

“IF WHAT YOU WRITE IS CORRECT, WE MUST SHUT DOWN OUR TOWER”

In stressful situations, we often react in a way that we would not imagine.

Sebastian Daeunert provides a case study of what can happen when we are suddenly confronted with several challenging and stressful tasks.

KEY POINTS

- **Differences in understanding can create surprises.**
- **Stress affects the way that we react to situations.**
- **We need to improve the environment so that we can manage stress during sudden high workload periods.**

“If what you write is correct, we must shut down our tower.” This is what my boss said when he had read my investigation report, only to add: *“But what you write is very important. I need you to come with me to explain why we are doing this to my superiors, so they understand what we are doing here.”* I liked the way he used the word “we”. In my view he was an excellent leader.

What had happened? I had just finished a Human Factors course by Sidney Dekker. Incident reports prior to that used to finish with the sentence *“The controller recognised his mistake, apologised and promised to never do it again”*. My investigation report was an expedition into uncharted territory. This case is not recent, as you may have realised by now. And it’s not about developing a new approach to investigation.

We are back in 2011, Frankfurt International had three runways: RWY 18 for departures to the southerly directions, RWY 25 L/R for arrivals and departures to the north. One controller

worked RWY 25 L/R, the other RWY 18. Additionally, we had a coordinator, start-up controller, flight data assistant (sometimes two), and a supervisor, in the small OPS room of the old tower.

Generally, departures to southerly directions were assigned RWY 18 for departure. Pilots would sometimes ask to depart for these directions from RWY 25 as an exception. This would save taxi time when parked at the north-easterly Terminal D/E. If traffic would allow, we would grant their requests, the release being issued by the RWY 18 controller to the RWY 25 controller. However, this caused delay as these aircraft were not clear of RWY 18 departures until some distance had been flown.

At the time of the incident, three aircraft had been released by the RWY 18 controller in this way. During that time, he would hold his departures as they would conflict with the “exceptions”. Shortly after issuing the release, the RWY 18 controller was relieved by a colleague. The controller told his relief that there were two “exceptions

pending”. During the handover briefing, the first of these three aircraft passed by in front of the tower window. The controller handing over his position was, of course, referring to the two pending aircraft. However, the controller taking over position interpreted that the first of these two aircraft had just passed by.

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When the next “exception” passed, she issued the take-off clearance to her RWY 18 departure. As the aircraft started to roll, the third “exception” went airborne from RWY 25. The two aircraft missed each other by 1/2 NM, same altitude. Both had been sent to different frequencies, so there was nothing to do except warn the next sectors, hoping they could fix the problem. However, the RWY 18 controller pushed the wrong button on her intercom and warned the wrong sector.

When the controllers were later interviewed, it was not clear whether the off-going controller had told his replacement that *“there are two more exceptions”* or if the incoming controller understood *“there are two exceptions”*.

Abflug Departures Terminal 2

Rewind

Let's go back before the incident. None of the aircraft is released yet, and no takeover of the position has been executed. Earlier that morning, all the supervisors had left the tower to attend a supervisor meeting. One of their topics was the controversial new feature concerning digital labelling on the keys of the intercom, used during emergency situations. The positions of the adjacent centre sectors had been renamed from DEPSouth and DEPNorth to official designations DFANT and DFANB. The abbreviations were unfamiliar to most tower controllers. The touch pad was now labelled with nine new designators.

Supervisors in the tower are responsible for traffic management, issuing capacity slotting if needed, among other tasks. However, it was a beautiful day – no problems. When there was no supervisor available, tasks like traffic reduction were performed by a senior controller, one of whom was present. Because nothing out of the ordinary was going on, the active supervisor decided to go downstairs and join the meeting. The senior controller was working RWY 18 but it was felt that, due to the low traffic, he could handle both.

Things were easy, and the flight data assistant (who was relieved) stayed at the position chatting with a friend. Two technicians were working near the RWY 25 controller replacing an old radio panel.

When the RWY 25 controller was relieved for his break, he took out his camera. He wanted some photos for his website, standing between the RWY 25 and RWY 18 working position. Noise in the small ops room increased, but nobody complained since traffic was low.

An hour later, things suddenly changed. Unexpected storm gusts rolled over the airport. Was it unexpected or was there no one present on the supervisory position, where things were displayed on a screen?

It was first noticed when an A340 departing from RWY 25 almost hit the airport fence as the squall caught it from its righthand northerly side, tipping its wing.

Pilots were informed about what had just happened. Heavy long-range aircraft requested RWY 25 instead of RWY 18 due to gusts, which would mean tailwind on RWY 18.

