Friday the 13th Is on a Thursday

By Bengt Collin

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The Controller

It was Thursday lunch-time and he felt terrible. It felt like a cold, misty Monday morning in the winter; the first day after the vacation, back from two wonderful weeks in southern France; ten months to his next leave. He was on his way to work at the control centre, it started raining.

He began thinking about unimportant details, sometimes it irritated him but not now, he thought about the weekly information meetings at the centre called Monday meetings; not that they were arranged on Mondays, in fact they were never arranged on Mondays nowadays; someone had explained to him that in the beginning they were and the name stayed. Then he thought about Friday the 13th; why is Friday the 13th on a Friday and not on a Thursday?

Why am I focusing on these details; I should start focussing on more important things, a healthier life for example; I will definitely start jogging tomorrow.

The Private Pilot

The woman sitting next to him in his car was beautiful. Slim, dark hair to her shoulders, she was wearing an elegant, smart dress - Kenzo?

He had been dating her for just over two months now; at their very first date he told her about him being a private pilot; it was true, but trying desperately to impress her he overlooked the fact that he actually only had very limited experience in flying. He had got his licence a year ago and being extremely busy at his job he was at the minimum hours to keep the licence valid.

Today they were going to fly for an hour or so, the weather being nice, and at least he had the basic knowledge in handling a PA28.

The Captain B-Jet 3158

She had always loved flying. Now with six months experience as a captain it was even better; she worked with her favourite hobby, fantastic. The passengers often mistook her for a cabin attendant, she was a smart, tall, professional woman in her best years (some women always are); she thought about the airline she worked for in the same way, she was very loyal. The work was hard, really hard, but she never complained, why should she? This was what she had always wanted, she was young and healthy like the rest of her colleagues; they were like a big family.

The only blot on the landscape was from the competitor airline her company had bought recently; the merger between the two airlines' pilots had not been without problems to say the least. They could not in the short term survive without the other pilots, but they were used to a slower pace in doing things, very irritating; probably that's why they almost went bankrupt, she thought as she prepared the fourth leg of the day.

Her first officer, a man with some fifteen more years flying experience than her, was a nightmare; he kept talking about either:

A. When he was a fighter pilot (World War II she thought), or

B. The good old days in his previous job.

Either way it made her feel annoyed; 25 minutes turn-around was the maximum allowed; now they were late because the first officer just did not do things fast enough.

The Controller

Normally the traffic in the afternoon slowed down only marginally before increasing again in the evening, this afternoon being no exception. The supervisor closed down two of the terminal sectors; he was now in charge of a larger area than usual but this was the normal practice at this time of the day; he did not think about it – and others needed to eat, did they not? Besides, he thought, he was one of the best approach controllers in the centre and definitely did not need to ask anyone for help; no way, he never did.

He had five aircraft on the frequency but few conflicts; four were inbound, number one and two from one airline (A-Jet), the two last from another airline (B-Jet), one aircraft just departed (C-Jet), with a second departure soon to be airborne. From experience he knew that the first departure probably had to level out at around FL 100; he thought it was better to wait and see how things developed rather than re-clearing the pilots to a lower flight level; this was the way he had been trained, well almost anyhow; having developed his working methods further he now worked in a less strict way, allowing him to handle more traffic.

Back to Content

The Private Pilot
They departed from the small grass field and turned west. The flight was smooth and he explained what was happening during the flight for his girlfriend. He never used a map; instead he brought his new GPS, it was still in the box but no problem; it was only a short local trip in an area he knew well.

He did not file a flight plan; he did not like to talk to ATC anyway. They always spoke very fast and sometimes got irritated if he did not understand the instructions immediately. Once he had overheard a Tower Controller who in a very unfriendly way had "taught" a pilot who had obviously made a mistake; he would never call the Tower for sure, he did not like controllers.

The Captain B-Jet 3158
It was as soon as they got airborne, she asked for a direct route. They were twenty minutes late and she felt it was her personal responsibility to be on time. The relationship with the first officer was a bit "chilly", he obviously felt her getting irritated even if she did not say anything directly to him, she was far too professional to do that. They started descent a bit late, no problem; she instructed the first officer to keep a higher speed than normal during the descent, that would save a minute or two.

The Controller
"I knew this would happen," he thought as the first departure climbed towards the south west. The first two inbound aircraft would pass well ahead of the outbound aircraft, but he needed to re clear inbound number three, B-Jet 3158 and the first outbound aircraft, C-Jet 1582. The tower controller contacted him on the intercom:

TWR:
Do you know what is in the southern part of my control zone? It is moving west and blocking my departures. He saw the symbol on the screen moving west, it did not have a transponder on, it was definitely an aircraft; what was it doing there?

APP:
Haven't seen it before, can you see it from the tower?

