

DIETER STEFFEN COCKPIT



ZERO MISTAKES, NOT ONLY IN THE COCKPIT

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Foreword

When I wrote these lines, I intended to write a biography and about special moments in my life. Good enough to give my grandchildren a picture of the life of their grandpa.

My personal flying log book supported my memories. Crew members must keep their log up to date.

To be honest: writing essays has never been my favorite hobby.

For my English readers, please apologize my English writing, because I learned most of the language from polite British and American Engineers.

When I wrote, time was my main thread. Soon, however, I knew Lufthansa's air crash on 20 November 1974 in Nairobi and Air France's on 01 June 2009 in the South Atlantic kept on influencing my memories.

I often think about these two accidents. I, therefore, continue to write about them in the course of the book. (My opinion about the two accidents you will find in the book emphasized by italics).

Kiel-Russee on 10 January 1935 is the place and the date of my birth. My father was a master craftsman in an engine factory, and my mother worked as a nurse. In 1943 during a fire service after a bomb attack on Kiel my father was injured and died.

From then on, my mother educated and fed my four brothers and me all by herself. Respect!

Spending an idyllic childhood, attending school and apprenticeship, taking part in initial glider training and a ground course for flight engineers, I was 23 years old when I passed the theoretical part of the test as a flight engineer, together with twelve colleagues.

Up to that point, several decisions were beyond my control; nevertheless, I liked the beginning of this career. In fact, I had drawn the jackpot.

I was 24 years old when Elke and I started a family.

Manfred's arrival on earth was early; Susanne let herself have more time.

Elke has invested a lot of time and understanding to educate our two beloved children. With mutual consent, as they say, Elke and I separated after 28 years of marriage.

Since 1989 Edith keeps me on the go, she supports my enthusiasm, and I like that.

Between Rio and Santiago

On 1 June 2009, a very tragic accident occurred in the South Atlantic. The circumstances of the Air France 447 flight, an Airbus 330, which began its flight at Galeão airport in Rio de Janeiro, are still of great concern to me.

Several times I departed from Galeão airport in Rio de Janeiro.

The first time I flew as a flight engineer trainee with captain Guss and flight engineer Häussler on the 30 July 1959. It was Lufthansa flight LH 500 scheduled from Hamburg via Paris and Dakar, the capital of Senegal, and from Rio de Janeiro via São Paulo, Montevideo and Buenos Aires to Santiago de Chile. I do not recall the name of the copilot. Our airliner was a Lockheed 1049 G Super Constellation with the German registration D-ALID. Departure time was 1:00 p.m. according schedule.

We had pickup at 10:30 a.m. a Mercedes bus in Lufthansa colors waited in front of the Hotel Excelsior to have enough time for the trip to the airport and the preflight preparations. Hotel Excelsior was on Avenida Atlantica, in the Copacabana district.

It was winter in the southern hemisphere. The sun was shining, and the temperature was around 25° C. With a daylight flight ahead, the conversation on the bus reflected our good spirit.

With the perspective of three days off, we would arrive in Santiago de Chile, after all.

And for me, it was still a dream, anyway. I was 24 years young and on the way, to become a flight crew member of

Lufthansa.

In an office of the Lufthansa station at the airport, Captain Guss held his briefing. It included hints for emergency situations such as aborted take-off, emergency evacuation, ditching and weather information. He continued with the pre-calculated flight time for the first leg to São Paulo. In the meantime, the airplane had landed. To hold a short chat with the inbound crew, we went to the airplane, through the airport building.

(We heard the smoky and sexy voice of the female announcer from the terminal of the Aero Porto Antônio Carlos Jobim - as the Galeão is also called - on our way through the airport building.)

As far as the D-ALID was concerned, there were no complaints according to the crew. The flight engineer told me that engine 3 consumes a lot of oil, but that was nothing unusual for radial engines. About five minutes before the scheduled departure time, all crew members were on their stations and worked out the checklist for the departure. I sat on the flight engineer seat and gave answers to the questions from the checklist which the copilot recited.

Then I started the engines; this required some dexterity, because all, the outside air temperature, the humidity and the temperature of the engine had to be considered for the gasoline-air mixture formation. But it worked out right away.

After receiving the taxi clearance by the ground control captain Guss taxied to the runway.

There he set the parking brake so I could test the engines from the flight engineer's station, the so-called engine run-up.

I checked the engine power, the ignition system and the speed control of the propellers.

Now it was time: "Lufthansa 500 cleared for take-off runway one five". To reduce drag, I closed the cowl flaps at

40 kts to 30%; and adjusted the throttles to 56,5 inches of Mercury manifold pressure.

