



Case Study - Her new barbecue sauce

By Bengt Collin, EUROCONTROL

The Air Hostess

Welcome to Angel's Town, the local time is ten past two ...the air hostess stopped talking. The announcement was interrupted by a loud and different sound; the aircraft began to move in an unfamiliar way as it finally stopped. She got out of her seat, nobody said anything; it was like time had stopped, like someone had pressed the pause button. Through the window to the right she could see the terminal building far away, suddenly the captain's voice came over the PA system, focused and clear "evacuate, unfasten seat belts, evacuate", a brief irritating noise followed the message and then the pre-recorded message repeated what the captain had just said; they opened the doors and over wing emergency exits...

The Tower Controller

It had been a lovely summer evening until it started raining. The heavy shower hammered down noisily and all outside life looked miserable and very wet.

With the visibility in all directions reduced, it was like mist. She did not really care, no arrivals



Bengt Collin

works at EUROCONTROL HQ as an Senior Expert involved in operational ATC safety activities.

Bengt has a long background as Tower and Approach controller at Stockholm-Arlanda Airport, Sweden

nearby. Ten minutes later, as quickly as it had started raining, it stopped. Perhaps it was still possible to have a barbecue later, she wanted to test her new recipe for a barbecue sauce; olive oil, garlic, soya, black pepper, topped off with a large glass of Bailey's. Yum Yum! She planned to use the rest of the small bottle as a refresher while barbequing. After all you did not want to dry out completely, she thought and smiled.

The D-line Captain

They had been discussing the roster intently. "Why do I always have to sleep away from home on Friday nights?" the first officer complained.

"Someone has to do it" the captain replied. "I am always off on Fridays." 'Thank God it's Friday' is my motto," he laughed, but the first officer did not. "Have you checked the weather?" the captain asked.

"Yep, 270/11 CAVOK +20. Perfect for barbecuing" the first officer replied. "Should we ask for straight in runway 12?"

"We're a bit high but, OK, why not" replied the captain.

The Approach Controller

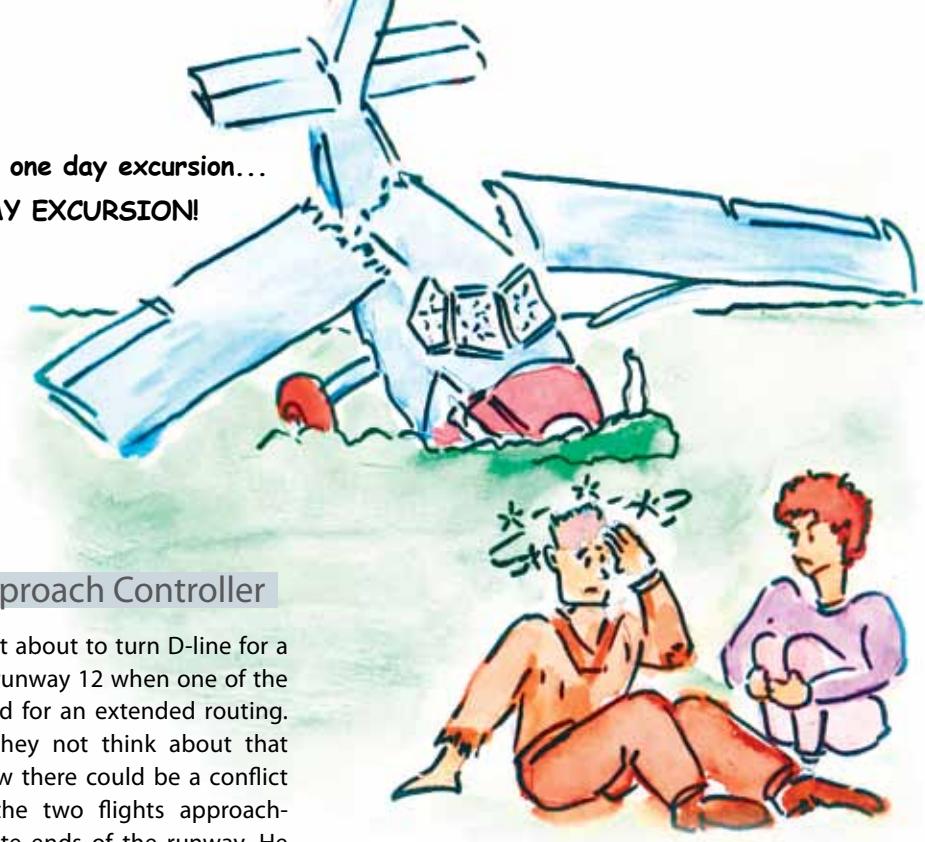
He was reading the morning paper even though this was not allowed when in position. He did not care, this was a widespread habit and no one complained. To the right of him worked Beate, a smart and good looking controller with a great sense of humour. "Do you know why Swedes can never become Formula 1 drivers?" she asked. "Because they return to the pit stop after each lap and ask for directions" she continued without waiting for his answer. She laughed - a bubbling but

