and non-active runways are handled by LVNL.

Air traffic safety at Amsterdam Airport Schiphol

On 6 April 2017, the Dutch Safety Board completed the 'Schiphol air traffic safety' investigation and published the outcomes. The Dutch Safety Board issued recommendations for reducing safety risks, to the Schiphol Group and LVNL. Because most of these recommendations also apply to this investigation into the runway incursion, the Board has not issued new recommendations, but will monitor the results of implementation of the above recommendations.

On 17 October 2018 the Dutch Safety Board [published the report on its website](#), from where it can also be downloaded.



Intersection E3 of runway 18L-36R.

Loss of directional control during water landing, Consolidated PBY-5A Catalina, PH-PBY, IJsselmeer, 15 August 2017

The crew of PH-PBY, a historical amphibious aircraft, was carrying out a flight from Lelystad Airport. The purpose of the flight was a memorial fly-over of the Indonesian monument, where a commemoration of the Second World War Japanese capitulation was taking place.

After a flight of almost two hours, the crew carried out a planned splash and go manoeuvre (water landing with immediate subsequent take-off) on the IJsselmeer near Lelystad. During the landing, immediately after hitting the water, the aircraft started to turn to the left, and the crew experienced difficulty controlling the aircraft. The crew attempted to counter the left-hand turn by applying full right rudder and with asymmetrical power. After a full 360 degree turn, directional control was suddenly regained, after which the captain ordered the co-pilot to apply full power on both engines. The aircraft then once again took off from the water.

After passing 500 feet during the climb, both pilots noticed via an inspection hatch that the left-hand nose wheel door was missing. When selecting lowered landing gear for the landing at Lelystad Airport, the right-hand nose wheel door remained closed and the nose wheel stayed inside the bay. Even using the emergency system it was not possible to extend the nose wheel. The crew was aware that a landing with nose wheel withdrawn had become unavoidable, and duly informed Lelystad Airport. The landing was well executed by keeping the nose up from the runway for as long as possible.

The damage resulting from the water landing was limited to the nose gear construction and its doors. As a result of the nose wheel up landing at the airport, the underside of the nose section of the aircraft was damaged. The eighteen persons on board suffered no injury.

The Dutch Safety Board published [the report on 21 December 2018](#). The report can be downloaded via the website of the Dutch Safety Board.



Archive photograph PH-PBY. (Source: J. Redeker)

Published reports

Runway excursion, Piper PA-28-235, PH-PJB, Koksijde (Belgium), 3 August 2014

During the landing at Koksijde airbase in Belgium, the single-engined propeller aircraft veered sharply to the left and ran off the runway. The pilot described the first part of the landing as normal. He was unable to correct the turn to the left and the aircraft finally stopped in a field next to the runway. The two persons on board, both Dutch nationals, remained unharmed. Following the landing it was noted that the nose landing gear had broken off, the propeller was bent and the firewall was damaged.

The accident was probably caused when the pilot applied pressure to both brake pedals during or immediately following the landing causing the right-hand wheel to block, resulting in an imbalance between the brake efficiency of both wheels. The right-hand wheel which became blocked braked less than the left-hand wheel, causing the aircraft to turn to the left.

The Air Accident Investigation Unit (AAIU) of Belgium published [the report](#) on 14 June 2017. The report can be downloaded via the website of the AAIU.



The aircraft following the runway excursion. (Source: AAIU Belgium)

Runway excursion, Fokker F28 Mark 0100, EP-FQF, Mashad Airport (Iran), 16 February 2018

During the approach to runway 31R at Mashad Airport in Iran, there was no indication in the cockpit that the left-hand main landing gear was extended and secured. The crew therefore decided to carry out a go-around. While in a holding pattern, the crew attempted to extend the landing gear but was unable to do so. Eventually, the crew decided to land with the left-hand main landing gear withdrawn. Shortly following the moment of landing, the aircraft lowered onto its left wing and came to a standstill next to the runway. The crew initiated an evacuation. No one on board suffered any injuries. The aircraft suffered damage to the left wing.

