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Havarikommissionen
Accident Investigation Board

Annual Report 2010

November 2011

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Contents

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1. FOREWORD

The Accident Investigation Board for Civil Aviation and Railways (the Accident Investigation Board) is an independent institution under the Ministry of Transport. Its main task is to investigate accidents and incidents in the aviation and railways sectors in Denmark, and in the aviation sector in Greenland and the Faroe Islands.

The Accident Investigation Board's investigations are not concerned with attributing guilt or responsibility, but are aimed solely at preventing breakdowns and accidents in the future.

Through this annual report, the Accident Investigation Board wishes to

- provide information on the year's investigation activities within the Accident Investigation Board;
- report on the implementation status of recommendations made by the Accident Investigation Board; and
- provide statistical information concerning the accidents and incidents investigated by the Accident Investigation Board.

The annual report contains general information about investigation activities, not detailed information about individual investigations. Reports and statements concerning individual accidents and incidents can be found on the Accident Investigation Board's website (www.havarikommissionen.dk).

Chapter 2 contains a brief introduction to the Accident Investigation Board.

Chapter 3 provides an overview of the Accident Investigation Board's investigation activities in 2010. This is done on the basis of figures for received and closed cases, which give a highly simplified picture, since the investigations vary considerably in scope and form.

Chapter 4 presents an overview of the implementation status of the recommendations made by the Accident Investigation Board, which can be studied in greater depth in Annexes 1 and 2.

Chapter 5 presents the statistical figures which can be found in Annexes 3 and 4.

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2. THE ACCIDENT INVESTIGATION BOARD

The Accident Investigation Board for Civil Aviation and Railways (the Accident Investigation Board) is an independent institution under the Ministry of Transport. The Board's duties to investigate aviation and railway matters are laid down in the Aviation Act (Consolidating Regulation No 731 of 21/06/2007) and the Railways Act (Consolidating Regulation No 969 of 08/10/2009 and from November 2010 Consolidating Regulation No 1249 of 11/11/2010).

The main task of the Accident Investigation Board is to investigate accidents and incidents in the aviation sector in Denmark, Greenland and the Faroe Islands and accidents and incidents in the railways sector in Denmark. Where Danish passengers or Danish-registered aircraft or trains are involved, the Accident Investigation Board can take part in investigations carried out by another country's investigation authorities.

The Accident Investigation Board's investigations are not concerned with attributing guilt or responsibility, but are aimed solely at preventing accidents and accidents in the future.

2.1. Mission and vision

The Accident Investigation Board's mission is as follows:

The mission of the Accident Investigation Board

The Accident Investigation Board should, through independent investigations, make recommendations to prevent accidents and incidents in rail and aviation.

The role and duty expressed in the mission statement are fundamental to the functioning of the Accident Investigation Board, and as a supplement to the mission statement, the Accident Investigation Board's vision serves as a guide for its activities.

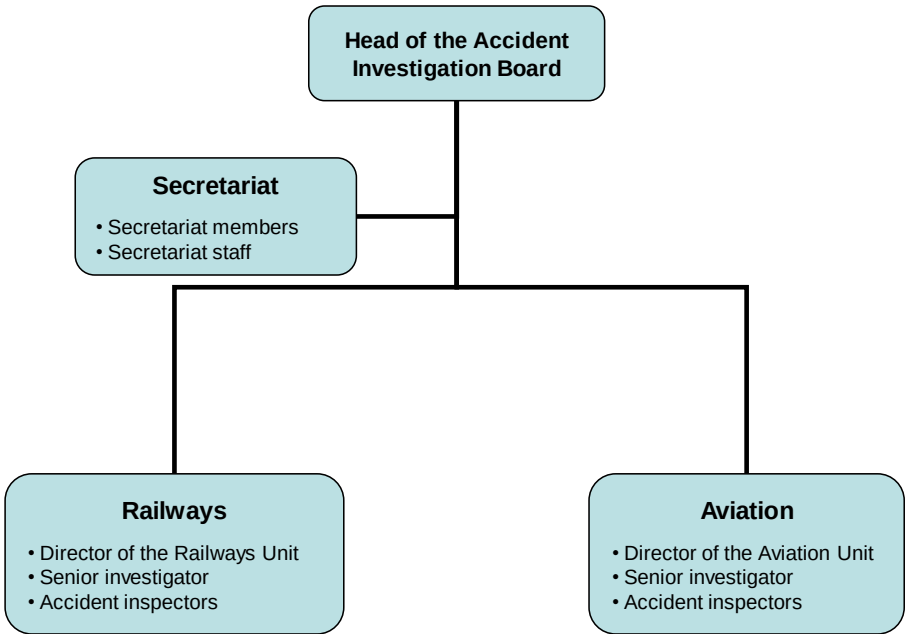
The vision of the Accident Investigation Board

The Accident Investigation Board will continue to:

- ensure that investigative activities keep up with academic and technological developments;
- develop the AIB as an attractive place to work;
- strengthen cooperation and dialogue with relevant national and international partners.

2.2. Organisation of the Accident Investigation Board

The organisation of the Accident Investigation Board includes investigation units for both aviation and railways, as well as a director and secretariat.



The Accident Investigation Board normally has a total of 14 staff, broken down into two employees in the Secretariat, four in the Railways Unit, seven in the Aviation Unit and one Director of the Board.

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3. THE YEAR'S INVESTIGATION ACTIVITIES

3.1. The aviation sector

For the aviation sector, the AIB received 215 reports in 2010, in comparison with 211 in 2009.

All the reports were subject to a preliminary investigation and 93 were found to lie outside the AIB's remit for investigation.

The reports in 2010 that led to further investigation may be divided into the following categories: motorised aircraft/helicopters 85.4%, gliders/motorised gliders 6.4%, ultralight aircraft/gyroplanes 8.2%. No accidents or incidents involving balloons were registered in 2010. Of the reports involving motorised aircraft/helicopters, 12.3% were classified as air traffic incidents. 54.9% of the reports concerned commercial aviation and 45.1% non-commercial aviation.

In 2010, for the aviation sector, 119 reports, statements and § 138 statements were published on accidents and incidents that took place in 2010 or in previous years. The § 138 statements include a brief description of the incident and in some cases an assessment. § 138 refers to § 138 of the Aviation Act. There can be two considerations behind the Aviation Unit deciding not to investigate an incident further. Either an investigation will not reveal any factors of major importance to flight safety, or the Unit does not have the necessary resources to carry out a further investigation of all reported incidents.

In 2010, the Aviation Unit assisted the accident investigation boards of other countries in 19 investigations.

3.2. The railways sector

In 2010, the Accident Investigation Board received 550 reports of accidents and incidents in the railways sector, compared with 521 in 2009.

The Accident Investigation Board assesses all the reports and decides whether a preliminary investigation should be carried out or whether the case may be closed immediately after it is registered. After any preliminary investigation, a decision is made on whether a full investigation should be carried out, resulting in a statement or a report by the Accident Investigation Board.

3.3. Summary of cases in 2010

The table below summarises opened and closed cases in 2009. Developments over the past five years are discussed in greater detail in Chapters 3.4 and 3.5.

The table first gives the total number of reports received. Some reports are closed following preliminary assessment, while others (referred to in the table as 'Opened in 2010 after closure [of others]') give rise to a preliminary investigation.

The number of cases after introductory closure is then divided into accidents and incidents.

The cases closed in 2010 are split according to whether or not they were closed within one year of the incident, in line with the common European objective to close cases within one year wherever possible.

Finally, the table gives the number of unfinished cases at the beginning and end of 2010.

Accident Investigation Board	**2010**		
	Aviation		Railways
Opened cases in 2010			
Number of reports	215		550
Closed after introductory assessment	93		464
Opened in 2010 after closure [of others]	122		86
Reported accidents	30		26
Reported incidents	87		60
Closed cases in 2010			
Published statements and reports < 12 mths	106		39
Published statements and reports > 12 mths	13		4
Note: Statements and reports include simplified statements - § 138 cases or § 21Q cases			
Unfinished cases			
Unfinished cases as at 31/12-2010	48		108
Unfinished cases as at 31/12-2009	59		65

4. RECOMMENDATIONS

As a result of the investigations carried out, the Accident Investigation Board can make recommendations intended to prevent future accidents. As an independent investigation body, the Board makes recommendations to the relevant safety authorities, whose task is to determine the necessary measures in conjunction with the organisations concerned and which are authorised to implement measures in the sectors.

In the aviation sector, the Civil Aviation Administration Denmark (CAA-DK) is the Danish safety authority, but because the aviation sector is highly international, more and more recommendations are currently being made to the EASA (European Aviation Safety Agency) at European level or the ICAO (International Civil Aviation Organisation) at international level.

The railways sector is gradually being developed along more common European lines, but still has a primarily national focus, and the recommendations are therefore made to the Danish Transport Authority, which is the national safety authority.

4.1. Aviation

The table below summarises the status of recommendations in the aviation sector.

Recommendations, aviation sector

Recommendations published		**Implementation status of recommendations**			
		Implemented		**Open / stand-by**	
Year	**Total**		%		%
2006	**6**	**5**	83.3	**1**	16.7
2007	**5**	**4**	80.0	**1**	20
2008	**2**	**0**	0	**2**	100
2009	**2**	**2**	100	**0**	0
2010	**8**	**0**	0	**8**	100
Total	**23**	**11**	47.8	**12**	52.2

An overview of open recommendations and recommendations implemented in 2010 within the aviation sector can be found in Annex 1.

4.2. Railways

The table below summarises the status of recommendations in the railways sector.

Recommendations, railways sector

Recommendations published		**Implementation status of recommendations**			
		Carried out/ Closed		**Open**	
Year	**Total**		%		%
2004	**7**	**5**	71	**2**	29
2005	**10**	**10**	100	**0**	0
2006	**12**	**12**	100	**0**	0
2007	**11**	**8**	73	**3**	27
2008	**20**	**19**	95	**1**	5
2009	**9**	**7**	78	**2**	22
2010	**4**	**2**	50	**2**	50
Total	**73**	**63**	86	**10**	14

For the railways sector, the 2009 annual report contained 15 open recommendations, and in 2010 the Accident Investigation Board made four recommendations. Of these 19 recommendations, 9 were implemented/closed in 2010, so that there are now 10 open recommendations. This development was achieved in conjunction with the Danish Transport Authority with a view to having the older recommendations in particular definitively dealt with.

An overview of all open recommendations and recommendations carried out/closed in 2009 in the railways sector can be found in Annex 2.

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5. STATISTICS OF REPORTED INCIDENTS

This year, the Accident Investigation Board chose to expand its annual report with statistical overviews of the accidents and incidents reported on by it in full or simplified form. The Board is taking up a tradition from the aviation sector, where such statistical overviews have previously formed part of annual reports.

In the aviation sector, there is a common European database (ECCAIRS) in which all incidents are recorded; there are very extensive requirements on the recording of parameters relating to the individual incident. This makes it easy to extract data for statistical use.

The statistical overviews in this annual report can best be read together with Civil Aviation Administration Denmark's annual reporting of the incidents reported to it ('BL 8-10 Annual Report 20xx' for the year in question).

The statistical overviews for the aviation sector (see Annex 3) are divided into accidents and incidents, which are in turn broken down into the categories scheduled flights, charter flights, taxi flights, training flights, other commercial flights, private flights, glider flights, ultralight aircraft and balloons.

Within each of these groups, trends in accidents and incidents are presented and – to the extent that there is a reasonable data set for 2010 – the overviews illustrate how accidents/incidents are divided into 'phases of the flight' and 'factors that contributed to the accident/incident'.

In the railways sector, a common European database (ERAIL) – corresponding to the one for aviation – is currently being developed. When ERAIL is implemented, it is expected that a series of standardised parameters will be defined and thereafter systematically recorded, which will make more ample statistical information easily accessible.

The statistical overviews for the railways sector (see Annex 4) are limited to dividing accidents and incidents into level of seriousness, i.e. serious accident, accident or incident and dividing accidents/incidents into the categories derailment, fire/smoke formation, collision, level crossing accident, collision with person, passing of red light and other.

The statistical overviews for the railways sector can best be read together with the Danish Transport Authority's annual safety report ('Safety report for the railways 20xx'), which is based on annual reports from operators and infrastructure managers in Denmark. These reports also include those accidents and incidents that have been investigated by the Accident Investigation Board. This then provides a broader statistical description of the year's safety-related incidents.

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6. ANNEXES

1. Overview of recommendations for the aviation sector
2. Overview of recommendations for the railways sector
3. Statistics for the aviation sector
4. Statistics for the railways sector

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ANNEX 1

STATUS OF RECOMMENDATIONS IN THE AVIATION SECTOR

The following status applied to recommendations in the aviation sector in June 2011.

<table>
<tr><td colspan="2">REC 06-2006 Open
The Danish Aircraft Accident Board recommends that the Danish Civil Aviation Administration should consider more suitable taxiway designators and more clear taxiways signs.</td></tr>
<tr><td>Synopsis:
Air traffic incident on 8 September 2003 at Copenhagen Airport, Kastrup

Aircraft A was on a flight plan from Copenhagen (EKCH) to Wick (EGPC). Aircraft B was on a flight plan from EKCH to Kangerlussuaq (BGSF). Aircraft A was parked at the eastern parking area and received a taxi instruction to the holding position at runway 04R via taxiways U, T and V and to hold short of taxiway B. Aircraft B was taxiing to holding position at runway 04R. Aircraft B received instruction to line up and was cleared for take-off. When aircraft A arrived at the intersection between taxiways T, V1, V2 and V there were 3 separate taxiways all starting with the name V (V, V1 and V2). The flight crew in aircraft A chose by mistake taxiway V2 and crossed the holding position marking for runway 22L/04R. Kastrup Ground instructed aircraft A to hold its position. At the same time Kastrup Ground called Kastrup Tower (using the intercom) ordering Tower to stop all aircraft movement on runway 04R. The Tower instructed aircraft B to hold its position. Kastrup Ground guided aircraft A back via taxiway V2 and further on to taxiway V.</td><td>Response to recommendation:
In its letter of 15 September 2010, the CAA-DK informed the AIB of the status of the work on the recommendation.
During an inspection, the CAA-DK drafted a report containing a series of measures to be taken by concession holders and air traffic services.
The CAA-DK will keep the AIB informed as these initiatives are implemented.</td></tr>
<tr><td colspan="2">Comments:
The AIB is awaiting the CAA-DK’s further response to the recommendation.</td></tr>
</table>

REC 03-2007	**Closed**
The Accident Investigation Board, Denmark makes the following recommendations to the European Aviation Safety Agency (EASA): Ensure that the aircraft manufacturer revises the work task card to ensure proper locking of the off-wing escape slide system.	
Synopsis: A few minutes after the descent was initiated from FL370 (37000 ft) the left hand off-wing escape slide separated from the aircraft. The aircraft landed in EKCH and it was confirmed that the left off-wing escape slide was missing. The left stabiliser was damaged by the slide when it separated from the aircraft.	**Response to recommendation:** In collaboration with the manufacturer, the EASA has revised those sections of the Aircraft Maintenance Manual (AMM) that concern the off-wing escape slide system with a view to illustrating correct opening and closure. The relevant sections of the AMM have also been revised for aircraft modified on the basis of SB 757-25-0298
Comments: Following the EASA's response, the AIB has closed the recommendation.	

REC 04-2007	**Open**
The AIB recommends that the Danish Civil Aviation Administration with a background in the incident undertake a risk assessment of the physical, technical and operative conditions at Copenhagen Airport, Kastrup (EKCH) and assess whether measures need to be taken and arrange for changes to be made where required.	
Synopsis: Aircraft A landed on runway 22L without permission, while aircraft B was pulling onto runway 22L via taxiway V2 (intersection). As aircraft B passed, the horizontal distance from aircraft A's right wing tip to aircraft B was approx. 10-15 m, and aircraft A's radio altitude (RA) was approx. 16 feet. The traffic load at the time of the incident was low to medium. The incident occurred in the dark and under visual meteorological conditions (VMC).	**Response to recommendation:** In its letter of 15 September 2010, the CAA-DK informed the AIB of the status of the work on the recommendation. During an inspection, the CAA-DK drafted a report containing a series of measures to be taken by concession holders and air traffic services. The CAA-DK will keep the AIB informed as these initiatives are implemented.
Comments: The AIB is awaiting the CAA-DK's further response to the recommendation.	

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REC 05-2007 **Closed**

The AIB recommends that the Danish Civil Aviation Administration, possibly in collaboration with the Danish Parachute Association, draft additional procedures if it is considering also applying ST 16/91 to tandem jumps. Alternatively, that it introduce into the existing ST 16/91 that tandem jumps are not permitted.

Synopsis:

The flight during which the accident took place was a sightseeing tour from Aars Airfield. The pilot took off from runway 29 with five passengers on board. After a tour over the area around Aars, the pilot began a standard approach to runway 29 at Aars Airfield.

