Preventing Level-bust
Operator's strategies

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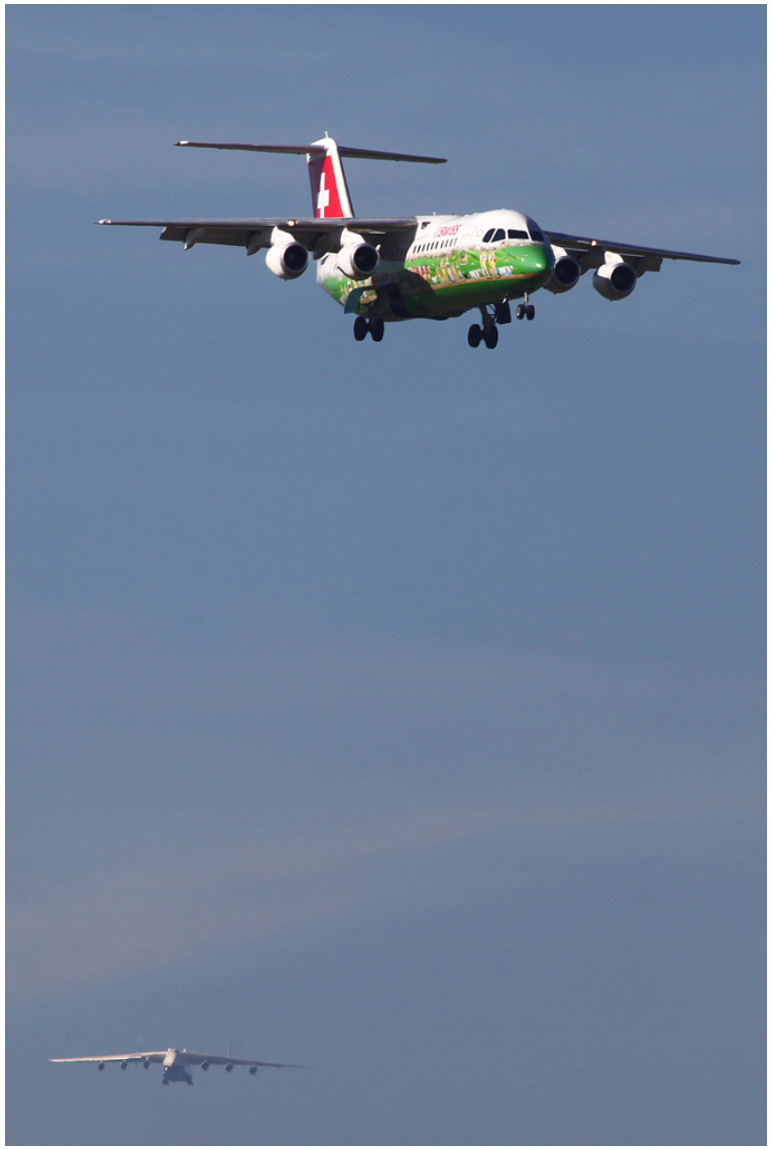

