

Investigation Report

Identification

Type of Occurrence:	Serious incident
Date:	17 October 2010
Location:	Near Lübeck-Blankensee Airport
Type of aircraft:	<ol style="list-style-type: none">1. Transport aircraft2. Motor glider3. Glider
Manufacturer / Model:	<ol style="list-style-type: none">1. Airbus / A320-2332. Burkhart Grob Luft- und Raumfahrt GmbH & Co. KG / Grob G 109 B3. Alexander Schleicher GmbH & Co. Segelflugzeugbau / ASW 27-18E
Injuries to Persons:	None
Damage:	Minor damage to the glider
Other Damage:	None
Information Source:	Investigation by BFU
State File Number:	BFU EX012-10

Factual Information

At 1650:31 hrs¹ about 1.5 Nautical Miles (NM) south of Lübeck-Blankensee Airport in airspace E an airprox occurred between an Airbus A320-233 (A320) and a tug – glider combination consisting of a Grob G 109 B (G109) as towplane and an ASW 27-18 E (ASW). The Airbus A320 flew in accordance with Instrument Flight Rules (IFR) and the tug – glider combination in accordance with Visual Flight Rules (VFR). The radar data showed a minimum horizontal separation of about 0.02 NM and a vertical separation of 400 ft.



Flight paths

Source: Google Earth, air traffic service provider

¹ All times local, unless otherwise stated.

History of the Flight

The A320 was on a flight from Danzig, Poland, to Lübeck-Blankensee with 162 passengers and six crew members aboard. The Deutsche Flugsicherung Bremen (air traffic service provider) controlled the airplane.

The tug – glider combination took off from Lübeck-Blankensee Airport. One pilot each was in the towing aeroplane and in the towed glider.

At 1632:51 hrs the A320 crew established contact with the control sector Bremen-Müritz and requested a landing on runway 25 in Lübeck-Blankensee. The responsible coordinator controller established contact with the responsible approach sector. The coordinator controller for the approach sector advised the A320 crew of the prevailing weather conditions (050°/5 kt) and said that if the crew wanted to use runway 25 anyway, further coordination would occur by the approach sector.

The crew decided to land on runway 25. At 1634:39 hrs the controller acknowledged “Roger, so expect runway 25”. At 1637:05 hrs the radar controller gave the clearance for the frequency change to the approach sector.

At 1638:09 hrs the A320 crew contacted the approach sector “[...] descending flight level 100 inbound Lübeck VOR [...].” The approach controller informed the crew of the expected Instrument Landing System (ILS) approach to runway 07; the crew renewed their request to land on runway 25. The controller acknowledged “We will check with Lübeck”.

At 1638:48 hrs the coordinator controller of the approach sector called Lübeck Tower and advised of the intended landing direction of the Airbus crew. The tower controller assistant refused. She asked the coordinator controller of the approach sector to call again later for a visual approach because there was a lot of VFR traffic in the vicinity of the airport.

At 1640:05 hrs the radar controller instructed the A320 crew “[...] expect ILS approach runway zero seven at Lübeck on request of Lübeck [...]”.

At 1643:38 hrs the G109 pilot radioed the tower controller in Lübeck-Blankensee “[...] noch einmal für einen F-Schlepp in Richtung Süden (once again for a tug – glider combination toward the south).” The controller answered “[...] QNH 1,023, keine Einwände (no objections).” Then the tug – glider combination took off and flew in southern direction.

At 1645:11 hrs the radar controller gave the descent clearance to 4,000 ft (QNH 1,023) to the A320 crew. The crew acknowledged it. At 1648:19 hrs the descent clearance to 3,000 ft was issued. At the time, the A320 was about 9 NM south-east of the runway in flight direction 250°, outside the control zone. The airplane was guided by radar vectors.

At 1649:10 hrs the A320 crew reported airfield in sight and requested clearance for a visual approach or short approach. (*"Bremen Radar (A320), we have field in sight, request visual approach or short approach [...]"*). The radar controller answered "Expect vectors first, I have to call at first to the tower first." At 1649:23 hrs coordination with the tower controller assistant in Lübeck occurred. During this conversation the coordinator controller requested information regarding an airplane which flew according to VFR south of the airport. The tower controller assistant answered it was a power glider.