discrete laugh which he loved, and her jokes were brilliant too! After all, why spoil a great joke with the comment that Sweden actually had produced a number of good drivers - it did not seem important.

He did not really pay attention to the traffic on his screen. Instead, he started thinking about an article he had read somewhere the other day, an article on runway excursion. It obviously caused a number of fatalities each year; he did not know the magnitude of the problem, they never discussed it at work. Some pilots obviously could not land. He had some pilot experience of his own; he did five hours in a Piper Cherokee some ten years ago. Could it be so complicated to land an aircraft safely? He had been sent to a conference the other week to gather some information on the subject, but it was really disappointing. The subject was "Runway excursions – the way forward", but already in the opening speech the scope was reduced to "how to standardise the measurement of braking action". He could not understand why, as this was only one of many minor contributing factors all completely overshadowed by other more significant ones. One presentation after the other followed, sometimes briefly interrupted by comments from participating pilots. The minutes and summary were probably written before the meeting and everybody just had to stick to them. At the end of day two, the way forward was decided, on the way home he could not remember what the decision was.

Beate left for a coffee, two aircraft were inbound, a B-line a long distance away towards the South East, the other one a D-line arriving from the North West.

You've promised me a one day excursion...
NOT A RUNWAY EXCURSION!



Runway 30 was in use with no departures scheduled for the next twenty minutes. It was difficult to decide who should be number one, probably the B-line but D-line was faster. He thought that it was always easier when the traffic is more intense to stop thinking and act on your instincts instead. Why not offer D-line a straight in Runway 12? That should solve the conflict between them. The standard culture when working on approach control included offering short cuts and diversions from standard routes. He was sure the flight crews liked it, not that he had talked to anybody about it, he just knew. "Is runway 12 available?" one of the flight crew at D-line suddenly asked, as if reading his mind. "Stand by" he answered and started to coordinate with the Tower Controller.

The Tower Controller

"Sure no problem, straight in runway 12 is approved. We have a few CBS around but they shouldn't interfere with the final. I will fix a new met report soon, just so you know, only need to finish my late lunch first. My colleague just went down to buy a newspaper, have to do everything myself as usual" she laughed. "Are you having a barbecue tonight by the way? I have used a new sauce recipe if you're interested. Talk to you later" she finished the conversation without waiting for his answer and continued with her salad.

The D-line Captain

"OK perfect, straight in runway 12 will save us a lot of fuel. We're a bit high. Please ask approach if we could make a delaying turn to lose some height. I'll tell the passengers, the cabin crew need to hurry up, your controls."

The Approach Controller

He was just about to turn D-line for a long final runway 12 when one of the pilots asked for an extended routing. Why did they not think about that before, now there could be a conflict between the two flights approaching opposite ends of the runway. He approved the extra turn, waited and waited before turning D-line back towards final for Runway 12. The aircraft turned very slowly, reduced speed so much that it almost stopped. "Descend to 2000 feet and keep the speed up, you're number one". The aircraft would join final inside 6 miles from touch down but at least it would probably not be in conflict with B-line. D-line did increase the speed.

The Tower Controller

She finished her salad and sat down in front of the computer intending to write the new weather report. Following the heavy rain a few minutes ago she noticed that the wind had increased, it was now almost 20 knots from North West. She started typing but stopped. Better inform approach. She pressed the intercom button while she discreetly held back an imminent and unexpected burp.

The Approach Controller

"Turn right heading 090, cleared approach runway 12."

"Tower wait I have traffic." The aircraft read back and turned towards five miles final. "Tower what did you say? OK I will give him the new wind. OK, thanks."

"D-line, the wind has increased, new wind 310 degrees 18 knots".

