Case Study Comment 4 by Anita Đuretić Bartolović

This story is a great example of how the aviation system is formed and affected by various expectations from various domains.

Even though, at first glance, it appears that the incident was caused by objective circumstances - adverse weather, inoperative ILS, strong wind, a politician's decision on noise abatement and runway configuration – careful reading reveals circumstances that are related to the manner in which the controllers performed their tasks. And not in the professional sense of the word, I would say, rather in the human sense. Their behaviour reveals that they too are human, with their attitudes, thoughts, and feelings. In this case, I would say that the contributing factors to the incident are largely in the realm of human factors - especially the team-related aspects.

Let us start with a few words about the objective circumstances which must not be overlooked in this type of review. The first factor is the winter weather with all its characteristics – grey skies, the cold, low clouds, snow, wind. Adverse weather is always a signal, to controllers and pilots alike, to increase alertness and attention and to be more vigilant.

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Additionally, the ILS at the cargo airport was out of service, so cargo aircraft were being re-routed to the international airport, thereby increasing workload in the international tower. For the An-124 pilots and the business jet pilots alike, it was their very first landing at that airport, a fact which should have been considered by the controllers, but also by the pilots.

The situation where the runway configuration had been changed four times and where take offs and landings were being performed in a manner conflicting with the standards of the profession due to a political decision, created additional load for the controllers because it required them to operate outside their normal routine.

The Approach controller concluded that "the wind situation was a bit strange", yet she disregarded it and – at least in her thoughts and actions – she did not give it much attention but carried on with her tasks because she believed in her ability to handle the situation. The Approach controller saw the problem of the rapidly decreasing distance between the An-124 and the business jet, but she was preoccupied with her reflections on why it was happening, and did not inform the Tower controller about it. From the conversation with the pilot, she understood that the pilots were busy and their workload was high, but she still did not ask any questions nor did she offer any assistance. Maybe they couldn't find the charts they wanted - they asked for the ILS frequency – they had never landed there before and they had tailwind. As the distance between the business jet and the preceding aircraft was decreasing, she assumed that the Tower controller would be able to handle it, but she was not certain. Despite that, she neither contacted him nor warned him of the insufficient distance problem and of the potential difficulties that the business jet pilot was experiencing. This in turn caused problems to the Tower controller, who found himself under heavy load.

Finally, stress was also a factor contributing to the error – the excessive workload on the Tower controller as three things happened simultaneously: the business jet approaching at very high speed, the fact that it was two miles behind the preceding traffic and still had not contacted the Tower, and the information received after a take-off clearance had already been issued to an aircraft on the ground that the An-124's wing was still over the runway. All this caused severe stress to the controller, and the incident happened.

Although a part of the above explanation is already related to human factors, one of the biggest problems that occurred is the communication problem, specifically the lack of communication and poor communication. The law of human communication states that non-communication is impos-

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sible - we even communicate by being absent. When I call a colleague on the phone, I verbally transmit a piece of information to him/her, thereby helping him/her, but myself as well, because I am sharing important information. If I do not call the colleague on the phone, I also transmit information, but since there is no verbal mode of operation, such information is more prone to interpretation – it is neither reliable nor certain, as the colleague does not in fact know why I am not calling. If I have an important piece of information and I do not forward it, but I instead believe, maintain or am certain that the colleague can manage without it, then it is detrimental to both me and the colleague. This is precisely what happened in the case in question. The International Tower controller had his hands full with both arrivals and departures and did not communicate with the Approach controller because he completely trusted her to be doing her job professionally as she always did. The Approach controller was thinking the same way.

I suppose that her not contacting the colleague was caused by over-reliance on his capabilities, without verification. This, of course, also leads to error - just as overconfidence does. When we are not completely certain, we take things for granted, and the assumption leads to error. There was no communication between the two colleagues from different positions as both of them believed that they were performing their own tasks in a professional manner and that they could handle complex situations. They thought that coordination was not required. Yet this time, it appears to have been more than required. Each controller worked independently, forgetting about the team, teamwork and coordination.

What must not be overlooked in this case is the pilot-controller communication, which was also deficient. The pilots of both the An-124 and the business jet were new to the airport, they had never been there before, and they did not ask much. The controllers did not ask questions either, nor did they initiate communication, especially the Approach controller. Instead of requesting verbal information on what was going on in the business jet's cockpit, the controller made conclusions based on para-verbal communication, which was equal to taking a guess. From the para-verbal signals in the pilot's voice (the tone of his voice, pitch, volume) she concluded that both pilots in the aircraft were very busy and that the workload was high. When we monitor non-verbal and para-verbal signs in communication, we do not aim at reading thoughts but at understanding behaviour. Para-verbal and non-verbal communications are even more prone to misuse and misinterpretation than verbal communication. Since radio communication is in question here, the interpretation of information is limited to voice characteristics because one cannot see the person and has no other non-verbal signals – such as facial expressions, gestures etc. – and verbal communication is limited by phraseology. Had the Approach controller known that verbal communication serves to convey information, and non-verbal communication to convey attitudes and emotional conditions, she would probably have communicated more in verbal mode.

A RECOMMENDATION

How can such human-factor-related errors be avoided? The CRM (Crew Resource Management) programme which has existed in airlines for years now as training in interpersonal skills and TRM (Team Resource Management) is being introduced into ATC. The aim of these programmes is to reduce errors related to poor teamwork, provide both pilots and controllers with behavioural strategies for improved communication and more successful teamwork and to enhance flight safety. The focus is on the skills required for a person to function more efficiently as a member of a team. It would also be possible to develop and introduce a training programme in interpersonal skills and teamwork enhancement for controllers and pilots together.