The Pilot in Command (PIC) of the A320 stated that the Traffic Collision Avoidance System (TCAS) showed a target in the 12-o'clock position about 5 NM away as the A320 was passing 4,000 ft. The traffic was shown 1,400 ft below and climbing. In 3,800 ft he had decreased the rate of descent to 500 ft/min. The other airplane continued to climb. The read-out of the A320 flight data showed that about 55 seconds before TCAS was triggered the rate of descent was reduced from about 2,000 ft/min to about 900 ft/min as the airplane passed 3,800 ft AMSL.

At 1649:32 hrs the radar controller issued the first traffic information: "[...] VFR – traffic, twelve o'clock, range three miles, moving to the south, my radar indicates two thousand three hundred feet, expect further descend when clear." The A320 crew answered: "[...] we have a balloon on the left hand sight at eleven o'clock. Is this the traffic?" The controller answered: "Should be a motor glider"; the crew answered: "[...] have the balloon in sight, [...]."

When the A320 crew first saw the tug – glider combination its flight path ran from right to left. The tug – glider combination then flew a turn and continued the climb now from left to right. TCAS had generated a Traffic Advisory (TA). The tug – glider combination had turned again and once again flew toward the A320 from right to left. At 1649:56 hrs the radar controller instructed the crew to fly 10° to the right. The crew carried out the instruction. The PIC stated in a flight altitude of 3,300 ft TCAS had generated a Resolution Advisory (RA) ("Climb"). The vertical separation the pilot had seen on the display was 400 ft below and decreasing. According to the flight data read-out, the A320 was at the time of the TCAS-RA in 3,034 ft AMSL.

At 1650:02 hrs the tower controller of Lübeck-Blankensee issued the instruction to the G109 pilot to not climb any farther and asked him to acknowledge the flight altitude of 2,500 ft. The pilot acknowledged the flight altitude of 2,500 ft and asked whether he had correctly understood the instruction to not climb any farther. The pilot stated, at that time the tug – glider combination had been in the last part of a full circle in a strong upwind in climb attitude flying about north-east. He completed the full circle by pushing and righting. He had seen the A320 which flew with a lateral angle over his airplane. At 1650:14 hrs the tower controller issued traffic information concerning the A320 in 3,000 ft. At 1650:18 hrs the pilot of the Grob reported the A320 in sight. After he had established visual contact with the A320 he had changed his heading to east-south-east and initiated a slight descent.

The towed ASW was on the frequency of the glider airfield. Therefore, he could not receive the traffic information regarding the A320 from the tower controller. He stated that once he had the A320 in sight he released the towrope and dived to the right in order to avoid a collision. In the process the ASW 27 collided with the towrope of the preceding Grob and tore off its left winglet.

At 1650:21 hrs the radar controller once again issued traffic information to the Airbus crew: “[...] have a good look out, the VFR traffic is in front of you, three hundred feet below.” At 1650:28 hrs the A320 crew reported a TCAS RA. The available flight data of the A320 showed that the airplane changed from descent to climb in 3,034 ft AMSL about two seconds after the TCAS RA (Climb) had been generated. After 10 seconds the TCAS RA changed to "don't descend" and a further seven seconds later the message "clear of conflict" was generated. During the RA the A320 climbed to 3,382 ft AMSL.

At 1650:38 hrs the A320 crew reported: “[...] clear of conflict [...] descending eh three thousand feet [...]”.

The A320 continued the approach and landed on runway 07 at Lübeck-Blankensee Airport. The G109 and the ASW landed safely on the glider airfield.

Personnel Information

Airbus A320-233 Crew

The 32-year-old Pilot in Command (PIC) held an Airline Transport Pilot's License (ATPL(A)), initially issued by the Joint Aviation Authorities, United Kingdom, on 23 April 2008 in accordance with JAR-FCL and ICAO valid until 22 April 2013. He had a flying experience of more than 4,500 hours.