The primary cause of the accident was the entering of foreign contamination into the hydraulic system of the left-hand landing gear during maintenance work (C-check). The contamination prevented the correct operation of a valve in the hydraulic system. As a result, the locking mechanism of the left-hand landing gear failed to operate correctly.

The following factors contributed to the occurrence of the accident:

- Insufficient supervision of maintenance work on aircraft.
- Lack of experience among maintenance personnel.

Recommendations were issued to the Iranian civil aviation authorities IRI, the EASA and the airline in question.

The Iranian Aircraft Accident Investigation Board (AAIB) published [the report](#) on 24 December 2018 on its website.



The aircraft following the occurrence. (Source: AAIB Iran)

Faulty radio altimeter and incorrect configuration, Fokker F28 Mark 0100, VH-FNT, Kununurra Airport (Australia), 15 May 2018

The Fokker 100 was carrying out a flight from Perth to Kununurra in Australia. The radio altimeter of the captain failed when the aircraft passed through 10,000 feet during descent, as a result of which multiple false warnings were generated. The aircraft made a safe landing. During the subsequent take-off by the same pilots, they observed that they had accidentally selected flaps 8 instead of flaps 15. The take-off was continued without further problems.

The Australian Transport Safety Bureau (ATSB) did not carry out an investigation into the above incidents, but did publish an [occurrence brief](#).

The incorrect flap setting highlights the importance of managing operational pressures and distraction. The traffic on the taxiway, the events of the previous flight and the extended turnaround time had distracted the crew from completing the pre-flight sequences in a conscious manner. During times of high workload, distraction and perceived time pressures can often lead to human error.

External pressures and distractions are sometimes unavoidable, however, there are effective ways to manage them, as discussed in the ATSB research report B2004/0324, 'Dangerous distraction: An examination of accidents and incidents involving pilot distraction in Australia between 1997 and 2004'. [This report](#) can also be downloaded from the ATSB website.

Incorrect configuration, Fokker F28 Mark 0100, VH-NHQ, near Kalgoorlie-Boulder Aerodrome (Australia), 1 August 2018

The Fokker 100 was conducting a flight from Perth to Kalgoorlie in Australia. During approach, the captain inadvertently called for flaps 42 while he in fact meant a flaps 25 landing configuration. The first officer questioned the captain about this call, which the captain interpreted incorrectly. The first officer selected flaps 42; the captain detected the incorrect flap configuration and conducted a go-around.

The Australian Transport Safety Bureau (ATSB) did not carry out an investigation into the above incidents, but did publish an [occurrence brief](#).

This incident highlights the importance of inter-crew communication. There was a breakdown of communication between the first officer and the captain. The flap configuration was not effectively communicated within the cockpit, resulting in an incorrect configuration being set. Although the first officer did query the captain's initial instruction for a flap 42 configuration, he did not further challenge this call. Flight crews are reminded that active and effective communication, including clarification of unclear instructions, plays an important role in ensuring safe flight.

This incident also highlights the importance of managing operational pressures and distraction. During times of high workload, distraction can often lead to human error.

Mid-air collision during air display training, Northrop F-5E Tiger II, J-3086, J-3088, in air space near Bitgum, 9 June 2016

On 10 and 11 June 2016, the Royal Netherlands Air Force organised its Open Days at Leeuwarden air base. These days included an air show. The period from 7 to 9 June was reserved as rehearsal days for the air show participants.

The Swiss Air Force's display team 'Patrouille Suisse' was one of the participating teams. This team flies with aircraft of the type Northrop F-5E Tiger II. The team arrived at Leeuwarden air base at around 11.00 hours on 9 June. The team members were informed of the rules, local procedures and programme by the local military authorities. This information was contained in the so-called 'Display Order'. Following flight preparations, the six F5 aircraft took off at around 16.00 hours to carry out a practice flight for their air show programme. The aircraft in the formation were numbered 1 to 6 whereby aircraft number 1 was the formation leader. The formation leader issued commands and instructions to the other pilots via the radio. The manoeuvres were flown at an altitude of between 1000 and 1500 feet.

