

Safety Bulletin



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Editorial

Dear readers,
As the Safety Bulletin is entering its second life year, I have the pleasure to take over the editor's function from my chief Martin Probst. My intentions are not to bring a revolution to the safety bulletin but of course I will initiate a few evolutions according to my personal preferences. I like to consider that the spirit of the Safety Bulletin is very positive and one of my objectives will be to perpetuate such spirit further!

Another objective of mine is to increase the number of readers, to generally further disseminate the many safety messages contained in this publication in order to reach the maximum number of 'souls'. Make the Bulletin more easily reachable for controllers is one of my priorities as well.

Displaying clearly the contents on the first page (see below) shall help readers to reach more easily their point of interest. Furthermore it is my intention to keep the safety Bulletin nice and short with the aim to allow anybody to

digest its full contents a reasonably quick lapse of time. Time dedicated to the reading of the Safety Bulletin has to be very valuable!

In each issue readers will discover articles about what is new in safety; at skyguide, or even international level. Additionally, incidents will be further analysed with the help of Safety Officers to obtain the "lessons learned" from them.

And last, in accordance with my predecessor, I would like to invite anybody to feel free to make comments on this issue, or better, even to propose an article that could be published in the Safety Bulletin . The only condition is to match the Safety Bulletin's intents and philosophy!



Thomas Novotny, DMS

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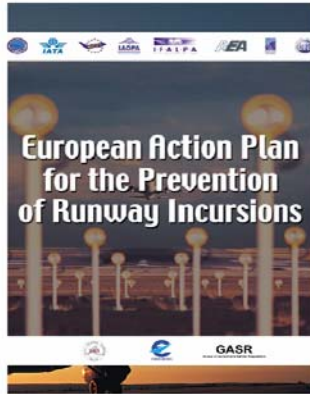
Risk Management Stéphane Barraz, Jean-Marc Bory, Fabrizio Balda **Safety Management** Martin Probst, Thomas Novotny

Risk Areas in our Airspace

Runway Incursions

Out of the 4 risk areas that are looked at here, runway incursions is the only one that managed to remain stable.

The Eurocontrol ACTION PLAN represents the joint efforts of Eurocontrol, IATA, IFATCA and several ATS providers. Recommendations and best practices are available for aerodrome operators, A/C operators, the ATS providers and the civil aviation authorities. A local runway safety team (LRST) has to be established at every airport. For the time being LRSTs are operational at ZRH, GVA and BRN. Additionally, a catalogue of weak points at every sg related aerodrome has been established to give an overview on the Runway Safety in Switzerland and to serve as basis to the next LRSTs to be established.



It has to be noticed that FOCA wrote a letter to the 4 major Swiss airports in order to urge them for the development of LRSTs (only LUG has no LRST for the time being).

The extreme severity of occurrences related to RWY operations has been recognised and steps are taken in order to increase safety in that domain. Further, SAMAX replacing ASDE at ZRH and GVA premises (and its RIMCAS-Runway IncurSION Monitoring and Collision Avoidance system, under development) will certainly contribute to a greater safety for RWY operations.

Level Bust

The number of level busts more then doubled from 2002 to 2003. However, these numbers have to be analysed with prudence as the 'incident reporting culture' is becoming more present at skyguide and therefore the values are quite difficult to interpret correctly. At Eurocontrol a group is dedicated to the study of level busts. Recommendations will be issued at European level.

Unauthorised penetrations

Their amount almost tripled. But again the reporting is very probably much higher than before. A high level group has been established to counteract the undesirable effects of such occurrences. This group is composed of representatives of the Swiss Aero club (AéCS), AAIB, FOCA, Air force and skyguide. This group's work is quite confidential for the time being, but this bulletin will certainly inform you about significant outcomes.