The 30-year-old copilot held a Commercial Pilot's License (CPL(A)), initially issued by the Civil Aviation Office, Poland, on 1 July 2010 in accordance with JAR-FCL and ICAO valid until 1 July 2015. He had a flying experience of more than 1,900 hours.

Grob G 109 B Crew

The 50-year-old pilot held a Private Pilot's License (PPL(A)) issued by the Landesbetrieb Straßenbau und Verkehr Schleswig-Holstein, Germany, in accordance with ICAO and valid until 2 October 2014. He had a flying experience of about 3,300 hours.

Schleicher ASW 27-18 E Crew

The 58-year-old pilot held a Private Pilot's License Glider (PPL(C)) issued by the Bezirksregierung Münster, Germany, in accordance with ICAO and valid until 8 September 2011. He had a flying experience of more than 860 hours.

Air Traffic Control

Centre Bremen

Radar Controller

The 40-year-old controller held a valid license for approach and sector control including Flight Information Service (FIS) valid until 16 August 2011.

Coordinator Controller

The 37-year-old controller held a valid license for approach and sector control including FIS valid until 12 April 2011.

Lübeck-Blankensee Airport

Tower Controller

The 39-year-old controller held a valid license for aerodrome control without radar including FIS valid until 11 June 2011.

Tower Controller Assistant

The 40-year-old controller held a valid license for aerodrome control without radar including FIS valid until 5 September 2011.

Aircraft Information

A320-233

The A320 is a twin-engine transport aircraft. It has a seating capacity of 180 passengers. The aircraft had a valid Hungarian certificate of registration and was operated by a Hungarian air operator.

Grob G 109 B

The motor glider was a two-seat, single-engine, low-wing airplane with a two-blade propeller. The aircraft had a valid German certificate of registration and was operated by a German Luftsportverein (aerial sports club).

ASW 27-18 E

The ASW is a single-seat glider with a retractable auxiliary propeller engine. The aircraft had a valid German certificate of registration and was operated by a German Luftsportverein (aerial sports club).

Meteorological Information

At the time of the occurrence, visibility was more than 10 km, the wind came from 040° at five knots, QNH was 1,023 hPa. In 4,800 ft GND one okta to two oktas cloud cover prevailed.

Aids to Navigation

Lübeck-Blankensee Airport is equipped with an Instrument Landing System (ILS) for both landing directions 07/25.

Communication

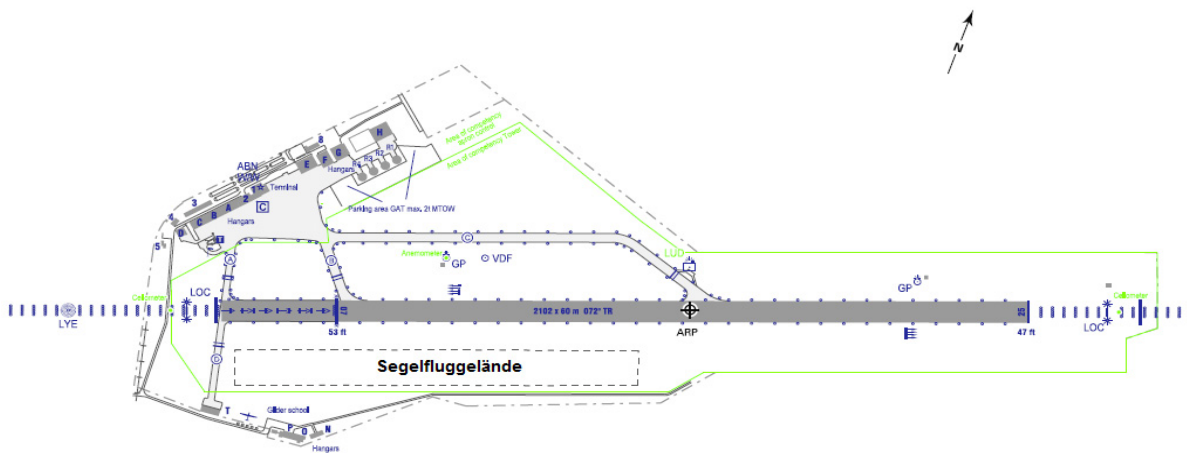
The radio communications were recorded by the air traffic control service provider and made available to the BFU. The Airbus crew had radio contact with Bremen Radar.