The pilot has explained that the last part of the flight was undertaken with full flaps. While flaring out, the aircraft became very tail-heavy and was about to stall. The pilot increased the thrust, trying to force the nose down. This attempt was unsuccessful, and the pilot then chose to go around, applying full thrust. At this point the aircraft's nose was very high, and the aircraft would not accelerate. The control column was pushed all the way forward, which had the desired effect. Around 100 metres from the end of the runway and at an altitude of two to three metres, the pilot realised that he was going to have to make a forced landing. The thrust was reduced to idling speed, and the aircraft 'flopped'. The aircraft hit the edge of the runway and came to a halt on the grass. The pilot has also explained that tail of the aircraft was the first thing to come into contact with the runway.

Response to recommendation:

In its letter of 18 December 2009, the CAA-DK responded as follows:

It is not possible to amend ST 16/91 and the associated Flight Manual Supplement so that it can be applied to tandem jumps, as ST 16/91 covers the transport of five parachutists, no more, no fewer, and these must be positioned as indicated in the Flight Manual Supplement. The version cannot therefore be applied to tandem jumps.

It makes no sense to amend the Flight Manual Supplement to stipulate that tandem jumps are not permitted.

Via the Danish Parachute Union (DFU), the Civil Aviation Administration Denmark wishes to point out to the Union's clubs and members that Danish Supplementary Type Certificate ST 16/91 may not under any circumstances be used for tandem jumps, since it may only be used for the transport of 5 parachutists.

Comments:

Following the CAA-DK's response, the AIB has closed the recommendation.

The AIB feels it is important that the CAA-DK emphasise to the DFU's management that ST 16/91 is issued on condition that there must always be five parachutists on board and that the CAA-DK emphasise the importance of this, so that it is clear that operating in the range of one to five jumpers is not permitted.

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<table>
<tr><td colspan="2">REC 01-2008 Open
The Accident Investigation Board recommends that the Danish Glider Union introduce a requirement that a radio check be carried out between the glider and the tow-plane prior to take-off if the glider has installed approved radio equipment.</td></tr>
<tr><td>Synopsis:
The accident occurred in connection with a towed start in an easterly direction. During take-off, the tow-plane pilot noticed that the angle of climb was abnormally low, and saw in his rear-view mirror both that the glider was not positioned correctly for a towed start, and also that the air brakes were not in and locked, but were partly out. After repeated unsuccessful radio calls to say that the air brakes were open, the tow-plane pilot opted to release the cable, which he did at a height of around 30-50 m, after having signalled an abortive start to the glider by moving the tow-plane’s rudder from side to side. Immediately after being released, the glider turned to the left. While turning, and taking an approximately northerly course, the angle of bank increased, after which the glider lost height and hit the ground with its left wing-tip. The glider then tipped over on its left wing-tip and hit the ground with its nose in an almost vertical position. The aircraft then bounced back into the air and landed backwards so that the rearmost section of the aircraft hit the earthwork that forms the new approach road to Arnborg Gliding Centre.</td><td>Response to recommendation:
The recommendation was discussed at a meeting with the Danish Glider Union on 9 February 2009. The Danish Glider Union does not agree with the Accident Investigation Board’s recommendation as written, as it believes it will be impossible to implement it under different conditions.</td></tr>
<tr><td colspan="2">Comments:
The Danish Glider Union and the AIB are engaged in dialogue about the content of the recommendation.</td></tr>
</table>

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REC 02-2008 **Open**

The Accident Investigation Board recommends that the Danish Civil Aviation Administration investigate the possibility of installing meteorological measuring equipment at/near Vagar Airport which is able to provide a better guarantee of a correct determination of the existing (and expected) degree of turbulence and wind shear on flight paths to and from Vagar Airport as well as at/near the airport – and also that it should re-assess the positioning and applicability of the 'Skeid' anemometer.

Synopsis:

The incident occurred in connection with a scheduled flight from Vagar airport (EKVG) to Copenhagen Airport, Kastrup (EKCH). The flight was a Pilot in Command under Supervision (PICUS) flight, with the candidate pilot sitting in the left-hand seat, and the pilot in the right-hand seat. The pilot in the right-hand seat was the Pilot Flying (PF).

Owing to the wind conditions at EKVG, the planned departure at 08.15 was put back to 08.55. The passengers boarded the aircraft early, so that the aircraft would be ready for departure once the wind direction was more favourable to take off.

When the wind began to turn from south-westerly to westerly, the pilots decided to start the engines and move to the starting position on runway 31. It was the pilots' experience that when comparable weather systems are passing, the wind direction will back westerly and remain in a westerly direction. At 08.51.26, Vagar AFIS reported the wind conditions to be 250° 19 knots pushing 37 knots. Both pilots understood the wind direction to be 260° and decided to initiate take-off.

Take-off was effected with flaps deployed at flap position 30° and maximum take-off thrust. The take-off run and initial climb were perceived to be normal. The landing gear was retracted, the flaps closed to flap position 18°, and the pilots began to establish the aircraft on LLZ (outbound) from runway 13. The turbulence was deemed to be light to moderate.

Shortly thereafter, the pilots' experienced the aircraft flying into an area of heavy turbulence. The aircraft's cruising speed dropped unintentionally to a speed below V2 for flaps at 18°. The pilots corrected for this by lowering the nose to build up speed. During this manoeuvre the speed increased suddenly and unintentionally to a speed above the maximum speed for flaps open at 18°. The pilots reported the turbulence conditions to Vagar AFIS and then decided to continue the flight to EKCH. The aircraft was inspected at EKCH. The inspection did not give rise to any comments.

Response to recommendation:

In its letter of 6 October 2008, the CAA-DK informed the AIB of the status of the work on the recommendation.

Comments:

The AIB is awaiting the CAA-DK's further response to the recommendation.

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<table>
<tr><td colspan="2">DENM-2009-001 Closed
The Accident Investigation Board, Denmark makes the following recommendations to the European Aviation Safety Agency (EASA):
It is recommended to review the design, the certification and the maintenance program of the MLG retraction/extension actuator and rod end.</td></tr>
<tr><td>Synopsis:
The accident flight was a scheduled domestic flight from Copenhagen Airport, Kastrup (EKCH), to Aalborg Airport (EKYT).
During the approach to EKYT the flight crew selected the landing gear down and did not get the appropriate down and locked indication for the right main landing gear (MLG). After a number of unsuccessful attempts to achieve the appropriate down and lock indication the flight crew declared an emergency. Approximately two seconds after touchdown on runway 26R the right MLG collapsed.</td><td>Response to recommendation:
The recommended review has been completed by Transport Canada, authority of the State of Design for the DHC-8-400 aircraft, and has resulted in the issuance of Airworthiness Directive (AD) CF-2007-20 which is presently at revision 2, dated 6 February 2009.
This AD requires repetitive inspections of the Main Landing Gear retraction actuator and its modification to an improved design.

EASA has accepted the results of this review and adopted AD CF-2007-20 revision 2.</td></tr>
<tr><td colspan="2">Comments:
Following the EASA’s response, the AIB has closed the recommendation.</td></tr>
</table>

DENM-2009-002	**Closed**
The Accident Investigation Board, Denmark makes the following recommendations to the European Aviation Safety Agency (EASA): It is recommended to review the landing gear abnormal and emergency procedures contained in the manufacturer's aircraft Flight Manual.	
Synopsis: See recommendation DENM-2009-001	**Response to recommendation:** A review of the Aircraft Flight Manual (AFM) was completed as a result of the safety recommendation and the following changes were made: - Under section 4.21 'Landing Gear Malfunctions' an introductory note has been added to the conditions for use of the alternate landing gear extension procedure in case of "any landing gear retraction or extension malfunction which would not be covered by a specific procedure". - The new procedure of Section 4.21.2 'All Landing Gear Fail to Retract' was added, which instructs the crew to select landing gear down and land at the nearest suitable airport. The manufacturer's Quick Reference Handbook (QRH) revision 21, dated 09 October 2008, was reviewed to confirm that the AFM latest additions were incorporated. The Agency considers that the above modifications meet the intent of the recommendation mentioned above.
Comments: Following the EASA's response, the AIB has closed the recommendation.	

DENM-2010-001	**Open**
The Accident Investigation Board, Denmark makes the following recommendations to the European Aviation Safety Agency (EASA): It is recommended to review if an in-line filter to protect the extend port of the Main Landing Gear Retraction/Extension Actuator is necessary. It is also recommended to review the design of the single line Main Landing Gear hydraulic system in order to prevent hydraulic locking of the Main Landing Gear system. The review should include a possible in-line filter blockage.	
Synopsis: During the approach to EKCH, the flight crew was unable to fully extend the right Main Landing Gear (MLG). After a number of unsuccessful alternate extension attempts, the flight crew declared that the landing would be an emergency landing. The MLG was stuck in an almost up position.	**Response to recommendation:**
Comments: The AIB is awaiting the EASA's further response to the recommendation.	

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DENM-2010-002	**Open**
The Accident Investigation Board, Denmark makes the following recommendations to the European Aviation Safety Agency (EASA): It is recommended to review the information that was available to the maintenance personnel in its unified whole to avoid misunderstandings of the definitions of aircraft components and/or aircraft parts as described. The information sources were the aircraft manufacturer serialisation list, operator computerised data support system, the IPC, the documentation following the MSV and the identification plate fitted to the MSV.	
Synopsis: See DENM-2010-001	**Response to recommendation:**
Comments: The AIB is awaiting the EASA's response to the recommendation.	

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DENM-2010-003 **Open**

The Accident Investigation Board, Denmark makes the following recommendations to the European Aviation Safety Agency (EASA):

It is recommended that the authorities evaluate possible technical solutions for the observation of and warning against migratory birds in darkness and in reduced visibility. This includes the option of installing and using radar equipment for this purpose.

Synopsis:

Following initial take-off from Runway 04R, the pilots noticed a flock of birds in the beam of the aircraft's searchlights. Immediately thereafter, at an altitude of 256 ft, the aircraft was hit by birds, which resulted in powerful vibrations in the aircraft. The vibrations made it difficult for the pilots to read the engine instruments, but they were nevertheless able to read the level of vibrations in the right engine which were fluctuating around the maximum values. The pilots were not able to tell whether the left engine had been hit which is why, in the first instance, they were hesitant to stop the right engine. Since the vibrations in the right engine only partially ceased when the pilots pulled the throttle grip back, they decided to stop the engine. The left engine functioned normally throughout the flight.

The incident was observed from the ground and from the control tower (TWR).

EKCH's on-duty Bird and Wildlife Control Unit warden was approximately 800 m east of the intersection between Runway 04R and Taxiway I at the time of the incident. He heard a loud bang from the starting aircraft and then saw shooting flames and sparks come from the right engine as it passed Taxiway I above Runway 04R.

The air traffic controller from TWR also saw flames come from the right engine of the aircraft immediately after it was in the air. When TWR was informed of the "bird strike" incident by the pilots, the air traffic controller gave the pilots their free choice of landing runway.

The pilots turned the aircraft round and flew visually in a right tailwind to Runway 04R where they landed at 21.17 UTC without further incident.

Response to recommendation:

Comments:

The AIB is awaiting the EASA's response to the recommendation.

DENM-2010-004	**Open**
The Accident Investigation Board, Denmark makes the following recommendations to the European Aviation Safety Agency (EASA): The European Aviation Safety Agency (EASA) evaluates the design, and/or possibly introduces a maintenance scheme including wear and tear limitations for the flaps locking device as well as an adjustment procedure for the handle spring, so that unintentional changing of the flaps position is not possible.	
Synopsis: Upon crossing the beginning of runway 27 at 10-15 metres' altitude, the air brake was fully opened. Shortly after – at 5-8 metres' altitude – the pilot heard loud rattling noises followed by a loud bang. The glider decelerated drastically as it hit the runway 27 without the pilot regaining control. The glider was substantially damaged.	**Response to recommendation:**
Comments: The AIB is awaiting the EASA's response to the recommendation.	

DENM-2010-005	**Open**
The Accident Investigation Board, Denmark makes the following recommendations to the Danish Transport Authority: The Danish Transport Authority evaluates and optimises the use of stop bar lights and the proximity denotations of runway holding positions at Danish airports (like H24 use of stop bar lights and enhanced taxiway centre-line markings).	
Synopsis: Aircraft A inadvertently crossed the stop line to runway 04L on taxiway A7 and entered the runway's safety area while aircraft B was taking off. The minimum horizontal and vertical distances between the aircraft were 19.5 m and 175 ft respectively. The traffic load at the time of the incident was estimated to be medium to high. The incident occurred in the dark, in drifting snow.	**Response to recommendation:**
Comments: The AIB is awaiting the Danish Transport Authority's response to the recommendation.	

DENM-2010-006	**Open**
The Accident Investigation Board recommends that the Danish Transport Authority and the Danish Ultralight Flying Association (DULFU) amend the retraining requirements so that it is not possible for someone to undergo extended retraining without an instructor.	
Synopsis: The flight during which the accident took place was a flight planned from Herning airfield to a local airfield near Grønbæk, from where the pilot had come earlier in the day. Before the flight, the pilot had a training flight at Herning airfield, as part of his retraining to fly and be an instructor in Rans S-12 aircraft. He had performed five take-off and landing exercises (touch & go) prior to the return flight to Grønbæk. After taking off from runway 27, the ultralight (UL) aircraft climbed with its nose very high to around 40-50 metres. The engine began to run erratically before stalling. The ultralight aircraft dipped its nose a little, swayed slightly from side to side, then suddenly nose-dived towards the ground in a clockwise spin. The ultralight aircraft hit the ground with its nose in an almost vertical position.	**Response to recommendation:**
Comments: The AIB is awaiting the Danish Transport Authority's response to the recommendation.	

DENM-2010-007	**Open**
The Accident Investigation Board recommends that the Danish Transport Authority and the DULFU assess current practice for the maintenance of aircraft and engines with a view to ensuring good maintenance practices.	
Synopsis: See DENM-2010-6	**Response to recommendation:**
Comments: The AIB is awaiting the CAA-DK's response to the recommendation.	

DENM-2010-008	**Open**
The Accident Investigation Board recommends that the Danish Transport Authority assess and carry out a risk assessment of the general maintenance rules laid down by the DULFU with a view to ensuring effective quality assurance and/or quality control.	
Synopsis: See DENM-2010-6	**Response to recommendation:**
Comments: The AIB is awaiting the CAA-DK's response to the recommendation.	

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ANNEX 2

STATUS OF RECOMMENDATIONS IN THE RAILWAYS SECTOR

Explanation of the terminology used by the Accident Investigation Board:

> ***Open**: All cases where it has not yet been decided whether to implement a measure, or where implementation has been started but not completed.*
> ***Carried out:** All cases where, on the basis of the Danish Transport Authority's feedback on 'compliance', a recommendation is deemed essentially to have been fulfilled.*
> ***Closed**: Cases where the recommendation has not been directly followed, but where initiatives have been implemented and the Danish Transport Authority as safety authority has assessed the initiatives as satisfactory, and will not take any further action.*
> ***Rejected:** the Danish Transport Authority or other authority to which the recommendation was made has refused to comply.*

2004 published

Head-on collision at Holstebro on 01.06.2004.	
A departing regional train collided head-on with an IC train that was arriving. In the collision, which occurred at low speed, five people were injured. The regional train had not had the departure signal, but the signal that blocked or allowed access could not be seen from the point of departure due to platform equipment. The signal has since been moved.	
R5 22.12.2004	Open
It is recommended that Rail Net Denmark ensures (and the Danish Transport Authority follows up) that the signal commissioning work started after the collision at Kølkær on 02.03.2000 is completed and that the case be closed with a report on the rectifications performed, which will then be assessed by the Danish Transport Authority.	
Response to recommendation: The Danish Transport Authority explained that certain signals had not been dealt with.	Comments: The Accident Investigation Board is awaiting final compliance.
R7 22.12.2004	Open
It is recommended that Rail Net Denmark harmonise safety equipment objectives and the visibility or operational options thereof, and that it sets out guidelines for the circumstances under which and for how long there may be a difference between the actual objectives and visibility or operation.	
Response to recommendation: On the basis of feedback from Rail Net Denmark on 07.02.2008, the Danish Transport Authority explained that agreement had been reached in a number of cases, but that there was still no feedback on Herning and Holstebro and these were still open.	Comments: The Accident Investigation Board is awaiting final compliance.