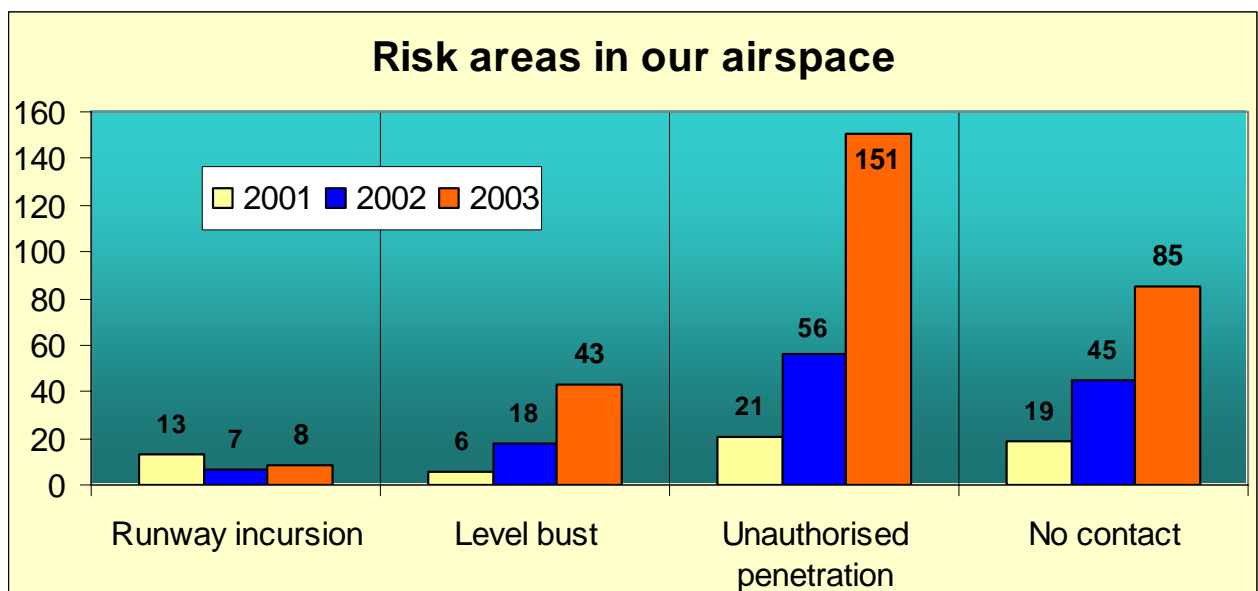
No contact

No contact or PLOC (Prolonged Loss Of Communications) are increasing as well. The perturbation related to such occurrences is well recognised but is quite out of our hands. However this issue is discussed at European Level in the Eurocontrol's SISG (Safety Improvement Sub-Group).

Any changes or new outcomes in respect of the occurrences discussed here will always appear in the safety bulletin!

To help us to identify all the weak parts in the system and subsequently to allow us to address them, **please report all occurrences !**

Thomas Novotny, DMS



TCAS

Participation at a TCAS downlinking simulation in Bretigny (Paris) in November 2003

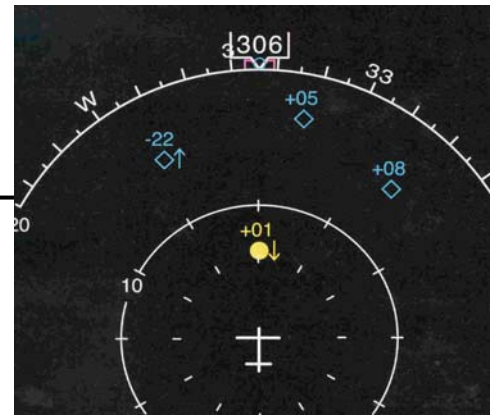
Following the mid-air collision of Ueberlingen in July 2002, and several near mid-air collisions (the worst of it happened in Japan in 2001), it became evident that something had to be undertaken to avoid last minute ATC-instructions contradicting with TCAS-RAs. In all cases the scenario was almost identical: late ATC instructions given by ATC to aircraft in the vertical plane that were contrary to the TCAS RAs displayed in the cockpits.

Bearing this in mind, Eurocontrol received from AGAS, the European High level Action Group for ATM Safety, the task to study the feasibility of downlinking the TCAS-RAs directly to ground ATC. The idea behind is of course clear: get the RA-information much quicker down to ATC than this is now done using radio with the aim to avoid with this the dangerous last minute ATC-instructions.

In November 2003, Eurocontrol had invited over 30 European Air Traffic controllers from more than 10 different ACCs to Paris to simulate and study the “controller situational awareness” with a possible downlinking of the RA. Switzerland and Skyguide had accepted the invitation and decided to send two Swiss controllers to attend the simulation: Thomas Doster for Zurich and Christoph Gilgen for Geneva. Here are some remarks and impressions we have gained from this very interesting two days we had spent in Brétigny:

The simulation was advertised as “study the downlinking of TCAS”, part of the FARADS project (Feasibility of an ACAS RA Downlink Project Study). In fact we learnt very quickly that the main thrust of the simulation was on the human machine interface (HMI), or better on the display of the downlink-messages on the radar displays used by controllers. In other words to study how the RA-information could best be presented to controllers? What must be presented, how and where, and of course what would be the reaction of operational controllers to such data?