Each engine delivered around 3250 HP.

The propellers controlled the engine speed to 2900 rpm, and the Connie sped up to the take-off speed of 145 knots.



Fig. 1: Lufthansa Super Constellation "Rhine-Main", 1955

For this short flight to São Paulo, the aircraft weighed 43 tons only, so the plane accelerated quickly. After liftoff, we made a shallow right turn, heading for Harbor Mouth, and south of the Sugar Loaf. Passing Harbor Mouth the airplane made another right turn. Now we followed the coastal line of the Copacabana.

Although the flight engineer's seat is deep in the cockpit, I could also admire the white beach for some moments.

After 18 minutes of the climb, the Super Constellation reached its cruising altitude of 15.000 feet, with a speed of 250 knots.

At the flight engineer station I took care of the required fuel withdrawal from the different tanks.

Fight engineer Häusler observed me when I adjusted the mixture on all four engines. This reduced fuel consumption to 700 lbs. /h on each engine.

This method of optimizing the fuel-air ratio was indispensable for long-haul operation and was the important task for the flight engineer. Adjustments of the fuel/air ratio were repeated at temperature or altitude changes. I also paid attention to the cabin pressure and cabin temperature for the comfort of the passengers.

Another 20 minutes were gone, the descent has begun. The copilot read the checklists for the descent and the landing.

Captain Guss pointed out the unique features of the approach to Congonhas, the city airport of São Paulo, and concluded that this airport was very similar to an aircraft carrier. I understood what he meant when I saw that the runway began at the upper end of a 90 feet high wall and ended at 5200 feet with a steep slope. Captain Guss hit the landing point, and put all the propellers to reverse thrust, stepped hard on the brakes, and yet there were felt 1000 feet only to the end of the runway left.

Once the plane was parked in front of the airport building, the passengers disembarked and the baggage was unloaded.

The crew met at the world's best shoe shine boys in the terminal of Congonhas. After their skillful treatment, our polished shoes shone, as if they were made of porcelain.

In the meantime, the flight plan was made and was updated with the recent weather data. The estimated flight time was three and a half hours to Montevideo. The aircraft was refueled. The Lufthansa mechanic made his pre-flight check and confirmed it in the squawk book.

I checked the fuel quantity with a so-called dipstick, In German: Tauchheber. For this, I had to climb on the wing

and open the fuel caps. I held the dipstick in the fuel tanks and closed the hole with my thumb. The length of the captured gasoline column corresponded to the amount of gasoline in the fuel tank. I added the amount of each fuel tank and compared it with the fuel tank gages. Additionally I add the refueled quantity to remaining fuel at the landing as a crosscheck.

Just in time for our departure, all the crew members returned to their stations, and soon the aircraft taxied to the runway. Congonhas had a surprise for me. After take-off, the engine noise subsided suddenly, once we were flying over the end of the runway. This time it coincided with the closing of the landing gear doors from the nose gear, and it became so quiet, that I had the impression that all four engines had died.

Anxiousness was written on my face. But the more experienced crew members expected this phenomenon, and they smiled at me.

At a safe altitude Captain Guss switched on the autopilot on and steered the aircraft into climb to an altitude of 12.000 feet

Arriving at the cruise flight level, I set the required engine speed of 2400 rpm with the prop control. Each engine now developed 1800 HP, so we reached an indicated cruising speed of 250 knots. With the fuel tank selector levers, the crossover valves and the fuel tank pumps, I took care of the required fuel withdrawal and fixed the right mixture impoverishment on the engines.

I had already carried out the method of mixture depletion at least 50 times. It became routine.

We continued on the air routes, marked by medium wave radio stations or VHF ranges, passing Curitiba and Porto Alegre, then across the border between Brazil and Uruguay to the airport of Montevideo, all in the most glorious weather.

At that period I was still in training. I had passed the theoretical training for flight engineers; now I had to gain practical experience. Therefore flights between Rio and Santiago and back were perfect because the trainee could practice many take-offs and landings on this route within a short time. And that was the point.

My first mission in South America lasted four weeks. I was accompanied by an experienced flight engineer, who gave me the advice, how to check all spark plugs. For this purpose, a Braunsche tube (oscilloscope) was installed in the flight engineer's table, and all spark plugs of each engine (4x36 pieces) could be checked for their correct function.

The secondary voltage of the ignition system was measured and displayed. The spark plugs of the lower cylinders often became faulty as lubricating oil caused them to be polluted. If a mechanical fault was the cause, both spark plugs of one cylinder produced no sparks anymore. This was always a reason to shut down the engine.