TWR:
It's a PA28. I guess it is turning south now

APP:
Wait, just a second. C-Jet 1582 stop climb flight level 100

C-Jet:
Stopping climb at flight level 100 C-Jet 1582

APP:
B-Jet 3158 stop descent flight level 110, traffic below

B-Jet:
Stopping descent level110 B-Jet3518

APP:
TWR, I will follow it on radar and see where it lands

TWR:
OK, thanks, are you joining us tonight for…

APP:
Sorry mate, I am on my own, need to work...

TWR:
See you.

The Private Pilot
Everything went very well, they talked, he told her his great joke about having some pork, she laughed, he was happy, the sun was shining; "Wow a jet aircraft that close," she said; the departure was passing well above them; instinctively he knew he was too far north, he discretely turned left, south away from the big airport.

The Captain B-Jet 3158
They were doing 270 knots indicated during the descent, 240 was the published speed but what the heck, ATC won't care, they never did.

APP:
B-Jet 3158 stop descent flight level 110, traffic below

B-Jet 3518:
Stopping descent level110 B-Jet3518.
"Was that for us?" the first officer asked. The captain did not answer, he asked again, they were level 120 descending with high speed; we won't be too late after all she thought, great I hate being late, "Was what for us?" she asked; if everything worked out they could even be at the gate on time.

The Controller
The third inbound aircraft, B-Jet 3158 (the first B-Jet) was fast, the distance to number two, the second A-Jet decreased rapidly. Strange, I will wait and see; this was a working method he practiced frequently, wait and see and do not overdo things, he thought controllers using belt and braces were chickens; he followed the VFR that now left the control zone and headed for the nearby grass field; he would tell the supervisor to phone the flying club.

The Captain B-Jet 3158
"TRAFFIC, TRAFFIC." The TCAS system brutally made them alert as a rabbit caught in the head lights. She checked the display, something was climbing towards them from the left, "ADJUST VERTICAL SPEED; ADJUST." "Increase the descent," she told the first officer. "CLIMB, CLIMB". Both instinctively almost at the same time initiated a climb; two seconds as long as years passed, they were in clouds…

Back to Content

By Bert Ruitenberg

Bert Ruitenberg is a TWR/APP controller, supervisor and ATC safety officer at Schiphol Airport, Amsterdam, The Netherlands. He is the Human Factors Specialist for IFATCA and also a consultant to the ICAO Flight Safety and Human Factors Programme.

In the narrative there are at least two items that correspond with the theme of this HindSight issue, i.e. "Production Pressure": the feeling of the airline captain that it was her personal responsibility to be on time, and the air traffic controller's conviction that he didn't need to ask anyone for help (ever!).

But in addition to this there are many other items that can be identified as "holes in the Swiss cheese" (cf. Reason's[3] model of accident causation). The controller was working on the first day after a vacation; the private pilot had very limited flying experience and flew only the minimum required hours to keep the licence valid. There had been an airline merger that went not without problems between the groups of pilots. The controller was working an area larger than usual, because he wanted to let his colleagues have a meal break. He had developed personal working methods that were less strict and allowed him to handle more traffic. The private pilot didn't use a map and his new GPS was still in the box; furthermore he didn't file a flight plan and didn't like to talk to ATC. The relationship between the crew on the flight deck of the airliner was "a bit chilly"; the descent was started late, and they kept a higher speed than normal during the descent. The private pilot didn't operate a transponder. The intruding VFR flight caused a distraction for the controller. There were similar callsigns of successive inbound flights. The captain in the airliner didn't notice the R/T call from the controller, and was slow to respond to the query from her first officer. The airliner crew initially chose a response that was contrary to the TCAS advisory. And this list is probably not even exhaustive…

According to the theory, the event could have been prevented by plugging any of the holes in the layers of the Reason trajectory. Bear in mind though that some of the holes identified above may actually belong in the same layer of the Reason model, so it doesn't necessarily mean that each of the items mentioned carries the same weight.

My challenge is to come up with one single safety recommendation for this case, and I'll restrict myself to the ATC environment for it. Although it would be tempting to say that the presence of a second controller (to assist the first one) would solve everything, this is probably not the best solution for there is no guarantee that this second person would catch the wrong read-back. Neither can it be assumed that such a second person would be handling the coordination with the Tower – it all depends on the task distribution in a 2-person set-up. My recommendation therefore is to integrate multi-antenna Direction Finding equipment on the radar screens that would present the controller with a graphical indication of which station is transmitting at a given time (e.g. with crossing lines over the target). This would increase the chance of a controller detecting a read-back by an incorrect station, regardless of the presence of another alert controller at his side.

[3] *A brief explanation of the Swiss cheese model may be found at http://www.skybrary.aero/index.php/James_Reason_HF_Model*

Back to Content

By Alexander Krastev

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The incident described in "Friday the 13th is on a Thursday" is a typical example of an incident caused by failed air-ground communication.

