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 short-comings 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 2020

In this quarterly report, the Dutch Safety Board gives a brief review of the past year. As a result of the COVID-19 pandemic, the number of commercial flights in the Netherlands was 52% lower than in 2019. The Dutch Safety Board therefore received fewer reports. In 2020, 27 investigations were started into serious incidents and accidents in the Netherlands. In addition, the Dutch Safety Board opened an investigation into a serious incident involving a Boeing 747 in Zimbabwe in 2019. The Civil Aviation Authority of Zimbabwe has delegated the entire conduct of the investigation to the Netherlands, where the aircraft is registered and the airline is located. In the past year, the Dutch Safety Board has offered and/or provided assistance to foreign investigative bodies thirteen times in investigations involving Dutch involvement.

In this quarterly report you can read, among other things, about an occurrence in which a helicopter and a jet fighter over the North Sea came into each other's proximity. The investigation into this occurrence shows that risks still exist from the use of the same airspace by military air traffic flying at high speed and other air traffic flying at low speed.

Jeroen Dijsselbloem
Chairman of the Dutch Safety Board


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Retrospective on reports and investigated occurrences in 2020

The COVID-19 pandemic has had a major impact on commercial aviation throughout the world. Intra-European traffic has fallen by 54%. In 2020, there were 52% fewer flights in the Netherlands than in 2019.[1] Furthermore, in 2020, commercial aviation submitted fewer reports to the Dutch Safety Board than in previous years.

The Dutch Safety Board is legally mandated to investigate all serious incidents and accidents involving civilian airliners in the Netherlands. In 2020, 17 accidents[2] and 10 serious incidents[3] were reported to the Board. One of these occurrences involved a commercial air transport aeroplane. This concerned a serious incident with a Boeing 737, which was conducting a flight after not having flown for an extended period of time, due to COVID-19. Unusual speed and altitude indications during the flight prompted the crew of this aircraft to return to Amsterdam Airport Schiphol. In addition, an accident involving a Dornier 228 took place at Eindhoven Airport. The crew lost control during the landing roll out, after which the aircraft completed a ground loop and came to a standstill alongside the runway. The crew were unharmed.

In April, the Dutch Safety Board launched its first investigation into a single aircraft occurrence involving a drone, in the Netherlands. In July, the Dutch Safety Board launched another investigation into an occurrence involving a drone. There were no injuries in either occurrence. The other occurrences took place in general aviation. One of these occurrences involved an air ambulance helicopter. The overwhelming majority of these investigations into the course of events in these occurrences are still ongoing.

In 2020, two occupants died in general aviation accidents in the Netherlands. In June, a powered paraglider crashed near Didam, killing the pilot. In July, a glider pilot crashed at the Gilze-Rijen airbase. In July, in Germany, two Dutch glider pilots were killed when their aircraft collided and crashed. Also in July, a Dutch NH90 helicopter belonging to the Dutch armed forces crashed in the Caribbean Sea, resulting in the loss of life of two crew members.

The Dutch Safety Board, together with the Defence Safety Inspectorate (IVD), conducted an initial investigation into the accident involving the NH90 helicopter, and published a *preliminary report* on this matter. Acting on its own authority, the IVD will be carrying out a further investigation into this accident. The Board has submitted a number of questions for investigation to the IVD that it considers important in terms of safety improvements.

In the past calendar year, the Dutch Safety Board has offered and/or provided assistance to other countries' safety investigation agencies on 13 occasions. These were investigations into occurrences where there was Dutch involvement, such as an aircraft with Dutch registration and/or produced by a Dutch manufacturer. Two of these occurrences involved Fokker 50s, while Fokker 100s were involved on six occasions. In addition, the Dutch Safety Board launched an investigation into a serious incident involving a Boeing 747 that took place in Zimbabwe in 2019. This was in response to a formal request from the investigating authority in Zimbabwe. The investigating authority made this request because the aircraft (which had lost part of its right inboard fore flap) is registered in the Netherlands, and the airline is based there.

Partly in response to a request from the Minister of Infrastructure and Water Management, the Dutch Safety Board has launched a follow-up investigation into flights over conflict zones. The Board's goal here is to better understand the steps currently being taken by the aviation sector and individual states to manage the risks involved. In conducting this investigation, the Dutch Safety Board hopes to make a further contribution to safe flying, while also improving the management of the risks that conflict zones pose to aviation.

At the request of the Dutch Minister of Infrastructure and Water Management, the Dutch Safety Board launched a limited additional investigation into an accident during the landing of a McDonnell Douglas DC-10-30F at Faro airport in Portugal on 21 December 1992. The Board wants this limited investigation to provide answers to specific technical questions about the landing gear.

1 EUROCONTROL, Aviation Intelligence Unit, Think Paper #8 – 1 January 2021.
2 15 x general aviation, 1 x Coastguard and 1 x drone.
3 8 x general aviation, 1 x commercial/large-scale aviation and 1 x drone.

General aviation reports

The number of serious general aviation incidents and accidents reported in the Netherlands has fluctuated around 25 a year since 2014. In 2020, this number was lower than in previous years. COVID-19-related restrictions may have contributed to this. Given the small number of serious incidents and accidents involved, it is not possible to perform a trend analysis. Furthermore, a wide range of aircraft (from powered paragliders to turbine engine aircraft) are used in general aviation.

56% percent of all general aviation occurrences reported to the Dutch Safety Board in 2020 occurred while landing, 22% in the circuit (including VFR departure/arrival routes), 13% during take-off, and 9% en route.

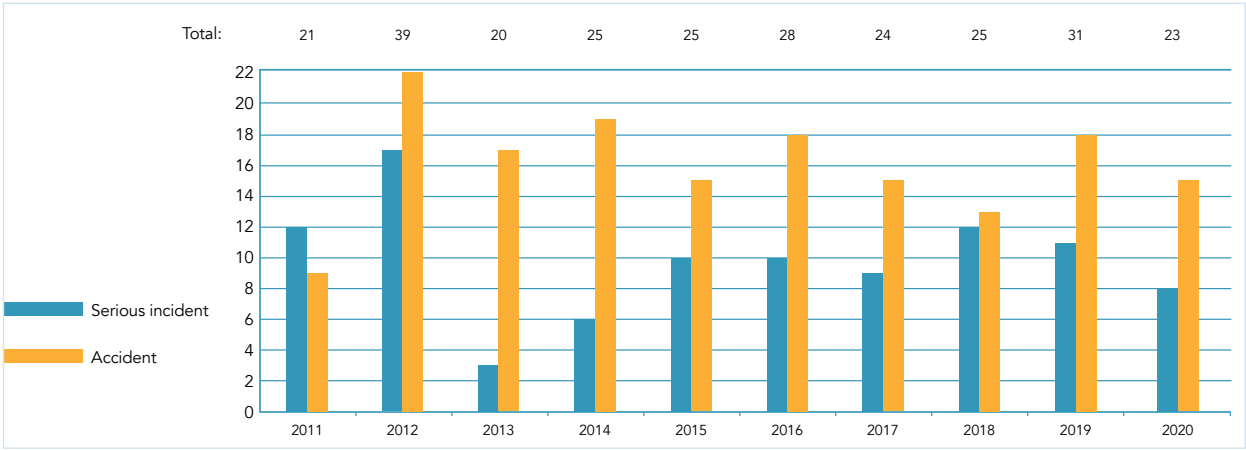
As in 2019, the most frequently reported type of occurrence (six times) was the airprox. An airprox is an event in which, in the opinion of a pilot or an air traffic controller, both the distance between aircraft and their relative positions and speeds were such that the safety of the aircraft in question may have been at risk.

