

# STAYING AHEAD OF THE GAME



By Michael R. Grüniger  
and Capt. Carl C. Norgren  
of Great Circle Services AG (GCS)

Zurich airport seems engaged in routine operations on a beautifully clear day. Both main take-off runways, 16 and 28, are in use. Zurich Tower clears Swiss International Airlines flight 1326, an Airbus A320, for take-off on runway 16. LX1326 switches its landing lights on and begins the take-off run. Forty (40) seconds later, Zurich Tower clears Swiss International Airlines flight 202W, also an Airbus A320, for take-off from runway 28. Runway 28 and 16 are intersecting runways.

As flight 202W reaches V1, at 135 Knots, the commander notices the converging traffic on runway 16 and immediately rejects the take-off. The flight crew of flight 1326 in the meantime continues with a normal take-off without noticing the dramatic moments on Runway 28.

The Swiss Accident Investigation Board (SAIB) investigated this serious incident and classified the risk of collision as high. Had flight 202W not noticed the converging traffic, a catastrophic collision with many fatalities would have ensued.

The investigation concluded that the main cause of this serious incident was the almost simultaneous take-off clearance to two aircraft on intersecting runways. The SAIB focussed their analysis on the role of air traffic control. No doubt the mistake by the tower controller was at the beginning of the chain of events.

The tower controller had not been provided with a monitoring system providing effective electronic collision warning. The controller was not in the position to identify his mistake in a timely manner.

One more safety barrier failed on that day. Both aircrews did not realize the mistake by the tower controller. We might wonder how two experienced crews could not have noticed the clearance issued to the other aircraft? Both aircraft were on the same Tower frequency and both received their take-off clearance within 40 seconds of each other. But neither crew took notice of this situation. They did not notice the hazardous situation which had been created and which was directly threatening them.

Luckily the captain of flight 202W kept a good look-out during the take-off roll and noticed the converging traffic on the intersecting runway. He reacted immediately and initiated a rejected take-off which saved both aeroplanes.

## Mindfulness

Almost too late, but still in time, the commander of flight 202W looked out and recognised the conflicting traffic. He perceived this critical visual clue.

However, he had been expecting a smooth take-off. In fact, expecting a routine take-off, all pilots involved did not perceive how fast the second take-off clearance had been given. Once the take-off run had begun, only a brief interval existed between the initial surprise of dis-

covering conflicting traffic and initiating a procedure to resolve the situation.

Mindfulness obviously played a key role in saving the day. Mindfulness means the combination of ongoing scrutiny of existing expectations and the capability to react to unexpected situations. In an organisational context, this definition will be extended to include the identification of new dimensions of context and ways to deal with it, and to improve foresight and current functioning. In our example though, mindfulness simply meant keeping awareness high of events unfolding outside of one's own routines.

Both flight deck crews involved were busy with their respective take-off and expected no problems, trusting ATC fully. The actual situation was obscured by this blind spot.

## Blind Spots on the Flight Deck

Blind spots develop when the attention is taken by tasks being performed. All pilots will remember occasions when they did not see a warning light. They were simply too busy to notice and did not expect to be disturbed by a system failure exactly at the very same moment in which they were busily working through checklists.

At Zurich airport runway 28 and runway 16 are the standard departure runways. For both crews it was a departure from their home base and from the standard runway configuration. The increased risk of operations on intersecting runways was their

## CLOSE-CALL

The captain of flight 202W noticed converging traffic and rejected take-off.



normal mode of operation and the increased risk of such an operating mode will eventually not be perceived as such.

Transposed to the fast-paced, multi-stimuli environment of the flight deck mindfulness requires effective task management and 'making time'. It is evident from numerous case studies of accidents that carrying out tasks associated with the landing checklist (Bournemouth, Buffalo, Schiphol), emergency drills (Everglades, Indonesia, Palmerston North), landing charts (Cali) or handling of the FMS (AF447, Cali) can take priority over monitoring tasks.

Task scheduling (e.g. carrying out normal checklist), sharing (e.g. balancing the monitoring workload and being aware when the PM has limited capacity) and shedding (e.g. prioritising tasks) must be considered as strategies to achieve and maintain mindfulness.

### Anticipation

Mindfulness allows improved situational awareness. Situation awareness leads to anticipation.

Situation awareness (SA) means appreciating all you need to know about what is going on if the full scope of your task - flying, controlling or maintaining an aircraft - is taken into account.

More specifically, in the context of complex operational environments, SA is concerned with a person's knowledge of particular task-related events and phenomena.

For example, for a fighter pilot SA means knowing about the threats and intentions of enemy forces as well as the status of his aircraft. For an air traffic controller, SA means (at least partly) knowing about current aircraft positions and flight plans and predicting future states so as to detect possible conflicts.

Therefore, in operational terms, SA means having an understanding of the current state and dynamics of a system and being able to anticipate future changes and developments.

A general definition of SA is that it is the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning and the projection of their status in the near future.

SA needs to include the following four specific pieces of information:

- extracting information from the environment;
- integrating this information with relevant internal knowledge to create a mental picture of the current situation;
- using this picture to direct further perceptual exploration in a continual perceptual cycle; and
- anticipating future events.

Taking these four elements into account, SA is defined as the continuous extraction of environmental information, the integration of this information with previous knowledge to form a coherent mental picture, and the use of that picture in directing further perception and anticipating future events.

### Expecting the Unexpected

On that routine day, both flight crews were expecting to take off smoothly from their home-base aerodrome and nobody really expected to be confronted with the unexpected. Busy with routine cockpit work, the unusually fast clearance given by the Tower controller to the second aircraft went unnoticed.

Anticipation of potential problems kicked-back in when the commander of flight 202W started looking out to see conflicting traffic. He had not lost the awareness of him and his aircraft taking-off.

His mindfulness saved the day, at the very last minute.

In conclusion, adapting a sentence by Weick and Sutcliffe, mindfulness and anticipation counteract many of the blind spots that occur when people rely too heavily on expectations of normality.



*Michael R. Grüninger is Managing Director and Capt. Carl C. Norgren is a Consultant at Great Circle Services (GCS) Safety Solutions. GCS assists in the whole range of planning and management issues, offering customized solutions to strengthen the position of a business in the aviation market. Its services include training and auditing (IS-BAO, IOSA), consultancy, manual development and process engineering. GCS can be reached at [www.gcs-safety.com](http://www.gcs-safety.com) and +41-41 460 46 60. The column Safety Sense appears regularly in BART International.*

### ERROR

A mistake by an Air Traffic Controller meant two aircraft nearly collided at Zurich Airport.