The direct cause for the loss of separation between B-Jet 3158 (descending to land) and C-Jet 1582 (climbing out) was the failure of B-Jet 3158 to follow the ATC clearance to stop its descent at FL 110. There are numerous causal and contributory factors which lead to this outcome. In my view the most important are:

- **The call-sign confusion**

B-Jet 3518 took incorrectly the clearance issued to B-Jet 3158. This is a classical example of call-sign similarity, which should have been acted upon in advance. [Since both aircraft were operated by B-jet, it should have been possible to detect and eliminate this obvious source of confusion. Studies have shown that the majority of call sign confusions are between flights operated by the same company. Ed.]

- **The hear-back error**

The APP controller did not pick up the different call-sign in the pilot's reply. Several factors lead to this error: the distraction caused by the airspace infringement (the APP controller did not monitor the developing unsafe situation); the overconfidence of the APP controller in his ability to manage traffic in a larger volume of airspace "than normal" and the reactive mode of air traffic control practiced by him ("wait and see how things develop"). Instead of acting on the threats, the APP controller is waiting for undesired states to develop.

- **The Captain of B-Jet 3158**, being responsible for the communication with the ground as PNF did not hear the ATC clearance. She was distracted from her pilot and pilot-in-command duties by the fixation on the on-time arrival, for which she felt personally responsible. Apparently production pressure is an important factor in the cockpit too. This and her negative attitude to the first officer prevented her from paying attention to the first officer's warning ("Was that for us?") and from taking timely action to clarify the issue with the APP controller.

Aggravating factors for the severity of the outcome were the higher descent speed and the incorrect interpretation of the RA by the captain of B-Jet 3158.

Actually, the loss of separation discussed above might have been the second in a row involving the climbing out aircraft - C-Jet 1582 as it passed very close to the infringing aircraft – PA 28. This (potential) loss of separation was not detected by the commercial flight, nor by the ATC as the PA28 did not have a transponder on. Such occurrences caused by airspace infringement are of highest severity because the aircraft pass each other in an uncontrolled way. TCAS is useless (needs altitude reporting transponder) and visual avoidance is ineffective in IFR/VFR flight encounter. Again, numerous factors "helped" the private plot enter the CTR without clearance:limited experience and pilot skills; lack of pre-flight preparation, no map on board; GPS not switched on (but overreliance on GPS is often misleading); overconfidence; distraction; negative attitude towards ATC (often mutual). These and many more factors have been identified and analysed in the course of the Airspace Infringement Initiative. It delivered a comprehensive set of risk reduction recommendations consolidated in an action plan(http://www.eurocontrol.int/safety/public/standard_page/Airspace_Infringement_Initiative_Actionplan.html).

A dozen recommendations to both controllers and flight crews can be derived from the analysis of this incident, but one of the most important for this particular case appears to be the prevention of call-sign confusion through correct application of read-back and hear-back procedures.

By Captain Ed Pooley

Captain Pooley is an experienced airline Captain 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 consultant and is currently acting as Validation Manager for the safety web-site - SKYbrary.

What a plausible – and typical – scenario! At the outset, every player carries their unknown-to-others personal 'baggage' with them as they go about their often demanding jobs or, in the case of our typically under-cautious private pilot, a leisure activity which can directly impact the safety of the others!

The scenario provided has all three players exhibiting 'individualism' in their performance. All of them also exhibit a certain deficiency in either self-awareness or the potential for other peoples' perspectives to be different. A series of actions and decisions involving all three of our players begins to build towards a potentially dangerous situation in which 'production pressure' is gratuitously increased by the sum of their actions. Fortunately, when 'it' happens, a more serious outcome is averted by the correct use of the available safety net - TCAS - by the flight crew who, at last, work as an integrated team for some critical moments.

It's worth taking a look at the constituent behaviours which we can see have a bearing on this build-up.

First the Private Pilot: Given his relative lack of experience and flying recency, he figured that it was good to be flying an aircraft he was familiar with in an environment he was also familiar with in ideal VFR weather. But he was also displaying the beginnings of complacency. He did not think a map - or map-reading ability - were relevant and he seems to have acquired the view that a GPS, in or out of a box, could be considered relevant to his intended VFR navigation. He also appears to have allowed past experience of 'unfriendly' ATC to affect his judgement on the value of keeping at least a listening watch so that what, in this case, was effectively a basic safety net against airspace infringement was lost. Of course, the presence of his passenger removed any possibility, probably remote in the first place, that he would admit his navigation error to ATC. Self-awareness of the implications of his decision-making is lacking

Next the Controller: A can-do man as many controllers are, he had allowed his task familiarity to breed a little bit of over-confidence or complacency which in turn had fuelled an 'independent approach' to maximising the capacity and efficiency of his sector. He was in no doubt that his liaison with TWR about the infringement was not going to interfere with his assigned sector control task. After all he knew not to spend any more time on this 'diversion' than was strictly necessary. But being firmly in his relaxed comfort zone, he failed to pick up the incorrect read-back from a very similar call sign and then failed to spot the conflict developing so that TCAS was all that was left. Again, there is a lack of self-awareness of the implications of his style. Had he been more attentive, the read-back error would have been neutralised quickly and normal standards would have been maintained.