To reduce the drag of a shutdown engine, the propeller was feathered. (Propeller blades turned to zero angle of attack.)

This occurred frequently. The engine had then to be exchanged for a spare engine. The Lufthansa statistics from that period show that an irregularity in the engines was detected on every third flight.

-This coincides with my experiences.-

The engine manufacturer Curtiss Wright began developing this engine in 1935. It was a twin-row-radial-engine with 18 cylinders and a total displacement of 3350 cubic inches, which contained a two-stage mechanical blower (charger).

This engine ran for the first time in 1937 and flew 1941 for the first time in the XB19 and then in the B29. Both were long-range bombers, which were built in large numbers during the Second World War. To increase performance, improve cooling and reduce fuel consumption, the engine

was equipped with direct fuel injection 1944. Direct fuel injection was a novelty, but a successful step forward. The mixture formation for each cylinder with the direct injection is much more precise than the mixture formation by a carburetor. The performance was further increased by three exhaust recovery turbines. They delivered their power to the crankshaft via fluid couplings.

The engine delivered under standard conditions a maximum take-off power of 3250 HP, at the same time moderate fuel consumption during cruise flight.

The expense of maintenance and the susceptibility to disruptions meant that this aircraft was not a cost saver for any airline.

On certain stations such as Santiago de Chile or Rio de Janeiro, spare engines were stored, to replace a defective engine. Frequently, flights were carried out with three engines only to ferry the aircraft to a station where a spare engine was available. These so-called three-engine ferry flights filled another chapter in the Super Constellation Flight Manual.

About 20 minutes before Montevideo the descent was started and the checklists were read. For me, it meant adapting the air pressure in the cabin to ambient air pressure of the Montevideo airfield. I also calculated the landing weight. With these numbers, the pilots could read the corresponding landing speed in a table. A specific fuel withdrawal was required for the landing; the four engines were supplied by the four main tanks. Then I had to check ignition and the charger. The ignition was switched to "retard," prepared for a go-around if necessary. The charger or blower had been anyway already on "low" because we had cruised this leg in flight level 130.

As in all the previous legs, the best weather was also in Montevideo, so we approached according to visual flight

rules.

Coming from the northwest, we flew straight on a long descent to runway 24. (24 mean that the runway is 240° in the magnetic direction. That's it, how runways get their names).

Reaching the parking position, the Lufthansa mechanic, stationed there welcomed me, and I told him that there were no technical squawks.

Only a few passengers got off. Even less boarded the flight. Flight planning for the next leg was easy.

The shortest flight on this day was from Montevideo to Buenos Aires, just 90 nautical miles. From starting the engines in Montevideo and cutting the engines in Buenos Aires airport, Ezeiza it took 40 minutes only. After take-off, we saw the Atlantic and the Río de la Plata in the west. In a slight right turn, it went to the west course. In this short flight distance, it was not worth to climb above flight level 70, which means 7.000 feet

Minutes later, on the west coast of the Rio de la Plata, Buenos Aires, and this city of enormous proportions came in sight. We saw Aeroparque, the city airport at the coast. The port of Buenos Aires and the 400 feet-wide Avenida 9 de Julio, which points to the north, were visible during the approach. The plane parked in front of the airport building, which reminded me of Munich-Riem.

50 minutes after landing, everything was ready for the next flight. Passengers were on board, cargo and luggage stowed, the necessary fuel quantity in the tanks and the pre-flight checks done.

Captain Guss held his briefing, emphasizing on the crossing of the Andes. He pointed out that according to the forecasted strong winds; turbulence was expected due to lee waves over the mountains. The chart for weight-dependent speeds at severe turbulence should be accessible during the flight. The cabin crews should be

ready with the service after two hours of flight time and remain belted for the rest of the flight.

I would like to know whether the captain of the flight Air France 447 reminded his crew before the take-off in Rio that the flight to Paris would lead through the inter-tropical convergence zone and with violent turbulences, strong thunderstorms, and heavy icing. I am also interested in how he divided the guards and break sequences for this flight.

In the meantime, the sun went below the horizon, we flew into the night, or to be more precise, the night caught us from behind. After the take-off, we flew straight ahead to Curico, which is south of Santiago de Chile, following an air way, which allows flights across the Andes at 18,000 feet in Instrument flight rules. The Andes on this route are 13,000 feet or 4000 meters high. To climb over 16,000 feet, the blowers had to be shifted from "low" to "high." The shifting could only be carried out below engine speeds of 1600 rpm and a manifold pressure of lower than 20 inches of Hg.

