HASTE MAKES WASTE

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A trough that extended from the Norwegian Sea to the Bay of Biscay was blowing mild, humid and sometimes unstably stratified air over the Alps towards the northeast. While the surface front crossed the airport of St.Gallen-Altenrhein (Switzerland), the crew of Dalia 211 was preparing their flight in Geneva. They planned a flight from Geneva to Altenrhein in the early afternoon of 6th of August 2012. Due to the topography and resulting waves along the frontal zone, the weather in Altenrhein was challenging for the pilots. But both Altenrhein runways were open. Runway 10 offers an ILS approach with a 4 degree gradient. A circling approach was available for runway 28.

The Embraer EMB-505 Phenom 300 (CN-MBR) proceeded quickly across Switzerland with 70 knots tailwind. The approach was fast. On the ground, 9 knots tailwind were to be expected. Local rain showers were causing visibility problems. The crew opted for a runway 10 ILS approach. The first approach did not succeed. Immediately the crew attempted a second approach.

On its second attempt, the Phenom was half-way down the wet runway, when the co-pilot, who was pilot non-flying, said "hopefully it will work". The captain, who was pilot-flying on this short flight replied "That's what I told you..".

Seconds later the aircraft reached the end of the runway, still travelling at 44 knots IAS. The aircraft exited the runway, broke through the perimeter fence, crossed a road and came to rest in a cornfield. The crew and one passenger exited the aircraft unaided. The Phenom 300 suffered substantial damage.

Approaches

The crew performed a go-around from the first ILS approach after continuing well below the decision height without sufficient visual references for a landing. When the commander finally initiated the go-around, the tires were only one foot (!) above the runway.

BLURRED
A lack of a clear hierarchy between pilot and co-pilot lead to an accident for EMB-505.

The first approach had been flown at very high speed. With a strong tailwind the aircraft intercepted the localizer and glideslope at high speed and then struggled to slow down and configure. The gear was extended while descending on the glideslope at 222 Knots IAS at 2'000 ft AAL. Flap 1 was selected at 1'000 ft AAL. At that point the commander requested flap 2 followed by full flaps. The co-pilot selected full-flaps, and 3 seconds later selected flap 3, which was the maximum flap certified for this aircraft. At that point the "FLAP FAIL" warning indication illuminated and the flaps stopped moving. The flaps stayed "jammed" in the Flap 1 position for the remainder of the flight. The aircraft was at this point passing the decision height of 500 ft AAL.

The crews decided to continue the approach, while they were faced with an abnormal situation late in an unstabilized approach without visual contact.

Unstabilised Approach

During the initial descent the crew prepared for the approach to Altenrhein. After receiving the ATIS they prepared for an ILS approach to runway 10 followed by a circling for runway 28 due to the prevailing Westerly winds. The navigation equipment was set and the approach reviewed on the cockpit screens.

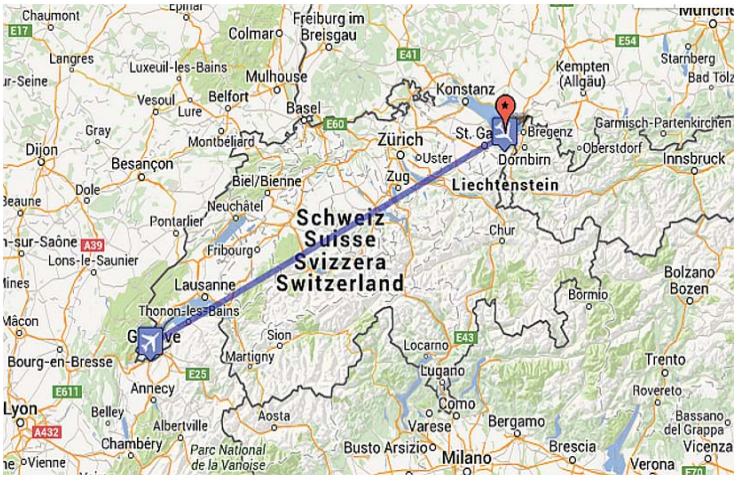
Critical altitudes, approach speeds, the non-standard approach angle of 4 degrees as well as the missed approach procedure were not mentioned in the briefing.

Considering that it was the first time that either crew member flew into Altenrhein airport this lack of preparation for an approach into an unfamiliar airport in cloudy, rainy and windy conditions is incomprehensible. It was symptomatic of the crews lack of adherence to standard operating procedures throughout the flight.

Poor Decision-Making and Poor Preparation

According to the ATIS the crew prepared for an ILS approach to runway 10 followed by a visual circling for runway 28. The prevailing wind according to the ATIS was 340 at 8 Kts. After establishing on the ILS for runway 10 the crew contacted the Tower at Altenrhein. The tower passed an actual wind of 280 at 9 Kts and asked Dalia 211 which runway they would prefer. At this point the aircraft was below 2'000 ft AAL with only the gear extended and travelling at over 200 Kts IAS. Without consulting the captain the co-pilot requested a straight-in landing on runway 10.