The lay-out was such that all controllers present, at least the ones that were together with us, found the simulation “rather unrealistic”. In fact, the lay-out was such that it was assumed that the controllers of the simulation were supervising OJT-trainees and had no means of intervening directly into the traffic handling. All participants were just observing the situation and then had to make, in a debriefing process, remarks about the situation. Where and what, and more importantly, if the RA info on the radar was qualified as “enhancing situations awareness and understanding of the situation”.



Whereas we can fully understand why Eurocontrol had invented such a static way of doing the simulation (to let the RAs happen without any possibility to intervene) it took away the feeling and involvement of the simulation participants.

The Swiss participants felt that the study and simulation was certainly very beneficial, we both had the impression that for each question more or less answered, at least two new questions appeared requiring answers. Many of the simulation options were severely criticized by the simulation participants, such as too much data in the announcements of RAs (e.g. limiting Rate of climb to less than 1500 ft/min), and possible confusion with STCA alarms also shown on the same label with almost the same color and feature. Other problems, although carefully put aside by Eurocontrol, were of course questions about the operational co-habitation of ATC and TCAS RAs downlinks. For instance how does a controller has to react when, in the middle of a clearance (in the vertical plane) a message is shown that the very aircraft is subject to a conflicting TCAS-RA? Shall it stop the transmission, or shall it say something such as “follow your TCAS”?

Whereas Eurocontrol, in it's press release talked about “successful trials where it was assessed if the transmission of ACAS Resolution Advisories to air traffic control would enhance the situational awareness, working methods and capability to handle traffic”, the opinion of the outgoing participants of the simulation was much more nuanced. Not that we want to contradict the outcome and Eurocontrol's perception, as this simulations certainly was successful as it helped to gather more information about the possible solutions. But there is certainly the feeling that we are at the beginning of a long-lasting process where many hurdles, and major obstacles must be passed. In fact we had only touched on some small aspects of a very large process that is still in the childhood and with a rather unknown future laying ahead. But each step, even excluding options, brings certainty and is a good step forward.

For Switzerland and Skyguide: Thomas Doster and Christoph Gilgen

Lessons learned – 1st case

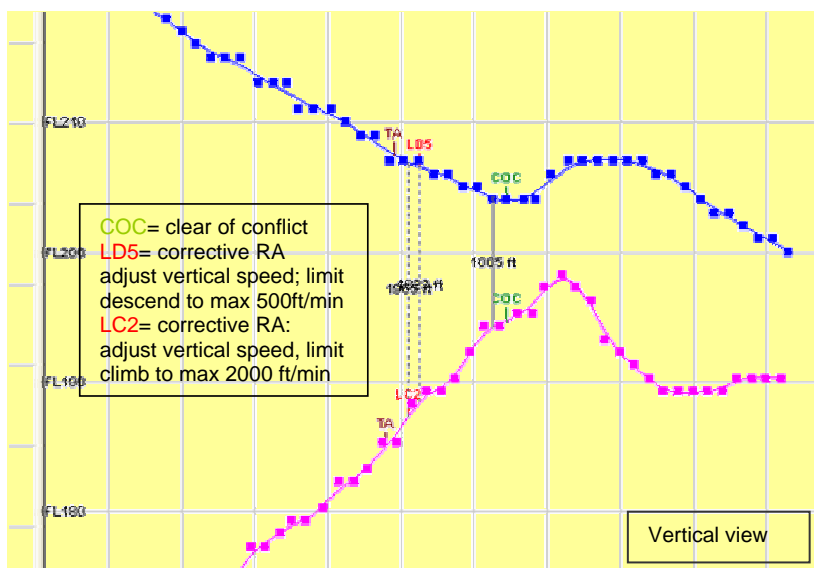
Strange and not logical TCAS Manoeuvre

On July 21, 2003, in the region of Zurich, a very confusing TCAS-RA happened. There was a situation of CB with aircraft flying on avoiding headings to remain clear of the most dangerous cells. Two flights were approaching their cleared levels, either descending to FL 200 or climbing to FL 190. The first flight, climbing with approximately 1500 ft/min in IMC, experiencing icing and turbulences, received a TCAS-RA when passing through FL 187. The descending flight, inbound KELIP point, received a TA when passing FL 208 and started to reduce its rate of descent to 500 ft/min in anticipation of a possible RA.

Whereas this description seems more or less logical, how it was felt and perceived by ATC was rather unusual and strange. The climbing flight reported, shortly before planned level off "Aircraft A, TCAS climb" on RT. This was acknowledged by Zurich ACC. As nicely said in the ensuing TCAS analysis report, this message must have confused the Zurich controller quite a bit. The ATCO knew pertinently well that the conflicting traffic of the flight was above and descending. So ATC expected a TCAS descend, certainly not a TCAS climb manoeuvre, in this type of constellation.