In order not to disturb the passengers, the two inboard engines 2 and 3 were shifted one after the other; the engines 1 and 4 were shifted simultaneously.

In high blower, we climbed up to 19.000 feet The captain had chosen this height to avoid the turbulence on the lee side of the Andes. Over Curico we made a right turn to the north. It was still 90 nautical miles to Santiago de Chile. Soon the lights of the big city became recognizable. The silhouettes of the Andes also appeared on the right-hand side.

Precise instrument navigation was required, because to the west, parallel to our course, the coastal cordillera with mountains up to 9200 feet high were located.

During the descent, the blowers were switched back from "high" to "low," which was one item of the checklist. At

around 9:00 p.m. local time we were cleared to land on the Cerrillos airfield.



Fig. 2: Lufthansa Network 1955

The Lufthansa ground crew in Santiago always operated exemplary. Thanks to their good organization at customs, Passport control, luggage, and transportation, we got into our hotel rooms of the Carrera just one hour later.

13 hours passed since we left the Hotel Excelsior in Rio. Hotel Carrera was on the corner of Augustinas and Teatinos. The impressive entrance faced to Plaza de la Constitución. The next morning around 10:00 a.m. I heard the music. A military band accompanied the change of guards, in front of the La Moneda, the Presidential Palace.

-What a welcome, I said to myself.-

Breakfast time. Now my Spanish vocabulary was tested. "Huevos fritos y jugo de naranja" was the magic words. Restored to strength, I discovered Santiago by foot. There was sufficient time for me as the next assignment was only two days later. Some excursions I joined the crew, but to the sports airfield Tobalaba, I took the public bus by myself. And I was very proud to get there.

There I met a gentleman who appeared as if he were speaking German. Yes, he did because all the others on the airfield spoke Spanish only and their English was rather poor. Wilfried was a flight instructor, he was Chilean with German roots. He was my age, spoke perfect German, English and of course Spanish. We never ran out of issues concerning aviation, for 58 years.

The circumstances and the likely causes of the accident of flight Air France 447 were and are important topics of conversation for us.

I visited Wilfried 2010 in Santiago de Chile, and he visited me in Aschaffenburg 2013.

Wilfried soon made a career in commercial aviation, and flew as a captain with Ladeco, later with LAN, both Chilean Airlines. Some years later he worked for the Danish airline Cimber Air, and at Royal Air Maroque he flew a Boeing 737. Wilfried also flew the Catalina, an American amphibious aircraft, and a DC 3 with rocket assisted take-off from the airfield of Punta Arenas next to the Straits of Magellan.

On Monday 3 August Lufthansa 503 returned to Rio de Janeiro. This time, Franz von Gablenz was our captain. He was the son of Carl-August Heinrich Adolf Freiherr von Gablenz, who had founded Lufthansa in 1926.

Early in the morning, at 7:00 a.m. the departure was scheduled. My boss, Georg, told me on the way to the airfield I was to make the take-off; this gave me confidence because under his supervision I had only done two take-off. Because of the good weather and light winds, von Gablenz crossed the Andes in visual flight rules. To the left was the mighty Aconcagua, the highest mountain of (all) America with 22,970 feet above sea level, illuminated by the rising sun.

It was an overwhelming sight.

I enjoyed flying more and more.

(The inclined reader is waiting for action, but action is rare in the cockpit of passenger aircraft).

So it began.

Flying is my favorite hobby since 1953. I was a mechanic apprentice at the Bohn & Kähler machine and engine factory in Kiel. In September of that year, the Luftsportverein Kiel organized a course at the Kiel-Holtenau airfield, with the aim, to instruct glider pilots. My eldest brother Walter advised me to do so and my mother permitted me to do, so I signed up for this course.

Three girls and four boys took part in the course. The training took place on a Schulgleiter SG 38 at the Kiel-Holtenau airfield. We had built this Schulgleiter in many winter adventures in the years 1952 and 1953 in a workshop. It consisted essentially of plywood, and tension wires. Gluing, splicing, welding, and stringing were the basic workings.

It was an open, single-seat glider with harmless flying characteristics. The flight student got his instructions before take-off, sometimes also during the flight, by loud screams of the flight instructor. The first exercise concerned the ailerons only. We turned the plane into the wind, and the flight student had to use the control stick to control the longitudinal axis with the aileron, he has to keep the wings horizontal.

On the ground and only one axis, the longitudinal axis was to be corrected; this was an easy task for the flight student.

In fresh wind, only small inputs on the control stick would be necessary; this was an important experience for the flight student. The next exercise was a jump straight out.