Editorial

Dear reader,

Zurich Airport wants its operations to be as safe and efficient as possible. And making this happen, together with its partner companies, is Unique’s mission under its overall operating licence.

Safety and efficiency – aren’t they incompatible? Only at first sight: efficient operations can easily be safe operations, too. When the aviation industry plans and pursues its airport processes and procedures, it always builds in certain safety margins that can be used to catch or cushion any errors, deviations or other unexpected developments. This safety margin is often hard to see, though; and it is regularly put under pressure, or even “eaten into”, in the interests of greater efficiency.

It is well possible to reduce turnaround times, cut the numbers of personnel working on a turnaround, increase taxiway or runway capacity or shorten runway occupancy times. And all these actions are sure to have a positive effect on overall efficiency. Up to the point where they are taken too far, that is. But where this limit lies, and how far it can be pushed: that’s the perennial question.

It’s a question that is centrestage in Issue 5 of our ZRH Safety Newsletter, even though it is one that cannot be answered in detail. Because the answer lies only in an active and effective dialogue among all the parties involved.

In our Safety Basics section we look at the issue of time pressure and stress. Our Case Study shows what repercussions time pressure can have on the ramp. Our Observation Notes illustrate the thin line we tread between achieving operating efficiency and eroding operational safety. And this latest issue also features a short Crossword to present flight safety in a fun and enjoyable way.

We hope that our latest ZRH Safety Newsletter can help raise everyone’s awareness that operational efficiency at Zurich may be a prerequisite for our airport’s successful operation, but that we all bear a responsibility, too, to ensure that our flight operations remain safe and accident-free.

Daniel Bircher
Safety Officer
In this section we look at a concrete example of a safety incident relating to our focus topic, describing the incident in detail and highlighting the lessons to be learned.

**Case Study**

Getting those last few bags to the flight...

**The facts in brief**
On 14 November 2008, at 05:45 local time, a Bombardier CL-600 of Northwest Airlines arriving at Detroit Metro Wayne County Airport collided with a baggage tug belonging to Delta Air Lines as it was taxiing to its gate. The aircraft suffered substantial damage, and the driver of the baggage tug sustained minor injuries. The aircraft’s crew and 17 passengers were uninjured.

**The background**
The flight had landed uneventfully on the airport’s Runway 22L. The aircraft was instructed by Ground Control to proceed via taxiways Kilo and Quebec 3 and to hold short of Taxiway Quebec. The pilots were then cleared to proceed via Taxiway Quebec from north to south to arrive at Gate C7. (Traffic here usually goes from south to north, but such clearance is given in the peripheral hours when ground traffic is light.) According to his own account, the ramp controller could see the aircraft clearly. The weather conditions at the time of the collision were: wind 170°, eight knots, fog, 7 kilometres visibility and light rain.

The baggage tug driver has started his shift at 05:15. This was the second day of a four-day block of ten-hour shifts. That morning he found that he had been assigned to “baggage running” duties. He grabbed his radio and drove to the Terminal A baggage hall to load some last-minute baggage for a Delta Air Lines flight to Atlanta (ETD 05:55). He picked up the baggage and drove it back towards Terminal B/C. In doing so he took one of the roadways between terminals A and B/C. It was dark and rainy, and he could not see any traffic along his route. But as he crossed the taxiway, he was suddenly surprised by the sound of aircraft engines. He had a glimpse of a fuselage, and then the aircraft collided with his tug.

The baggage tug impacted with the aircraft about halfway down the left wing, and ended up near the wing-to-fuselage fairing. The tug driver was ejected from the tug and lay unconscious on the tarmac for some time.

**Investigation findings**
The following factors were found to have contributed to the accident:

- The baggage tug driver had hardly arrived at work before he was required to set off and load the last-minute baggage.
- The baggage tug driver had not informed himself about the current taxiing arrangements before starting his shift.
- The Bombardier CL-600 was asked to taxi from north to south instead of the usual south-to-north arrangement.

Source: National Transportation Safety Board

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**Schematic representation.**
Conclusions
This case study illustrates two aspects of safety. First: pressure of time and the lack of an overall overview that poor weather can lead to will tend to create more favourable conditions for accidents to occur. Second: inherent system weaknesses and unfavourable design – e.g. roadways crossing taxiways – will also make incidents more likely to occur. Zurich Airport has similar design weaknesses of roadways crossing taxiways. When these conditions combine with time pressure and simply unexpected events, operational hazards may arise.