In one of the manoeuvres, four aircraft split off from the other two aircraft. These four aircraft then split into two formations of two aircraft (numbers 1 and 2 and numbers 3 and 4) with the two formations approaching and passing each other at a certain point, in opposing directions. After this manoeuvre, the aircraft made a number of turns at the end of which the four aircraft were to once again take up formation together. As the aircraft came back into formation, aircraft number 3 with registration J-3086, slightly lost position. The pilot flew below the other aircraft, reduced speed and rolled at a vector to the right, in order to regain the correct position. This was a standard procedure. Aircraft number 2, with registration J-3088, was flying to its left and rolled to the left, in order to reach the correct position in respect of aircraft number 1. Because aircraft numbers 2 and 3 had both rolled in different directions, the pilots lost sight of one another. During this manoeuvre, the aircraft came into very close proximity. Because aircraft number 3 reduced speed, aircraft number 2 was traveling at a higher speed. As a result, the tip of the left-hand wing of number 3 came into contact with the underside of the right wing of number 2, thereby cutting off part of the right-hand elevator of number 2.

As a result of the collision, the left-hand wing of aircraft number 3 was so badly damaged that the aircraft became uncontrollable. The pilot activated the ejector seat and left the aircraft. Suspended from his parachute he fell through the glass roof of a greenhouse complex, and suffered minor injuries. The ejector seat also fell through the roof of the greenhouse a short distance away. The aircraft crashed into a lake close to a home adjacent to the greenhouse complex.

Despite the damage suffered, aircraft number 2 was able to return to the airbase, where the aircraft landed without problems.

The accident occurred because the pilot of aircraft number 3 slightly lost position and during manoeuvring lost sight of the other aircraft, number 2, as they returned to formation. As a result, aircraft number 3 collided with number 2 while both aircraft were angled away from one another.

The pilots of the demonstration team fly both operational and demonstration flights with multiple aircraft types. This, combined with limited training flights and the lack of adequate procedures for a situation in which a pilot loses sight of other aircraft possibly played a role in the occurrence of the accident.

The Dutch Safety Board published [the report](#) on 31 October 2018 on its website.



Estimated position of the two aircraft at the moment of the collision.

Occurrences that have not been investigated extensively

Two accidents involving paramotors

Over a period of twelve months, two accidents were reported to the Dutch Safety Board that occurred during the first solo flight of trainee paramotor pilots. A paramotor, or motorised paraglider, is an aircraft which in its simplest form consists of a paraglider that looks something like a parachute. However, it is not a parachute and cannot be used as such. The paraglider is a sort of wing that produces lift through forward speed. The paraglider is connected to the harness by means of (quick-release) carabiners. This specially developed harness is attached to the pilot by a series of straps with quick-release clips. The frame with the motor and the (push) propeller is attached to the harness. The harness has an integrated seat in which the pilot sits following take-off. During take-off and landing, the seat is in a vertical position. The pilot uses his legs to take off and land. This version of the paramotor is a walking version.⁴ The paramotor is controlled using steering lines held by the pilot. The propeller is protected by a cage consisting of a metal frame around which a mesh is wrapped, to prevent the lines of the paraglider coming into contact with the rotating propeller.

A paramotor is an aircraft; the use of which is subject to aviation law. The Human Environment and Transport Inspectorate (ILT) issues the registration certificate and special airworthiness certificate. The Royal Netherlands Aeronautical Association (KNVvL) regulates the training, examination and certification of flying with paramotors in the Netherlands.

It is normal practice for a trainee to complete a tandem flight before making his first solo flight. A tandem flight means that the trainee undertakes a flight together with an instructor with a paramotor equipped especially for that purpose. During the tandem flight, the trainee is not permitted to control the aircraft. Such flights are generally short.



A paramotor. (Source: F. Moorman)

⁴ In other versions, the pilot sits on a tricycle or four-wheeler on which the engine is mounted.