2005 published

None open

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2006 published

None open

2007 published

Doors swung open at light 63 on 14.09.2006	
The doors swung open on the front unit as a goods train was passing. A fault in the door leaf / door system indicates that maintenance, adjustments and repairs were not of a sufficient standard to prevent the incident.	
R1 16.03.2007	Closed
The Danish Transport Authority should have train operators who use carriages and units of different types review and assess the safety level of the door functions, safety mechanisms and monitoring systems.	
Response to recommendation: The Danish Transport Authority claims that the content of the two recommendations is covered by the individual railway company's liability for maintenance, etc., in accordance with the certificate of release to service and does not want to take further steps in addition to an order issued in connection with this case and its inspection plan.	Comments:
R2 16.03.2007	Closed
In connection with the results of the above, the Danish Transport Authority should assess the need for general requirements to safeguard against trains travelling with open doors.	
Response to recommendation: The content of the two recommendations is covered by the individual railway company's liability for maintenance, etc., in accordance with the certificate of release to service and the Danish Transport Authority does not want to take further steps in addition to an order issued in connection with this case and its inspection plan	Comments:

Collision between car and train near Rindsholm on 20.04.2006	
Shortly before the train was due to pass over the crossing, a private car drove out in front of the train. A collision could not be avoided, and the car was hit. Several factors either influenced or could have influenced the occurrence of the accident and the sequence of events. A lack of signs and visibility, including the fact that on many occasions the gate was open without being in use, thereby allowing cars to pass over the crossing without stopping. In addition, the escape time had been calculated on the basis of crossings with single tracks and this was a twin-track crossing.	
R1 19.04.2007	Open
The AIB recommends that the Danish Transport Authority ensure that the 'Rules for securing railway crossings open to general traffic' are updated and completed.	
Response to recommendation: Rail Net Denmark has secured the specific crossing in accordance with the applicable provisions – including reducing the speed to 75 km/h,	Comments: The 'Rules for securing railway crossings open to general traffic' have not yet been updated.

straightened out the configuration of the ground, etc., and carried out a risk assessment. The updating of the 'Rules for securing railway crossings open to general traffic' is expected to be completed by September 2010. The Danish Transport Authority considers the recommendations to have been complied with.	
R2 19.04.2007	Open
The AIB recommends that the Danish Transport Authority assess whether it is justifiable from a safety viewpoint to allow crossings secured with a gate on stretches with a speed in excess of 75 km/h and that measures be taken in line with the results of the assessment.	
Response to recommendation: Rail Net Denmark has secured the specific crossing – including reducing the speed to 75 km/h through Rindsholm. The assessment of speeds at crossings secured with a gate has been undertaken as part of the work on the 'Rules for securing railway crossings open to general traffic', which is expected to be completed by September 2010. The Danish Transport Authority considers the recommendations to have been complied with.	Comments: The 'Rules for securing railway crossings open to general traffic'.
R3 19.04.2007	Open
The AIB recommends that the Danish Transport Authority assess whether it is justifiable to allow crossings that cross more than one track to be secured with gates, and that measures be taken in line with the results of the assessment.	
Response to recommendation: Rail Net Denmark has secured the specific crossing in accordance with the applicable provisions – including carrying out a satisfactory risk assessment. The assessment of conditions for allowing crossings that cross more than one track to be secured with gates has been undertaken as part of the work on the 'Rules for securing railway crossings open to general traffic', which is expected to be completed by September 2010. The Danish Transport Authority considers the recommendations to have been complied with.	Comments: The 'Rules for securing railway crossings open to general traffic' have not yet been updated.

2008 published

Fire in work vehicle in Great Belt tunnel on 05.06.2006	
While passing through the Great Belt tunnel with wagons and three work vehicles (placed in front, in the middle and at the rear), the breakdown of the engine in the vehicle at the rear caused a fire to start. This spread to the supply of approx. 1.2 aluthermic welding powder – thermite – resulting in an extremely fierce conflagration.	
R7 30.05.2008	Closed
Together with infrastructure managers, railway operators, police and the emergency management agency, the Danish Transport Authority is having an analysis carried out of the alarm procedures in connection with accidents in railway tunnels.	

Response to recommendation: The case was discussed at the meeting of the Incident Management Group for the Great Belt Link on 11.11.2008. During the meeting, Rail Net Denmark reported on the ongoing process to simplify alarm procedures, inasmuch as simplification is desirable, with as few scenarios as possible in the alarm phase. The alarm decision itself should be taken early by the personnel at the site of the damage, which is stressed in the training. Weekly tests are carried out, involving all parties: SRO operators, RFC Roskilde and the alarm centre in Slagelse. Rail Net Denmark also emphasised the link between this recommendation and the training activities that had been implemented in connection with other recommendations. The Danish Transport Authority considers the recommendation to have been complied with.	Comments:

Collision north of Lyngby station on 14.02.2005	
After passing a stop signal, an S-train collided with the rear of an S-train that was at a standstill just outside Lyngby station's northern I-signal. Visibility was reduced due to snow on the signal's lanterns and low light in the red lanterns. The speed at the time of the collision was approx. 67 km/h.	
R1 20.06.2008	Closed
Against the background of the serious errors and shortcomings that have been established in relation to AM 5450 (lanterns, technology, documentation), the Danish Transport Authority should ensure that other or equivalent errors and shortcomings do not occur elsewhere in Rail Net Denmark's infrastructure, e.g. by selecting together with Rail Net Denmark a representative number of Rail Net Denmark's safety equipment (both station safety equipment and rail safety equipment) for inspection.	
Response to recommendation: Since the accident, Rail Net Denmark has altered its organisation and practice such that not only is a representative number chosen, but all the actual safety equipment is inspected and documentation examined once a year. The Danish Transport Authority monitors whether Rail Net Denmark does this and takes action if faults are found in the safety equipment. This supervision is part of the Danish Transport Authority's supervision of Rail Net Denmark's safety approval. Regarding the situation in question, Rail Net Denmark and the Danish Transport Authority have assessed that this was an isolated incident. The Danish Transport Authority considers the recommendation to have been complied with.	Comments:

Derailment near Ellebjerg on blocked track on 18.07.2007	
Three sleeper transport wagons were derailed while shunting on blocked track near the old Ellebjerg station on the S-track to Køge. The track (left track Copenhagen H – Åmarken) was being reconditioned.	
R1 17.07.2008	Closed
Together with Rail Net Denmark, the Danish Transport Authority should ensure that the rules and procedures for preparing tracks for mechanical reconditioning take rail safety into account, and that subcontractors do likewise.	
Response to recommendation: (a) The Danish Transport Authority states that conditions surrounding mechanical track work will form part of the work on the 'Standard Plan 2010' being drafted by Rail Net Denmark in the spring of 2010 (b) The Danish Transport Authority states that Rail Net Denmark's handling of subcontractors is documented in the safety management system which Rail Net Denmark had certified after December 2009 and that this was inspected as part of the Danish Transport Authority's audit.	Comments:
R2 17.07.2008	Open
The Danish Transport Authority should ensure compliance with the requirements on the training of personnel involved in reconditioning track (including subcontractors' personnel), including monitoring the rail safety conditions beyond those relating purely to track reconditioning.	
Response to recommendation: The Danish Transport Authority states that in the spring of 2010 four competence rail standards are being approved on an interim basis by the Danish Transport Authority for use in a pilot trial and that final approval will follow the assessment of the pilot trial.	Comments: The Accident Investigation Board is awaiting information on final approval.

Train derailed while leaving Ringsted on 04.11.2007	
While leaving Ringsted on track 4, the front wagon – the 'A' unit – was derailed at a set of points with a pinion that could not be moved. After setting off, the train had stopped because of door closure problems such that the locomotive personnel could not see that the signal for the train had been withdrawn, while the information in the ATC equipment that authorised the departure was still maintained and seen in the driver's cab.	
R1 22.09.2008	Closed
Rail Net Denmark is analysing the interplay exposed between safety equipment and ATC more closely and will identify those points where similar dangerous situations could occur, and then assess what technical measures can be taken to counter the risks uncovered.	
Response to recommendation: Together with Rail Net Denmark, the Danish Transport Authority has dealt with and assessed the incident, and it is agreed that the instruction solution is perfectly satisfactory.	Comments:

2009 published

Collision with combine harvester at crossing near Borris on 28.07.2008	
A combine harvester was hit at a crossing and was thrown into a field, where it landed on its roof and burst into flames.	
R1 08.01.2009	Open
Together with the Danish Road Directorate, the Danish Transport Authority is to assess the practicalities of driving across railways in high, slow vehicles and the possibilities of creating high visibility road signals on crossings for vehicles with elevated driving positions.	
Response to recommendation: With the assistance of the Road Directorate, the Danish Transport Authority has assessed the specific crossing, but has not yet assessed the general problem	Comments: The Accident Investigation Board is awaiting the assessment.
R2 08.01.2009	Open
In conjunction with the Road Directorate, the Danish Transport Authority should assess the rate which unmanned crossings (crossings secured with warning signalling) are being upgraded to manned crossings (crossings secured with barriers), if necessary with crossings taken out of service, including assessing the rules for equipping railways with unmanned and/or manned crossing facilities.	
Response to recommendation: The Danish Transport Authority has not yet assessed the rate of upgrading or the possibility of closures.	Comments: The Accident Investigation Board is awaiting the assessment.

Fires in engine room of an MF (IC3) on 10.10.2009 and 22.10.2009	
Several fires occurred in the engine room of MF (IC3) stock as a result of leaks in fuel oil hoses that occurred after remotorising.	
R1 10.11.2009	Closed
It is recommended that the DSB, together with the supplier of the remotorising programme, carry out an assessment of whether all hose and cable ducts are in order.	
Response to recommendation: Two inspections have been carried out of the hose and cable ducts. The Danish Transport Authority considers the case closed.	Comments: The recommended general assessment of whether the hose and cable ducts are in order (design) has not been carried out.

2010 published

Collision between ER units at Helgoland on 10.07.2007	
While shunting at Helgoland station between DSB's and Rail Net Denmark's areas, an ER unit collided from behind with another ER unit that was shunting at the same time.	
R1 28.06.2010	Closed
The Danish Transport Authority should ensure through approvals and inspections that shunting work on infrastructure managers' infrastructure is undertaken in accordance with the prescribed rules on	

shunting.	
Response to recommendation: The Danish Transport Authority has been informed by DSBFirst that efforts will be made in several areas (training, instructors, procedures) to improve the safety culture.	Comments:
R2 28.06.2010	Closed
The Danish Transport Authority should ensure that two or more infrastructure managers with infrastructure that is used for shunting by several operators are given and apply common shunting regulations that mention all the necessary special rules, including regarding shunting from the infrastructure manager's area to another area.	
Response to recommendation: Rail Net Denmark has stated that a common shunting instruction (SIN Instruction 10.4) is now in use.	Comments:

Train collided with lorry on crossing near Soderup on 19.09.2009	
Shortly after leaving Tølløse, a unit collided with a lorry on a crossing secured with a half-barrier. An engine driver and the lorry driver were killed in the collision, the train was derailed and the lorry burned out completely, and parts of the crossing facilities were destroyed.	
R1 30.06.2010	Open
The Danish Transport Authority – if appropriate in collaboration with the Danish Road Directorate – should assess what further measures can be taken to reduce the risk of collision with heavy road vehicles by reducing the number of times such vehicles use railway crossings.	
Response to recommendation: The Danish Transport Authority states that it is the road authorities that are responsible for re-routing heavy traffic. The Danish Transport Authority will therefore pass the matter on to the Association of Local Authorities and the Danish Road Directorate. The matter is being followed up.	Comments:
R2 30.06.2010	Open
The Danish Transport Authority should assess the need for ongoing evaluation of safety conditions by the road authorities on secured railway crossings.	
Response to recommendation: The Danish Transport Authority states that road markings on crossings are the responsibility of the road authorities. The Danish Transport Authority will ask the Association of Local Authorities and the Danish Road Directorate for a general assessment of the need for ongoing evaluation of safety conditions. The matter is being followed up.	Comments:

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ANNEX 3

STATISTICS FOR THE AVIATION SECTOR

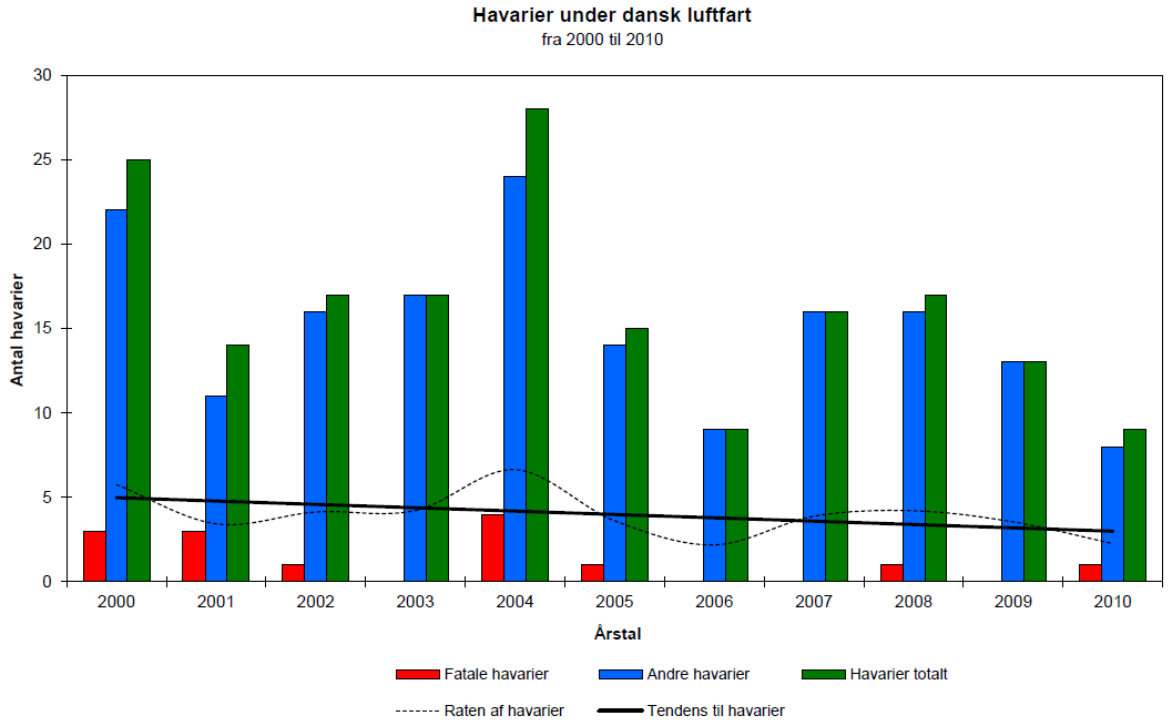
The statistics for aviation accidents and incidents take into account the aviation accidents and incidents reported for 2010 involving Danish and foreign-registered aircraft which the Aviation Unit is obliged to investigate.

The statistics are produced so as to give an overview of the number of aviation accidents and incidents within Danish aviation as a whole, as well as the number of aviation accidents and incidents within the six main areas into which Danish aviation is divided. These six areas are: scheduled, charter, taxi, training, other commercial and private flights. The recreational aviation areas of glider flights, ultralight and balloon flights are not included in Danish aviation, but are listed in separate statistics for each recreational area.

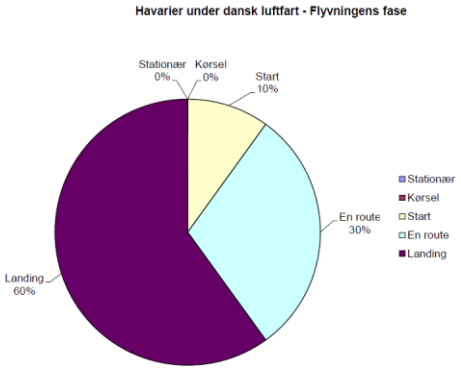
For 2010, diagrams have also been drawn up for aviation accidents and incidents involving foreign-registered aircraft in Danish territory, where the Accident Investigation Board has been in charge of an investigation. Rate and trend are not calculated for foreign-registered aircraft.

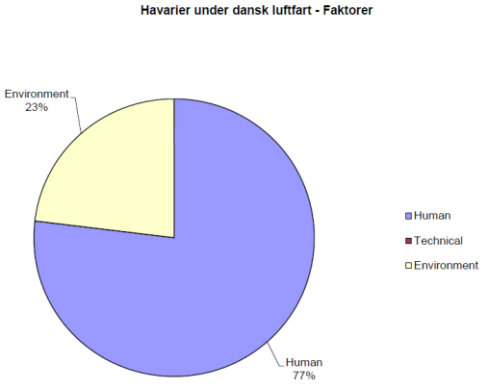
The statistics also show how the rate of aviation accidents and incidents changes from year to year. The rate is calculated as the number of aviation accidents and incidents per 100 000 flying hours. Based on the calculated rate, the trend in aviation accidents and incidents is calculated using the least squares method. Trend gives a picture of a rising or falling occurrence of aviation accidents or incidents on the basis of the number of reported flying hours.

The number of flying hours within Danish aviation is reported to the Civil Aviation Administration Denmark. The statistics on aviation accidents and incidents broken down according to the flight's purpose and phase are drawn up in line with the classification of the ICAO ADREP Manual. It should be noted that the total number of aviation accidents and incidents is not comparable with the total for accident/incident type or the total for factors, inasmuch as an accident or incident can involve several types, and several factors may influence the same accident/incident.