The map below shows the locations of cases in which right-of-way was not observed by vehicles meeting aircraft at roadway/taxiway crossings at Zurich Airport in 2008 and 2009.

Number of non-observances of right-of-way by vehicles meeting aircraft during push-back, taxi into or taxi out of stands.
Number of non-observances of right-of-way by vehicles meeting aircraft on taxiways.
It’s 11:00 as our aircraft taxis from its landing runway to its stand, and Zurich Airport is its usual busy self at this time of day. As we get out of the car, we are greeted by a wall of sound. The sheer noise and the wet and cold weather are enough to raise our stress levels, and simply concentrating becomes an art in itself. That’s why ear protectors are a must. Most of the aircraft around us are surrounded by more than five apron vehicles. They are performing various tasks: fuelling, toilet servicing, cleaning, providing electricity. To obtain more information on the various work processes involved, we try to talk to some of the ramp personnel. But they’re all in a hurry, and wave us away.

Just as we are about to drive off, we see the ramp coordinator. We hurry over to him and ask if he can tell us something about the turnaround process at Zurich Airport. His answer: “Everything has to be done quickly here. The Airbuses A319/320/321 and Avro RJs have turnaround times of 35 to 40 minutes. The ramp staff, the cleaners, the fuellers and the crew: everyone has to work flat out. The problem is the short turnaround times that the airlines insist on. We just have to keep to them.” Pressure of time is clearly a major turnaround issue. We decide to gain our own impressions of the turnaround process, and head off to the India 9 stand.

It’s 11:08 when an Avro RJ pulls up at India 9. The ramp staff rush to the aircraft, put on the chocks and arrange the safety cones. It’s all done in seconds. The baggage tug drivers open the cargo door to start unloading the bags. Meanwhile, the passengers disembark and get into their apron buses. At 11:11 – three minutes after parking – the cleaning vehicle arrives. By 11:15 the toilet servicing truck is attaching its hose. With the fleet of vehicles now in attendance, it all looks a little chaotic.

Deboarding is complete: the buses shut their doors and head off to the terminal. Time to give the cabin a thorough clean. The driver of the cleaning truck runs up to us and shouts, “These bus drivers: they always park so that I can’t get through. But I’ve got my work to do, too!” We smile. But we also appreciate that he’s got his timetable to keep to just as the bus drivers have. By 11:16, the cleaning team is on board. The fuelling truck is here, too, and the fuelling agent is fitting the hose to the plane. By 11:19, the toilet servicing vehicle and the baggage tugs have done their work at the aircraft and withdraw from the scene. By 11:24 the cleaning crew are also done: they race down the airstairs and get into their car. Our friend from the cleaning company gives us a quick wave. We suddenly notice that none of the cleaners are wearing ear protectors: how can they work on the apron all day like that?

By chance, we then meet the departing flight’s
first officer, who is performing his walk-around check. How does he feel about the short turnaround times at Zurich? “Everything works really well and fast here,” he replies. “That’s not always the case at other airports. The ramp people here do a great job: they’re really very professional. But I can see, of course, that they’re under a lot of time pressure.” “The people who work on the apron here also have to cope with very cramped conditions,” he continues. “When two buses pull up and one of them isn’t even half-full because it only has Business Class passengers on it, that’s pretty annoying. The space shortage this causes is serious, and it affects all the other ramp handling processes.”

11:30. The apron bus brings out the new passengers. We are amazed: the whole ramp handling process has taken less than half an hour, and the aircraft will soon be on its way again. As our first officer confirmed, everyone involved in the turnaround process does a huge amount of work in a very short time. The stress is written on their faces, though. Everyone wants to do a good job. And in all the hectic, it’s bound to happen from time to time that a regulation or a safety distance fails to be observed. This time it didn’t, and the whole handling process functioned flawlessly. The safety margin was clearly generous enough.
Conclusions
So how big is this “safety margin”? To answer that question, we need to look at the incidents and accidents that occur in our flight operations, and especially in our turnaround processes. From these investigations we can conclude, for example, that:
1. many of the people involved in incidents or accidents seem to have failed to properly assess the situation;
2. they all seem to have been performing their work under sizeable stress or time pressure;
3. distractions, not following instructions, failing to keep to prescribed work procedures and miscommunications are frequently named as factors in the accidents that occur.

The chart below shows the “causal factors” in accidents at Zurich Airport in 2008 and 2009, as cited by the persons involved.