What happened? You are probably aware that there are two TCAS-RAs possibilities? There is first the well known TCAS **corrective RA** where the crew is required to deviate from ATC clearance and change its current flight path to follow an RA trying to avoid a possible conflict. For instance in a level flight situation one aircraft is asked to climb, the other is ordered to descend.

Figure: simulation of the occurrence with the INCAS tool



The second possibility of an TCAS RA is a **preventive RA**, meaning that the air crew is only limited in the vertical manoeuvre, without necessity to deviate from the ATC clearance received. This situation happens most of the time when an aircraft is either in climb or descent and then the vertical speed is limited by the green arc (e.g. in the VSI) to maintain a certain limited rate in climb or descent. Most of the time fully compatible with the received and acknowledged ATC clearance.

This is exactly what happened in this encounter in July 2003. The crew of the climbing flight was subject to a preventive RA limiting its rate of climb to 1500 ft/min to make sure the required separation at CPA (closest point of approach) remained somewhere in the region of 600ft vertically (called ALIM, Altitude LIMit). The confusing part of the situation was the "TCAS climb report" of the climbing flight staying well below the descending flight. In fact, as the climbing BA146 was subject to a preventive RA, compatible with ATC clearance, there should have been no RT report to ATC (see definition of TCAS manoeuvre "once an aircraft starts to manoeuvre")

In this particular situation the RA report, CLIMB was rather confusing maybe even disruptive for ATC. This is also the reason why ICAO and the sub-committees analysing TCAS procedures on its behalf, are currently in the process of changing and adapting the RT procedures for aircrews in preventive RA manoeuvres by specifying that in this type of RAs no RT to ATC is required.

I just want to finalise my description of the incident by saying that the crew of the climbing Swiss overshot the cleared level of FL 190 by manoeuvring at the top of the green arc in the VSI until levelling off at FL 199. Then, descended again down to the cleared level by ATC.

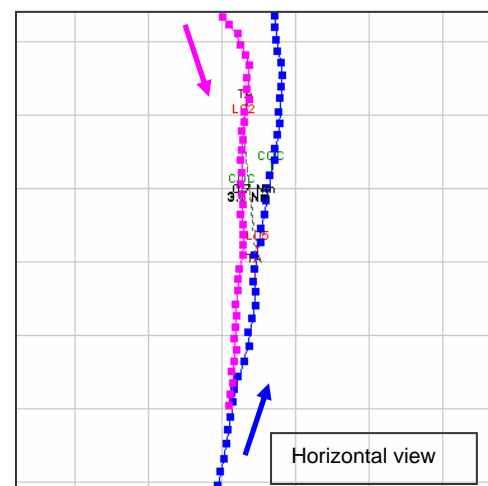
The descending flight, possibly using the TA indication and the visual display as clues, climbed to FL 207 despite the fact that no RA could be simulated and generated in the relevant TCAS-analysis using simulators. (see figure)

This in itself gives a very clear message to all:

TCAS training for pilots and controllers is a problem and needs urgent improvement.

A group is existing at Eurocontrol with the task to address these issues.

Christoph Gilgen
Safety Officer ACC/UAC Geneva



Lessons learned – 2nd case

SAMAX helpful tool for the controller

On a sunny morning last January at Geneva, runway in use was 05 with a mixed sequence of arrivals and departures. The grass runway was open and some VFR were flying in and outbound.

An MD82 was on the runway and cleared for take-off, a RJ85 on final. An E135 taxiing called on the Tower frequency and said ready for departure. Then the ADC controller told him: "XYZ123, RJ85 4NM final, behind line up and wait behind". Read back followed: "XYZ123 roger behind lining up and waiting behind". But instead of lining up behind the traffic on final, the E135 lined up behind the departing MD82. When the MD82 was airborne, the controller cleared the RJ85 to land. At this time the pilot of the RJ85 said that there was an aircraft on the runway. Go around procedure followed and a remark to the pilot of the E135.

What went wrong with this usual normal daily sequence? First of all the E135 didn't understand two essential elements. The first one is: "**4NM final**". That means that the traffic information concerns traffic on final and this will be landing within two minutes. The second element is the type of aircraft. A RJ85 doesn't look like a MD82. This misunderstanding could have been detected by the read back. "Roger behind lining up and waiting behind" is the content of the message. Nowhere was mentioned that the pilot will consider his essential traffic as **a landing traffic or/and a RJ85**.