Havarier under dansk luftfart			Accidents in Danish aviation	
fra 2000 til 2010			from 2000 to 2010	
Antal havarier			Number of accidents	
Årstal			Year	
Fatale havarier	Fatal accidents	Andre havarier	Other accidents	Havarier totalt
Raten af havarier	Rate of accidents	Tendens til havarier	Accident trend	Total accidents





Havarier under dansk luftfart – Flyvningens fase	Accidents in Danish aviation – Flight phase	Havarier under dansk luftfart – Faktorer	Accidents in Danish aviation - Factors
Stationær	Stationary	Environment	Environment
Kørsel	Taxiing	Technical	Technical
Start	Take-off	Human	Human
Landing	Landing		

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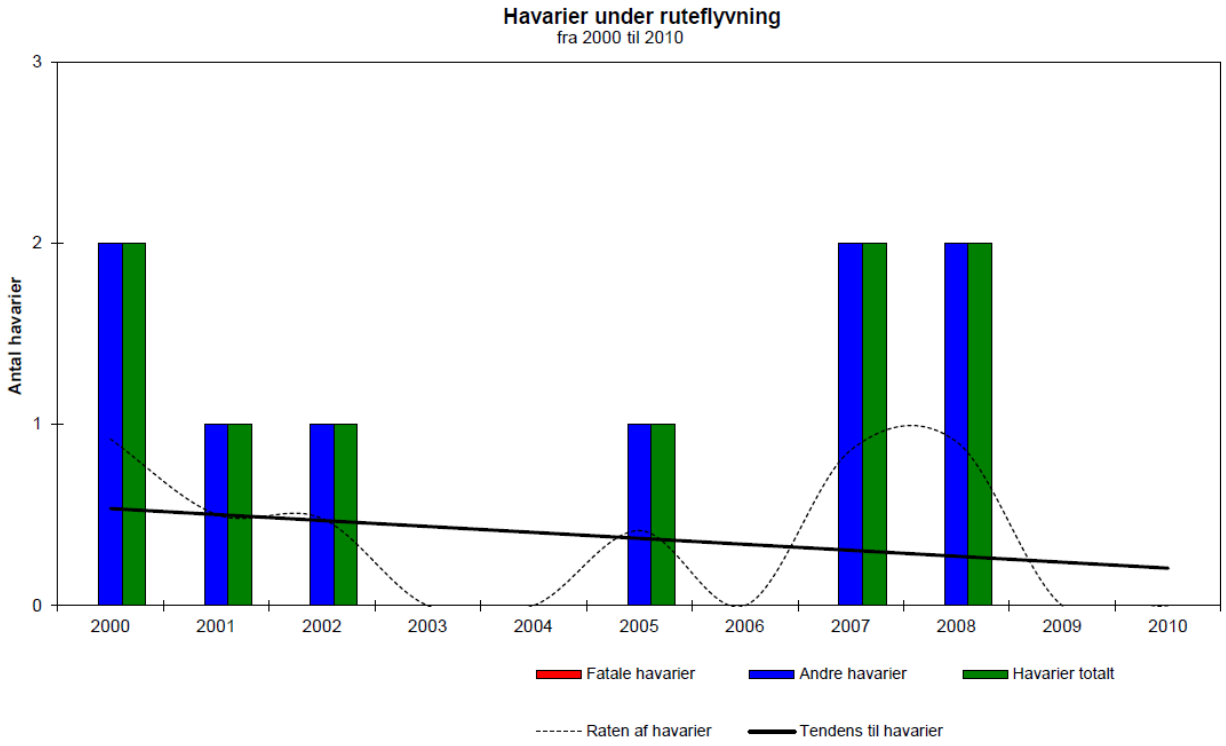
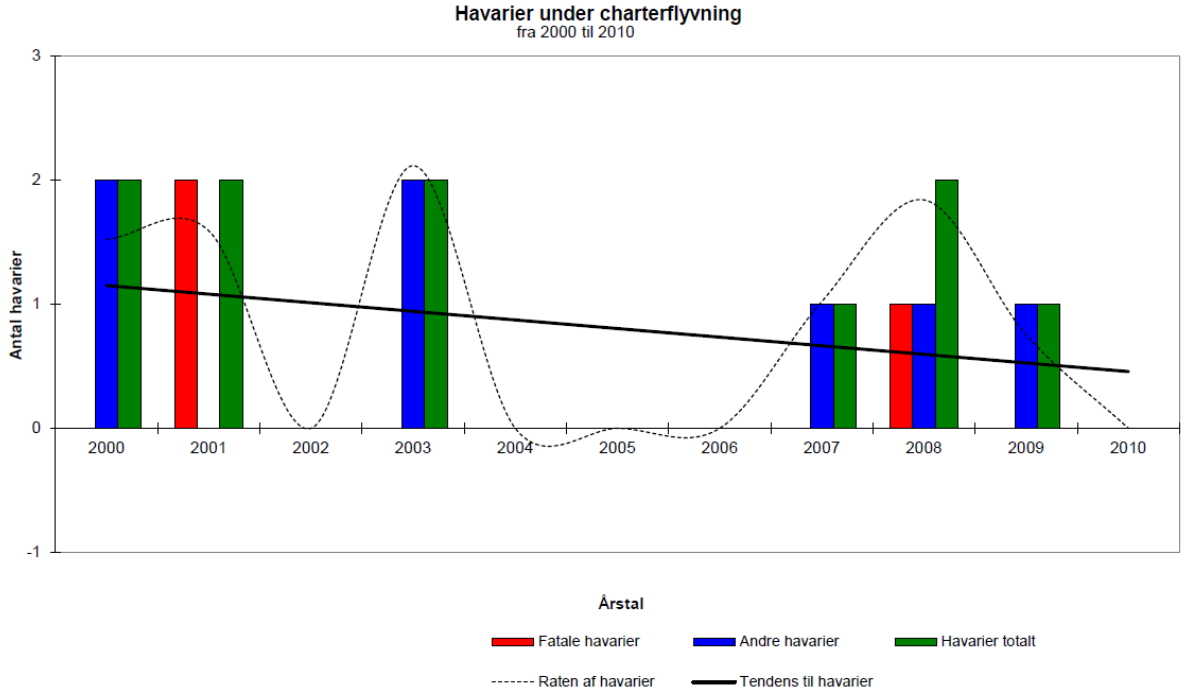
En route	En route		



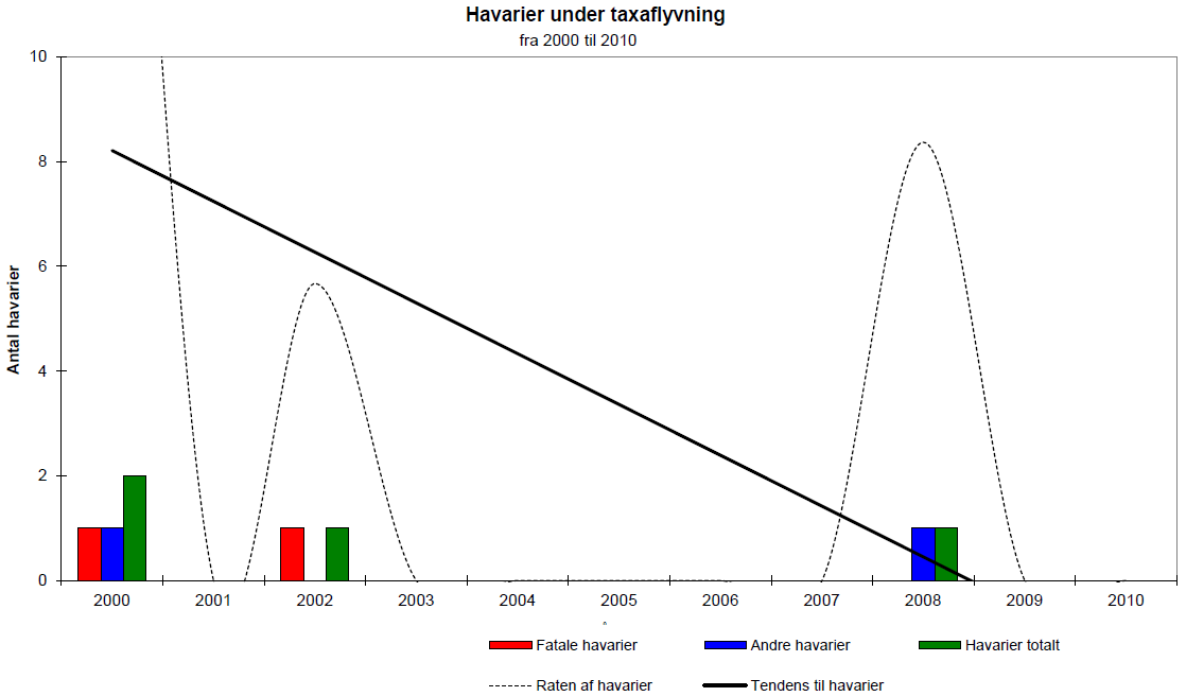
Havarier under ruteflyvning			Accidents on scheduled flights	
Fra 2000 til 2010			from 2000 to 2010	
Antal havarier			Number of accidents	
Fatale havarier	Fatal accidents	Andre havarier	Other accidents	Havarier totalt
Raten af havarier	Rate of accidents	Tendens til havarier	Accident trend	Total accidents

No accidents occurred on scheduled flights in 2010, which is why the flight phases and contributory factors are not given.



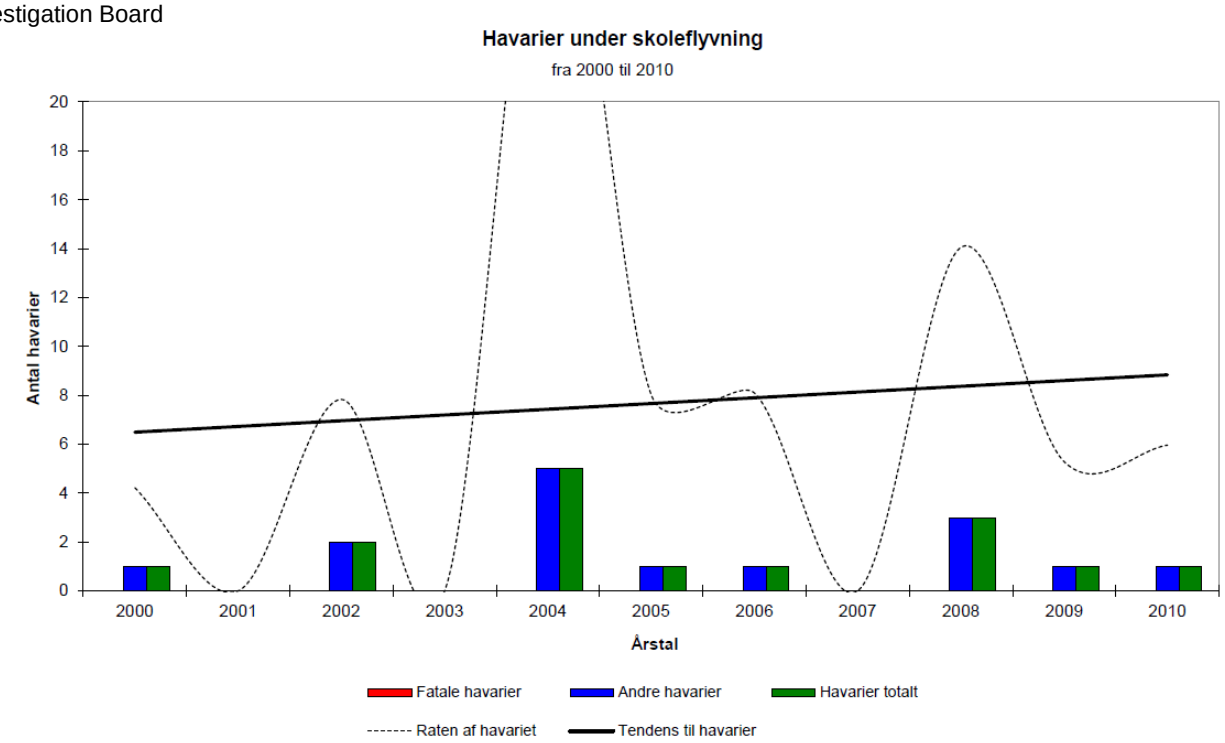
Havarier under charterflyvning		Accidents on charter flights		
fra 2000 til 2010		from 2000 to 2010		
Antal havarier		Number of accidents		
Årstal		Year		
Fatale havarier	Fatal accidents	Andre havarier	Other accidents	Havarier totalt
Raten af havarier	Rate of accidents	Tendens til havarier	Accident trend	Total accidents

No accidents occurred on charter flights in 2010, which is why the flight phases and contributory factors are not given.



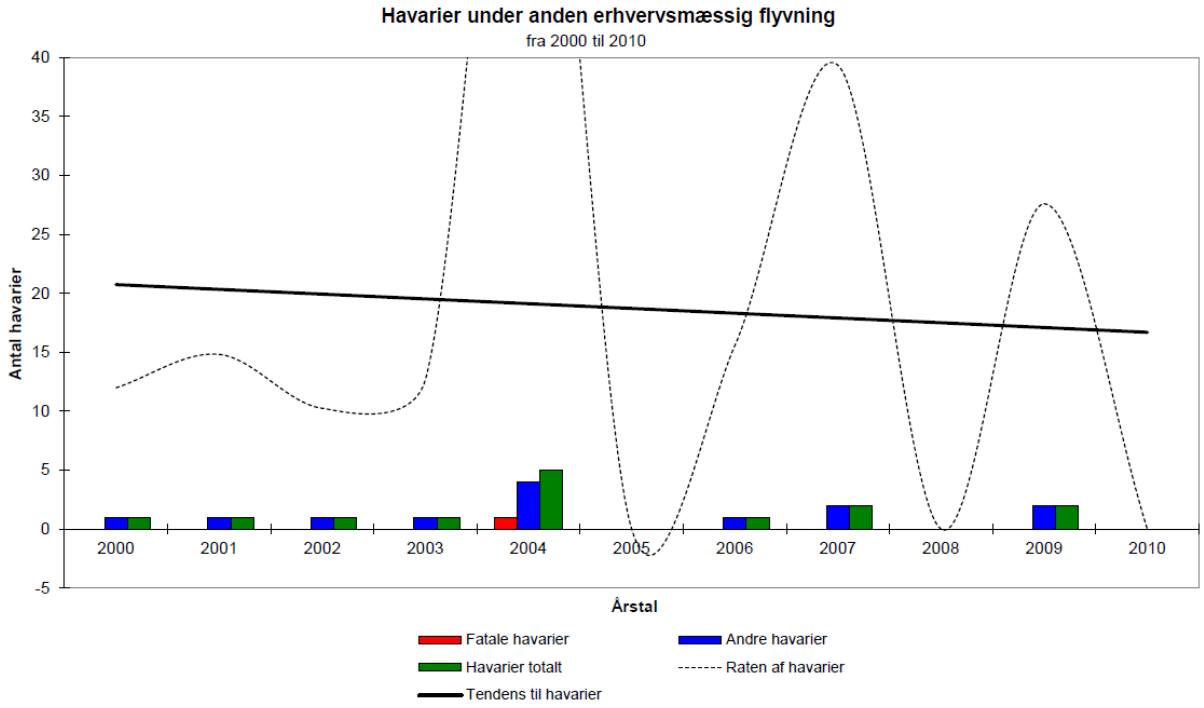
Havarier under taxaflyvning			Accidents on taxi flights	
fra 2000 til 2010			from 2000 to 2010	
Antal havarier			Number of accidents	
Fatale havarier	Fatal accidents	Andre havarier	Other accidents	Havarier totalt
Raten af havarier	Rate of accidents	Accident trend	Tendency towards accidents	Total accidents

No accidents occurred on taxi flights in 2010, which is why the flight phases and contributory factors are not given.