The G109 crew had radio contact with Lübeck Tower and the gliding operations coordinator. The ASW had radio contact with the gliding operations coordinator and the G 109.

Aerodrome information

Lübeck-Blankensee Airport has a single 2,102 m long and 60 m wide runway in the directions 07/25. Taxiway C running north of the runway can be used during the day by airplanes with less than 5,700 kg for take-offs and landings, after the tower has agreed.

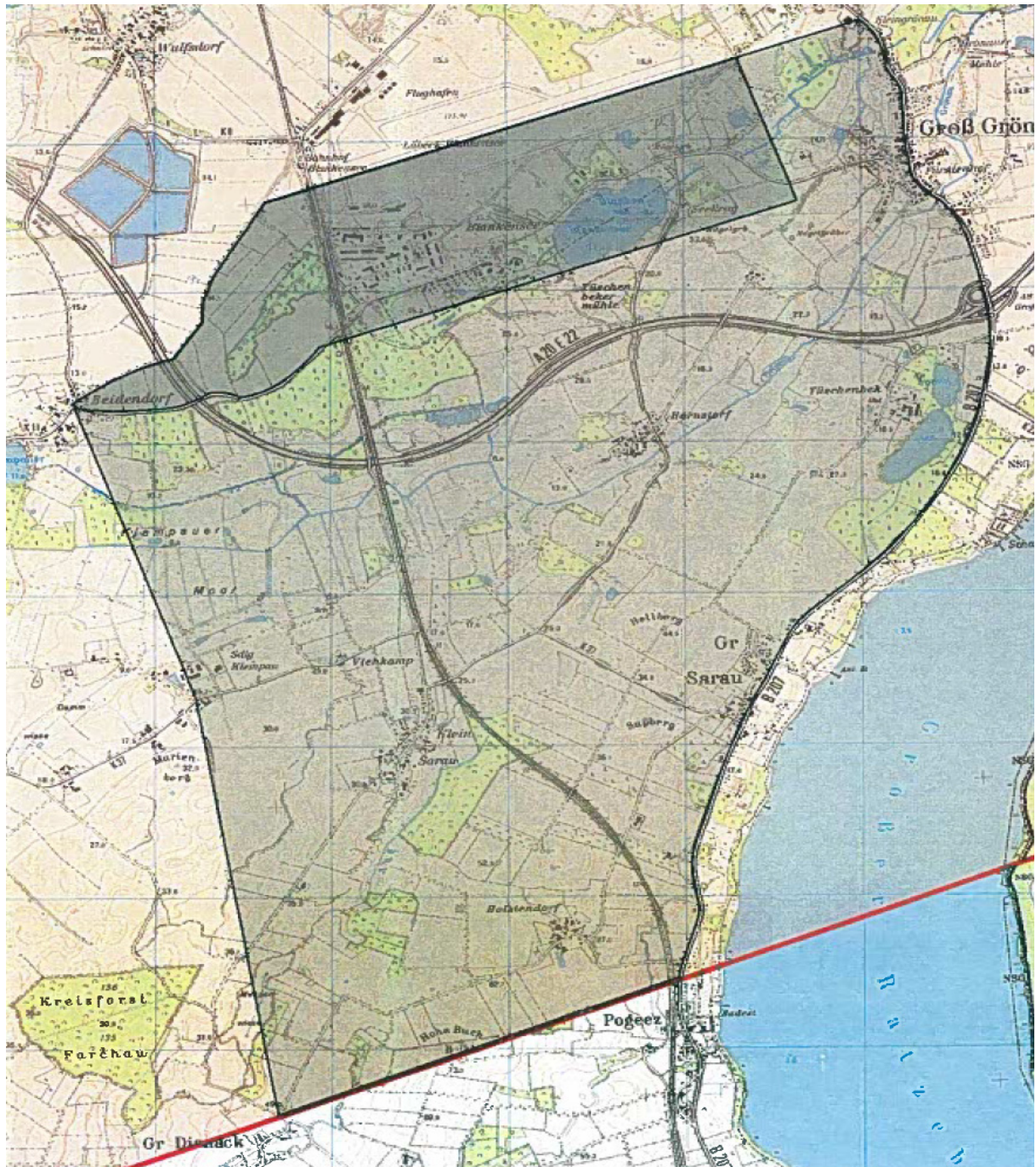
At the southern end of the airport the glider airfield is located. It has two asphalt strips running parallel to the runway; each is 300 m long and 15 m wide, which are used for aerotows. The grass runway for gliders is located south of these strips.