Causal factors cited for accidents at Zurich Airport, 2008–2009

<table>
<thead>
<tr>
<th>Causal Factor</th>
<th>Number of Citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>No assistance available</td>
<td></td>
</tr>
<tr>
<td>Misread situation</td>
<td></td>
</tr>
<tr>
<td>Distraction</td>
<td></td>
</tr>
<tr>
<td>Stress/time pressure</td>
<td></td>
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<tr>
<td>Procedure not observed</td>
<td></td>
</tr>
<tr>
<td>Instructions not followed</td>
<td></td>
</tr>
<tr>
<td>Right-of-way ignored</td>
<td></td>
</tr>
<tr>
<td>Miscommunication</td>
<td></td>
</tr>
<tr>
<td>Inadequate training</td>
<td></td>
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</tbody>
</table>

Apparently obvious solutions (more space, more time, more training etc.) are certainly good starting points. But these do tend to focus on only part of the problem. The best approach is to find the right balance between safety and efficiency, and thereby ensure that the safety margin does not become too slim. It’s a balancing act; and it’s one of which we must all be constantly aware.
Stress and time pressure

General remarks
Stress is a reaction by the body to internal or external threats. It’s a response which demands strengths of us that go beyond our usual “operating” intensity; and if the causes of the stress and our response to it extend over a longer period of time, this can be damaging to our health. Stress tends to fatigue us and exhaust us and, as a result, we may fail to notice certain signals or be unable to concentrate to the required degree.

The factors that can cause stress in our ramp work at the airport include:
• time pressures
• continuous noise (such as from engines or radios)
• poor lighting
• a confusing traffic situation
• weather conditions (heavy rain, cold, heat, wind).

The signs that we are suffering from stress include:
• forgetfulness and lapses of concentration
• irritability
• hectic driving and working styles
• chronic fatigue
• making mistakes and/or poorly perceiving and assessing situations.

People are very different in their character, their behaviour and their degrees of flexibility. And it is this sheer variety that leads to certain weaknesses in the man/machine interaction. We all react in many different ways, and each have our own physical and mental limits; and if we are pushed beyond these, we will be more likely to make errors or fail to observe regulations and procedures.

Stress and time pressure: critical work situations at Zurich Airport
Aircraft land and take off at Zurich Airport in a clear and coordinated pattern. The work required to handle these movements must also be swift and well coordinated if Zurich is to remain competitive on the international airport scene. This means that ground handling, too, must be performed as quickly as possible. The work here is often very demanding, though, and requires high degrees of concentration and attention.

Time pressure is a prime and constant stress factor at Zurich Airport. And this pressure of time can cause wrong decisions to be made. In stress situations, people will tend to fall back on automated decisions, rather than thinking things through and responding to the actual situation with which they are faced. Work processes may be shortened, for example: an apron vehicle may be driven 10–15 km/h above the speed limit, or the safety distances between vehicle and aircraft may not be maintained, putting other parties in danger, too.

Stress management
Here are a few tips for reducing stress symptoms (or even preventing them developing) in our airport work and operations:
• Wear ear protectors, to reduce the permanently-high noise levels in the ramp and apron areas.
• Practise effective time management:
  – get to work in good time
  – plan enough breaks
  – make good use of these breaks.
• Familiarise yourself in good time with any changes to ramp and apron procedures, so that you won’t forget how to act and react in a stress situation.
• Communicate with everyone else involved, to avoid misunderstandings and take the right actions when required.
• Safety first! Even under time pressure, always make safety your paramount priority – and don’t be afraid to say “no” if something really can’t be done.

Further information (in German)
http://www.psychologie.ch/de/publikationen/medien/archiv_medien/deutlich_mehr_stress_am_arbeitsplatz.html

Stress check
http://www.stressnostress.ch/d/04-check/Check1/check.php
Occurrences at Zurich Airport

Highloader collides with aircraft’s cargo door
The incident occurred when a highloader was unloading a flight on Stand D06. With space tight around the aircraft, the highloader driver had to move his vehicle several times. While doing so, he failed to notice the aircraft’s open cargo door, which collided with his cab. The bottom edge of the door was dented by the impact. The damage was later repaired.

The Safety Office adds:
Routine processes and procedures should be regularly checked:
• Keep to all designated routes and maintain all distances around aircraft.
• Wait till the aircraft has come to a standstill, the chocks have been applied and the anti-collision light is off.
• Check yourself to see that all cables have been disconnected before removing equipment.