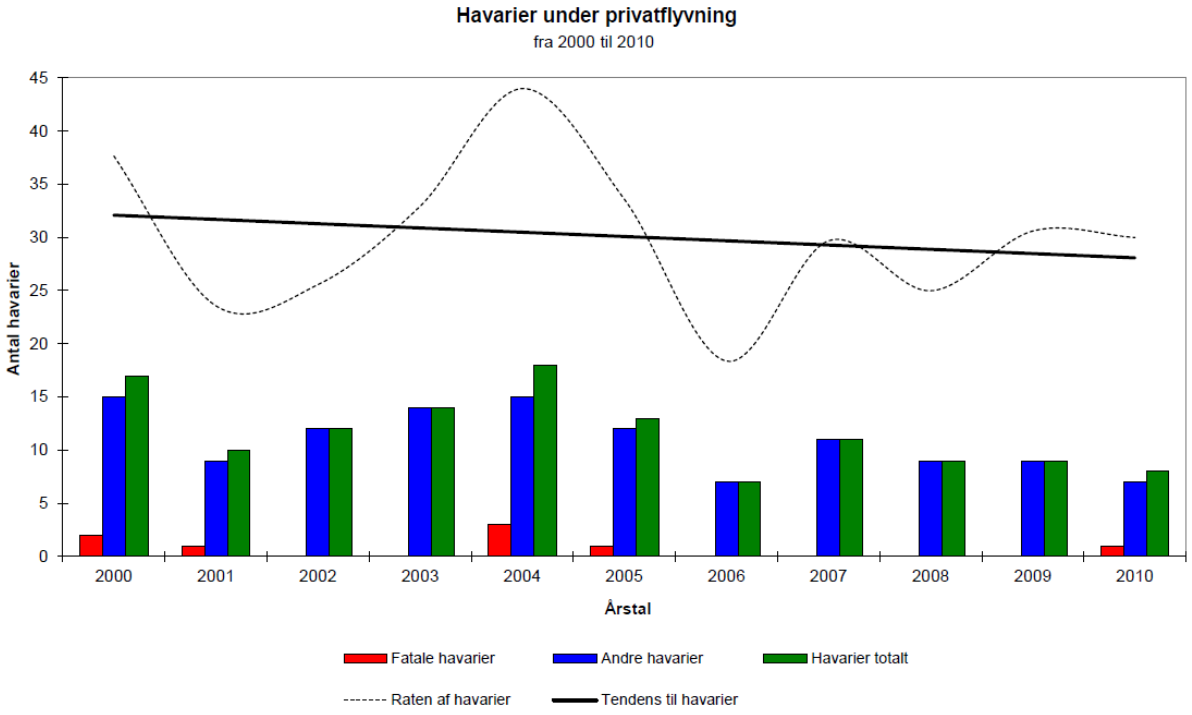
Havarier under skolefflyvning		Accidents on training flights		
fra 2000 til 2010		from 2000 to 2010		
Antal havarier		Number of accidents		
Årstal		Year		
Fatale havarier	Fatal accidents	Andre havarier	Other accidents	Havarier totalt
Raten af havarier	Rate of accidents	Tendens til havarier	Accident trend	Total accidents

The accidents that occurred on training flights in 2010 all occurred en route and the contributory factor was Human Factors.

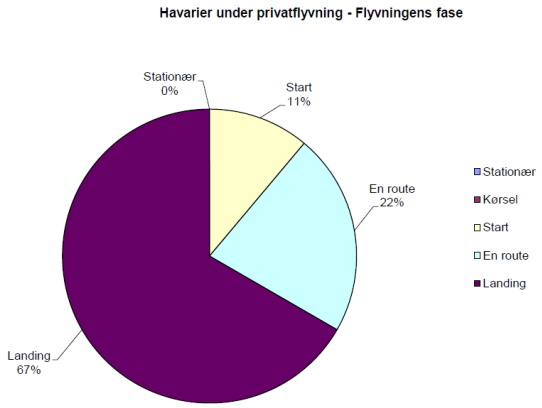


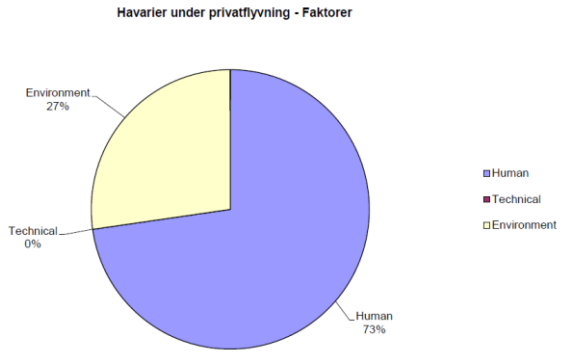
Havarier under anden erhvervsmæssig flyvning			Accidents on other commercial flights	
fra 2000 til 2010			from 2000 to 2010	
Antal havarier			Number of accidents	
Årstal			Year	
Fatale havarier	Fatal accidents	Andre havarier	Other accidents	Havarier totalt
Raten af havarier	Rate of accidents	Tendens til havarier	Accident trend	Total accidents

No accidents occurred on other commercial flights in 2010, which is why the flight phases and contributory factors are not given.



Havarier under privatflyvning			Accidents on private flights	
fra 2000 til 2010			from 2000 to 2010	
Antal havarier			Number of accidents	
Årstal			Year	
Fatale havarier	Fatal accidents	Andre havarier	Other accidents	Havarier totalt
Raten af havarier	Rate of accidents	Tendens til havarier	Accident trend	Total accidents





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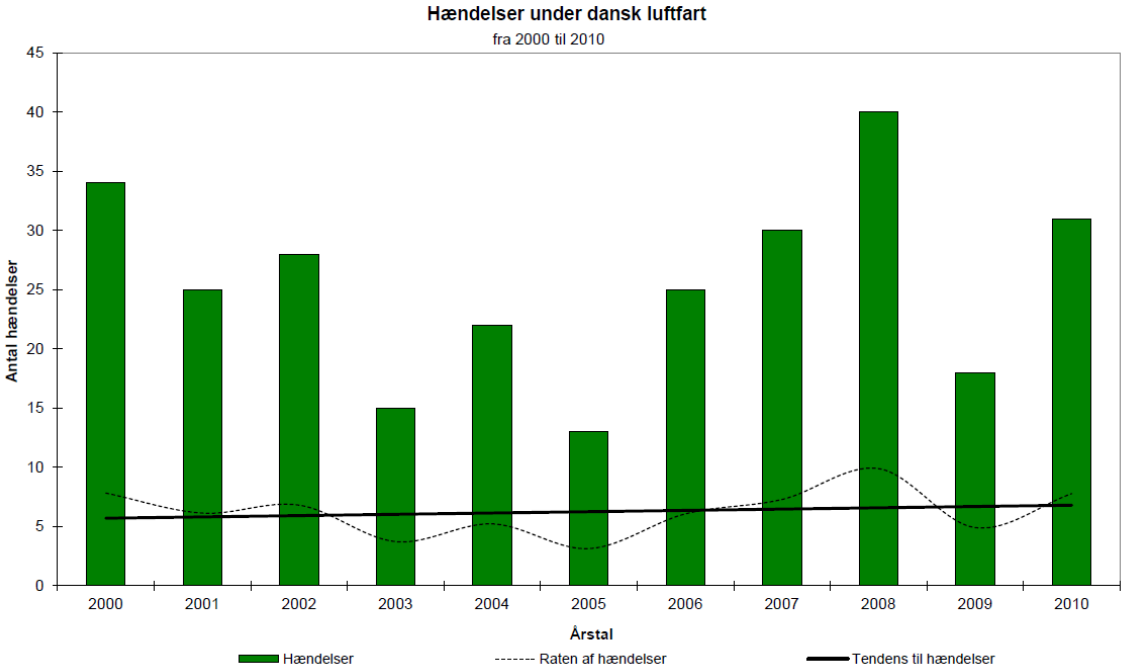
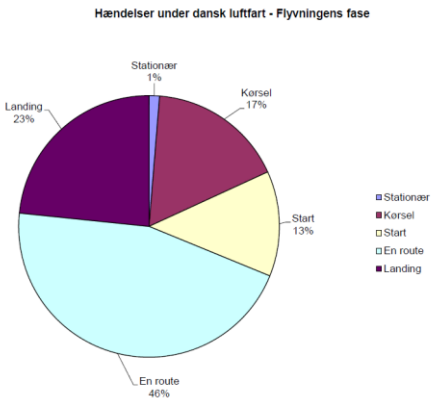
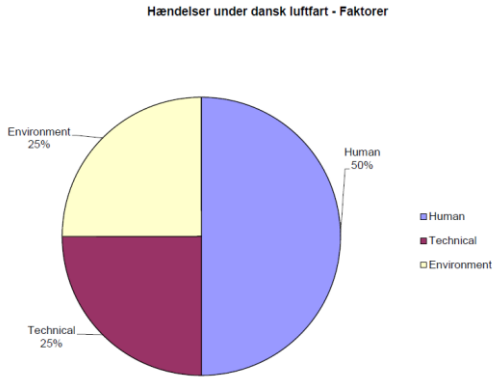
Havarier under privatflyvning – Flyvningens fase	**Accidents on private flights – Flight phase**	**Havarier under privatflyvning – Faktorer**	**Accidents on private flights – Factors**
Stationær	Stationary	Environment	Environment
Kørsel	Taxiing	Technical	Technical
Start	Take-off	Human	Human
Landing	Landing		
En route	En route		

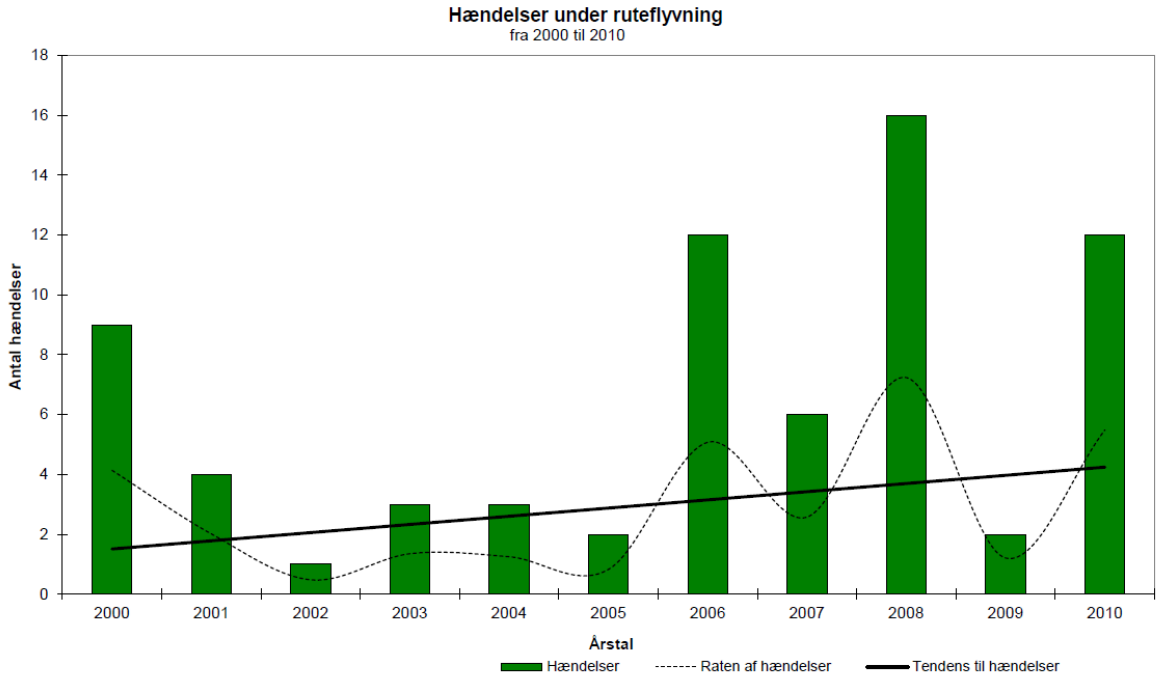


Hændelser under dansk luftfart	Incidents in Danish aviation
Fra 2000 til 2010	from 2000 to 2010
Antal hændelser	Number of incidents
Årstal	Year
Hændelser	Incidents
Raten af hændelser	Rate of incidents
Tendens til hændelser	Incident trend

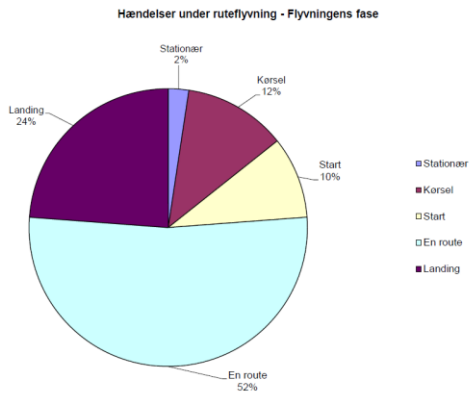


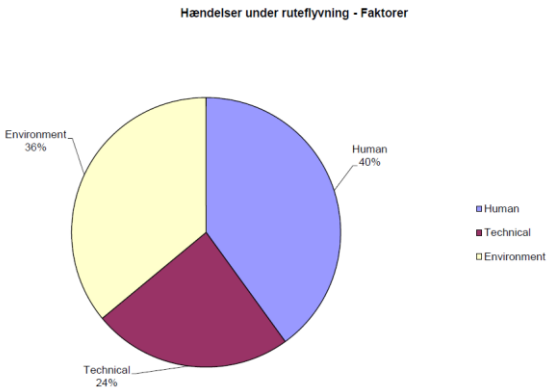


Hændelser under dansk luftfart fase – Flyvningens fase	**Incidents in Danish aviation – Flight phase**	**Hændelser under dansk luftfart fase – Faktorer**	**Incidents in Danish aviation - Factors**
Stationær	Stationary	Environment	Environment
Kørsel	Taxiing	Technical	Technical
Start	Take-off	Human	Human
Landing	Landing		
En route	En route		

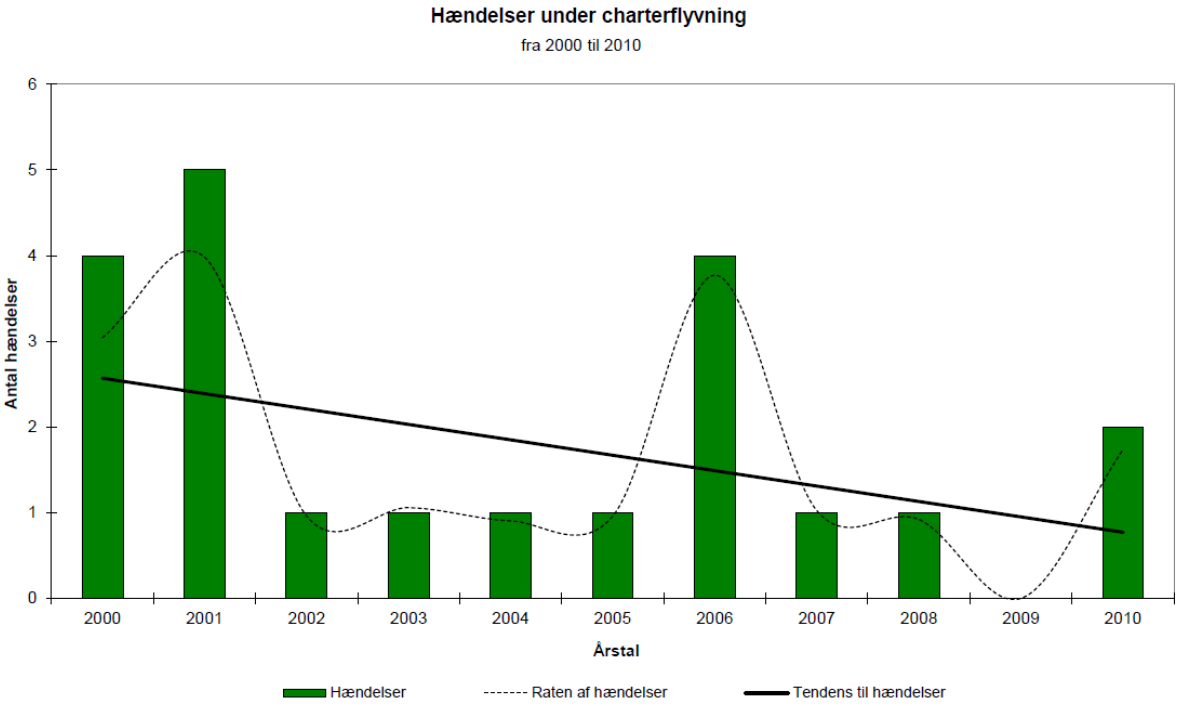


Hændelser under ruteflyvning	Incidents on scheduled flights
fra 2000 til 2010	from 2000 to 2010
Antal hændelser	Number of incidents
Årstal	Year
Hændelser	Incidents
Raten af hændelser	Rate of incidents
Tendens til hændelser	Incident trend