In the control zone of Rotterdam The Hague Airport, an Airbus EC135 helicopter and a Reims F172N aeroplane approached on another, after which the pilot of the helicopter performed an evasive manoeuvre. On the base leg of the Teuge International Airport circuit, a Piper PA-18 and Socata TB-9 came into close proximity with one another, after which the Piper pilot performed an evasive manoeuvre. A second airprox took place at Teuge: during final approach a Reims F172N was overtaken by a Cessna 208, which flew over the F172N and then landed on the runway in front of it. The pilot of the F172N then performed a go-around. A third airprox at Teuge occurred when a Tecnam had to take evasive action halfway through the downwind leg, to avoid a Reims F172G that had merged from a southerly direction on the downwind leg. During final approach, the Reims F172G came into close proximity with a Cessna 172P, which was also on its final approach. As a result, the Cessna pilot decided to abort his approach. In the Eelde CTR, a Socata TB 10, flying the Uniform VFR departure route, came into close proximity with another Socata TB 10, flying the Romeo VFR arrival route. At the Nistelrode glider airfield, a glider pilot disconnected the winch cable during the launch to avoid a collision with a Cessna 172P that was flying over the glider airfield.

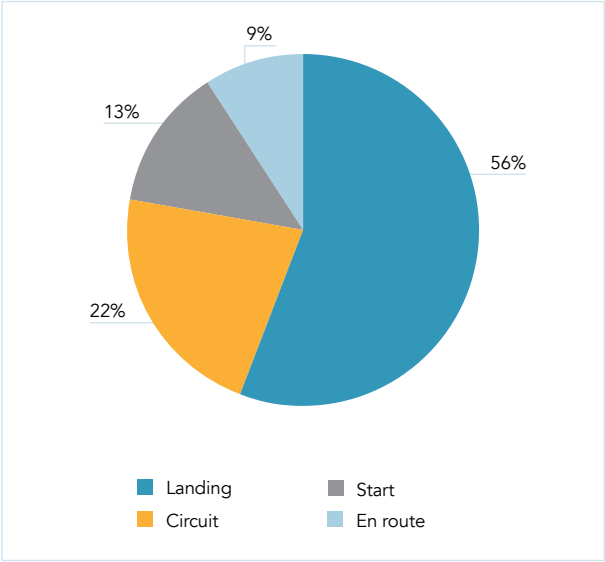
Three runway excursions were reported, all of which occurred while landing. These occurrences involved a Blackshape Prime (Middenmeer airfield), a Van's Aircraft, Inc. RV-8 (Kempen Airport), and an APEX Aircraft DR 400/140 B (Rotterdam The Hague Airport). The occupants were unharmed. The aeroplanes were damaged.

Three hard landings involving gliders were reported in 2020: at Midden Zeeland airfield, at Volkel air base, and at the Terlet glider airfield. In one case, the pilot sustained minor injuries. The aircraft were damaged. In one case, the tail of an ASK-21B broke off.

Two occurrences were reported in two other categories – a crash following loss of control (Condor powered paraglider at Didam and LS8 glider at the Gilze-Rijen airbase) and an emergency landing following engine failure (Cessna A152 at Veelerveen and Diamond DA40 at Den Bommel).



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



The flight stages in which general aviation occurrences and accidents occurred in 2020.

Separation between fast and slow flying traffic

In 2019, a serious incident took place above the North Sea, where a helicopter flying under instrument flight rules (IFR) and an F-16 flying under visual flight rules (VFR), came in close proximity to each other. The occurrence took place in class E airspace. In this airspace, only IFR traffic is separated from each other.

The combination of high speed military traffic and other traffic flying at low speed in uncontrolled airspace forms an unacceptable risk. In 2004, the Dutch Transport Safety Board (RvTV)[4] concluded this already in the investigation into the mid-air collision between an F-16 and a general aviation aircraft near Sellingen[5] in 2002. In 1999, near Etten-Leur[6] also a collision took place, involving an F-16 and a general aviation aircraft.

People were fatally injured in both collisions. In the report of Sellingen, the RvTV concluded, among other things, that the combination of both types of air traffic in the same airspace at low altitude poses an unacceptable risk.

The report mentions that foreign investigations into similar occurrences argue in favour of equipping military fighter planes with collision warning systems. In addition, it states that the underlying cause of the accident near Sellingen is, that after the accident in Etten-Leur in 1999, despite the clear recommendation of the RvTV in 2001, insufficient measures have been taken by the involved ministries (the Ministry of Infrastructure and Water Management and the Ministry of Defense). In the report, the RvTV again issued the recommendation to both ministries to take adequate measures for separation in height, time or place between high speed military traffic and other air traffic in those airspace classes where uncontrolled traffic is allowed.

Circumstances in 2019 show, along with the findings of the previous investigations, that the risks of these operations in uncontrolled airspace still exist. Below is a description of the occurrence in 2019 and its analysis, with the aim to draw attention to the importance and urgency of the safety issue.

4 The Dutch Transport Safety Board was formed in 1999, with a mandate to carry out and report on all investigations in the transport sector. The Dutch Safety Board was founded on 1 February 2005.

5 https://www.onderzoeksraad.nl/en/page/567/botsing-in-de-lucht-general-dynamics-f-16-comco-ikarus-c42-24-april

6 https://www.onderzoeksraad.nl/en/page/462/botsing-in-de-lucht-piper-pa-28-140-general-dynamics-f-16-22-december

Airprox, Airbus Helicopters EC175 B, PH-OSF and General Dynamics F-16AM, J-513, North Sea, 27 June 2019

An Airbus EC175 B helicopter was en route under instrument flight rules (IFR) from a platform in the North Sea via waypoint ATRIX towards De Kooy Airport. On board were 15 passengers and two flight crew members. The helicopter was flying at 3,000 feet AMSL in instrument meteorological conditions (IMC) under air traffic control service from De Kooy Arrival. While approaching waypoint ATRIX, De Kooy Arrival informed the helicopter crew about F-16 traffic under visual flight rules (VFR), which was northeast at a distance of 6 NM at approximately 1,500 feet AMSL, tracking in a southerly direction.