GPU cable forgotten
Three cases occurred between October 2009 and February 2010 in which the external power supply to the aircraft was not disconnected before the ground power unit (GPU) was taken away.

Engine collides with airbridge
This incident occurred to an Airbus A320 which, after landing, was taxiing to its assigned stand of A13. As it was doing so, the ramp supervisor suddenly noticed that the aircraft had not stopped when instructed by the stand’s parking guidance system. He immediately told all the staff in the vicinity to leave, grabbed the chocks and other items lying around and fled. The aircraft rolled into the A75 airbridge with its left engine. Fortunately, there were no injuries among the ground staff, passengers or aircraft crew.

FOD damage to an Emirates Boeing 777
In this incident, which occurred on 14 January 2010, the technical staff at Stand E53 found a metal pin embedded in a tyre on the aircraft’s main landing gear during their outside check. The pin had penetrated the tyre so deeply that it had to be replaced. The cost of the new tyre was around CHF 10,000. As a result of the tyre change, the flight’s departure was also delayed. According to SR Technics, the tyre must have been damaged after the aircraft had landed, so the pin must have been lying on the ground in Zurich.

The Safety Office adds:
Foreign object debris (FOD) – items lying around – causes damage to aircraft costing millions of francs every year. In view of this, every ramp and apron worker is required to:
• clear up their workplace before leaving it and
• remove any waste or other items they find on stands, in taxi areas or on airport roadways.
If you can, please place any such items you find in the special yellow FOD bins.
Cessna jet blast injures ramp worker
A line maintenance worker was seriously injured by jet blast at McElroy Airport (Colorado, USA) on 23 August 2009. As the aircraft – a Cessna C-560 – was taxiing to the fuelling stand, the line maintenance worker noticed that it was blowing grass onto the apron area. He asked the pilot to blow away the grass when taxiing away, so that he (the worker) would not have to clean the area himself. After fuelling, the aircraft turned with a higher engine thrust; and the worker, who was some 60 metres away, was blown away by the jet blast. He suffered a broken leg. The worker had undergone safety training, but was not sure whether this had included warnings on the dangers posed by jet blast.

Near-collision between a landing and taxiing aircraft
A near-collision occurred at Frankfurt Airport on 8 March 2009 between a landing Boeing 747-400 and a taxiing Bombardier DHC8-Q400. The DHC8 had been pushed back from the V108 parking position. It was then instructed to taxi towards Runway 25L via Taxiway A and hold before Taxiway D. The cockpit crew only acknowledged taxiing along Taxiways A and D, however. The aircraft then proceeded along Taxiways A and D and stopped at the holding point for Runway 25R.
At the same time, a Boeing 747 with 370 passengers and 22 crew was on final approach to Runway 25R. The 747 flew over the DHC8 – which was then standing at the point where Taxiway D meets the runway – at a height of around 15 metres.

Landing gear collides with vehicle
Cargolux flight 7933 touched a maintenance vehicle when landing on Runway 24 at Luxembourg Findel Airport on 21 January 2010. The incident occurred under Category III conditions with a cloudbase of 100 metres and a runway visual range of less than 350 metres. The Cargolux Boeing 747 touched the roof of the vehicle as it was landing at 12:53. Both the vehicle and the aircraft’s landing gear were damaged. The vehicle was on the runway to repair the runway lighting. The incident is still being investigated.
News

Zurich Airport recertificated
Zurich Airport was successfully recertificated by the Swiss Federal Office of Civil Aviation (FOCA) on 17 December 2009.

Web-based safety training

Background
The International Civil Aviation Organisation (ICAO) and the FOCA require all airport employees to undergo safety training. In view of this, Unique has developed a web-based safety training programme. The aim of this training is to prevent accidents and incidents in our flight operations. The new web-based safety training centres on: the safety management system (SMS), runway safety, ramp safety and human factors.

Any employees wishing to complete Unique’s new web-based safety training can obtain the appropriate system access authorisation from their superior (if they are at Unique) or via their training officer (if they are with a partner company). This arrangement is intended to ensure that all airport personnel receive the same standardised safety training. For further information here and/or to obtain a system access authorisation, please send an email to occurrence@unique.ch

Training required
From April 2010 onwards, anyone holding an airport ID badge authorising them to access the V, O or G zones will be required to complete the new web-based safety training course when they renew or change their ID (or have it initially issued). This will ensure that the new training will gradually be completed by all airport personnel.

