

2. A n a l y s i s a n d c o n c l u s i o n s .

2. 1. A n a l y s i s .

There were no troubles on the aircraft during the flight, before the explosion occurred. That is testified by the fact, that the radiocommunication between the aircraft and the ground, as well as the record of the voice-recorder show, that all messages of the crew and the work in the cabin were passing normally.

The flight was stabilized in speed and vertically as well / no signs of turbulence /. The last course correction was small from 196° to 192° , in keeping with the correction of the track. The aircraft flew in the airway, circa 1 - 2 kilometres east of the centre line.

According to the record of the voice-recorder the crew began receiving the meteorological messages VOLMET at 15,59 GMT, i.e. about 2 minutes before flying over NDB HD. This receiving / after sending off the position NDB HD to ACC Cottbus/ was suddenly cut off at 16,0129 GMT, evidently because of the current suppression. At the same time recording of the flight-recorder ceased too. This moment may be regarded as the moment of the explosion.

The beginning of destruction of the aircraft was in the altitude of 10050 m, which is testified by a sudden cutting off the function of the flight recorder and the voice-recorder. The cause was explosion of an explosive, which was enveloped

in an ignition charge. Composition of the explosive and ignition charge has been determined. The explosive with ignition charge was placed in a suitcase of brown-red colour, ignited by an exploder /electric/, timed probably by an alarmclock-work , on which traces of the explosive were found. Traces on the frame of a black coloured trunk of the size 45 x 70 cm testify, that inside was placed the brown-red suitcase containing the explosive with ignition charge and the timing device. All this was packed with newsprint and rags. The black trunk then served as a masking luggage in the forward baggage compartment on the left of the entrance. The centre of the destructive force has been determined through identification of the found materials and materials of the same type of aircraft.

The time of rupture of the aircraft after the explosion can be determined only approximately. Taking regard to the total destruction of the aircraft it is possible to assert, that the explosion has damaged the whole supporting framework, except the ceiling part of the cabin which could not withstand further flight loads. The heaviest destruction took place in the vicinity of the explosion, where cut cables and singed cable were found. The clue which could precisely determine the time of rupture of the aircraft, is the mentioned singed cable, heating of which, approximately to 350° , took place after the explosion through burning of sprayed ignition charge, under simultaneous tensile and rupture stress. The broken end of it is joined by welding, from which it follows, that after the breaking of the cable the heating went on till the wire ends got welded up. Melting-down of the remaining part of the cable did not occur. The time of heating untill melting-down can be determined approximately as 30 - 40 seconds. Breaking of the cable took place prior to melting-down, as the wires close behind the melted-down end show merely traces of thinning by stretching and heating up. Rupture of the aircraft in the moment of explosion

is unlikely. Heavily damaged aircraft structure however could resist the rupture no longer after complex of all adverse influences after the explosion made itself felt, which can be estimated approximately from 3 to 20 seconds after the explosion. At this time probably the rupture of the aircraft and breaking of the cable took place, and the end of this heated cable after breaking got melted down.

Dispersion of the wrecks and victims after the disaster correspond to the above mentioned hypothesis.

The primary rupture of the fuselage took place in the baggage compartment on the level with the left side of the entrance door, by virtue of impact force from within, which is testified by the expert evidence of the found parts of the fuselage, roughly from between the pilot's cabin and the leading edge of the wings, especially parts of the sides and the bottom of the fuselage, the floor, the interior of the cabin and the seats for passengers.

The wrecks of the aircraft were dispersed into four areas. Nearest to the place of explosion off the flight path there were greater and smaller covering panels and parts of the interior of the fuselage from between the pilot's cabin and the leading edge of the wings / i.e. the place of explosion/. In the flight path, about 2 km away there was the main part of the wrecks / the rear of the fuselage with wings, without the port engine/, its fall being under very steep angle and most likely with the tail piece forward. In the flight path in the same distance, but about 1 km to the left, fell the front part of the aircraft with the pilot's cabin and the equipment compartment, almost vertically, with the ceiling part downwards. Farthest away, about 1 km past the main part of the fuselage, fell the port engine with the pylon, vertically too. In the view of the commission the port engine was separated by virtue of excessive

forces and moments produced by violent motion of the tail piece after the rupture. Fractures of the suspension beams are the force fractures /by tensile and bending stress/ and no breaking or impact marks are apparent; no marks of fire were found.