The D-line Captain

He turned right towards final for Runway 12, they were still well above the glide path, with gear down and flaps 3 selected. The speed was still too high, flaps all the way he requested; and take care of the EGPWS warning he quickly added in a friendly way. The Approach Controller called, the wind had increased; no problem he told the first officer, I landed here before you were born, the runway is long enough. They continued the approach, were told to contact the Tower and got visual contact with the runway straight ahead, how he loved coming home to Angel's town. Passing 500 feet the aircraft was still not properly stabilised but he had full control and had been cleared to land with speed OK. Passing the threshold, twenty, ten, the metallic voice was too loud he thought, still not on the ground, they finally touched down almost half way down the runway, full reverse selected, the auto brakes started working.

The Tower Controller

The aircraft almost didn't land; finally it did and started braking. She had observed the same situation before, you think the aircraft will not stop before the end of the runway but it always does. She was very surprised when it almost stopped but then continued slowly off the paved surface and onto the grass area beyond. Perhaps better postpone the trial of my new barbecue sauce she thought as she pressed the alarm button.

Case Study Comment 1

by Dragan Milanovski



Could it be complicated to land an aircraft safely?

Well, we all know that although it might be complicated to land an aircraft safely, it is achievable with rare exceptions. This case study describes one of these exceptions, where a landing aircraft failed to stop before reaching the end of the runway.

Dragan Milanovski

is ATC training expert at the EUROCONTROL Institute of Air Navigation Services in Luxembourg.

Most of his operational experience comes from Skopje ACC where he worked for a number of years on different operational posts.

Now, his day-to-day work involves ATC training design as well as Initial Training delivery for Maastricht UAC.

The D-Line crew was returning to An-gel's Town, which was a familiar place to them, on a lovely summer evening where the weather seemed to be perfect for barbecuing. It all started when the captain accepted the first officer's suggestion to ask for straight-in approach runway 12. If it wasn't for the first officer's idea it would have probably been suggested by the approach controller. Pilots ask for shortcuts / directs / straight-ins on a daily basis. Controllers' standard practice includes offering shortcuts and diversions from standard routes especially when this helps solving conflicts and improves sequencing. Overall, it leads to fuel saving and more efficient utilisation of airspace. I don't think that it was a factor in this case.

One might argue that the approach controller was not busy and was not focused on handling the traffic (lovely colleague with good sense for humour; reading a newspaper when in position; thinking about the conference) and he had too much time to think about the two aircraft he was controlling. If the traffic was busy he might have had to deny the pilot's request for straight-in approach runway 12. Maybe... we will never know.

The captain was aware that the aircraft was a bit high and that he would need to do something about it and so he asked for delaying turn. However, this was not the approach controller's expectation; he was trying to get the D-Line out of the way of another aircraft; so he decided to put on some extra pressure by asking the D-Line captain to keep the speed up. It is important to mention here that the complexity of human relations could also have played a significant role. I am guessing that the captain was probably thinking that the controller had done him a favour by approving the straight-in approach and he needed to keep the speed up in return. He did not know exactly what speed was required to solve the problem nor for how long he needed to maintain it. In these circumstances, the captain will probably "stretch it" to the maximum, hoping not to disappoint the guy who did not think twice before approving his

request, when that might not be absolutely necessary, or at least not necessary all the time or at such high speed. Specifying the speed and the limit is usually a better solution. Nevertheless, I think the controller acted according to the standard culture like every other controller on any other day... so far.

Then the vectoring for approach was done under pressure to shorten the D-Line's track distance and the aircraft joined final inside 6 miles from touch down. Although this is not recommended, it is also one of these things that happens almost daily and usually they end safely. The approach controller failed to recognise that there were too many factors working hand-in-hand and maybe vectoring inside 6 miles to intercept the glide path from above was not a good idea on this occasion. Bearing in mind that they never discussed runway excursions at work and that he did not know the magnitude of the problem, this is not a surprise.

In the meantime, the surface wind changed significantly. When the captain was informed about the new wind, he did not react at all; his mind was set and committed on landing the aircraft. The first officer's call that the wind had increased was dismissed relatively easily by the captain who intimidated the first officer (I landed here before you were born). It also looks like the crew was not

aware of the recent heavy rain and the fact that the runway was wet and probably contaminated with standing water. Although the tower controller was a bit late with fixing the new met report, the information about the wind change did reach the crew in time. Can we blame "her new barbecue sauce" for keeping her thoughts elsewhere? No, I do not think so. It was business as usual I would say. It is normal to think of other things when you are sitting in a position with low (or no) traffic. Eating her lunch while working, well – I would not do it. I like to enjoy my lunches.

The aircraft touched down almost half way down the runway (beyond the normal touchdown zone) with significant tailwind (excessive ground speed) on a wet runway and probably contaminated

with standing water (reduced breaking action). Failing to stop at the end was the likely outcome.