The weather report of the Royal Netherlands Meteorological Institute (KNMI) indicates that at the moment of the occurrence, there was a broken to overcast stratocumulus cloud cover between 1,000 – 1,500 feet with cloud tops up to 2,500 feet and visibility of more than 10 km.

A Netherlands Air Force F-16 had finished an exercise in the training areas north of the Wadden Islands and proceeded in visual meteorological conditions (VMC) towards the south-west. The F-16 flew at approximately 1,500 feet AMSL and was in radio contact with Amsterdam Information. The F-16 pilot's intentions were to perform a requested fly-past along a Royal Netherlands Navy vessel that was located approximately to the north-west of De Kooy Airport, just outside the De Kooy CTR. While getting closer towards De Kooy Airport, the F-16 entered the airspace of Dutch Mil. Amsterdam Information informed the pilot about this and asked for his intentions. The pilot replied to fly approximately five miles southbound after which he would return to Leeuwarden Airbase under instrument flight rules. Amsterdam Information then advised the F-16 pilot to change frequency to Dutch Mil Info or De Kooy Arrival.

The F-16 pilot, however, changed frequency to Rapcon North where he requested to continue under instrument flight rules. Rapcon North informed the F-16 pilot that he was flying in De Kooy airspace and advised to contact De Kooy. Thereupon, the pilot requested the radio frequency. Rapcon North replied with standby while coordinating for a frequency and clearance. Almost immediately after this, the F-16 pilot informed Rapcon North that he was making a 180 degree turn to the north, as he was approaching the northern boundary of De Kooy CTR. The pilot had decided to cancel the fly-past, because of deteriorating weather conditions. After the roll out on a north-easterly heading, the F-16 climbed to an altitude of approximately 4,000 feet AMSL.

Shortly after passing waypoint ATRIX, the ACAS[7]-system of the helicopter generated a Resolution Advisory ("climb climb") indicating the proximity of other traffic. The crew of the helicopter reacted by making a right hand climbing turn. The crew informed De Kooy Arrival that they had received an ACAS traffic warning and momentarily deviated from their assigned altitude and course. After the encounter the helicopter proceeded towards De Kooy Airport and landed uneventfully.

Radar data showed that the F-16 initially approached the helicopter from left to right with an airspeed of approximately 360 knots. The horizontal separation was approximately 3 NM (5.5 km) and vertical separation of 1,700 feet. When the F-16 was in front of the helicopter, it made a right hand turn towards the northeast. During the turn, the horizontal separation was approximately 1.9 NM (3.5 km) and the vertical separation 1,100 feet. After rolling out of the turn, the F-16 climbed to approximately 4,000 feet AMSL in less than 30 seconds. At the same time, the helicopter's ACAS presented the warning. The F-16 pilot was not aware of the proximity of helicopter, as he did not have visual contact. It could not be determined if the helicopter was presented on his on-board radar. The F16 was not equipped with an airborne collision avoidance system.

7 *Airborne Collision Avoidance System.*

At the time of the occurrence the helicopter and the F-16 were both flying in the De Kooy Arrival sector of the Nieuw Milligen TMA A. This is class E airspace (from 1,500 feet AMSL to FL065) in which IFR flights are provided with air traffic control service and are separated from other IFR flights. Separation between IFR-VFR, VFR-IFR or VFR-VFR traffic is not provided and is the responsibility of the flight crew. Traffic information about other flights is provided as far as practical. VFR-flights need to maintain a minimal distance of 1,500 m horizontal and 300 m vertical from clouds. The rules for class E airspace further state that provided that the visibility is more than 8 km, the speed limitation (of 250 KIAS) is not applicable to military jet fighters with a minimum air speed of 250 KIAS.

The encounter between the F-16 and the helicopter near waypoint ATRIX, based on radar data. The given altitudes are expressed in QNH. (Source chart: AIS the Netherlands en-route chart ICAO, source background map: OpenStreetMap)

Separation between fast and slow flying traffic

Analysis

The investigation showed that De Kooy Arrival sector was not depicted on the various aeronautical charts F-16 pilots were issued[8] and that it is not common for them to operate in the vicinity of De Kooy. The F-16 pilot was unfamiliar with De Kooy Arrival airspace and therefore contacted Rapcon North as the air traffic service provider of the Nieuw Milligen TMA A. Regarding the aeronautical information provided, the Dutch Safety Board notes that the existence of the De Kooy Arrival sector is only depicted on one map[9] issued by Air Traffic Control the Netherlands, which may prevent an adequate level of familiarity amongst users of this airspace.

The coordination between the F-16 and De Kooy Arrival for an IFR clearance could not be arranged before the F-16 had to reverse course because of the deteriorating weather. After reversing course, the F-16 pilot misinterpreted Rapcon North's instructions (Able to fly VFR VMC to the range?) which made him to climb above the clouds. From the weather data provided by the KNMI it appears that the actual weather conditions at the time of the occurrence were such that a climb through the clouds under visual flight rules was not possible.

Rapcon North did not anticipate the sudden reversal and rapid changing situation, leaving no time to provide traffic information about the helicopter to the F-16 pilot. During this manoeuvre, the pilot of the F-16 was not aware of the position of the helicopter. The crew of the helicopter was aware of the approximate position of the F-16, because of earlier received traffic information and indications on the ACAS. The ACAS of the helicopter was activated due to the high velocity, momentary head-on heading and rapid climb of the F-16.

Safety actions Royal Netherlands Air Force

To improve the familiarity with the airspace around De Kooy Airport, the Royal Netherlands Air Force briefed F-16 pilots about the airprox and added the De Kooy Airspace sector and the appropriate frequencies to the F-16 pilot's in-flight publications.

Conclusions

This occurrence concerned a situation where helicopter traffic under instrument flight rules and high speed military air traffic under visual flight rules in airspace class E, where only IFR flights are separated from other IFR flights, came into each other's proximity. The F-16 pilot was not aware of the position of the helicopter and besides that the F-16 was not equipped with an airborne collision warning system. These circumstances entailed an unacceptable risk of mid-air collision. The Dutch Safety Board points out that the circumstances of this occurrence together with the findings of the earlier investigations show that the need to separate high speed military traffic under visual flight rules in uncontrolled airspace from other traffic still exists. The in earlier investigations identified.