All pressure vessels of all systems /hydraulic, oxygen, extinguishing bottles, slides, life-boats/ were collected, their number being in compliance with the list in the aeroplane manual, and it was stated, that no pressure vessel had been damaged by inner overpressure. The tyres of the main landing gear held pressure as well, in spite of outer damage.

On the wrecks of the aircraft no traces of damaging from outer side by virtue of foreign bodies, splinters, pressure impact of ballistic wave were found, nor by the torn off engine either.

According to the dispersion of the victims after the fall, it is obvious, that 19 passengers fell out of the ruptured aircraft when still in the air. They fell upon the ground off the wrecks, vertically without forward speed. Nature and extent of the ascertained injuries, as well as the findings on the place of accident, correspond to the free fall from high. On three of the victims it was proved, that they were injured before reaching the ground. It can be concluded, that the injuries took place at the time of destruction of the aircraft in the air and did not cause immediate death.

The investigation of medical jurisprudence stated, that both pilots, in the moment when the front part of the aircraft fell upon the ground, were in their seats and fastened with safety belts. Their feet were on the pedals and hands on the stick control. All ascertained injuries were of devastating nature and were caused by violent deceleration and crushing in the cabin striking the ground. From the findings follows,

that the pilots in the course of the accident were capable of acting. Both obviously made every effort to control the situation. Neither of the pilots was during the time of accident under influence of alcohol, medicaments or drugs. The dissection and other investigation has testified, that neither of the pilots had any marks of illness or disability, which could be in any causality with the accident.

The findings of medical investigation showing an increased concentration of carbon monoxide in the blood and tissue of five victims, marks of explosive or sudden decompression affecting the crew and passengers, and evidence of several passengers having been injured already before falling on the ground, are fully in compliance with the findings of the mechanoscopic, defectoscopic and chemic investigation.

Civil air traffic on the air route AU - 4 in the area NDB HD in the time of passing of the flight JU - 367 was low, the separations between all aircraft were much greater than minimal. There was no other operation in the area NDB HD than the civil operation.

By revision of the extract from the technical service documentation no defaults of maintenance were found, except exceeding the prescribed time limit for the overhaul C-2 by 46 hours. No reason for this exceeding or any document allowing it were presented to the commission. The commission does not also know, why the previous crew started the unserviceable APU in preflight operation on the airport ARLANDA before the flight on the route STOCKHOLM - COPENHAGEN.

2.2 C o n c l u s i o n s .

a/ S t a t e m e n t s

- The aircraft had regular certification and was serviceable.
- The crew had due qualification for given flight.
- Both pilots in the moment when the front part of the aircraft fell upon the ground were in their seats and fastened with safety belts. Neither of them in the time of accident was under influence of alcohol, medicaments or drugs. The dissection and other investigation has testified, that neither of the pilots had any marks of illness or disability, which could be in any causality with the accident.
- No defect has been found on the aircraft or its systems.
- The aircraft did not catch fire even after the fall upon the ground.
- The aircraft was loaded and balanced within given limits.
- The weather did not influence the accident.
- The units of ATC did not influence the accident.
- The aircraft was destroyed by explosion of explosive. The centre of this destructive force was in the forward baggage compartment on the level with the left side of the entrance door.
- On the wrecks of the aircraft no traces of damaging from outer side by virtue of foreign bodies, splinters, pressure impact of ballistic wave were found, nor by the torn off port engine either.

b/ T h e c a u s e o r p r o b a b l e c a u s e .

The results of the inquiry proved explicitly, that the cause of the accident was total destruction of the aircraft by explosion of the explosive placed in carried luggage.