Why? What made the difference this time?

It seems that this is another story where everybody involved was doing what they usually do. There were several major and few minor factors (mentioned above) that were contributing to each other and all were working in the same "direction". There were many chances to alter the outcome of this event by taking a different course of action, but it did not happen. The last and most crucial took place when the captain decided to continue approach after passing 500 feet above ground level with his aircraft still not properly stabilised on approach. He should have decided to go around

at that point. The D-Line company will have to do some work on strict enforcement of stabilised approach criteria.

RECOMMENDATION

The ATC establishment in this story needs to increase the awareness of runway excursions, as well as awareness of control actions which can contribute to unstabilised approaches. I recommend a small training package comprising of all the main and contributing factors, with a few case studies that illustrate typical scenarios alongside the associated risk mitigation techniques, to be included in the refresher training for air traffic controllers. 

Case Study Comment 2 by Captain Ed Pooley

The outcome here could have been a lot worse, just a little bit faster off the end and a few obstacles and you have a potentially fatal accident...

What can we learn from it? The scenario is not unusual – all the actors are doing what they normally do with a universally relaxed approach on a day when all the equipment is working normally and the weather is nothing special. The controllers are reading the paper or letting their minds wander a little and the flight crew talking 'intently' about one of the two favourite routine concerns of all flight crew – rosters (the other is crew meals!). All the players were in 'underload' – which can be as risky as the more complained-about 'overload' and experience has shown this. It is just these circumstances where complacency easily creeps in and

bad habits which normally have no effect, are ready to line up and create a potential accident and then help ensure that it becomes one.

Let's start by commenting on the end-game. The air hostess (with that title, our author is either betraying his years or watching too many old films!) started her arrival PA prematurely, before the aircraft has cleared the landing runway. She switched too early from her primary safety role to her secondary 'customer service' role. Not difficult to do really insofar as the safety role of cabin crew is rarely called for despite often being of

crucial importance when it is. We don't know if this arose from a breach of D-Line SOP or whether they had failed to specify or train the right



Captain Ed Pooley

is an experienced airline pilot who for many years also held the post of Head of Safety for a large short haul airline operation.

He now works as an independent air safety adviser for a range of clients and is currently acting as Validation Manager for SKYbrary.





Case Study Comment 2 (cont'd)

► ► timing of the post-landing change of role emphasis, but either way this needs fixing for the day when the outcome is less benign...

Now to the developing accident scenario. Flight crew these days are pre-programmed to carefully consider opportunities to get to their destinations as quickly as possible while also using the least possible fuel. The days of automatically maintaining maximum speed are gone - fuel use considerations must also be taken into account and there are typically also automatic maximum speeds below FL 100 even before ATC step in with specific speed control. Finally, stabilised approach 'gates' must be passed with recommended and ultimately fixed aircraft state conditions met in order to continue. So the main thing the crews look for is a shortened routing as offered on this occasion by the helpful approach controller – even before the captain had asked for it!

The actual scenario – a judgement call for ATC about whether it would work if the approaching B-Line and D-Line were sufficiently far apart for them to approach and land using opposite directions of the same runway. The decision to go for this option was based upon some unverified assumptions about the groundspeed and tracks of the two aircraft. Having decided that it was unnecessary to place any spe-

cific conditions on the D-Line straight in clearance, the Approach Controller then acceded to the request for a track miles increase rather than review the initial straight in clearance. He decided that it would 'probably' not be in conflict with B-Line...

Of course, pilots are often their own worst enemies. By nature and training they are can-do people who sometimes temporarily vacate the middle ground between the extreme version of 'can-do' and the extreme version of 'overcautious'. Like ATC, the captain is determined to keep to the original plan – it would be a shame to add ten minutes to the flight time when it simply wasn't necessary to do so.

Neither ATC nor the captain considered in advance the possibility of wind velocity variations during the approach, given the Cbs in the vicinity and a wind already close to the maximum allowable tailwind limitation. And when the updated wind was passed on, with the aircraft already above the ILS glideslope and the prospect of an EGPWS activation growing, the fact that the tailwind component was now well outside landing limits was either positively ignored or just passively overlooked by both pilots. Finally, the mandatory 500 ft stabilised approach criteria were consciously

breached by a captain fully overconfident about his skills without even a comment from the 'monitoring pilot'. Of course, such interventions against the flight deck 'authority gradient' are never easy - but it is every operator's job to make sure that they can, and do, happen whenever the need arises and that critical SOPs, such as stabilised approach gate criteria, are never breached.