Hand in propeller, paramotor Fresh Breeze 122 AL2F, PH-9B8, Hellevoetsluis, 17 October 2017

The trainee pilot was to carry out his first short flight with a paramotor. This was preceded in the training programme with a tandem flight. The standard take-off procedure is as follows: the parachute is placed unfolded on the ground. The pilot then runs and accelerates with the engine that drives the pusher propeller on his back, into the wind in order to generate lift with the paraglider. Once the paraglider generates sufficient lift, the aircraft takes off, and the pilot is suspended in the harness. At that moment, the pilot is able to place the seat beneath his body, and sit on it. This procedure was followed. During take-off, the pilot was in two-way radio contact with the instructor on the ground who issued instructions.

During the take-off run for the paramotor the pilot sat down too early, and the propeller cage came into contact with the ground. The pilot's hand came into contact with the rotating propeller, causing permanent injury to the hand. The paramotor mesh was also damaged.

At the time of the accident, in addition to the trainee pilot and the instructor, two other trainees were located close to the take-off position (on the ground). They reported not having seen the accident occur.

Analysis

The instructor explained that trainees are taught to only sit down once the paramotor makes a clear rising movement. In this case, according to the instructor, the pilot sat down in the harness too early, causing the cage to hit the ground. The pilot's left hand ended up in the protective mesh. As a result, his fingers came into contact with the propeller, resulting in permanent injury. The mesh, the purpose of which is to prevent the lines of the paraglider coming into contact with the propeller, was unable to prevent this from happening.

The trainee pilot explained that he had attended regular classes for around six months, including running with the propeller motor unit on his back. This is confirmed by the task checklist kept by the instructor. The list for example shows that on 14 October 2017, three days before the accident, the trainee practiced 'running, in a straight line and slalom, with paraglider raised, with and without paramotor'. The task checklist also shows that the trainee had practised aborting take-off on that day. All the points on the checklist were ticked off for the point 'correct start (3 phases: set up, check and accelerate)'.

The accident flight was the first time that the trainee had made a take-off with engine running. On that day, a different engine was used for the first time from the engine which had been used for practice. This was because the original Fresh Breeze engine was too heavy and had too much power for the pilot's posture. In his own words, he had only completed limited theory study prior to the flight.

He also stated that flight preparations on the day of the accident had been somewhat hurried because he had arrived at the take-off site later than planned, and as a result had less time for flight preparations. The flight was carried out without an emergency parachute. The use of an emergency parachute is required according to the KNVvL regulations.

In addition to the section of the harness to which the paraglider is attached, the engine of the type Miniplane was fitted with shoulder straps attached to the underside of the engine propeller unit. In the opinion of the pilot, these straps had not been sufficiently tightened so that when the cage came into contact with the ground, the engine was able to tilt forwards. As a result, his hand was able to come into contact with the propeller, above his head. Following the accident, the trainee found it difficult to extract himself from the paramotor, partly because one belt was knotted because the clip was broken. The knotting of a belt can have serious consequences in the event of an engine fire or if a flight ends in the water, due to the risk of drowning as a result of the weight of the engine. Under such circumstances, it is essential that the pilot is able to free himself quickly.

In this phase of the training, it is the task of the instructor to ensure that the equipment is sound and used correctly.

Occurrences that have not been investigated extensively

Crash, Paramotor PAP 125, D-MVJV, Leusden, 10 October 2018

In the morning, the instructor provided paramotor flying lessons to a number of trainees, at a site near Leusden. One of the trainees was to make his first solo flight. He had started training in June 2018 and had followed a total of eight hours ground training with the paraglider type in question, on seven different days, including that morning. During the ground training, the trainee was taught to gain control of the paraglider; at a later stage in the training, the engine would be fitted on his back, to simulate take-off. The trainee had carried out one prior tandem flight with a walk starter. The instructor stated that on the day of the accident, the trainee demonstrated his readiness for his first solo flight, which was followed by an extended briefing during which all phases of the take-off flight and landing were discussed. The trainee then fitted the engine on his back and carried out the pre-take-off checks. There was little to no wind on the take-off field. Earlier in the morning, a flight had been carried out with the same engine, which had already been warmed up. The trainee was provided with communication equipment for two-way contact with the instructor on the ground, during the flight, so instructions could be given. The trainee then took off.