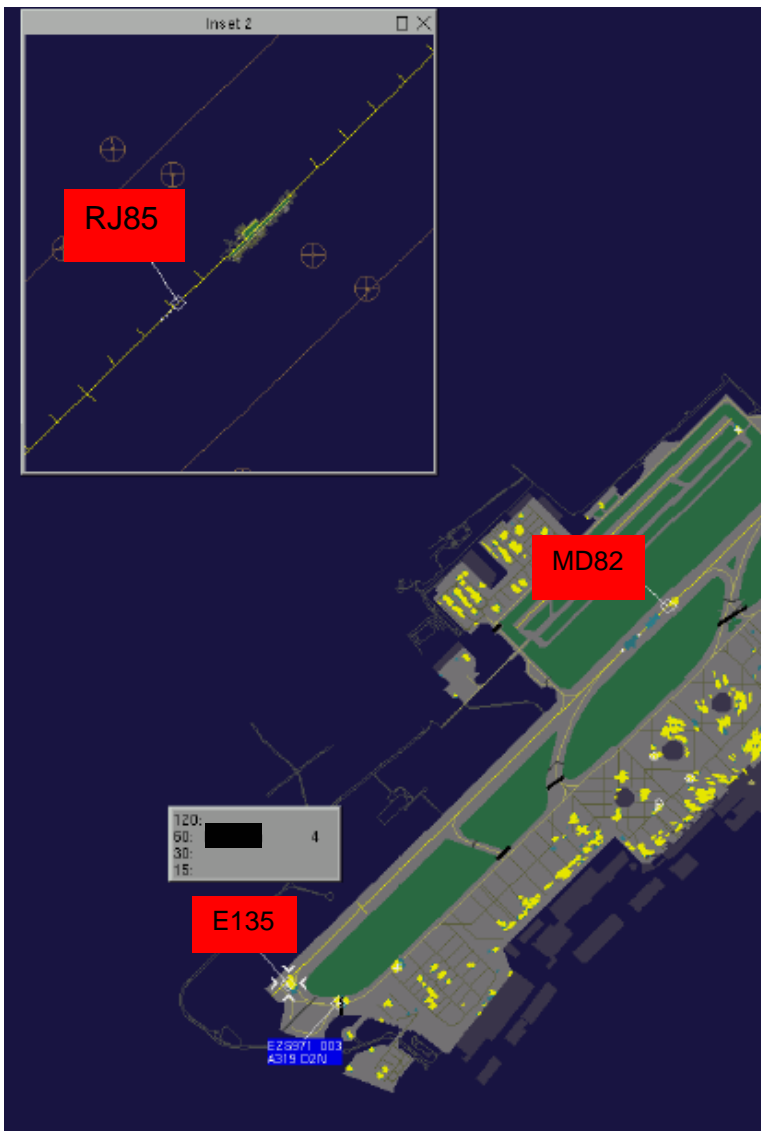
Absorbed by the traffic, the controller didn't take the time to look at the runway before clearing the inbound. The monitoring of the departing MD82, of the landing VFR on the grass runway, clicking on the SYCO screen transmitting the ATA (Actual time of arrival) of the VFR and the ATD (Actual time of departure) of the MD82 took the controller away of one of another of his task:

monitoring the traffic to watch if it is complying with the clearance.

In the future, SAMAX will help the controller by removing some of his tasks. SAMAX will calculate and transmit the ATD and ATA of all correlated aircrafts (IFR or VFR). Another tool of SAMAX is the Runway incursion alarm. In this particular case, SAMAX will detect that the E135 is entering the runway though there will be a traffic over flying the threshold 05 within xy seconds (parameter to be tuned up). An acoustic alarm will draw the controller's attention. The controller will have then the time to react by vacating the runway or order a go around to the traffic on final.

When there is a lack of precision in a read back, do not hesitate to repeat the clearance by emphasizing the element which is missing: "**I confirm behind the landing RJ85, line up and wait behind**". SAMAX will give us more time to watch outside where everything is going on. The aim of watching outside remains the same although we have SAMAX. SAMAX is only the tool combined with a surface radar and will never detect essential safety relevant elements as smoke, fire or dangerous manoeuvres. The human eye is essential in our work.

*Bertrand Du Bois
Safety Officer TWR/APP Geneva*



Lessons learned – 3rd case

Respect of procedures

An A320 eastbound between Geneva and Zurich is cleared by GVA ACC MS4 (MOL4) sector initially from FL 340 to FL320. Five minutes before the incident the flight is coordinated with MS4 by MS3 (MOL3) sector at FL 300 (according standard LoA procedure inbound Stuttgart have to be transferred to ZRH at max FL300), and to be transferred directly to ZRH ACC U1(Upper 1) sector This means that MS3 ATCO accepts to have this TFC shortly in his sector with no radio contact.

separation minima infringement occurs, the A320 is switching frequency as instructed and therefore the possibility to interrupt his descend as requested by U1 is not possible. Finally the A320 calls U1 sector informing about the TCAS climb it got and that it is actually at FL325.