RECOMMENDATION

ATC helped set up this accident but, as is usually the case in human factors scenarios, the flight crew caused it. Taken together, the poor decision making and ineffective teamwork on the flight deck and the blatant disregard for stabilised approach criteria are unlikely to be a one-off in D-Line. Either the existing flight operations manager has failed to find ways of keeping themselves informed about what's really happening on the line, or they were aware and tacitly condoned it. Either way, they are clearly past their 'sell by' date and should be replaced by somebody capable of improving the prevailing flight operations culture in D-Line - and who will have a mandate to do this from the D-Line accountable manager.



Alexander Krastev

works at EUROCONTROL as an operational safety expert. He has more than 15 years' experience as a licensed TWR/ACC controller and ATM expert. Alexander is the content manager of SKYbrary.

Case Study Comment 3 by Alexander Krastev

The factor that played a primary role in this RE incident is the decision taken by the APP controller to permit opposite direction approaches...



Although not a standard practice, opposite direction approaches have for years been an operational practice at many airports. Such approaches were not an exception during my TWR controller years. However, the incident statistics at our ATC unit clearly showed that opposite direction approaches led more often to incidents of more severe consequences. The development and implementation of dedicated procedures did not change the level of risk significantly. Opposite direction approaches require very high precision of planning and acting both on the ground (by APP controller) and on board (by pilots). Even a small deviation from the estimates can dramatically complicate the situation. There is very little time to react and quite limited options to resolve the dangerous situation. That is exactly what happened in this story. The APP controller's plan collapsed when the D-line pilot asked permission for a delaying turn.

The flight crew contributed to the primary trigger of this chain of events – the decision for opposite direction approaches - by giving the 'final push' to the APP controller. Despite being aware that the aircraft was "a bit high" for a straight-in-approach to RWY 12 the captain agreed to the FO suggestion. Moreover, one could argue that the APP controller was misled by the crew because at the time the FO asked the permission, the crew were aware of the need to extend the approach to lose height. Such a hypothesis stands on the fact that the crew asked for the extension immediately after getting the permission for straight in RWY 12.

The next important stage where the sequence of events leading to the incident could have been broken was the decision point for the APP controller whether or not to clear the D-line for a delay turn. Without proper assessment of the situation and the potential consequences, the APP controller issued

the clearance. This way the initial plan to use opposite runways for landing in order to provide optimum flight paths to both arriving flights has quickly turned into a fast developing situation beyond the chances for effective control by ATC. Perhaps physiologists and human factors experts could tell us what the chance of recognising a failed plan at an early stage is, but I will not bet my dinner on it.

The snowball effect of the flawed decision should not come as a surprise to any experienced controller or pilot:

- Stress in the cockpit owing to the speed restriction late into the approach and late final joining. These are typical contributors to unstabilised approach.
- Stress in the APP and TWR caused by the unexpected increase in wind speed and the uncertainty about the outcome of this non-routine situation.

The captain's decision to disregard the EGPWS warning and to continue approach despite the aircraft position in relation to the glide path (well above) and the high tail wind component (perhaps exceeding the limits set in the AOM/SOP) made the situation worse and the unwanted outcome almost sure. Instead of going round, he decided to land. The unstabilised approach supplemented by inadequate assessment of the situation and captain's overdone self-confidence led to a long overshoot on landing and eventually runway excursion.

One should not overlook the contributions of the TWR controller and the FO to the incident. The complacency displayed by the TWR controller who put lunch higher than the professional obligations in her priority list (I could hardly believe this can happen in reality) led to late notification of the APP controller and the crew of the increased wind speed. The FO did

not question any of the decisions and actions of the pilot-in-command. This could be explained by his failure to follow the SOPs or by organisational factors, such as lack of or inadequate CRM, inadequate SOPs or even an organisational culture which tolerates high risk inducing behaviour.

There were a number of other risk contributing factors that, in my view, did not play a role in this particular event, but are important precursors which should be acted upon by management and staff responsible for safety in an organisation, notably:

- Distraction – displayed by the APP controller who was reading a newspaper at his working position
- Unsafe practices at organisational level – tolerating reading newspapers in ops room and 'single man' operation in the TWR (may be in breach of the operational procedures).

RECOMMENDATION

How could such incidents be prevented from happening? Opposite direction approaches should not be permitted unless the concerned flights are separated by a safe time/distance calculated on the basis of the difference between the estimated times of landing of the concerned flights. □