The instructor stated that the trainee had made a good take-off but that he sat down in the harness relatively early. The video recording made of the take-off shows that after sitting down the paramotor descended briefly, and the metal frame of the cage almost touched the ground. However, the paramotor once again gained altitude and after some time was blown away from the take-off site by the wind. The instructor then instructed the trainee to steer back towards the field because he would otherwise be lost from the view of the instructor.

The trainee stated subsequently that he had not been prepared for this and did not know how to return to the field. According to the instructor, up to that moment, the flight appeared normal. The turns made by the trainee were wide but he was carried further by the wind. The instructor once again instructed the trainee to aim back to the take-off location, and in the meantime kept an eye on the paramotor.

The paramotor then started to turn at a higher rotation speed, at which point the instructor told the trainee to 'raise his hands'. This is a standard steering command. By raising his hands, the pilot lets go of the control and the paraglider flies itself, thereby once again achieving a stable condition, according to the instructor. At that point the paramotor disappeared from the view of the instructor behind the trees and as subsequently emerged, crashed. The trainee stated that when he tried to fly into the wind, the paraglider adopted a 'stall' position, and that he then perhaps selected too much power and at the same time pulled too hard on the steering toggles. The trainee then rotated with his body through around 180 degrees beneath the paraglider as a result of which the lines became twisted. At that time the paramotor was an altitude of approximately 200 metres, and entered a spiral dive and crashed. The trainee suffered lung contusions and injuries to his legs. The paramotor was damaged.

Analysis

The immediate cause of the crash of the paramotor cannot be identified with certainty. The trainee found himself in a 'twist'. In this situation, the pilot rotates through 180 degrees below the paraglider, and is suspended as it were back to front beneath the paraglider. The trainee may have overcorrected as a consequence; as a result of the twist, the steering lines have more difficulty returning to their neutral position. This may have caused the paramotor to turn further, rather than returning to horizontal flight. As a result, the trainee lost control over the paramotor, and entered a spiral dive.

The trainee stated that he did not know how to fly back to the take-off location against the wind, how to respond in emergency situations or how to operate the emergency parachute. Although the trainee had received several days of ground training, had completed a tandem flight and although the instructor was convinced that he was ready for his first solo flight, it turned out that the trainee was insufficiently prepared. The trainee had received and read a theory book about paramotor flight. He had received elementary theoretical knowledge and ground training, but was insufficiently prepared to deal with new situations, such as returning to the take-off location into the wind. In addition, as described in the case above, during his first solo take-off, the pilot sat down too soon.

Conclusion from the two accidents

Both accidents took place during a first flight by the trainee pilots. Both stated that in hindsight they had paid too little attention to the theory before starting their first flight. In the take-off accident in Hellevoetsluis, insufficient flight preparation on the day itself also played a role.

There is no requirement to complete theory training before making a first solo flight. The same applies in other aviation sectors. As a rule, during practical lessons, theory is also taught, including how to react in emergency situations.

It is also common knowledge among paramotor instructors that during their first solo flight, trainees have a strong tendency to sit down too early. This occurred in both cases and was the cause of the first accident. Although this situation is known within the sector, it is clear that the attention paid to this phase of the take-off in training and flight preparation is still insufficient to prevent new pilots sitting down too early.

Unlike in other aviation sectors, during the first paramotor flight when the trainee controls the aircraft, there is no instructor present who can intervene physically. The Board is therefore convinced that it is of vital importance that prior to their first flight, trainees must be thoroughly informed by the instructor of the most common beginner's errors and (emergency) situations they may face and how to respond. These aspects could also receive (some) attention during a tandem flight prior to the first solo flight.