As avoiding action to the B733 the U2 (Upper 2) executive ATCO instructs a descent to FL290. At the same time the B733 informs ATCO about the TCAS RA descent he got. Aircraft passed at 4.3 NM / 900 ft from each other.

Conclusions and recommendations

The ATIR board identified the following causes as having contributed to the AIPROX:

- Forgetting
- TFC load/complexity
- Inter-sector coordination

The incident was classified as "B" risk with ATM direct contribution.

A **safety letter** has been written by GVA ACC safety officer with the following recommendations:

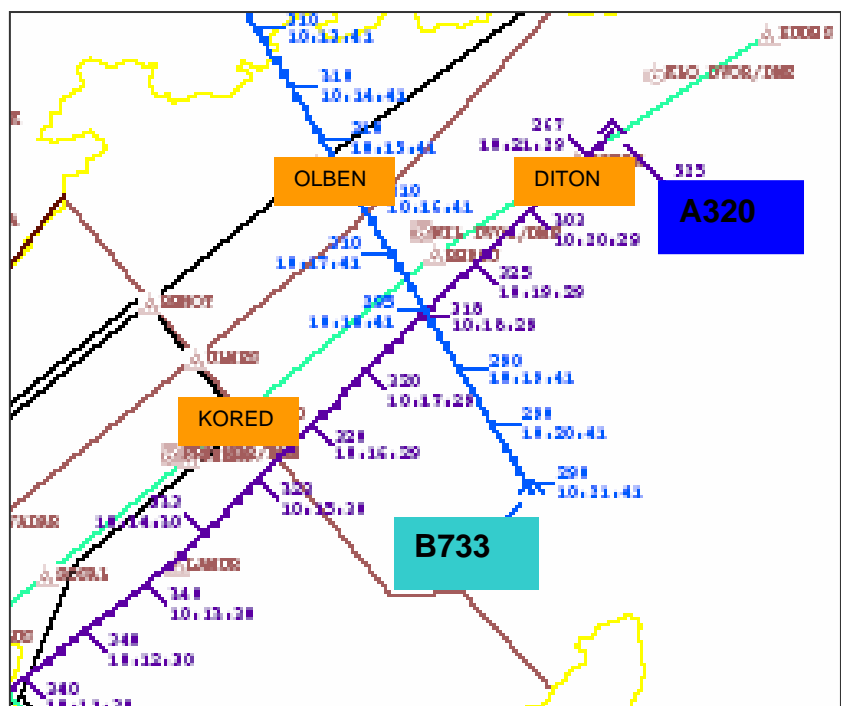
- Anticipate climbs and prepare well the descents
- Transfer A/C to "accepting" sector when there is any "problem"
- Coordinate when one transfer condition can not be respected

Additionally, the following general recommendation has been made in the safety letter :

Stick to the procedures because their correct application permits to face high TFC loads with full safety.



The MS4 radar executive is under high workload (5 flights are under vertical evolution) and forgets to descend the A320 to FL300 as coordinated. The A320 enters ZRH U2 sector at FL320, south of KORED. Two minutes later MS4 Executive instructs the A320 to descend quickly to FL300 and to contact ZRH U1 sector. ZRH U2 sector has an B733 under its control transiting from North-West direct to SRN at FL310. It is to be noted that the B733 TFC was not displayed on radar screens of both MS4 and U1 sectors because of the filtering according levels. When the



Audit Management - Report 2003

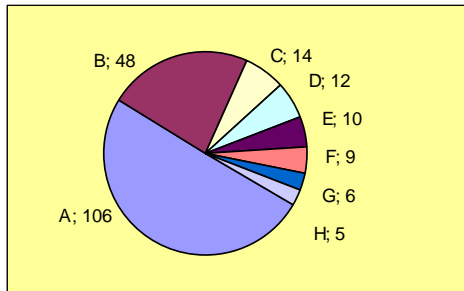
Introduction

In the year 2003 the evaluation team carried out 8 audits within skyguide. 1 sg-audit at a military unit (ADDC). 7 TriNET-audits: ACC in Zurich and Geneva, TWR/APP

Geneva, TWR/APP Berne, TWR Lugano, AIS Zurich and for the first time a technical unit TNN-Z. (TriNET-audits are carried out by a lead auditor from skyguide and a co-auditor from Germany or Austria.)