Lübeck-Blankensee Airport

Source: Aeronautical Information Publication

When glider operation is in service the glider area extends up to the southern border of the control zone.



Glider area

Source: Operating instruction No 01/09 - glider operation of the Aero Club Lübeck e.V. and the glider flight training school Buch

Organisations and their Procedures

In May 2011, as a reaction to the serious incident, the operator has concretised the procedural instructions for crews (OM-C) regarding approaches and departures.

The OM-C of the operator valid at the time of the serious incident stated the following procedural instructions in regard to approaches and landings at Lübeck-Blankensee Airport:

APPROACH and LANDING

Speed limit 250kts below 10,000' must be strictly observed there is Class E airspace surrounding the airport to 10,000'. There is general aviation activity in the region: ballooning, gliders and parachuting. Generally, it is advisable to maintain a good lookout and a careful listening watch.

Expect an ILS approach to either runway.

The new OM-C of May 2011 states the following procedural instructions:

WARNING: See and avoid rules apply at all time. Trajectory below FL 100 is susceptible to enter class E airspace. High concentration of VFR traffic. Approach and departure limitations apply (See DESCENT and TAKE OFF). Two VORs and one NDB named "Lubeck". Ensure correct tuning.

DESCENT

Trajectory below FL 100 is susceptible to enter class E airspace. In good weather conditions there is a high probability to meet VFR traffic with or without transponder, known or unknown by ATC.

Speed limitations in approach: Max 220 kts below 10 000 ft. Max Green dot speed below 7000 ft.

STARs published for both runways although shortcuts are often given.

Additional Information

The airprox between the aircraft took place in airspace E.

Airspace E is a controlled airspace in which flights in accordance with Instrument Flight Rules (IFR) and flights in accordance with Visual Flight Rules (VFR) take place. The Air Traffic Order (LuftVO), Appendix 4, Para 10, Section 2 states only IFR flights are separated not IFR and VFR flights. As far as possible IFR flights receive

traffic information regarding VFR flights. VFR flights also receive traffic information, as far as possible. The speed limit is 250 kt (IAS).