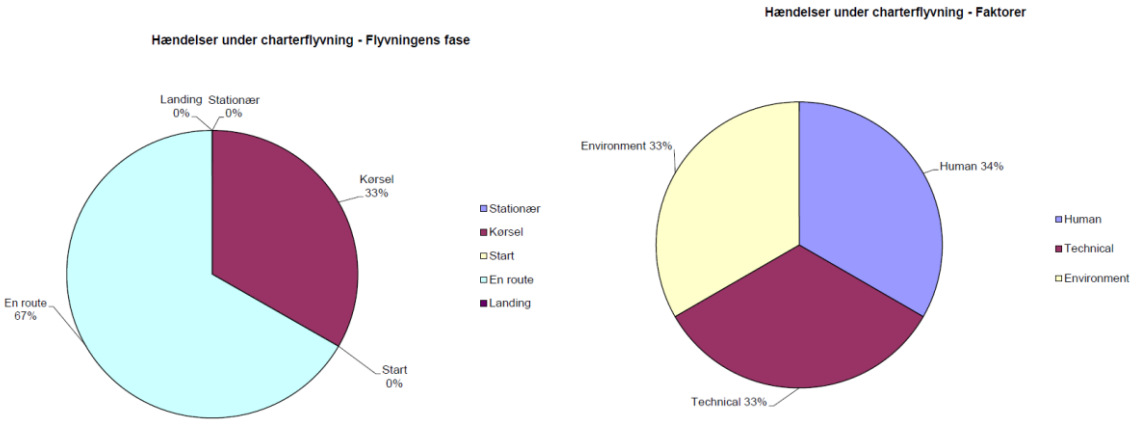




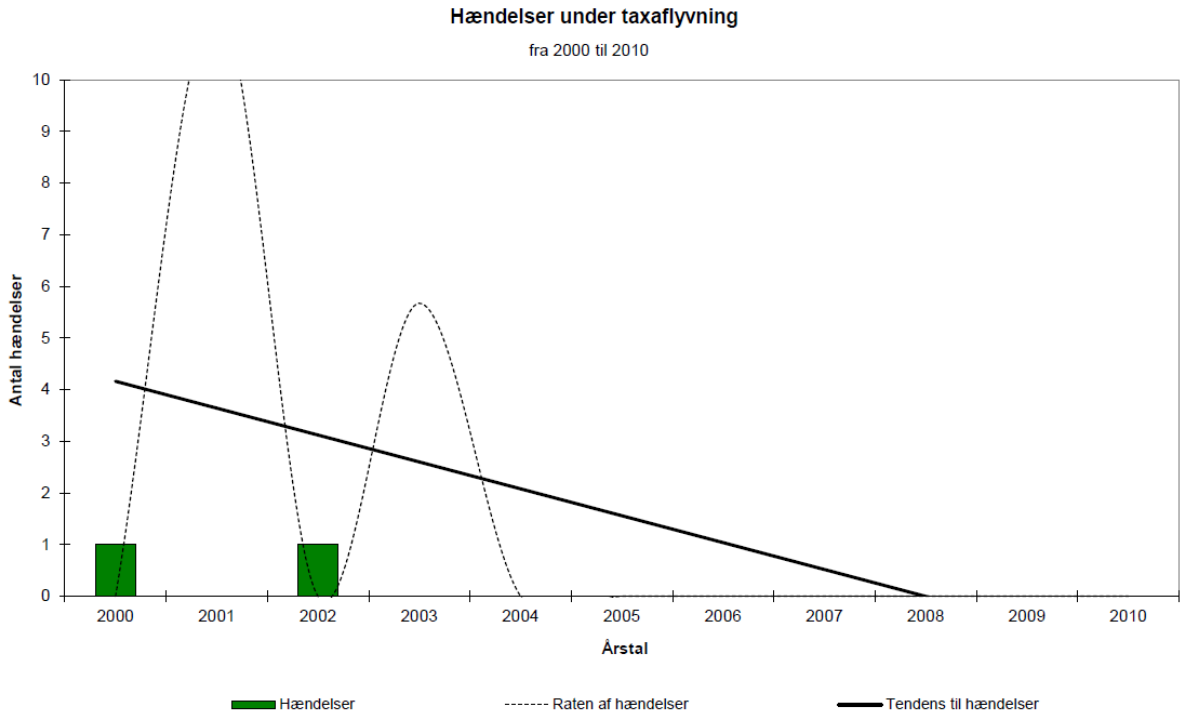
Hændelser under ruteflyvning – Flyvningens fase	Incidents on scheduled flights – Flight phase	Hændelser under ruteflyvning – Faktorer	Incidents on scheduled flights - Factors
Stationær	Stationary	Environment	Environment
Kørsel	Taxiing	Technical	Technical
Start	Take-off	Human	Human
Landing	Landing		
En route	En route		



Hændelser under charterflyvning	Incidents on charter flights
Fra 2000 til 2010	from 2000 to 2010
Antal hændelser	Number of incidents
Årstal	Year
Hændelser	Incidents
Raten af hændelser	Rate of incidents
Tendens til hændelser	Incident trend

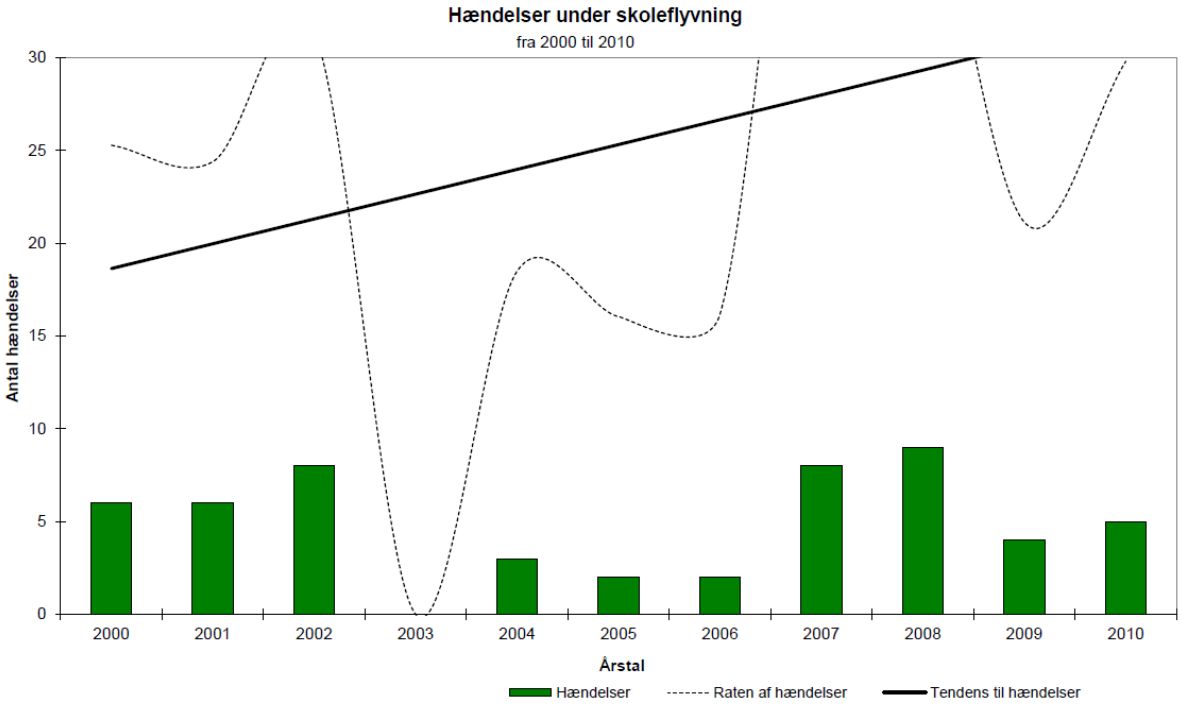


Hændelser under charterflyvning – Flyvningens fase	Incidents on charter flights – Flight phase	Hændelser under charterflyvning – Faktorer	Incidents on charter flights – Factors
Stationær	Stationary	Environment	Environment
Kørsel	Taxiing	Technical	Technical
Start	Take-off	Human	Human
Landing	Landing		
En route	En route		

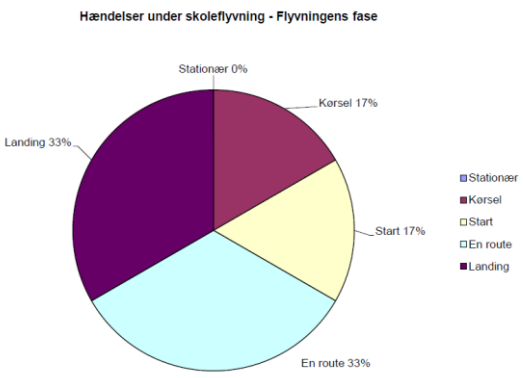


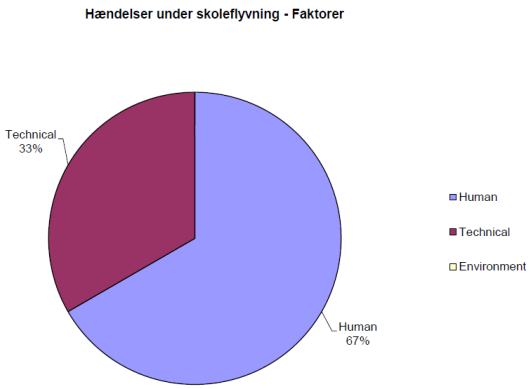
Hændelser under taxaflyvning	Incidents on taxi flights
fra 2000 til 2010	from 2000 to 2010
Antal hændelser	Number of incidents
Årstal	Year
Hændelser	Incidents
Raten af hændelser	Rate of incidents
Tendens til hændelser	Incident trend

No incidents occurred on taxi flights in 2010, which is why the flight phases and contributory factors are not given.

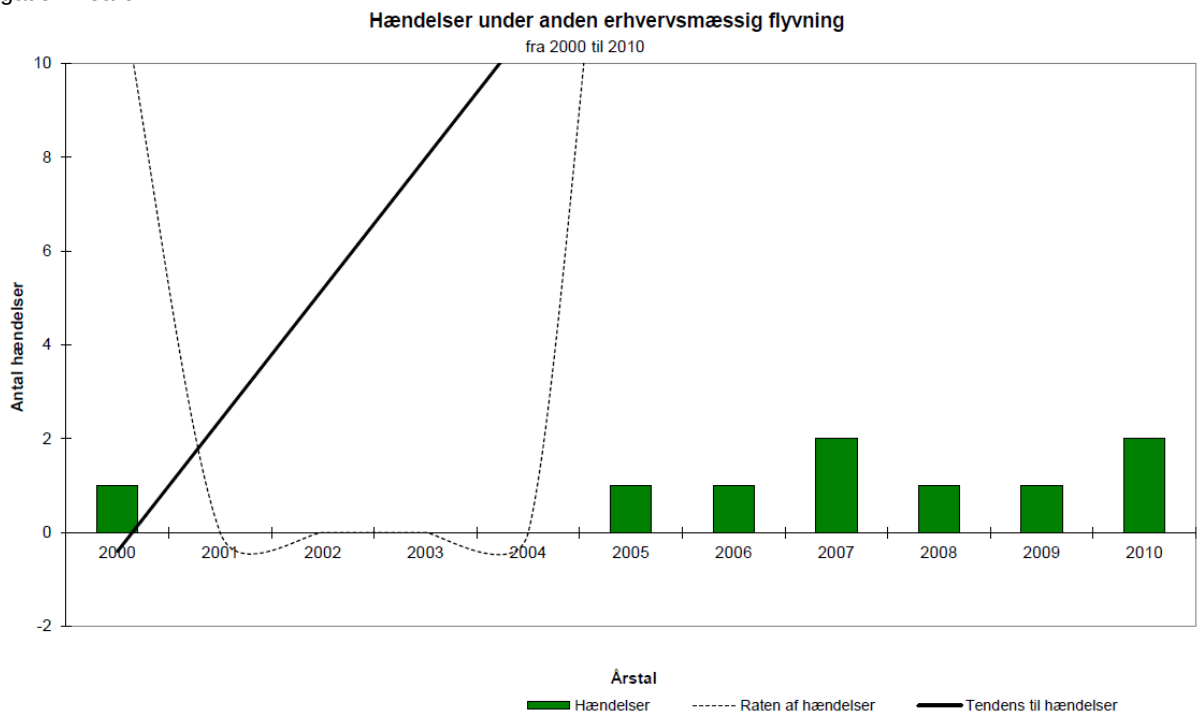


Hændelser under skoleflyvning	Incidents on training flights
fra 2000 til 2010	from 2000 to 2010
Antal hændelser	Number of incidents
Årstal	Year
Hændelser	Incidents
Raten af hændelser	Rate of incidents
Tendens til hændelser	Incident trend



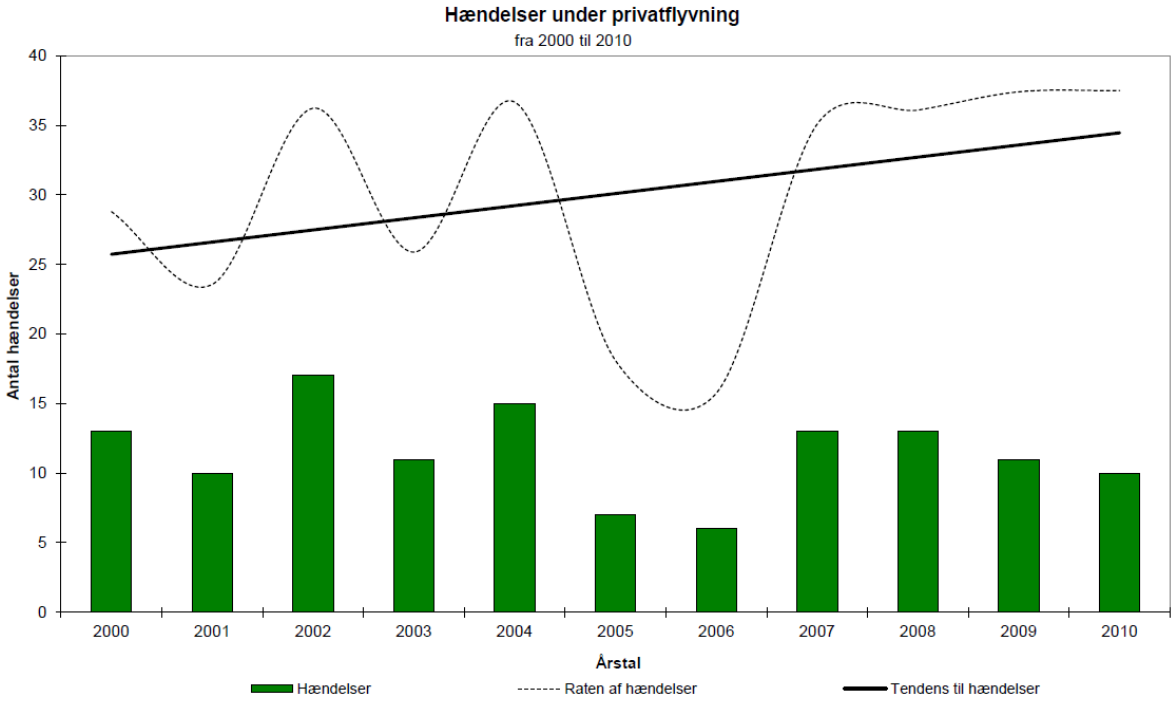


Hændelser under skoleflyvning– Flyvningens fase	Incidents on training flights – Flight phase	Hændelser under skoleflyvning – Faktorer	Incidents on training flights – Factors
Stationær	Stationary	Environment	Environment
Kørsel	Taxiing	Technical	Technical
Start	Take-off	Human	Human
Landing	Landing		
En route	En route		

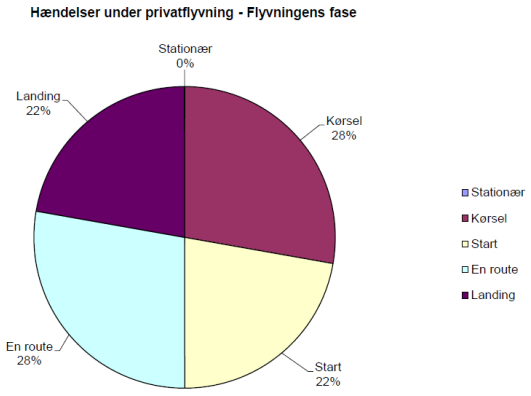


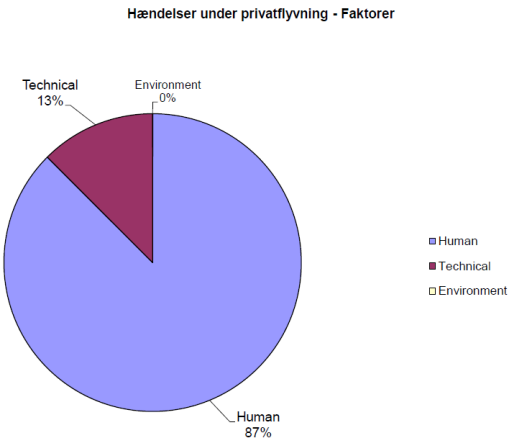
Hændelser under anden erhvervsmæssig flyvning	Incidents on other commercial flights
fra 2000 til 2010	from 2000 to 2010
Antal hændelser	Number of incidents
Årstal	Year
Hændelser	Incidents
Raten af hændelser	Rate of incidents
Tendens til hændelser	Incident trend

The incidents that occurred on other commercial flights in 2010 all occurred during en-route. The contributory factors were split 50-50 between Technical and Environment.