Analysis

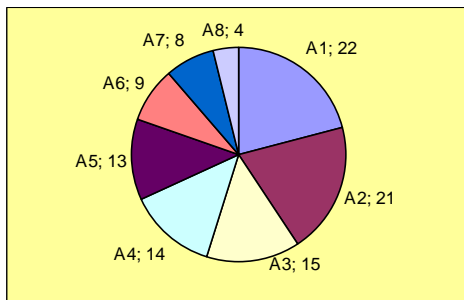
During these audits 210 problems were found. These findings can be split up in the following main topics:



- A Publications
- B Procedures
- C Technical insufficiencies / security
- D Emergency equipment is missing, no checks of evacuation procedures
- E Handover, coordination
- F Missing training, generally lack of training
- G Information / Cooperation not satisfactory regulated
- H Headsets

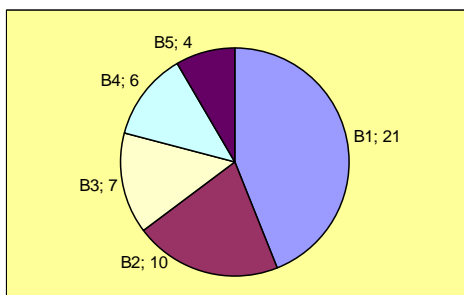
Detailed Analysis

A) Publications (106 problems in sub-categories)



- A1 Publications which do not correspond with others (AIP etc.)
- A2 Publications which are wrong or out-of-date or which do not correspond to the actual/current situation any more
- A3 Missing, obsolete or incomplete agreements
- A4 Procedures which are not defined and described (no regulations available)
- A5 Missing guidelines, regulations for daily work
- A6 Working places documentation not up-dated or not available
- A7 Missing (emergency) manuals and check lists
- A8 Duty statements

B) Procedures (48 problems in sub categories)



- B1 Procedures which are unclear and faulty or do not correspond with AIP/ATMM Switzerland
- B2 Not compliance with regulations
- B3 Different interpretation of regulations
- B4 Deviations of international regulations without a written approval by FOCA
- B5 Missing or wrong separation standards

Comments

→ The units have reported until December 31st, 2003, 60 of the problems listed above as solved.

→ 150 open problems remain. It has to be emphasized that it is often not possible for the units to solve a problem in short time because other departments are responsible for the solution. For the statement above the following has to be noticed. Three audits took place in November and December. 80 problems were found at these audits. The three unit managers must report the status of the solved problems at the end of March 04 for the first time. Therefore so many problems are not solved yet.

→ It is conspicuous how many problems concern the publications. Last year was remarkable how many units

don't have any agreements with the airports or with the adjacent units or these are no longer up-to-date. And, secondly, it has to be noticed that the contents of the manual did not agree with other regulations either.

→ Many problems also concern the procedures. Procedures are described in the manuals but they do not correspond with the ATMM Switzerland or procedures are carried out which are described nowhere.

→ Sometimes the units are not aware, which consequences could have procedures that are wrong and not updated, not implemented correctly or not described.

Peter Scheuber /Jürg Bichsel , DME

Swiss FMP

Flight level compliance, Yo-Yo flights and more...

According to a report from CFMU over 30% of all ATFM-over-deliveries in 2002 were caused by inconsistency between the filed flight plan level and reality. At the end every excessive workload in a sector is a safety-issue.

It's a natural fact, that AO's are trying to avoid all delays imposed by ATC and therefore searching for all gaps in the current ATFM and ATC systems. One way is the filing of "creative" flight plans such as yo-yo flights, request for early descent or late climb with adjusting the requested flight levels to avoid sectors with regulations.

In order to track such flight plans und to react with measures, the FMP managers invite controllers and flight plan data progressing staff, to report such flight plans and information to the local FMP's.

However there is an effort needed from all partners involved in flight operations to get the desired improvement. Last year for instance, Swiss FMP imposed mandatory scenarios in flow management for certain flights to file at specific cruising levels. These measures helped to reduce the delay significantly and therefore it reduced the need to file "yo-yo" flight plans. Nevertheless, if everybody involved in ATM would live to the following clues, the need for flow measures would even decrease:

- AO's need to inform pilots ahead about the reason for a lower FL being filed
- Pilot's should keep in mind, that there is a good reason behind the filed FL
- ATS – systems should provide means to inform all other ATC – units when a cruising FL needs to be changed and ATS – systems should present to the controller the complete FPL when needed, not only a portion of it
- Controllers should consider the downstream impact, before proposing a change to the cruising FL

The cruising FL can be modified, in particular if safety is involved. In most cases this will be due to weather phenomena. Remember: The flight plan is the "contract" between the pilot and the controller.