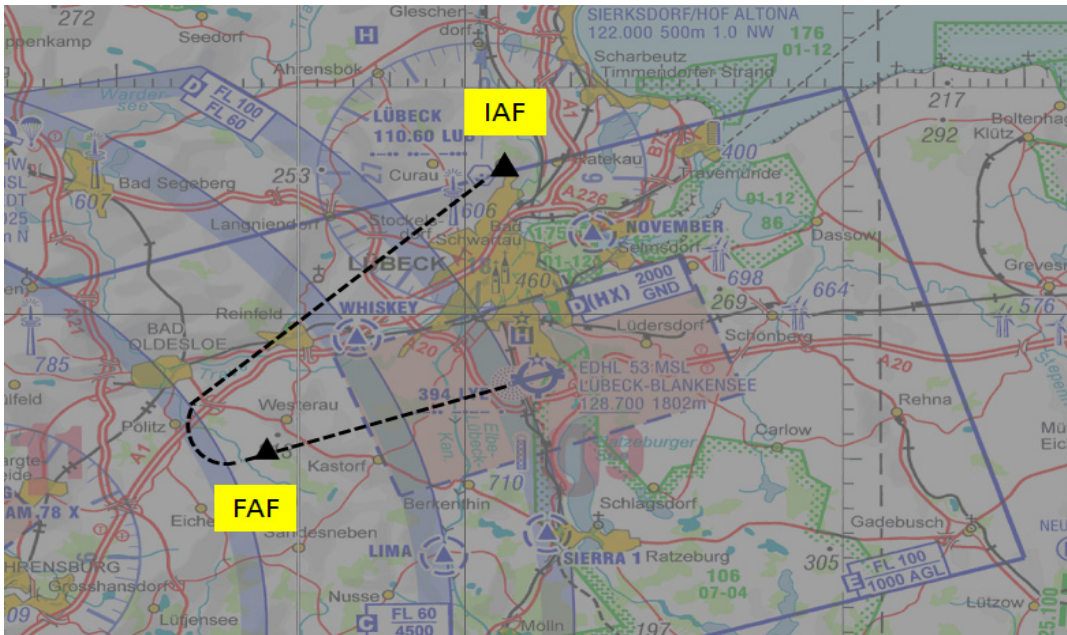
In addition, the following is required for VFR flights in airspace E: A flight visibility of 8 km, distance from clouds 1.5 km horizontally and 1,000 ft vertically. Powered aircraft have to engage a transponder above 5,000 ft AMSL.

German Air Traffic Order (LuftVO) Para 13 is valid:

- (1) Aircraft approaching head-on shall alter their heading to the right in case of danger of collision.
- (2) When two aircraft are converging at approximately the same level, the aircraft approaching from the left shall give way. However,
 1. power-driven heavier-than-air aircraft shall give way to airships, gliders, hang-gliders, paragliders, and balloons;
 2. airships shall give way to gliders, hang-gliders, paragliders, and balloons;
 3. gliders, hang-gliders and paragliders shall give way to balloons;
 4. power-driven aircraft shall give way to aircraft which are seen to be towing other aircraft or objects.

[...]

The standard ILS approach procedure for runway 07 begins at the omnidirectional radio beacon (DVOR) Lübeck about 9 NM north of the airport. The Initial Approach Fix Altitude (IAF-Altitude) and, therefore, the lowest allowable altitude is 3,000 ft AMSL. The approach leads in direction of 227° toward the intermediate fix. At that point the aircraft turn left toward the Final Approach Fix (FAF). The minimum altitude is 3,000 ft AMSL. From the FAF the descent continues with a magnetic heading of 071° toward the localizer until the landing on runway 07. Up until about 6 NM DME (centre of the runway) one is in airspace E. The control zone (CTR (D)) extends up to 2,000 ft AMSL.



Standard ILS approach procedure, runway 07

Source: Air traffic service provider

Analysis

All persons involved held valid licenses.

Airbus A320

The A320 crew had been informed about the tug – glider combination in time. The radar recordings together with the description of the flight path of the tug – glider combination given by the A320 PIC prove that visual contact to the tug – glider combination had been established in time. The way the PIC describes the flight path, visual contact had been established at least at the time of the course correction by the controller (at about 2.5 NM). At that time the A320 had a speed of 260 kt (AGL). The crew did neither independently conduct a lateral avoidance manoeuvre nor terminate the descent.

An early heading change by the A320 crew could have contributed to the avoidance of the airprox.

During a short approach the necessary procedure steps have to be carried out in less time than during a standard approach. Therefore the workload of the crew increases and resources decrease, e.g. to observe the airspace and, where necessary, initiate appropriate steps to avoid hazards.

Tug - Glider Combination

The pilot of the towing aeroplane received the first traffic information regarding the A320 at a distance of 1 NM and an altitude difference of 400 ft. He subsequently reported the traffic in sight and initiated a course change including a slight descent. There was no chance to inform the ASW pilot about the A320 because on the radio the frequency for the glider airfield was selected.

The ASW pilot stated he only saw the A320 at the time of the fly-over. To avoid a collision he had released the towrope and dived downward.

At the time when the pilots of the tug – glider combination received the information about the A320 they did not have enough time anymore to avoid the airprox.