Classification: *Serious incident*
Reference: 2019056

8 In an earlier investigation into an accident with an Apache helicopter of the Royal Netherlands Air Force, shortcomings were found in quality and availability of aviation cards at the air force. In the report, a recommendation was issued to address this issue. See the report 'Apache wire strike during night flying Zoelmond, 13 November 2017'.

9 LVNL, AIS-publicaties, Aeronautical Information Products, eAIP, ENR6 En Route Charts, Amsterdam FIR en route communication ENR6-2.3.

Occurrences into which an investigation has been launched

Deviating speed and altitude indications, Boeing 737-800NG, Amsterdam Airport Schiphol, 3 October 2020

During the climb a difference between the captain's and co-pilot's altitude and speed instruments was noticed. At cruising altitude this difference had increased. The crew attempted to solve the problem, however, this was unsuccessful. A decision was made to return to Schiphol, where the aeroplane made a safe landing.

Classification: Serious incident
Reference: 2020068

Flipped over during landing, TL Ultralight s.r.o. TL-3000 Sirius, Ameland Airport, 17 October 2020

During landing the aeroplane flipped over and came to a halt upside down. The pilot was unharmed. The aeroplane was substantially damaged.

Classification: Serious incident
Reference: 2020076

The Sirius after the landing. (Source: Dutch Aviation Police)

Runway excursion, APEX Aircraft DR 400/140 B, Rotterdam The Hague Airport, 31 October 2020

During landing the pilot lost control of the aeroplane, whereupon it veered off the runway and hit a PAPI[10] light unit with the left wing, before it came to a stop. The pilot was unharmed. The aeroplane and the PAPI were damaged

Classification: Accident
Reference: 2020079

The aeroplane after the runway exursion. (Source: Airport authorities Rotterdam The Hague Airport)

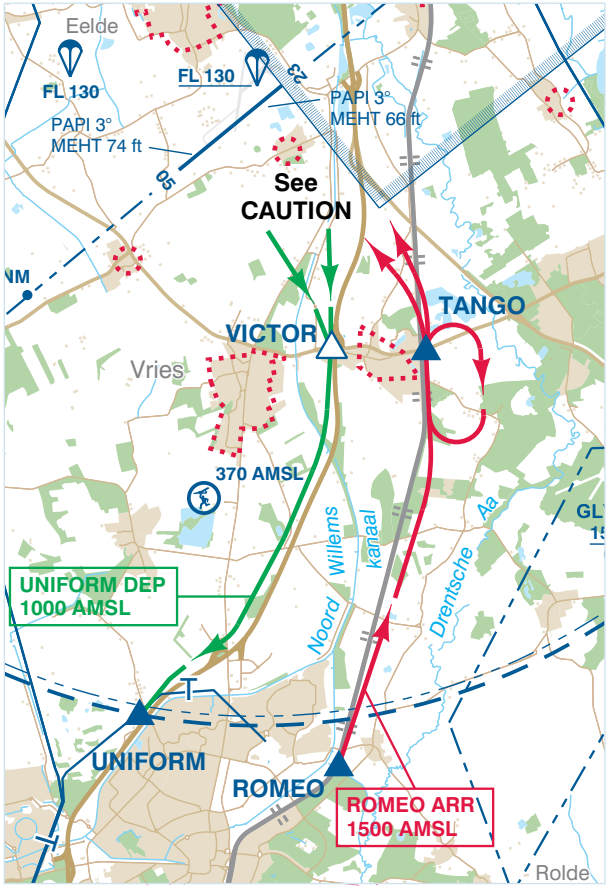
10 A Precision Approach Path Indicator (PAPI) is a visual aid that provides guidance information to help a pilot acquire and maintain the correct approach (in the vertical plane) to an airport or an aerodrome.

Occurrences into which an investigation has been launched

Airprox, Socata TB 10, Socata TB 10, Eelde CTR, 25 November 2020

The Socata TB 10 took off from Groningen Airport Eelde via the Uniform VFR departure route. The aircraft came into close proximity of another Socata TB 10 flying the Romeo VFR arrival route.

Classification: Serious incident
Reference: 2020088



Visual approach chart, EHGG. (Source: AIP Netherlands)

Airprox, Tecnam P2010, Reims Aviation S.A. F172G, Cessna 172P, International Teuge Airport, 29 November 2020

The Tecnam was flying mid downwind for runway 08, when a Reims F172G entered downwind from a southerly direction. The Tecnam pilot made an evasive manoeuvre to avoid a collision between the two aircraft. On final the Reims F172G came into close proximity of a Cessna 172P, which was also flying on final, after which the pilot of the Cessna decided to perform a go-around.

Classification: Serious incident
Reference: 2020089

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

Uncontained engine failure during take-off roll, Fokker F28 Mk 0100, Mehrabad International Airport (Iran), 13 October 2020

When the Fokker 100 started rolling for take-off, engine number 2 failed. Parts of the engine turbine damaged the engine, the fuselage and some of the parts entered the cabin. The flight crew aborted the take-off and returned to the ramp. None of the 94 occupants were injured.

The Iranian Aircraft Accident Investigation Board has launched an investigation into the occurrence. The Dutch Safety Board has offered its assistance.

Classification: Serious incident
Reference: 2020075

Published reports

Erroneous takeoff performance calculation, Boeing 777-300ER, VT-JEW, Amsterdam Airport Schiphol,
21 April 2017

A Boeing 777 was scheduled for a passenger flight from Amsterdam Airport Schiphol in the Netherlands to Toronto Pearson International Airport in Canada. During the initial climb, the flight crew was informed by Air Traffic Control that probably a tail strike had occurred. The crew decided to treat the event as an actual tail strike and returned to Schiphol. After landing, it appeared that a tail strike had occurred but that the wear of the tail skid shoe was within limits and no immediate repair was necessary.

The tail strike was caused by an overrotation of the aeroplane during the takeoff, which was the result of a lower than required airspeed at which the rotation was started. The reason for this was that the actual takeoff weight was higher than the takeoff weight that had been used for the takeoff performance calculation. The combination of a calculation error, the cross check of data by the pilots, the airline's loading procedures, limited systems integration and operational pressure to meet the planned takeoff time contributed to the takeoff performance calculation with the incorrect data as input.

Reduced thrust takeoffs are commonly used as a cost reduction measure. However, performing reduced thrust takeoffs introduces safety risks, such as the risk of input of erroneous takeoff parameters into the Electronic Flight Bag and/or Flight Management System as well as a reduction of the takeoff performance safety margins. The erroneous data input may lead to calculated takeoff speeds and thrust settings being lower than required, causing a flight safety hazard, because the required takeoff roll increases. In case of only minimal changes in takeoff parameters, the resulting additional cost reduction will probably also be marginal. However, changing the input data introduces the risk of erroneous entries, especially when a change is introduced last minute.