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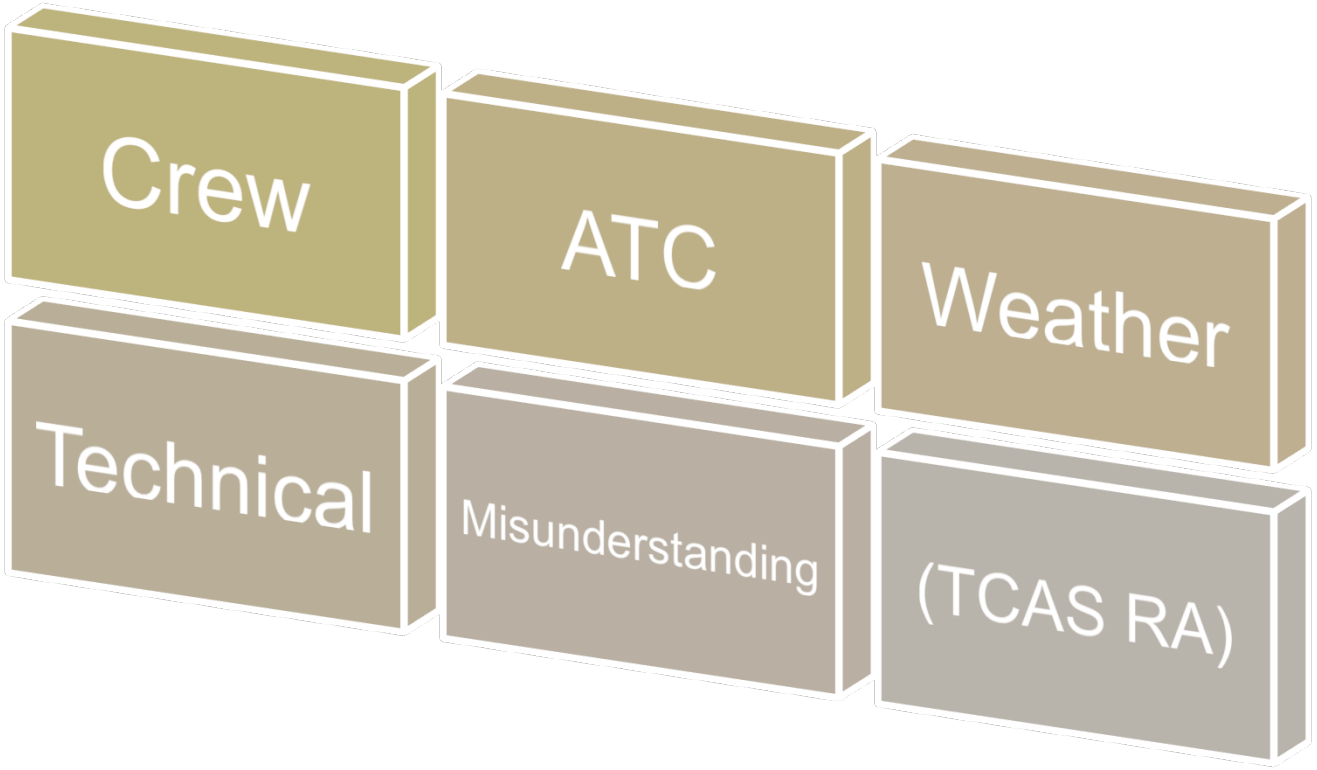
Data Collection

Since 2006 we received 57 reports of unintended level deviation

Only reports with an actual altitude deviation were considered



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Weather

…flying in moderate turbulence we were passed by an aircraft 1’000 ft below. We encountered a downdraft and at the same time the other aircraft encountered an updraft resulting in an immediate TCAS RA. We climbed 400 ft whereas the other flight maintained altitude…

Technical

- …during level flight with automatics on the AP suddenly disconnected due to an out of trim situation. Aircraft pitched up and A/T increased power. Immediate manual take over of aircraft but still a level bust of 500 ft occurred…

- …flight was cleared to altitude 8’000 ft. This was set and confirmed by both pilots. When approaching 8’000 ft CMD realized that altitude preselect showed 7’000 ft. 8’000 ft was confirmed with ATC. Aircraft was levelled off but undershoot of 200 ft could not be avoided…

- …as the rate of climb was 2’500 ft/min vertical speed was selected with a rate of 1’000ft/min about 1’400 ft before cleared altitude. FGS captured the altitude but due to the slow reaction of the AP the aircraft overshoot by 300 ft…

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ATC

- …at FL 159 received reclearance to level off at FL 160. Undershoot of 500 ft…

- …at FL 310 cleared to descend to FL 200 to be level within 3 minutes. Passing FL 240 with a rate of descent of 4’000 ft/min ATC ordered «turn left HDG 120°, level off FL 230». Even with AP disengagement an undershoot of 300 ft could not be avoided…

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Misunderstanding

- Handover to next sector
- Similar call signs
- Readback hearback issues
- Atmospherical disturbances
- Language proficiency
- Callsign versus flight level e.g. LX1100 – FL110
- Unclear or complex SID description

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Crew


Flight Crew
Automation
Altimeter
Workload
Manipulation
Distraction
Fatigue
Assumptions
Technical
Training
Aircraft energy
Communication Callsign
PAX issues
Public address
Small talk

Just Culture

- Human nature remains the weakest link
- Today's SOPs are usually well developed and sound
- To be able to correct the flaws within it is imperative that the system knows what is going on
- To understand an error we need the crews to report events and this will only work with trust in the system

Therefore to manage human error a just culture environment is a MUST

Risk mitigation
What are we doing?