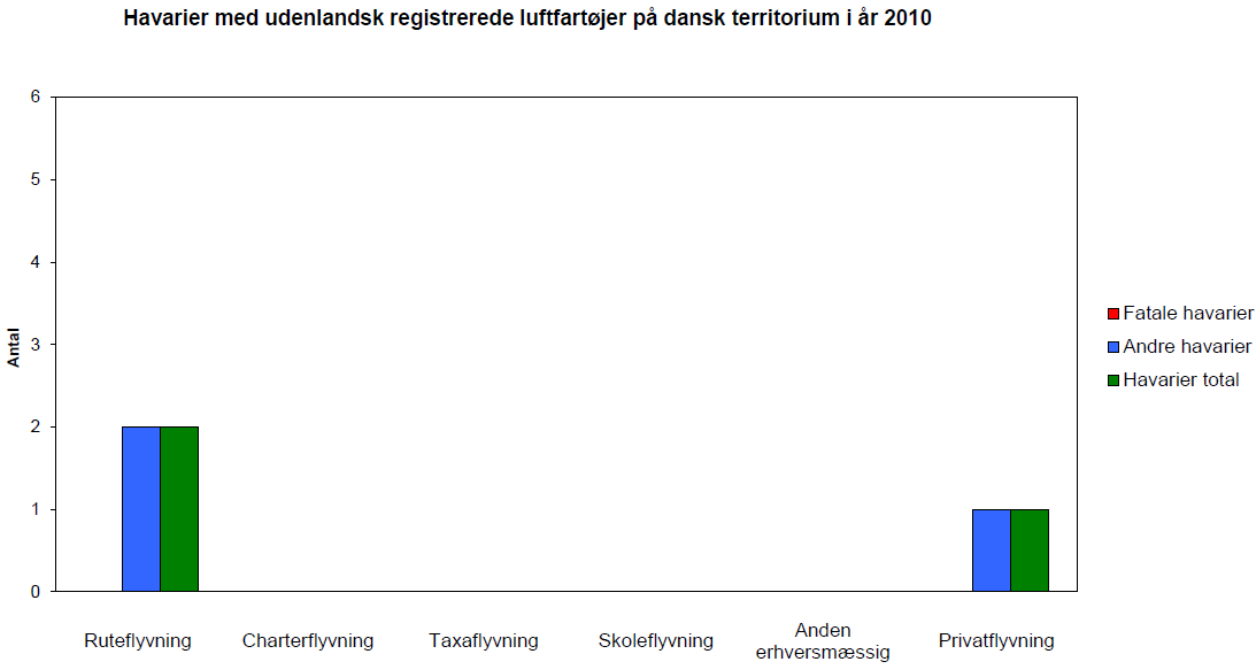


Hændelser under privatflyvning	Incidents on private flights
fra 2000 til 2010	from 2000 to 2010
Antal hændelser	Number of incidents
Årstal	Year
Hændelser	Incidents
Raten af hændelser	Rate of incidents
Tendens til hændelser	Incident trend

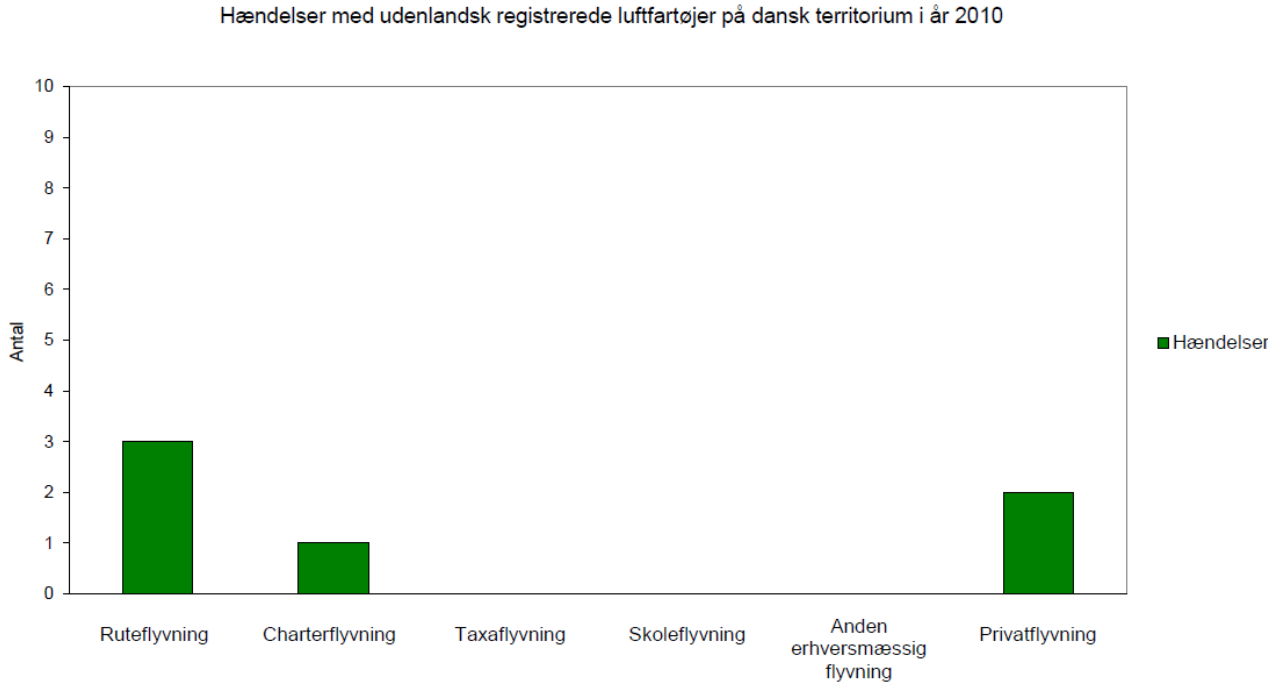




Hændelser under privatflyvning - Flyvningens fase	Incidents on private flights – Flight phase	Hændelser under privatflyvning – Faktorer	Incidents on private flights – Factors
Stationær	Stationary	Environment	Environment
Kørsel	Taxiing	Technical	Technical
Start	Take-off	Human	Human
Landing	Landing		
En route	En route		



Havarier med udenlandsk registrerede luftfartøjer på dansk territorium i år 2010	Accidents involving foreign-registered aircraft on Danish territory in 2010
Antal	Number
Ruteflyvning	Scheduled flights
Charterflyvning	Charter flights
Taxaflyvning	Taxi flights
Skoleflyvning	Training flights
Anden erhversmæssig	Other commercial flights
Privatflyvning	Private flights
Fatale havarier	Fatal accidents
Andre havarier	Other accidents
Havarier total	Total accidents

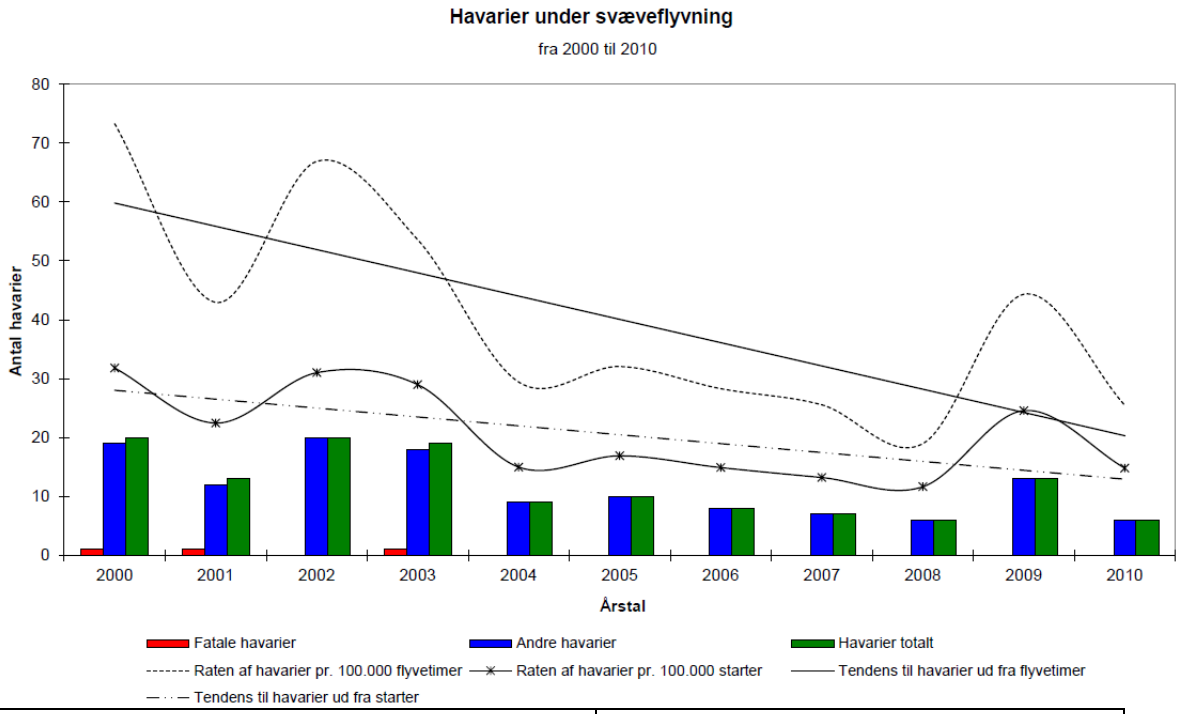


Hændelser med udenlandsk registrerede luftfartøjer på dansk territorium i år 2010	Incidents involving foreign-registered aircraft on Danish territory in 2010
Antal	Number
Ruteflyvning	Scheduled flights
Charterflyvning	Charter flights
Taxaflyvning	Taxi flights
Skoleflyvning	Training flights
Anden erhversmæssigflyvning	Other commercial flights
Privatflyvning	Private flights
Hændelser	Incidents

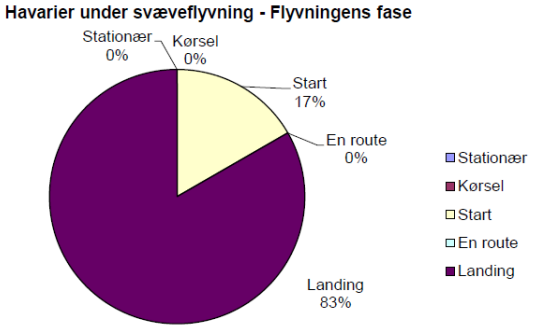
Gliding

For glider flights, the rate of accidents and incidents is calculated as the number of accidents and incidents per 100 000 flying hours and per 100 000 take-offs. On the basis of the calculated rate, the accidents and incidents trend is calculated using the least squares method.

The trend shows whether aviation accidents or incidents are increasing or decreasing in number from the perspective of the number of flying hours reported to the Civil Aviation Administration Denmark.

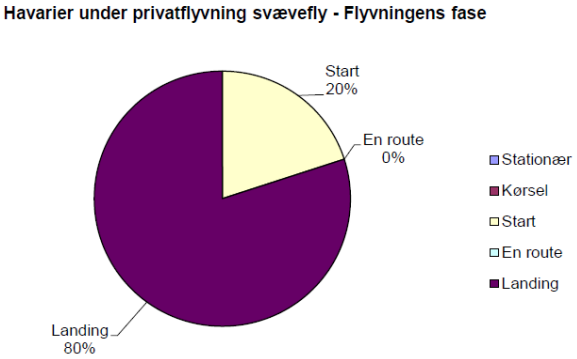


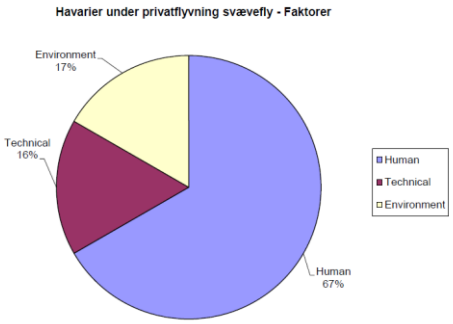
Havarier under svæveflyvning	Accidents on glider flights
fra 2000 til 2010	from 2000 to 2010
Antal havarier	Number of accidents
Årstal	Year
Fatale havarier	Fatal accidents
Andre havarier	Other accidents
Havarier totalt	Total accidents
Raten af havarier pr. 100.000 flyvetimer	Rate of accidents per 100 000 flying hours
Raten af havarier pr. 100.000 starter	Rate of accidents per 100 000 take-offs
Tendens til havarier ud fra flyvetimer	Accident trend based on flying hours
Tendens til havarier ud fra starter	Accident trend based on take-offs



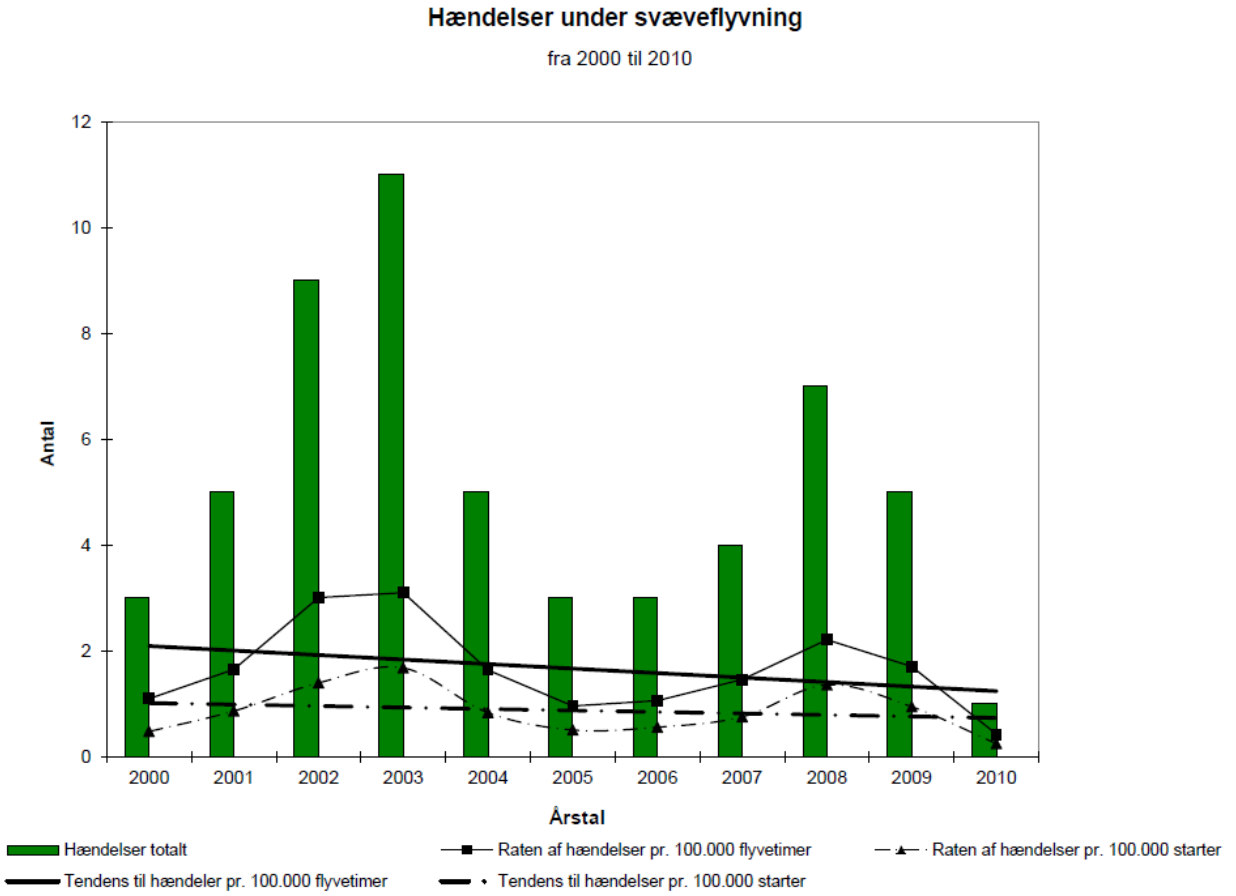
Havarier under svæveflyvning - Flyvningens fase	Accidents on glider flights – Flight phase
Stationær	Stationary
Kørsel	Taxiing
Start	Take-off
Landing	Landing
En route	En route

For training flights in 2010, there was one accident during landing and the contributory factor was Human Factor.





