

No. 50

Karl Herfurtner Air Transport Company, DC-4, D-ALAF, crashed at Dusseldorf on 3 November 1957. Report released by the Directorate of Civil Aviation, Federal Republic of Germany.

Circumstances

The flight was to be from Dusseldorf, Germany, to New York via Reykjavik. One crew was to pilot the first leg of the trip to Reykjavik and the relief crew was to complete the flight to New York. Of the ten aboard the aircraft, seven were crew and three were passengers. Take-off from Dusseldorf at 0700 hours was normal until the aircraft became airborne. Immediately after becoming airborne and following retraction of the gear No. 1 engine was cut off and its propeller feathered. Then the No. 2 engine was also cut off and its propeller feathered. During this process the flaps were immediately and fully retracted. The aircraft, having attained an altitude of 50 metres, dropped sharply, lost altitude and crashed (0703 hours) into buildings within the city limits killing six of the occupants instantly and seriously injuring the other four. In addition, one person on the ground was killed and two others seriously injured. The wreckage was completely destroyed by fire.

Investigation and Evidence

The wreckage lay about halfway between a burning house and the next inhabited block of houses. The right wing, torn free at the wing root, with both engines torn out, lay between the house and the wreckage. The left wing remained attached to the centre part of the fuselage. Both left engines were burnt out of their housings. The rear part of the fuselage was torn free at the trailing edge of the wing and had turned over on its side. The front part of the fuselage (cockpit to wing leading edge) was completely destroyed by fire, the light metal structure having melted. Cockpit instruments were recognizable only in a few scattered pieces.

The landing gear was retracted. The left flap stood at zero setting and the rods of the flap controls on both sides showed that the flaps were fully retracted. The right flap was destroyed with the wing. The propeller blades of both left engines (Nos. 1 and 2) appeared to be feathered, while those of both right engines (Nos. 3 and 4) were on take-off pitch.

All four power units were examined in Hamburg, Germany and the report on the examination set forth the following conclusions:

"The No. 1 propeller blades were certainly feathered at impact. There was no evidence that the pilot had reversed the pitch of the propeller.

The condition of No. 2 propeller revealed that at the time of impact the propeller blades were fully or almost fully feathered. It is impossible to ascertain from the condition of the pitch control mechanism whether the blades were already feathered or whether they were in the process of change to or from the feathered position.

The position at impact of the pitch control level gear for the blades of Nos. 3 and 4 propellers shows these to have been in take-off pitch. The damage to each separate blade confirms this assumption.

The damage to the blades of No. 1 and No. 2 propellers shows that at the time of impact these propellers were motionless or rotating very slowly. Examination of the power units, although they were extensively damaged by fire, failed to disclose evidence of malfunction. It can even be stated that in all probability they were in perfect working order."

The witnesses heard by the Investigation Commission stated that the pilot of D-ALAF, Chief Pilot of the Herfurtner Company, often brought about dangerous situations in flight with a view to emergency drills, among other purposes. On these occasions he would suddenly cut off an engine and feather its propeller, frequently even during take-off and when carrying passengers. Following a hearing of the relevant witnesses and experts, the Investigation Commission came to the conclusion that on such occasions he largely disregarded safety precautions and that in his action he failed to follow the prescribed safety requirements.

According to the Commission's findings, the emergency drills, as brought about and carried out by the Chief pilot, were unusual. It was, furthermore, determined that they were contrary to the practices recommended by the American pilots who supervised the training on DC-4 type aircraft. The following information was supplied by a witness:

"I was trained on the DC-4 by..... of North American Airlines for the firm.. They both strongly advised me never to feather an engine under training conditions on take-off as this was totally unnecessary: proving only that the feathering mechanism worked. They said that if a pilot could handle the aircraft with the propeller windmilling (throttle back only) he could certainly cope with the same engine feathered. With the throttle back the engine power is available in case of emergency."

In accordance with the statements of witnesses it was established that although the Chief Pilot possessed good manual flying skill, he was unable to grasp the causes and effects of flying techniques. He was described as an exceptionally self-confident and conceited person. The findings of the Commission showed that he often flew carelessly.