Currently, there is insufficient insight in the relation between the actual cost reduction on one hand and the increase in safety risk with respect to erroneous data entry on the other hand. Also, there is no common airline policy or procedure regarding reduced thrust takeoffs and the entry of takeoff performance data. The Dutch Safety Board recommends to operators to consider the benefits of reduced thrust takeoffs against the possible safety risks, like reduced safety margins in case of an engine failure after the decision speed V_1.[11] In addition, it is urgently needed, as this occurrence once again shows, to introduce new systems that are fully integrated in the cockpit and among others provide a timely alert to flight crew when the achieved takeoff performance is inadequate for the given aeroplane configuration, actual weight and balance and aerodrome conditions.

The Dutch Safety Board therefore issues recommendations to European Union Aviation Safety Agency (EASA), the Federal Aviation Administration (FAA), International Air Transport Association (IATA), The Boeing Company and International Civil Aviation Organization (ICAO).

The Dutch Safety Board published the report on 15 October 2020.

11 V_1: Decision speed - the maximum speed at which a rejected takeoff can be initiated by the pilot, and the minimum speed at which the takeoff can be continued in the event of an engine failure. If an engine failure does occur after V_1, the takeoff should be continued.

Uncontrolled landing in strong winds, Schroeder Fire Balloons G 34/24, PH-HPJ, 31 August 2019

The pilot of the hot air balloon, which had three passengers on board, was forced to make a landing due to rapidly deteriorating weather conditions. In doing so, the balloon ended up in weather conditions that endangered the safety of the occupants. After several landing attempts, the balloon eventually came to a halt with the envelope against a tree line after a landing in which the basket skidded over the ground. During the landing, first the passengers fell out of the balloon's basket. Hereafter, the pilot partly fell out of the balloon's basket. The passengers sustained minor injuries.

The weather conditions caught the pilot by surprise because he had paid insufficient attention to the weather forecast during the flight preparations. The weather forecasts specifically prepared for hot air ballooning mentioned high risk weather conditions. These weather forecasts were not consulted by the pilot. Sources he did consult also indicated unfavourable circumstances, but these were not interpreted as such by him. The decision to carry out the flight was therefore based on an incomplete and outdated weather forecast.

Because of the vulnerability of hot air balloons and its occupants, there are clear requirements for consulting weather information before the flight. Because the weather is changeable, it is necessary to follow weather developments during the day. To do this, as many sources as possible must be used, but in particular the weather forecasts specifically prepared for hot air ballooning.

The assessment of whether a hot air balloon flight can be performed safely depends mainly on correct and up-to-date information about current and expected weather conditions. Passengers must be able to assume that a flight will only be performed if it is safe to do so. It is important that a pilot is at all times aware of his great responsibility for the safety of the passengers and that the safety of his passengers always comes first. It is part of good balloon airmanship to actually put this responsibility into practice. Therefore, the Dutch Safety Board recommends to the Royal Netherlands Aeronautical Association (KNVvL) to bring the lessons from this accident to the attention of their members, and point out to them the procedure to follow when consulting the weather forecasts in preparation for a balloon flight.

The Dutch Safety Board published the report on 17 November 2020.

The hot air balloon, against a tree line. (Source: Dutch Aviation Police)

Published reports

Findings of initial investigation, accident NH90 helicopter, N-324, Aruba, 19 July 2020

On 19 July 2020, an NH90 helicopter of the Royal Netherlands Navy ditched unexpectedly in the sea during an exercise in the Caribbean area. As a consequence of the impact, two of the four crew members on board were killed, and the aircraft suffered irreparable damage. Together with the Defence Safety Inspectorate (Inspectie Veiligheid Defensie IVD), the Dutch Safety Board launched an initial investigation on Curaçao because it was an aviation occurrence with fatalities with an uncertain course of events.

The Board has concluded the following, on the basis of the initial investigation:

- Based on the logbooks and the initial analysis of the essential parameters, it has been determined that the aircraft revealed no technical non-conformities.
- The uncontrolled descent was initiated by the combination of falling speed and the engine power setting selected at the moment.
- The personal lifejackets worn, the use of which had not been trained, prevented the rapid escape of the backseaters, and reduced their chances of survival.
- After ditching in the water, the pilot was able to exit the aircraft, but remained connected to the aircraft. The tactical coordinator was unable to free himself. Both died as a result of drowning, but the physical injuries as a result of the impact were limited. As such, there is no medical explanation for the inability to escape from the helicopter.
- Were the station ship and its crew sufficiently equipped and prepared to rescue the crew members of the NH90 helicopter floating in the immediate proximity of the ship?

The Board advised the Defence Safety Inspectorate to further investigate the following subjects: education and training, choice for single pilot configuration and the modular crewing concept of the station ship.

Archive photo NH90. (Source: Ministry of Defence)

The Dutch Safety Board published the results of the initial investigation on 9 December 2020.

Reports published by foreign investigation authorities

Failure of steering actuator of main landing gear, Boeing 747-406F, PH-CKA, Ministro Pistarini International Airport, Buenos Aires (Argentina),
12 February 2019

While a cargo aircraft belonging to a Dutch airline was taxiing, a defect occurred in the steering actuator of its right main landing gear. The aircraft had to be stopped on the taxiway and its cargo discharged before it could be towed to a parking position.

Argentina's Junta de Seguridad en el Transporte (JST) investigated the occurrence. It concluded that the threaded connection between the wishbone and the piston had loosened, causing the actuator's hydraulic rotary drive to fail. The threads of the wishbone and the piston showed signs of corrosion and extensive wear. The sealant that normally covers the washer/wishbone and washer/piston connections was not present, which enabled contaminants to penetrate and corrosion to subsequently occur. The corrosion process reduced the thread bearing depth over time, until the threaded connection was no longer able to bear the load placed on the hydraulic drive.

The sealant probably became compromised during the service life of the component, resulting in increased corrosion, which caused the actuator to fail. The aircraft maintenance manual does not indicate a specific service life limit for the actuator.

The JST of Argentina published the report. The report does not contain recommendations.

Occurrences that have not been investigated extensively

Right air brake malfunctioning, LAK-17B FES, PH-1620, glider field Biddinghuizen, 19 April 2019

During the daily inspection and the pre-flight check of the glider, the pilot did not notice any particularities. After takeoff, he made a cross country flight, after which he returned to the airfield for landing. The pilot stated that, on final approach for Runway 05R, he pulled the air brakes control lever, after which only the left air brake of the glider opened. The pilot was able to control the asymmetrical flight condition and decided to make a long landing in the field, since the target landing area would be overflown due to limited airbrakes operation. On touchdown the right air brake opened, after which the right wing dropped, which was followed by a ground loop. The glider suffered some damage. The pilot remained unharmed.