Many of them had to taxi back from RWY 18 to RWY 25, opposite to some 'Mediums' still accepting RWY 18. This was no longer an economic exception but a safety necessity, and all piled onto the radio frequency of the RWY 25 controller who had just witnessed a near accident.

Workload increased manifold in seconds, too quickly to influence the situation. The spotter was now blocking the view between the controllers needing to do coordination. No time to send technicians away as the board had been dismantled. No time for the flight data assistant to realise silence in the small room was an utmost necessity. No time for the senior controller working RWY 18 to get out of position to reduce traffic.

A natural reaction when faced with an overload situation is to solve it by focussing on the immediate task. There is no time for rearranging the surroundings.

Sure enough, questions started coming in to the RWY 18 controller about releasing those heavies from RWY 25, as they had spent time taxiing back and forth on the airport and were in urgent need to depart.

The controller on RWY 18 released three of them, while on the phone trying to arrange position relief early, so he could take over supervisor tasks to stop inbound traffic. There was no direct number to the three conference rooms. So he took the direct link to the recreation room of the controllers. Since it was break time, it took some time until someone picked up the phone.

Back in the Present

As the replacement controller aborted her break and ran up the stairs to the tower ops room, she immediately noticed the noise of many people. While a stressful situation evolves, tunnel vision can set in. We may not concentrate on the problem or pay attention to the surroundings. If you arrive as a new person on the scene, you may have a better chance to see the whole picture and notice the surroundings.

She arrived at the working position where she got a brief handover as the senior controller finally wanted to coordinate the traffic flow with the surrounding units.

She saw the departing aircraft pass in front of her, expecting one more. The senior controller did not stay behind her to check his last clearances, trusting that she had understood correctly what he had told her. His mind was firmly fixed on his new task.

He grabbed the phone at the supervisor position, as "number two" of the "exceptions" passed in front of the RWY 18 controller.

Thinking "this is number two", she took her microphone and issued the take-off clearance to her long waiting departure from RWY 18. At this moment, the third aircraft started rolling from RWY 25.

The RWY 25 controller quickly noticed what was happening and shouted across the ops room: *"You have it under control?"* This interaction was visually blocked by the 'spotter' and audibly impeded by the excessive background noise. He had no time to pursue this any further.

When the RWY 18 controller realised what was happening, she had already sent off her departure to Departure Radar. Seeing the two aircraft approaching each other, she pushed a button on the intercom to warn Departure Radar of the conflict. However, she hit the wrong one and



"Surprise: stress and overload are bad partners in solving problems."

warned the wrong sector. She had studied the new names of the intercom in her briefing documents, but had used the old label for over twenty years. This is another symptom of stress: we fall back into known patterns.

The two aircraft missed each other, coming as close as 0.5 NM on their SIDs.

What did we Learn?

Surprise: stress and overload are bad partners in solving problems. We learned about a senior controller suddenly confronted with three challenging and stressful tasks: solving the traffic puzzle, finding a replacement, and reducing traffic flow. Doing three things at a time, even if only anticipating them, distracts us from doing one thing right. Thus, he missed the proper handover of his position.

So what did we change at my old airport? We made it a rule, that either the Supervisor or Senior Controller performs only one task: Supervision. This meant restrictions in so-called "early goes" or "leave days" as the position had to be occupied by a person.

A handover/takeover checklist was created and implemented nationwide, and it was made a rule that the controller being relieved stays behind the position until all significant aircraft are processed by the replacement.

We demanded and succeeded in having the intercom relabelled to its old names, as labelling a button made no difference to the receiving end.

Private talks and activities by non-active controllers in the tower OPS room were suspended. People not needed on the flight data position (at times it was occupied by two) were to spend their time downstairs.

Technical repairs were to be coordinated with the supervisor before commencing, to be stopped at any time.

As a bonus, we printed papers drawn into plastic strip holders with the names

of the Departure Routes in large print, enough to lay one across the electronic departure data screen for each released aircraft. Once a released aircraft had passed the end of the runway, it was to be removed. Nowadays with the tower flight data processing system (TFDPS), the entire runway is coloured red, a more modern version of my plastic solution.

These actions do not prevent stress during abnormal situations, but they make it easier to focus attention on the main task of solving a sudden problem.

No, my boss did not have to close the tower, and he never intended to, but I think we proved that this method would reduce incidents in a much more effective way. Things change. These days there is a new tower, a new runway, new equipment and new problems. But the systemic method of solving problems remains effective. 



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