A simple and flexible approach
When they are issued their new airport ID badge (after April 2010), the employee concerned will also be given a log-in and a personal password enabling them to access the new web-based safety training pages at any time – from their office, from home or during their travels. And if they only initially have time to complete part of the course, they can log-in again later and will be taken to the point they previously reached, from which they can continue.

Web-based safety training is simple and flexible, while promising good learning results. We hope you enjoy it, and thank you in advance for continuing to make your personal contribution to safety at Zurich Airport.
The Flight Safety Crossword

The crossword below is made up of various airport and safety terms (in English and German). If you get all the answers correct, the letters in the grey boxes should spell out the solution. Just send this by 15 April to Flughafen Zürich AG, Safety Office, P.O. Box, CH-8058 Zurich Airport or communicate it personally to our Safety Office giving your name, address, email and phone number. The winners will be drawn from all the entries received: the first three correct entries drawn will each win an airport voucher.

Enjoy, and good luck!

Waagrecht

3 Er wird nach einem Unfall ausgefüllt
6 Synonym für Rollhaltebalken
8 Wenn das Flugzeug über den Pistenrand hinaus gerät (Runway…)
10 Dokument das die Grundhaltung des Flughafens bezüglich Safety beschreibt
11 Überprüfung der Einhaltung von flughafenweiten Bestimmungen
15 Schnelle von den Triebwerken produzierte Luftströmungen
17 Abkürzung von Low Visibility Procedures
20 Kurze aber gefährliche Ermüdung (z.B. am Steuer)

Senkrecht

1 Standort des Bundesamt für Zivilluftfahrt (BAZL)
2 Unsere längste Piste misst 3700 …
4 Abkürzung von Dockleitsystem
5 Ein Flugzeugstandplatz im Süden
7 Kollision zwischen Vögeln und Flugzeugen
9 Abkürzung von Safety Management System
12 Enteisungsfahrzeug (Umgangssprache)
13 Abkürzung für Internationale Zivilluftfahrtorganisation
14 Abkürzung für Ground Power Unit
16 Ereignis das grossen Schaden verursacht
18 Verfahren um das Flugzeug vom Standplatz in die richtige Rollposition zu bringen
19 Wird mehrmals am Tag durchgeführt (Pisten…)

Solution
The Occurrence Reporting Form

Unsafe situations and “near-misses” should never be left unaddressed. We encourage everyone at Zurich Airport to communicate any ideas or observations they may have regarding the safety of flight operations to our Safety Office using the form below.

### Zurich Airport Occurrence Reporting Form

1. **Basic details**
   - **Datum**
     - **Time**
       - day
       - night
       - dawn
       - dusk
     - **Weather**
       - clear
       - cloudy
       - overcast
       - rain
       - fog
     - **Visibility**
       - good
       - moderate
       - poor
     - **Surface conditions**
       - dry
       - wet
       - snow
       - slush
       - ice
     - **Location**

2. **Description** (what happened?)

3. **Causes** (why might this have happened?)

4. **Proposals** (what could be done to prevent this kind of thing happening again?)

5. **Personal assessment**
   - **a.** How likely do you think it is that this might happen again?
     - 1. very unlikely
     - 2. unlikely
     - 3. possible
     - 4. likely
     - 5. very likely
   - **b.** How serious do you think such an occurrence and its consequences could be?
     - 1. harmless
     - 2. minor
     - 3. moderate
     - 4. serious
     - 5. disastrous

Any information you give above will be used to help further enhance safety at Zurich Airport. You can decide yourself whether you wish to provide your own personal details. If you do, we will cut off and dispose of this section once we have received your form, but will take the liberty of contacting you if we have any follow-up questions or if anything is unclear. None of the information you provide will be passed on without your express consent.

When you have completed the form, please mail it or fax it to:
Unique (Flughafen Zürich AG), Safety Office, P.O. Box, CH-8058 Zurich Airport, fax +41 (0)43 816 8363, occurrence@unique.ch

Thank you in advance for playing your own active part in keeping our airport safe.

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### Contributors to this issue:

Safety Office, Kyung-Jin Ha, Peter Frei

The ZRH Safety Newsletter provides regular information and updates on safety issues at and around Zurich Airport. If you have any contributions or suggestions of your own, the Safety Office will be pleased to hear from you at occurrence@unique.ch

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**Last and first name (optional)**

**Company (optional)**