Herfurtner, the owner and operator, was aware of his Chief Pilot's flying methods, as well as of the fact that he repeatedly brought about emergency conditions while carrying passengers. The operator told the Commission that he had several times called the Chief Pilot to account with regard to these practices. Finally, the operator had told him, some three weeks before the accident, that he would remove him from his post as the airline's Chief Pilot and, if necessary, dismiss him from the Company. No such action, however, had been taken.

On the evening of 1 November, at a gathering of the Herfurtner flight personnel, the Chief Pilot mentioned that he would henceforth attempt a take-off on two engines.

The Chief Pilot intended to test a pilot during the flight on 3 November and had explicitly stated this intention in the presence of some of the witnesses. The fact that the pilot was to be checked on this take-off was also revealed by the distribution of crew members in the cockpit as observed by a witness during the take-off run.

After careful examination of all evidence, the Commission established the following immediate causes of the accident:

1. No. 1 engine was cut off and its propeller feathered on take-off immediately after the aircraft became airborne and following retraction of the gear. The propeller stopped.
2. Immediately afterwards the flaps were fully and unhesitatingly retracted, thus causing the aircraft to drop sharply and lose an estimated 25 m of the 50 m altitude it had by then attained;

3. In this already critical situation, No. 2 engine was also cut off and its propeller feathered. This propeller was also stopped.
4. Under these circumstances the aircraft was no longer able to stay airborne at its height and this fact became evident when buffeting appeared.

The Commission examined the possibility that No. 2 engine might have failed through malfunction. However, it held the view that no failure occurred. An engine failure would certainly have been noticed by the pilot who sat in the passenger compartment and followed the proceedings with particular attention. When questioned by the Commission this pilot expressly declared that No. 2 engine was operating perfectly at take-off power until it was stopped. This statement was confirmed by the report on the condition of the power units - "... it can be stated in all probability that no malfunction occurred in No. 2 engine..."

In the opinion of the Investigation Commission and in agreement with the report of two experts, there can be no doubt that any sensible pilot would under the circumstances have brought No. 2 engine to full power until No. 1 engine again became operative, even at the risk of thereby damaging the engine to the point of ultimate failure. A careful pilot would never have feathered No. 2 engine before No. 1 engine was again operative.

The Commission examined the possibility of an inadvertent feathering of No. 2 propeller. It held the view that such inadvertent feathering did not occur, as it was ascertained that the position described above (... No. 2 engine was also cut off and its propeller feathered... this propeller was also stopped) can only be brought about by successively operating separate levers.

Some witnesses described a glare of fire which was observed on the aircraft before the actual crash.

The Commission believed that this glare of fire was identical with the reflections of the anti-collision lights which had been lit and emitted a bright red flashing light. It is also possible that the engine exhaust flames, still visible at dawn, were by some witnesses mistaken for glare of fire.

The Investigation Commission looked into the possibility that the flight engineer retracted the flaps of his own accord without awaiting the captain's orders.

Two witnesses stated that, in their opinion, the flight engineer was inclined to act independently on board, particularly as the Chief Pilot allowed him a great deal of freedom.

It was impossible for the Commission to determine with certainty whether the flight engineer retracted the flaps on his own initiative without awaiting the captain's instructions. However, this question may be left undecided, as the flap retraction only accelerated the accident which at that point was unavoidable.

Probable Cause

The accident was caused by the intentional creation of an emergency situation on take-off for a long distance flight: first No. 1 engine was cut off and its propeller feathered, then No. 2 engine was also stopped and its propeller feathered. In addition, the flaps were immediately and fully retracted at low altitude.

Such action by the pilot-in-command during take-off immediately after the aircraft became airborne, with a view to testing a crew member, caused the aircraft to crash.

The piloting technique was not consistent with the safety requirements and operating instructions as prescribed by the Directorate of Civil Aviation.



FIGURE 28

Flight path of D-ALAF prior to its crashing at Dusseldorf



FIGURE 29

View toward approach
with burnt out house.

Accident to DC-4, D-ALAF, at Dusseldorf,
3 November 1957



FIGURE 30

In the foreground demolished
right wing and engine No. 3.

In the background mid-section
of fuselage.



FIGURE 31

Engine No. 2 with mid-section
of fuselage.