The paramotor following the crash. (Source: Aviation Police)

Occurrences that have not been investigated extensively

Near-miss, Diamond DA-40 NG, PH-EGM, HOAC DV-20 Katana, PH-MFT, above the Flevopolder, 23 February 2018

A Diamond DA-40 was flying according to visual flight rules from Texel International Airport to Lelystad Airport. The pilot was flying alone along the North Sea coast and, having travelled southwest of the control zone (CTR) Schiphol, he first flew in an easterly direction. He then flew at an altitude of approximately 1,250⁵ feet in class G airspace, with the sun behind him, in a north-easterly direction towards the compulsory reporting point Bravo at Lelystad Airport.

An HOAC DV-20 Katana that had taken off from Oostwold Airport approached from Dronten, at an altitude of approximately 1.350⁶ feet. The pilot and his passenger were en route to Hilversum airfield in class G airspace. The route took them past notification point Bravo. According to the pilot of the Katana, he had asked his passenger to keep an eye out for other air traffic, because high traffic volume was expected in the vicinity of point Bravo.

⁵ On the basis of 1022 hPa, flying altitude was 1,250 feet in respect of sea level.

⁶ On the basis of 1022 hPa, flying altitude was 1,350 feet in respect of sea level.

Radar information revealed that above the Flevopolder, the Katana had gradually descended from 1,350 feet to 1,250 feet. With a few more minutes flying time to point Bravo, the pilot of the Diamond received a warning signal from his Traffic Avoidance System (TAS). The TAS revealed the position of the Katana on the Primary Flight Display (PFD). Once the pilot actually saw the Katana, he initiated an evasive manoeuvre by descending. The pilot of the Diamond estimated the minimum separation between the two aircraft at 10 metres. After the Diamond landed at Lelystad Airport, in his own words, the pilot had to recover from the shock. The pilot of the Katana stated that initially, flying into the sun, he had not seen the other aircraft. Subsequently, he stated that at some point after passing Bravo he had seen another aircraft at a separation of approximately 100 metres.

The METAR weather conditions for Schiphol (EHAM) at that moment were CAVOK. For Deelen air base (EHDL), the METAR reported more than 10 kilometres visibility with broken cloud at 22,000 feet, changing to uninterrupted cloud cover at 21,000 feet. Air pressure was 1022 mbar.

Analysis

Radar information reveals that both aircraft were flying on a collision course at approx. 9 NM southwest of Bravo. The gradual descent of the Katana meant that at that time, both aircraft were flying at approx. 1,250 feet. The 'see-and-avoid' principle only worked at a late stage, assisted by the warning from the Traffic Avoidance System in the Diamond. The excellent weather conditions (good visibility, sunlight) meant that the effectiveness of strobes and anti-collision lights was reduced.

In August 2018, the Dutch Safety Board published the [report](#) of a near-miss near Lelystad Airport on 1 August 2015. This report also discussed the limitations of 'see-and-avoid'.

The route of the Katana passed close by point Bravo, but the near miss took place well past point Bravo. The pilot of the Katana had asked his passenger to help keep a lookout for other traffic because he realised that high traffic levels could be expected close to Bravo. Avoiding locations where high traffic levels are expected – such as close to a notification point – reduces the risk of collisions.

Classification: Serious incident

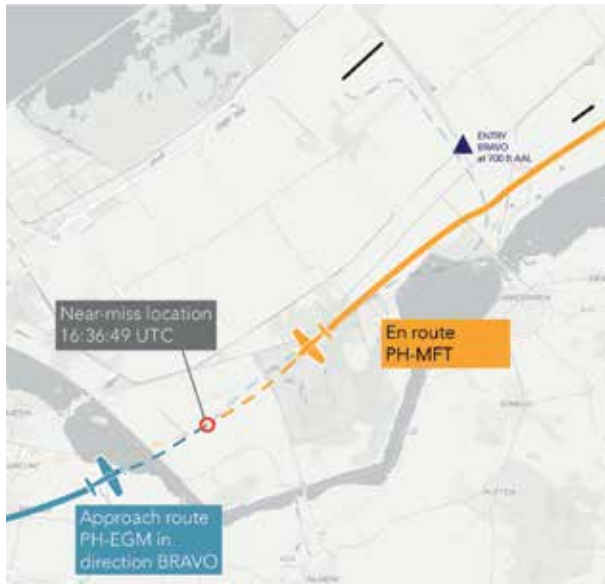
Reference: 2018015



Archive photo of PH-MFT. (Source: G. van der Schaaf)