This was a significant change to the planned approach. Had the crew evaluated their situation properly, i.e. by



taking some time to discuss their options, they would have realized that their altitude, configuration and airspeed did not allow them to successfully accept a straight-in approach for runway 10.

The circling minimum (864 ft AAL) is higher than the minimum of the ILS for a straight-in approach (500 ft AAL). Given the weather conditions with heavy rain reducing visibility the straight-in approach might have offered a higher chance of a successful landing.

Without any verbal communication it remains unknown what went through the crews minds and what caused the co-pilot to request this change to the landing runway and the captain to accept this change at such a late stage in the approach without having prepared for this option.

At no point was a briefing for a straight-in approach to runway 10 performed.

Don't Jam Your Flaps and Don't Mishandle the Resulting Abnormal Situation

Shortly after accepting the first straight-in approach into runway 10 Dalia 211 received the landing clearance for runway 10.

As the crew lowered the flaps the co-pilot mishandled the Flap Selector Lever and selected Full Flaps. A position not certified for the aircraft and forbidden by the manuals. To prevent such mishandling a mechanical stop should have been installed to block selection of full flaps on the Flap Selector Lever. This mechanical stop was missing on the accident aircraft. As a result the flaps jammed just past the Flap 1 position and remained jammed for the remainder of the flight

At this point the crew should have discontinued the approach as there was no chance to slow the aircraft down and to achieve a stabilized approach. Instead the captain continued encouraged by the co-pilot. Only at the last moment did the captain perform a go-around and only narrowly prevented a collision with terrain.

After performing the missed approach the crew did not ask for a

READY
Pilots should be prepared for the short runway at Altenrhein airport.

holding pattern or radar vectors in order to perform trouble-shooting on their technical malfunction as well as to evaluate the reasons for the unsuccessful approach and what their options were.

At this point the flight was affected by a minor technical abnormality. The flaps were jammed in Flap 1 position. This does not pose any direct danger to the aircraft or its occupants.

A jammed flap introduces a number of operational restrictions such as higher approach speeds, longer landing distance required, more time and distance to slow down.

Considering the fact that Altenrhein has a steeper than normal approach of 4 degrees, considering the length of the runway and its wet condition and considering the approach and landing with a tailwind the decision to attempt a second approach and landing into Altenrhein's runway 10 cannot be understood.

What is however most astonishing is the lack of an evaluation of their situation as well as the alternative options available to the crew. At no time were these discussed. The abnormal checklist for the FLAP FAIL warning was consulted briefly, but not completed. No structured trouble-shooting was performed to establish the cause of the jammed flap.

Instead the co-pilot without coordination with the captain repeatedly and erratically cycled the flap lever during the flight and second approach without any effect on the flap position.

If the abnormal checklist had been completed the crew would have realized that the factored landing distance with the adjusted Vref for Flap 1 configuration for a wet runway was longer than the runway available at Altenrhein.

Instead the crew requested radar vectors for a second approach and rushed into a second unstable approach.

Take Your Time

HASTE
Not taking the time to consider all the options led to this accident.

Most importantly, the flight had another 3 hours of fuel on-board for an extended holding time followed by a diversion to a number of airports in the vicinity with longer runways and approaches into wind.

Unclear Roles in the Cockpit

The captain was the pilot-flying and the Commander of this flight. In addition to his flying duties he held a management function as the deputy of the director of flight operations. The co-pilot was employed as quality and flight safety manager at the company. At 53 he was 13 years older than the commander. Previously he had been a commander in the Moroccan military on the C130-H aircraft and had been an instructor on single-engine aircraft.

The co-pilot's management position combined with his considerable flying experience affected the authority gradient on the flight deck and contributed to a break-down in the normal crew cooperation. The co-pilot took decisions without prior consultation with the captain on numerous occasions.

During the first approach the co-pilot accepted the change in landing runway without discussing this with the captain. After the aircraft had passed the Decision Height the captain, who was pilot-flying, repeatedly said "Here, one can't see anything.". But the co-pilot, who was pilot non-flying, encouraged the captain to continue below the decision height with the words "go on..descend, descend!".

Also the co-pilot made numerous configuration changes without consultation.

In his role as pilot non-flying the co-pilot failed to monitor the pilot-flying on numerous occasions. During the go-around the pilot-flying forgot to raise the landing gear. This remained unnoticed by the co-pilot and the gear remained extended during the go-around and for the second approach.

The lack of a clear hierarchy on the flight deck prevented an effective teamwork between the two crew members and ultimately the crew failed in their primary role of ensuring flight safety.

Haste Makes Waste

The pilots induced the jamming of the flaps. The weather was challenging. The airport had a short runway and was unfamiliar. The crew did not adhere to standard operating procedures. They did not work properly together and forgot about the limitations of the flap system. The real show stopper though was not the combined effect of all the factors mentioned.

Had the pilots found a way out of their press-on-itis and chosen to take some time to consider the options calmly and act in an enlightened way, the flight will most likely have ended successfully, and not in a cornfield behind a cold front.

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