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Risk Mitigation
What are we doing?

Awareness measures

- Altimeter setting errors
- Where are the automation traps
- Foster awareness for environment and traffic
- Publish own cases on a regular i.e. monthly basis
- Joint ATCO-Pilot CRM courses
- Importance of discipline
- Encourage reporting

Operator

- Review of SOPs
- Encourage the use of intercoms
- Use of mode S
- Lobby for SID/STAR redesign

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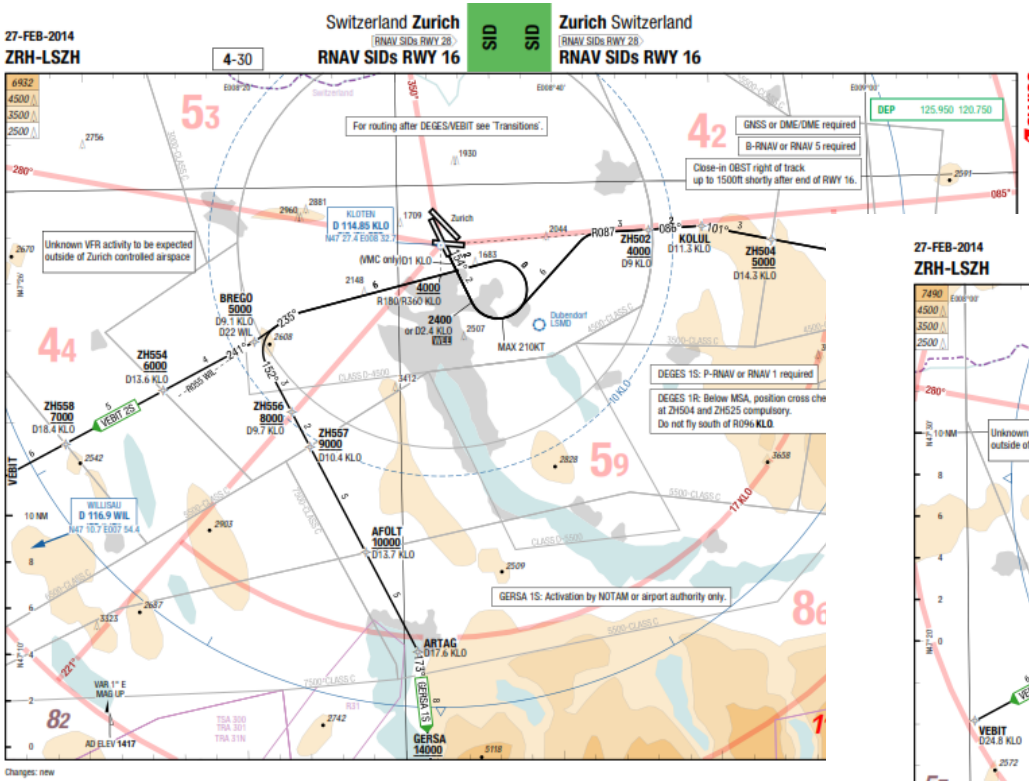
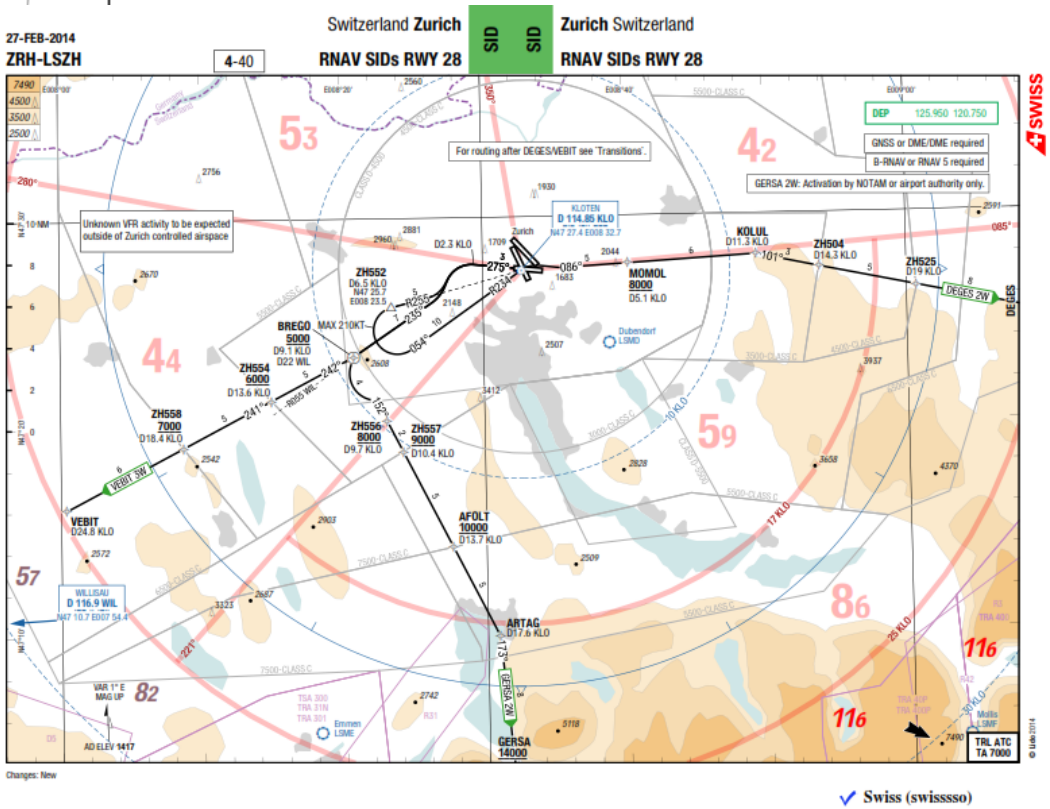
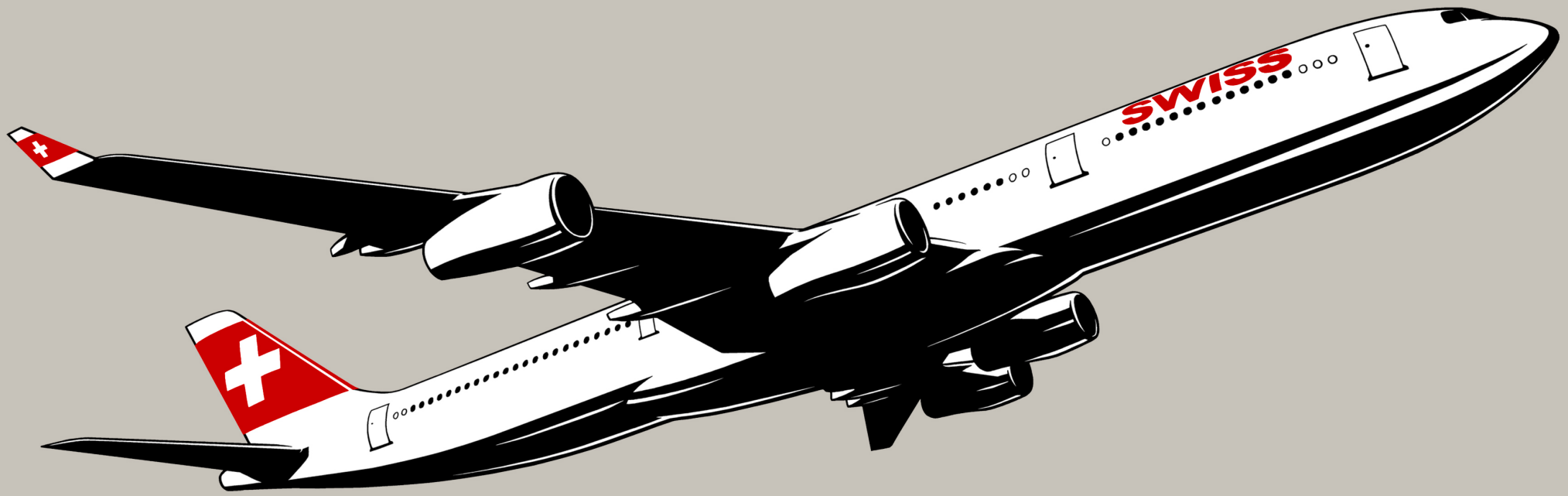
SID LSZH example





Swiss (swisssso)

Thank you for your attention ☺



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