Havarier under privatflyvning svævefly- Flyvningens fase	Accidents on private glider flights – Flight phase	Havarier under privatflyvning svævefly – Faktorer	Accidents on private glider flights – Factors
Stationær	Stationary	Environment	Environment
Kørsel	Taxiing	Technical	Technical
Start	Take-off	Human	Human
Landing	Landing		
En route	En route		

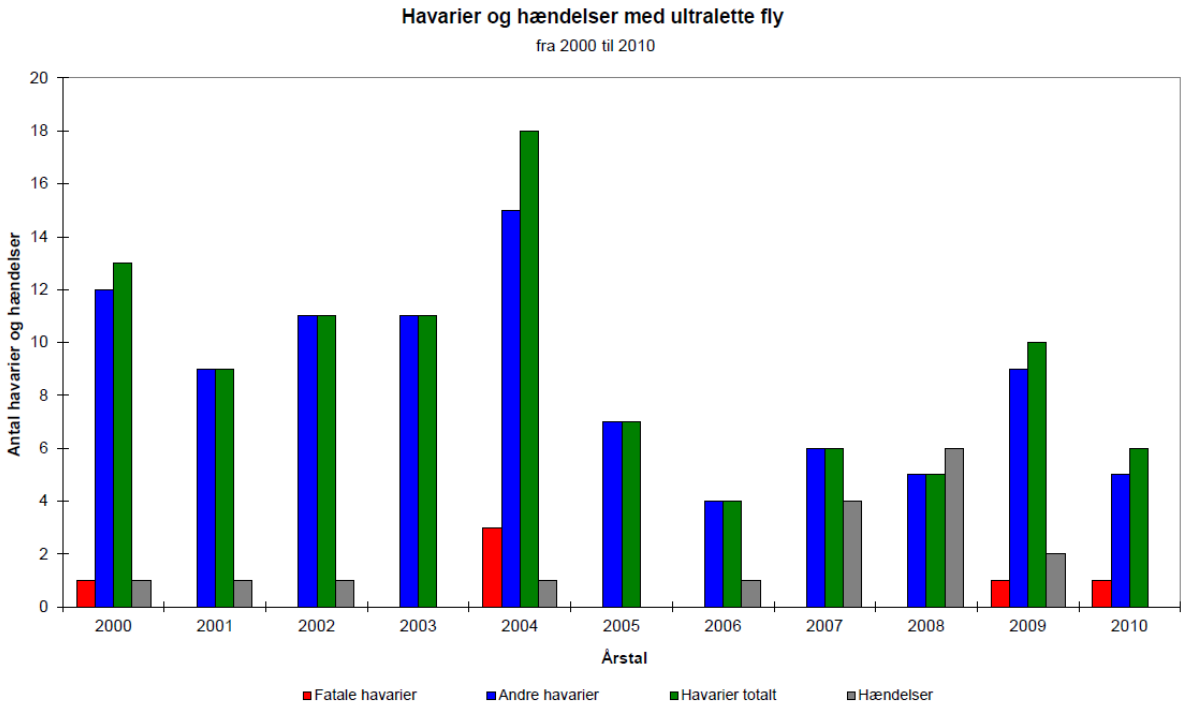


Hændelser under svæveflyvning	Incidents on glider flights
fra 2000 til 2010	from 2000 to 2010
Antal	Number
Årstal	Year
Hændelser totalt	Total incidents
Raten af hændelser pr. 100.000 flyvetimer	Rate of incidents per 100 000 flying hours
Raten af hændelser pr. 100.000 starter	Rate of incidents per 100 000 take-offs
Tendens til hændelser pr. 100.000 flyvetimer	Incident trend per 100 000 flying hours
Tendens til hændelser pr. 100.000 starter	Incident trend per 100 000 take-offs

The incident on a glider flight occurred en route and the contributory factor was Technical.

Ultralight flights

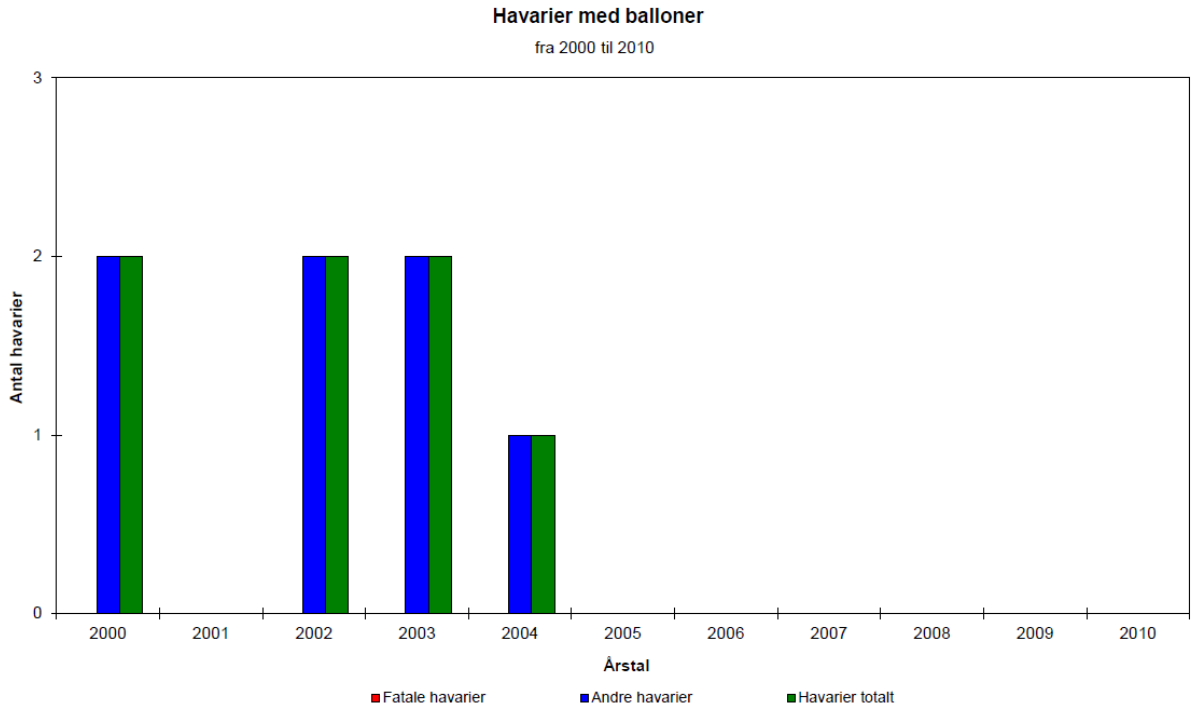
The number of accidents and incidents is also recorded for ultralight aircraft. The number of flying hours has not previously been recorded, but the Danish Ultralight Flying Association has begun collating flying hours in connection with the renewal of ultralight flight flying permits. The Accident Investigation Board will begin to include rates and trends once there are sufficient data for accurate statistics.



Havarier og hændelser med ultralette fly	Accidents and incidents with ultralight aircraft
Fra 2000 til 2010	from 2000 to 2010
Antal havarier og hændelser	Number of accidents and incidents
Fatale havarier	Fatal accidents
Andre havarier	Other accidents
Havarier totalt	Total incidents
Hændelser	Incidents

Balloon flights

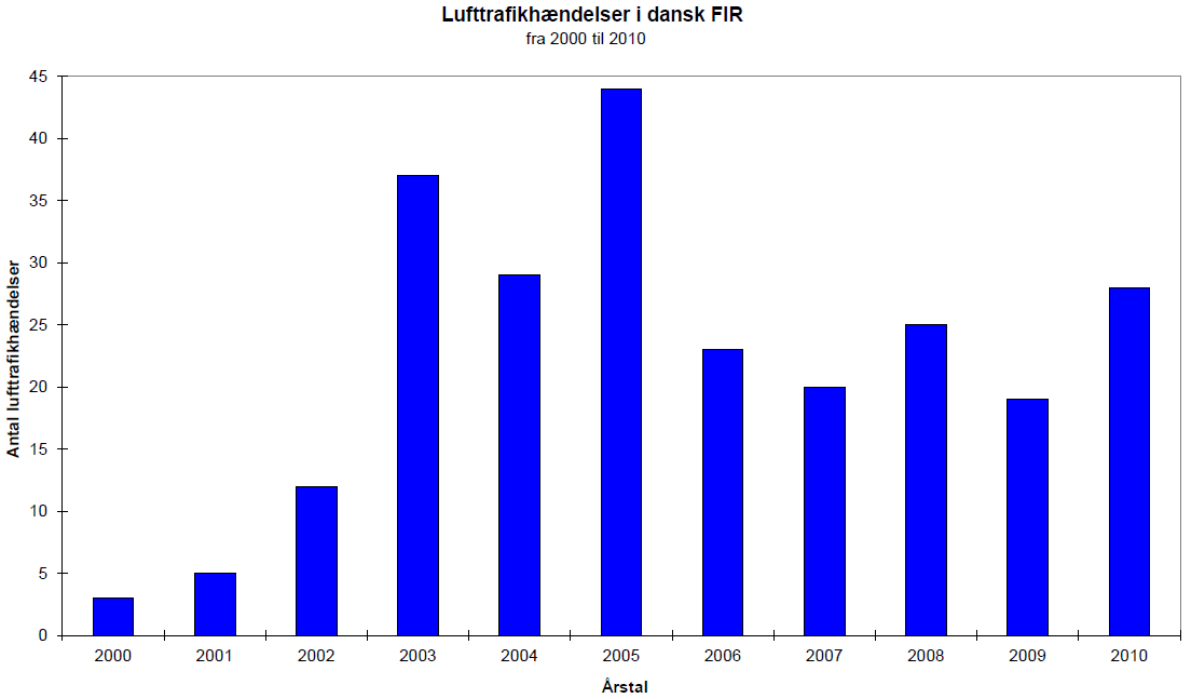
For balloons, the number of accidents is recorded. The number of incidents and the flying hours are not recorded.



Havarier med balloner	Accidents with balloons
Fra 2000 til 2010	from 2000 to 2010
Antal havarier	Number of accidents
Årstal	Year
Fatale havarier	Fatal accidents
Andre havarier	Other accidents
Havaner totalt	Total accidents

Danish Flight Information Region (FIR)

Air traffic incidents in Danish FIR cover both Danish and foreign-registered aircraft. The number of air traffic incidents is shown as the number of incidents handled each year. The rate and trend are not included under air traffic incidents.



Lufttrafikhændelser i dansk FIR	Air traffic incidents in Danish FIR
fra 2000 til 2010	from 2000 to 2010
Antal lufttrafikhændelser	Number of air traffic incidents

ANNEX 4

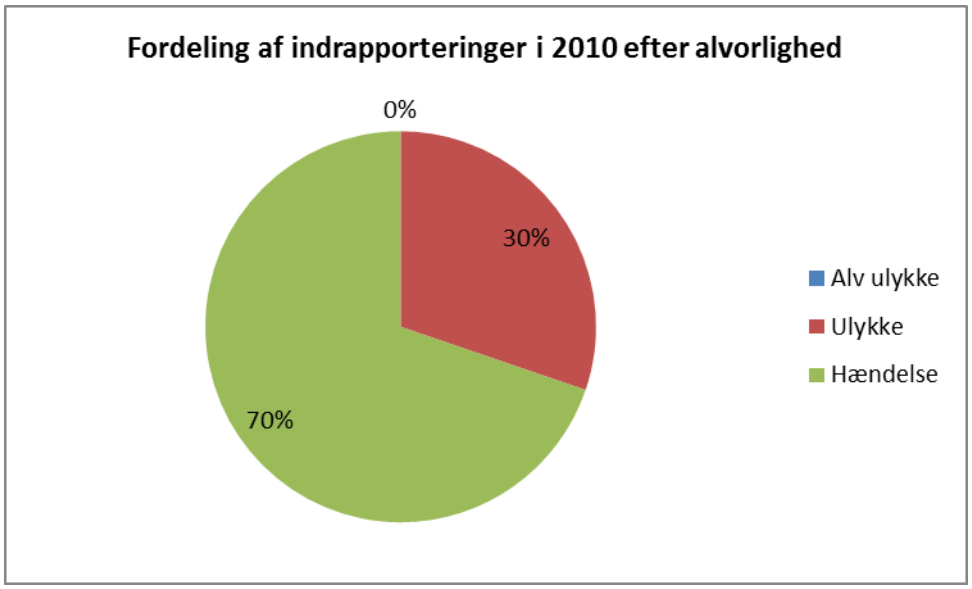
STATISTICS FOR THE RAILWAYS SECTOR

The statistical overviews for the railways sector are currently limited to presenting data from 2010 in relation to

- the breakdown of accidents and incidents according to level of seriousness, and
- the breakdown of accidents/incidents by category.

In the railways sector, a common European database (ERAIL) is currently being developed. With ERAIL's implementation, it is expected that a series of standardised parameters will be defined and thereafter systematically recorded, which will make more ample statistical information easily accessible.

Each year, the Danish Transport Authority produces a safety report ('Safety report for the railways 2010'), which is based on annual reports from operators and infrastructure managers in Denmark. These reports also include those accidents and incidents that have been investigated by the Accident Investigation Board and discuss accident trends over a period of years. The accidents are seen in relation to the amount of traffic on the railways (million train-km).



Fordeling af indrapporteringer i 2010 efter alvorlighed	Breakdown of reports in 2010 according to seriousness
Alv ulykke	Serious accident
Ulykke	Accident
Hændelse	Incident

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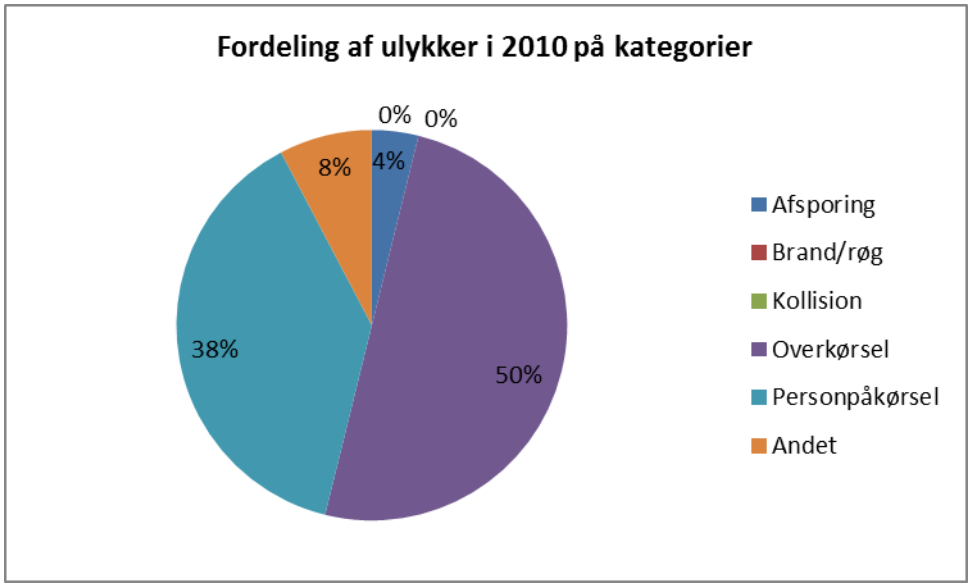
Translation provided for information purposes, by the Translation Centre for the bodies of the EU
The only valid version is the original version provided by the NIB

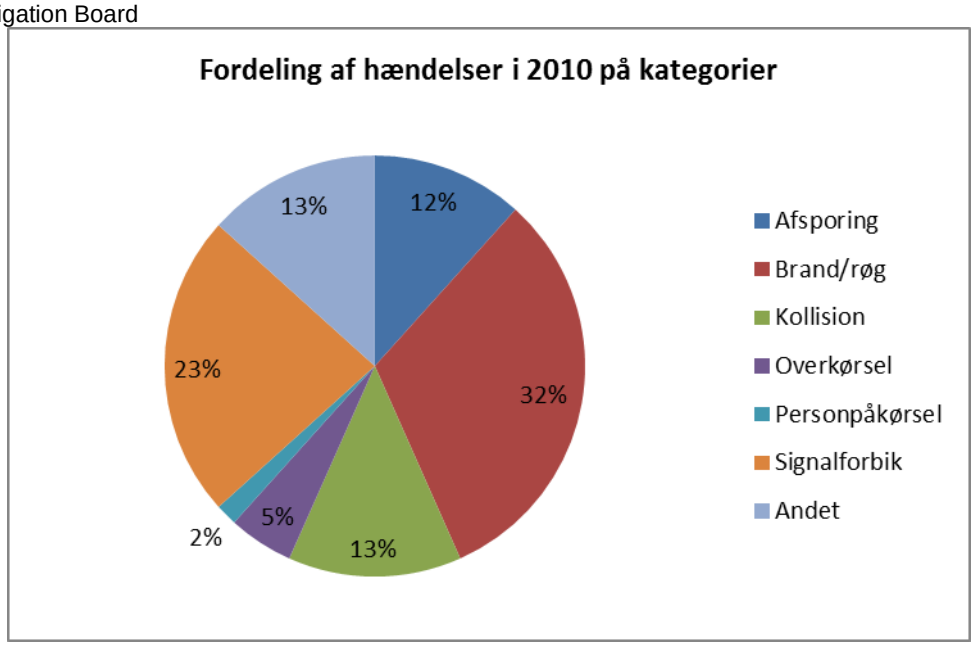
In 2010, 26 accidents were reported to the Accident Investigation Board, and these fell into four categories – derailments, crossing accidents, collisions with persons and other.



Fordeling af ulykker i 2010 på kategorier	Breakdown of accidents in 2010 by category
Afsporing	Derailment
Brand/røg	Fire/smoke
Kollision	Collision
Overkøsel	Crossing
Personpåkørsel	Collision with person
Andet	Other

In 2010, 60 incidents were reported to the Accident Investigation Board, and these were spread across all seven categories used by the Accident Investigation Board when recording incidents, with fire/smoke formation as the most represented single category.

Translation provided for information purposes, by the Translation Centre for the bodies of the EU
The only valid version is the original version provided by the NIB



Fordeling af hændelser i 2010 på kategorier	Breakdown of incidents in 2010 by category
Afsporing	Derailment
Brand/røg	Fire/smoke
Kollision	Collision
Overkøsel	Crossing
Personpåkørsel	Collision with person
Signalforbik	Passing of red light
Andet	Other