After the occurrence, a glider technician checked the glider; both air brakes opened at that moment, when he pulled the air brakes control lever. The technician did not find a cause for the malfunction of the air brakes control system. The glider had made a total of 16 flights and 39 flight hours. Similar occurrences with this type of glider, where one air brake opened during flight, are not known to the Dutch Safety Board (DSB).

On 13 May 2019 a technician from the aircraft manufacturer JSC "Sportine Aviacija ir Ko" visited the Netherlands to inspect the glider. A cause of the opening of only one air brake during flight could not be determined. On 29 October 2019 the glider was further examined by the manufacturer in the Republic of Lithuania, in presence of the Head of Transport Accident and Incident Investigation Division of the Republic of Lithuania and an investigator of the DSB. Both wings and the air brakes control system and its rigging were inspected. All parts of the air brake system, contained in the wing, were inspected through the inspection holes on the underside of the wing. Again no cause could be determined for the malfunction of the air brakes control system. On 26 August 2020 the manufacturer performed a test flight with PH-1620, which was equipped with cameras. The opening of one air brake could not be reproduced during the test flight. The manufacturer drew up a report of the test flight and shared it with the DSB. The report states, among other things, that no peculiarities were observed during the test flight. The manufacturer found no defects or deviations from the certified aircraft documentation in the right wing of the glider. The DSB was unable to determine the cause of the occurrence and will not perform further investigation into the probable cause. The DSB notified European Union Aviation Safety Agency (EASA) of the occurrence.

The right wing at the manufacturer in Lithuania.

Classification: Serious incident
Reference: 2019032

Hard landing followed by ground loop, Schempp-Hirth Discus bT, PH-1612, Midden Zeeland Airport, 23 May 2020

The pilot took off from Runway 27 by making use of an aerotow. The wind came from the west with a speed of 30 km/hour. The pilots' intention for this flight was to gain experience with the new starting procedure for the supporting turbo engine of the glider. During the winter break, PH-1612 had been modified with a new flight computer as part of the instrumentation panel and the fuel tank for the turbo engine was fitted in another position in the fuselage. The different location of the fuel tank changed the starting procedure for the engine.

After the winter break, the pilot had made two check flights with an instructor a week earlier. On the same day, he also made his first flight with PH-1612 in the new configuration. The pilot had a total flying experience of approximately 145 hours (407 starts), of which 43 hours (90 starts) on the Discus, of which 12 hours of the Discus bT.

Once airborne, the pilot released the rope at a height of 500 metres and looked for thermals to increase height. However, he was not able to gain height and therefore decided to start the engine while using the checklist. His altitude was approximately 350 metres. The pilot did not succeed to start the engine; a second attempt was also unsuccessful. Then, he attempted, without using the checklist, to retract the engine to reduce the resistance, but this did not work out either. The glider was now approximately at a height of 150 metres and a distance of 3.5 km from the airport. After the pilot had orientated himself, he performed the downwind checks and flew in a straight line back to the airport and considered landing on Runway 09. This would take the least amount of height and time.

Approaching the airport, the pilot noticed that an aerotow took place from Runway 27. Therefore, he decided to land on Runway 27, instead on Runway 09. At a height of about 10 metres, he made a left turn to an improvised short final for Runway 27. During this turn, the left wingtip contacted the ground, causing the glider to make a traversed landing and a ground loop. The pilot remained unharmed. The glider sustained damage to, amongst others, the canopy and left wing tip wheel.

The pilot was aware of the fact that he attempted the start of the engine at a lower height than 500 metres, which is the minimum height for starting the engine, as prescribed by the club he was a member of. The unsuccessful start and unsuccessful retraction of the engine took his attention away from flying the glider. Despite ending up in an unfavorable positon to proceed back to the airport, the pilot decided not to make an off-field landing. Later, the pilot recognized that felt peer pressure from fellow pilots to return to the airport, was an important factor in his decision-making.

The occurrence shows the importance of good flight preparation and the timely detection of and response to circumstances that could put the glider in an unwanted and risky situation. Especially with a flight that is intended to practice something new, it is essential to pay attention to how to deal with unforeseen events, such as not being able to start the engine, during flight preparation. The incident also shows that even in stressful situations, it is important to strictly follow the guidelines and procedures for a safe flight operation.

The damaged canopy of the Discus bT. (Source: Pilot)

Classification: Accident
Reference: 2020033

Occurrences that have not been investigated extensively

Inadvertent landing gear retraction, Blackshape S.p.A. BS 115, PH-TRZ, Lelystad Airport, 18 June 2020

The pilot performed an acceptance flight with the Blackshape BS115, a Very Light Aircraft, after which it would be used for flight training. The pilot, who had a total flight experience of 7,650 hours, of which 8 hours on the type concerned, was sitting in the front seat. The person in the back seat had the role of observer and would, in consultation with the pilot, perform some actions during the flight. The observer was a pilot, but not in possession of a single engine piston rating, which is required to fly the Blackshape.

In the rear cockpit, a mode selector is located, which can be rotated by using a key. Three different modes can be selected: OFF / PASSENGER / TRAINING. In the OFF position, the flaps and gear controls and indications of the rear cockpit are disabled. In the PASSENGER position, the flaps and gear controls are still disabled, but EFIS[12] and indication systems of the rear cockpit are available. When the mode selector is in TRAINING position, all the rear cockpit indications (EFIS, flaps, gear) and controls (flaps, gear) are available.

12 *Electronic Flight Instrument System.*

Before commencement of the flight, the PASSENGER mode was selected. After an uneventful flight, the observer selected the TRAINING mode, when the aircraft flew in the traffic pattern, and took over the flight controls. He configured the aircraft for landing and then the pilot took over the flight controls again on final. The aircraft made a safe landing. While vacating the runway, in consultation with the pilot, the observer selected the PASSENGER mode again and a warning horn sounded. Then, he immediately turned the selector back to the TRAINING mode. Nevertheless, the main landing gear of the Blackshape had collapsed. Both occupants remained unharmed. The landing gear actuator rods were found broken and the aircraft was, amongst others, damaged to the flap hinges and landing gear actuator system.

Section 9 - Supplement 1 REAR COCKPIT, which is attached to the Airplane Flight Manual of the Blackshape BS 115, provides guidance on the operation of the mode selector. It states, among other things, that the MODE selector position must be set on the ground before the engine is started. After the mode has been set, the key must be removed immediately. Changing the mode is not allowed during flight. The mode selector key should be in OFF or PASSENGER mode when carrying persons other than crew members. For training activities, it should be in in TRAINING mode. The mode selector's key was rotated during flight, which is not in line with the manufacturer's procedures.