Finally the Captain: Unfortunately, her obvious enthusiasm for her job is accompanied by evidence of an underlying and fundamental lack of ability to carry out flight management and to exercise leadership in an appropriately balanced way. She is keen to support the customer-focused on-time goal - but this consideration is not applied as an input to judgements about overall operational safety, which would surely not be much in dispute as the highest level goal. This poor tactical judgement extends to intentional disregard for ATC speed control too - and a failure to maintain situational awareness using the general pattern of R/T exchanges on the frequency or to ask ATC should any doubt exist on the intended recipient of an ATC instruction. Tunnel vision towards the on-time imperative has set in. There is a second very important problem area too. She shows little understanding of the fact that getting the best out of a particular co-pilot may require any one of a range of different approaches, none of which involve being irritated whether or not this is apparent to the other pilot and all of which start at the crew report point for the day's duty. In short, she exhibits a very basic lack of understanding of all the underlying principles of CRM as a means to deliver the real strengths of team working instead of the weakness of undue individuality.

We can observe that whilst the pilots eventually acted together to save the day, the Captain was at the centre of the error chain because of her style of command. So it's not difficult to make what I think is the key safety improvement recommendation here: **The process of selection and initial training for new Captains at B-jet needs a complete overhaul**. Selection and training are closely connected. Successful selection assumes that the training process is capable of delivering new Captains to their first line flying positions in a 'condition' which embraces the fundamental priority of the appointment. Having passed the necessary tests of technical competence, promotion to command also means being equipped so as never to lose sight of the need to bring informed flight management - and the prioritisation which goes with it - onto the flight deck on every trip. Amongst other things, this requires that the concept of CRM be actively embraced.

By Dragan Milanovski

Dragan 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.

All the parties involved in this story seem to have contributed to the event in one way or another. Did someone play the crucial role, or was it just a Friday the 13th on a Thursday when everybody has a bad day?

The young captain still has a few things to learn, not about flying, but how effectively to lead a team. Did she ever try to understand the first officer? Why was he always talking about old times? Maybe he felt more comfortable and/or more confident in his old job. Why?

He was not doing things fast enough. Maybe, he was making sure he did not make an embarrassing mistake (younger captain), or maybe he just thought that was the right way of doing things (culture). Did she say or do anything about his speed? If the speed was really a problem, did she try to help (lead by example or coach)?

Instead, the captain felt irritated, annoyed and blamed the first officer for the delay ("chilly" relationship). On top of that she decided to "bend" the rules a bit (higher speed) while setting her mind on the arrival time. In this state, I can understand why she was not ready to perceive what the first officer was saying, nor ready for the fast change required in the situation.

The poor controller must have been wondering in despair – "What happened? I issued the clearance in time and got the readback correct". Clearly, he could say: "It was the pilot's fault". Little did he know that he played an important role by using the "wait and see" technique. There are several risks associated with this technique, two of which were significant in this situation: distraction leads to a late re-clearance and fast change required from the pilots.

The first action that could have changed the chain of events was when the controller, based on his experience, could see a level off at FL 100 and still decided to continue and wait. The "wait and see" technique works as expected most of the time and it does not require any action, even when it is obvious that there is a very little chance it will work, we keep pushing it to the very end (the hope dies last).

Later he decided to let a relatively unimportant distraction in (VFR flight in the control zone). I must say he did well with the phone call and kept it short. Having promised to monitor the progress of the flight, at that point he could have also stopped the "wait and see" immediately and issued the required instructions. Then another "wait and see" with the number two catching up the number one in sequence… Nevertheless, it was not too late and he still managed to issue the instructions in time. On most other days it would have been good enough and nothing would have happened, but this was not an ordinary day.

Despite all the temptations, my recommendation goes to the controllers using the "wait and see" technique: Before you use it in the future, check the date first, maybe it is Friday the 13th on a Thursday. Stick to the techniques you learned in training and use the experience to build upon. Learn how to use the belt and braces in an efficient way.

How about the private pilot? Having spent many years on different airfields, I saw similar things happening on many occasions. My advice to this guy would be to fill in a flight plan and talk to the ATC, women are more likely to be impressed then. Although, in my time they were not wearing smart Kenzo dresses, or was I on a wrong airfield?