A more effective observation of the airspace would have allowed a timelier discovery of the A320 and contributed to the avoidance of the airprox.

Air Traffic Control

Centre Bremen

Radar Controller

The A3320 was guided by radar vectors south of the airport. During such traffic guidance procedures, changes in direction and altitude cannot be foreseen by other traffic. The standard approach procedures start north of the airport and can be better assessed by other pilots regarding altitude and route.

The radar controller issued the first traffic information at a distance of about 3.8 NM (“twelve o’clock, range tree miles”). The crew answered that they had a balloon in sight “left hand side at eleven o’clock”. She answered “should be a motorglider”. Thus, there was a discrepancy in direction (10°) and also in regard to the kind of aircraft. More detailed traffic information would have been appropriate. It should be noted, however, that this fact had no effect on the later course of events since the crew had the tug – glider combination in sight.

A recommendation for an avoidance manoeuvre did not occur at that time, but would have been appropriate. The controller did not cancel the descent clearance to 3,000 ft AMSL. At the time the Airbus was in about 3,700 ft AMSL and the tug – glider combination in about 2,300 ft AMSL. Had the descent of the A320 been stopped it could have contributed to the avoidance of the airprox situation.

The controller instructed the A320 to correct the heading 10° to the right at a distance of about 2.5 NM because the tug – glider combination (she had the information it was a motorglider) flew with a southern heading, according to her statement. In reality the tug – glider combination had turned right again into a full circle. However, at that time it was not yet visible on the radar display. At that time the A320 was in about 3,400 ft AMSL and still had a descent clearance to 3,000 ft AMSL. At the latest at that time, termination of the descent would have been appropriate. The heading change by 10° occurred very late and was too small to create enough lateral distance. In addition, the tug – glider combination turned north at that time which decreased the distance even more.

The guidance by radar vectors south of the control zone and the insufficient recommendation for an avoidance manoeuvre issued too late contributed to the airprox. The standard approach procedures begin north of the control zone and are, therefore, not limited by the glider area.

Coordinator Controller

The coordinator controller received the information during the coordination talk with the tower controller assistant in Lübeck-Blankensee that it was a motor glider. He, therefore, did not have the information that it was a tug – glider combination and he could not pass on this information to the radar controller.

Lübeck-Blankensee Airport

Tower Controller

At 1643:38 hrs the tower controller had issued a clearance to the towing aeroplane for an aerotow toward the south. Up until 1650:02 hrs there was no further radio communication with the G109 pilot. Timelier traffic information from the controller to the G109 pilot could have heightened the pilot's situational awareness significantly. And therefore, the ASW pilot could also have received the information about the A230 in time.

Tower Controller Assistant

During the coordination with the coordinator controller for the visual approach of the A320 the tower controller assistant said the VFR in the south (tug – glider combination) was a motor-glider after she had asked the tower controller. Even though the G109 pilot was in radio contact with the tower controller, the information that it was a tug – glider combination was not passed on. Had the coordinator controller received this information the A320 crew may have recognized the tug – glider combination

sooner and initiated an avoidance manoeuvre. It is possible that the radar controller, too, would have issued a more appropriate avoidance recommendation.

Conclusions

The serious incident is due to the fact that the crews of the aircraft involved did not or only belatedly recognise the risk of collision. The heading change of the A320 occurred too late and was not large enough to establish sufficient distance to the tug – glider combination.

Contributory factors:

The guidance of the A320 with radar vectors unpredictable for the tug – glider combination in combination with a relatively high speed minimised the chance for the pilot of the tug – glider combination to recognise the A320. The pilots of the tug – glider combination could not predict the flight path of the A320.

Investigator in charge: Blanke
Assistance: Hempelmann
 Lampert

Braunschweig, 17 October 2013

The investigation has been conducted in compliance with the law relating to the Investigation of Accidents and Incidents associated with the Operation of Civil Aircraft (Flugunfall-Untersuchungsgesetz - FIUUG) dated 26 August 1998. According to the law the sole objective of the investigation shall be the prevention of future accidents and incidents. It is not the purpose of this activity to assign blame or liability or to establish claims.

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