In the PASSENGER mode, the front cockpit landing gear switch controls the landing gear actuator. The manufacturer stated that if the front switch is set to up, the landing gear actuator will be actuated after the key of the mode selector is rotated from TRAINING to PASSENGER. This caused the gear horn to sound. Both landing gear switches were found in the down position after the occurrence. The pilot stated that the front landing gear switch was in the down position during landing and taxiing. In this configuration of the switches, the sequence of events that took place cannot be explained. The manufacturer has verified that the mode selection system was functioning correctly, according to the type design of the aircraft. The key change from TRAINING to PASSENGER position has no effect on the landing gear if the landing gear switches in both cockpits are in the down position. The Dutch Safety Board was unable to determine with certainty what caused the landing gear to collapse.

After the occurrence, the operator made a memo, as a mitigating action, that the pilot in command of a BS 115 shall read and sign before any flight, to ensure he is familiar with the Airplane Flight Manual and especially with Section 9 – Supplement 1 REAR COCKPIT.

Collapsed main landing gear. (Source: Lelystad Airport)

Classification: Incident
Reference: 2020038

Hard landing, Glassflugel Club Libelle 205, PH-407, Volkel Air Base, 20 June 2020

The pilot took off from 24L (a grass runway) in PH-407, a single-seater glider, using a winch launch. He had a total of 819 flying hours experience (1,565 starts) in gliders, 50 hours (31 starts) of which were in the type in question. Some time later, the pilot entered the left-hand circuit to land. On the downwind leg he made a downwind call and saw that both landing sites were occupied. The pilot extended the downwind leg, to postpone the moment of landing until a landing site was clear. After turning to the base leg, he saw that the target landing field was now clear. The alternate landing field was still occupied. The pilot then turned to final approach and opened the airbrakes at an altitude of approximately 80 metres.

Just before landing, while flaring, the pilot looked to his left and saw a small vehicle emerge from behind the take-off dolly. It was travelling from left to right, and was approaching rapidly. It looked as if the vehicle was going to hit the left wing tip of PH-407. Acting on reflex, the pilot partially closed the airbrakes and pulled the glider's nose slightly upward, to avoid the vehicle. At the same time, the vehicle's driver performed an evasive manoeuvre, turning right to avoid PH-407. A collision was avoided. One characteristic of this type of glider is that, when the airbrakes are retracted, the aircraft drops almost immediately. That was what happened in this case. PH-407 stalled and made a hard landing, stopping without rolling out. The pilot involved in this occurrence sustained minor injuries. PH-407 sustained damage to its canopy and landing gear, and elsewhere.

The Safety Management Team (SMT) of the gliding club involved carried out an investigation into the occurrence, and shared the results with the Dutch Safety Board. This investigation showed that the following factors were involved. The vehicle's driver and the field supervisor indicated that they had not expected any gliders to land during that brief period of time. They were focused on measures relating to the COVID-19 pandemic, such as disinfecting gliders and vehicles, and staying 1.5 metres away from other people. This distracted them from their actual tasks. Furthermore, from his position near the take-off dolly, the field supervisor did not have an unrestricted view of the downwind leg for runway 24. The field supervisor missed the downwind call, because he was placing a tail wheel in a vehicle at the time. Due to the measures relating to the COVID-19 pandemic, no-one was near the take-off dolly. This might explain why no-one heard the downwind call. The SMT's response included recommendations to make members aware of the fact that not flying for extended periods of time results in reduced currency, not only in the air, but also on the ground.

Crack in the edge of the canopy. (Source: Gliding club)

Classification: Accident
Reference: 2020039

Emergency landing with damage, Cessna A152 Aerobat, D-EFUN, Veelerveen, 8 August 2020

The Cessna departed around 18.15 hours for a flight from Norderney Airport to Borkenberge Airfield. On board were the pilot and a passenger. The pilot had a total flying experience of approximately 219 hours, of which 63 hours on the type concerned. Near the Dollard, when the aircraft was flying at 2,000 feet with a power setting of approximately 1,800 RPM, the pilot smelled oil, which smell grew stronger. At one point, the oil pressure indication was no longer in the green, but in the white sector, close to the red line (indicating zero). The oil temperature indication was still in the green segment. Then the engine lost power and the aircraft was not able to maintain altitude anymore. Subsequently, the pilot decided to perform an emergency landing in a field. During landing, the nose wheel broke off and the aeroplane flipped over and came to rest upside down. Both occupants were unharmed.

In the morning of the day of the accident, oil and fuel had been refilled at Borkenberge Airfield where the aircraft departed. There were no known technical defects to the engine, a Lycoming O-235 L2C. Investigation revealed that a part of the piston in cylinder number 1 had broken off. A piece of piston ring was found in the combustion chamber. The engine had run 2,340 hours and the time between overhaul for the engine was 2,400 hours. A reason for the piston failure and subsequent loss of oil has not been established.

The Cessna A152 after the emergency landing. (Souce: Dutch Aviation Police)

Classification: Accident
Reference: 2020055

Occurrences that have not been investigated extensively

Gear-up landing, Socata TB-20 Trinidad, PH-MLZ, Groningen Airport Eelde, 14 August 2020

PH-MLZ, a single-engine Socota TB-20 Trinidad aircraft, made a VFR instruction flight from Groningen Airport Eelde. On board were an instructor and a student. It was the third flight for the student in a TB-20. Before that, he had completed his training on the TB-10. This type of aircraft has a fixed landing gear, the TB-20 has a retractable landing gear.

The plane took off from runway 05 at 12.48 hours. The student was sitting in the left seat and was pilot flying, the instructor was sitting in the right seat. The crew stated that it was very hot in the aircraft. After takeoff, they flew north where a number of exercises were done. After completing the navigation exercise, the crew returned to the airport for a number of touch and go's.

First, two regular touch and go's, were made on runway 05. After the second touch and go, a flapless landing was made. According to the crew, these three landings went well. Then another touch and go was made with the intention of making a second flapless landing. At that time, another aircraft flew in the circuit in front of the TB-20. Air traffic control advised the TB-20 to overtake this aircraft by flying lower and turning to base earlier. The crew followed this advice, consequently the circuit was not flown at the usual altitude of 1,000 feet but at 500 feet and also the final leg became shorter.
Just before landing, the instructor noticed that the plane was sagging further than usual and shortly afterwards both noticed that the fuselage and propeller were hitting the tarmac of the runway. The plane then slid over the runway, with the instructor trying to keep the plane on the runway. Eventually, the plane came to a stop on the runway and both occupants were able to get off unharmed. The plane had made a so-called gear-up landing. Neither occupant could remember if they had heard the landing gear warning.