Archive photo of PH-EGM. (Source: H. Wadman)



Routes of PH-EGM and PH-MFT and the location of the near-miss.

Airprox, Schweizer SC330, PH-HHB and single-engined aircraft, near Dronten, 11 September 2018

The Schweizer helicopter was stationary at a height of 1,400 feet near Dronten. The pilot of the helicopter stated that a single-engined fixed-wing aircraft flew beneath the helicopter from back to front, with an estimated altitude difference of 15 metres. The aircraft could not be identified.

Classification: Serious incident

Reference: 2018098

Runway excursion, A-211 Aquila, G-GAEC, Breda International Airport, 5 October 2018

The aircraft was carrying out a local flight from Breda International Airport according to visual flight rules (VFR). On board were the pilot and a passenger. After a flight of approximately 40 minutes, the pilot landed on runway 25 followed by a (planned) go-around. The pilot stated that the subsequent approach for the planned full stop landing took place without problems, until the flaring procedure, when the main landing gear came into contact with the runway and the aircraft bounced several times. Following the third bounce, the nose wheel made initial contact with the runway and broke off. The aircraft came to a standstill in the grass, to the south of the runway. Both persons on board remained unhurt. The propeller was severely damaged. There was practically no wind during the landing. There was no cloud and visibility was more than 10 kilometres.

The pilot stated that the aircraft bounced during the landing because the aircraft had flared while the speed of descent was too high. Nonetheless, he decided to continue the landing rather than making a go-around. The Board emphasises that during a landing, the pilot must at all times be prepared to carry out a go-around, in the event that the landing can no longer be safely continued in the circumstances.

The pilot was in possession of an ATPL with SEP landing authorization and extensive flying experience. He had nine hours flying experience in the aircraft type in question.



The aircraft following the runway excursion. (Source: Breda International Airport)

Classification: Accident

Reference: 2018106

The Dutch Safety Board in three questions

1

What does the Dutch Safety Board do?

Living safely, working safely, safety. It seems obvious, but safety cannot be guaranteed. Despite all knowledge and technology, serious accidents happen and disasters sometimes occur. By carrying out investigations and drawing lessons from them, safety can be improved.

In the Netherlands the Dutch Safety Board investigates incidents, safety issues and unsafe situations which develop gradually. The objective of these investigations is to improve safety, to learn and to issue recommendations to parties involved.

2

What is the Dutch Safety Board?

The Dutch Safety Board is independent of the Dutch government and other parties and decides for itself which occurrences and topics will be investigated.

The Dutch Safety Board is entitled to carry out investigations in virtually all areas. In addition to incidents in aviation, on the railways, in shipping and in the (petro-)chemical industry, the Board also investigates occurrences in the construction sector and healthcare, for example, as well as military incidents involving the armed forces.

3

Who works at the Dutch Safety Board?

The Board consists of three permanent board members under the chairmanship of Mr Tjibbe Joustra. The board members are the public face of the Dutch Safety Board. They have extensive knowledge of safety issues. They also have extensive administrative and social experience in various roles. The Safety Board's bureau has around 70 staff, two-thirds of whom are investigators.

Visit the website for more information www.safetyboard.nl.



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This is a publication of the Dutch Safety Board. This report is published in the Dutch and English languages. If there is a difference in interpretation between the Dutch and English versions, the Dutch text will prevail.

March 2019

Photos

Photos in this edition, not provided with a source, are owned by the Dutch Safety Board.

Source photo frontpage:

Photo 1: Aviation Police

Photo 2: J. Redeker