The underside of the fuselage and the propeller of the aircraft were damaged. After the occurrence, the aircraft was examined by the technical service. This showed, among other things, that the landing gear was working properly. The warning horn, which goes off if the landing gear is not selected down just before landing, also worked well.

The accident was caused by the fact that the aircraft's landing gear had not been selected downwards before landing. Factors likely to have a role to play in this are:

- The higher working pressure for the student as a result of overtaking the other aircraft, flying at a lower altitude in combination with the shorter circuit and the higher approach speed, and conducting the radio communication;
- The relative inexperience of the student with an aircraft with a retractable landing gear;
- Not mentioning the check 'gear down' and not checking the 'three greens';
- The high temperature in the cockpit.

The occurrence shows that a good distribution of attention between flight procedures and disruptive circumstances, such as another aircraft in a non-standard circuit, is of crucial importance for a safe flight operation.

The TB-20 after the gear-up landing. (Source: GAE)

Classification: Accident
Reference: 2020056

Incident during winch launch, ASK-23, PH-774, glider field Soesterberg, 26 September 2020

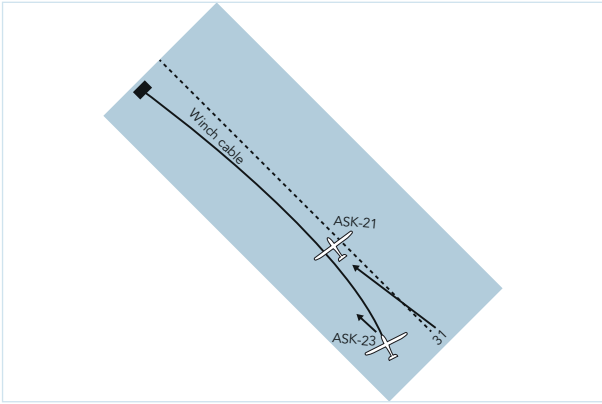
The ASK-23, a single-seater glider, was occupied by a soloist[13]. It was ready to take off from runway 31, using a winch launch. In this launch direction, the landing field is to the right of the take-off field. Due to the north wind, the winch cables had been reeled out on the north side of the runway, which meant that they were positioned between the takeoff field and the landing field. After an ASK-21 with an instructor and a student on board had landed far down the landing field, on the south side, the soloist indicated that he was ready for take-off, after which the winch cable was pulled taut. The instructor in the ASK-21 that had just landed noticed that the left wing of his aircraft was lying across two winch cables, including the one that was being drawn taut. When the instructor saw that the cable was being winched-in and was gaining speed, he and the student quickly got out of the ASK-21 and lay down on the ground. The winch cable cut into the tip of the ASK-21's left wing. When the ASK-23 lifted off the ground, the cable lifted the wing of the ASK-21, which then rotated approximately 180 degrees on its vertical axis, hit the ground hard and came to a stop. The winch cable detached itself from the ASK-23 prematurely, at an altitude of approximately 50 metres, because it had been

13 A soloist is an unlicensed pilot who flies under the responsibility of the instructor on duty.

caught up by the wing of the ASK-21. The soloist then flew straight ahead and made a safe landing. The instructor and the student were unharmed. The left wing of the ASK-21 was badly damaged.

The following three factors contributed to the occurrence. First, the wing walker, signals operator, and soloist did not consider the ASK-21's position in the landing field to be unsafe, so they gave the go-ahead for the ASK-23's takeoff. The club in question had no clear guidelines for determining when runways are clear and when take-offs can subsequently be initiated. Second, the cables had been reeled out further into the field than those involved had assumed. Nor had anyone at the takeoff point noticed that the ASK-21 (which was located far down the landing field) was lying across two winch cables. Third, the ASK-23's winch launch was not supervised by an instructor and/or a launch leader – both of whom were doing something else at the time of the occurrence.

The safety committee of the gliding club involved carried out an investigation into the occurrence, and shared the results with the Dutch Safety Board. One of the committee's recommendations concerned the use of a safe sector, which should be free of obstacles during take-offs.



Classification: Serious incident
Reference: 2020067

Tow bar not removed, APEX Aircraft DR 400/140 B, PH-SVT, Rotterdam The Hague Airport, 7 October 2020

Before the flight, the student pilot performed a walk-around inspection on the DR 400 in the hangar, after which he towed the single-engined aeroplane outside and placed it in front of another hangar. The student had left the tow bar in the nose wheel, in case it was necessary to move the aircraft again. The student then went indoors and obtained clearance to leave the aeroplane there for a while. After the briefing, the instructor and the student walked to the aircraft, which they approached from behind, and got in. The student started the engine and taxied to runway 24. The first part of the route had a smooth asphalt surface, while the next section consisted of Stelcon concrete slabs. While taxiing over these slabs, a rattling noise could be heard, which seemed to emanate from the area around the underframe. This faded away when the aircraft entered the taxiway. Nevertheless, the instructor wanted to test the nose wheel, so he made a few turns and braked a few times. Both occupants then saw wood splinters fly up into the air. The instructor assumed that these had come from the nose wheel fairing, and decided to return to the hangar. A fireman, who was walking along the service road at that time, made hand gestures indicating that they should turn the engine off. The student turned off the engine and he and the instructor got out. They then noticed that the tow bar was still in the nose wheel, and that the tips of the three propeller blades had been damaged.

The instructor had a total of 12,615 flying hours experience, 10,060 hours of which were as an instructor, mainly on single-engined aeroplanes. The student had 80 flying hours experience, 7 hours of which involved flying solo.

The student stated that he had deviated from his normal routine. On this occasion, he had not parked the aircraft at one of the usual parking positions. After he had obtained clearance for this, he forgot to remove the tow bar. The instructor stated that he had not found it necessary to walk around the aeroplane again, because he knew the student was extremely meticulous and always performed the walk-around check properly. During the braking tests, the aircraft's nosewheel leg was compressed, causing the nose to drop. As a result, it was possible for the propeller blades to hit the tow bar.

This occurrence shows that performing the walk-around inspection outdoors, shortly before getting in for an actual flight, reduces the risk that someone might forget to remove the tow bar. Indeed, walking right around the aircraft immediately before boarding, prior to take off, will automatically reduce the risk that things will be forgotten. This includes fuel caps, inspection hatches, luggage hatches, and the like. It is also good practice to always remove the tow bar from the nose wheel after parking the aircraft or leaving it unattended. This will avoid situations in which people become distracted by something or other, and forget to remove it.

The tow bar on the nose wheel. (Source: Instructor)

Classification: Incident
Reference: 2020070

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 occurences 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 wel 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 Jeroen Dijsselbloem. 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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March 2021

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

Source photos cover:
Photo 2: Dutch Aviation Police
Photo 3: GAE