All this factors will even be more important in the near future should the new sectorisations NUAZ in Zurich and SEPAGE in Geneva be a success and a benefit for safety and capacity.

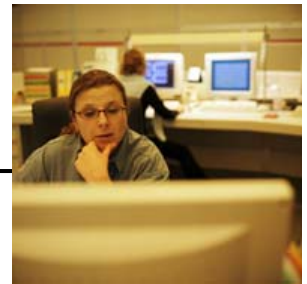
Additional information about "Fight Level Compliance" is found on the Eurocontrol homepage :

http://www.cfm.eurocontrol.int/home/presentations/docs/FL_compliance.pdf

or on SWAN under:

Opérations (Betrieb) / safety infos / external.

*Anton Habermacher, Johann Pradel
Swiss FMP*



SAFIR

First info bulletin issued !

The SAFIR (SAFety first) Action Plan is based on the mandate of the Head of DETEC, the Federal councilor Moritz Leuenberger. This Plan is derived from the NLR audit (initiated by DETEC) that has taken place recently after the many accidents that occurred in the Swiss aviation these last years. Its purpose is to improve the overall safety of all aviation actors.

It has to be reminded here (according last safety bulletin) that end of March 2004 a draft amendment of the Federal Law on civil aviation granting the "non-punitive reporting" will be presented to political authorities.



Recently DETEC edited the very first SAFIR INFO. This information bulletin concerning the SAFIR Action Plan displays the necessary info concerning the progress made to all interested people. It is issued in French and German and exists in electronic format only.

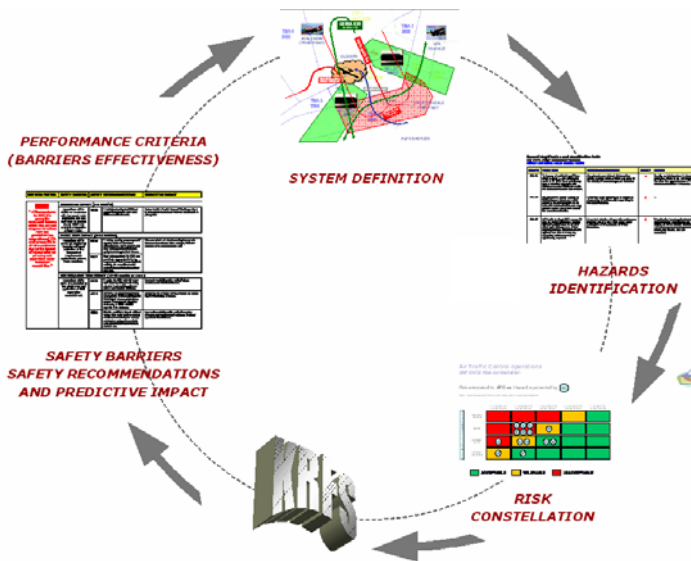
The bulletin is available on SWAN under either: Opérations/Betrieb or Technique/Technik , and: Safety Infos / External

Safety Assessment

Safety Assessments A few words about methodology ...

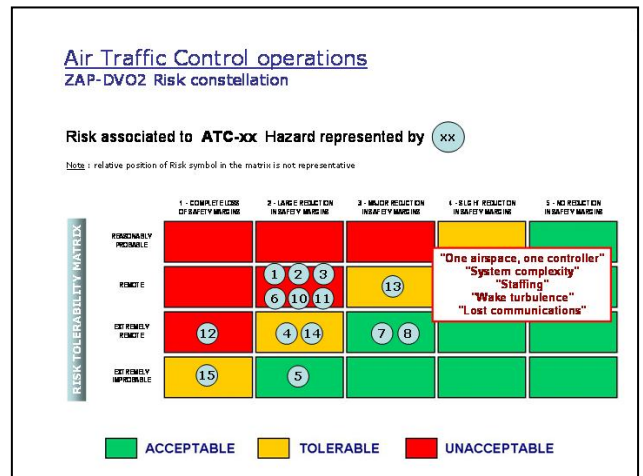
Up to now, Risk Management issues were mainly dedicated to general explanations about ESARR4 or to the presentation of concrete results. The goal of this article is to give you a general overview of the methodology applied by skyguide within the frame of Safety Assessment Programs.

In order to answer the fundamental question raised at the beginning of every Safety Assessment Program, e.g. "**What can go wrong ?**", it is obvious that the starting point shall be a precise description of the assessed System and the environment within which the foreseen changes will take place. By taking time to do this properly, the Safety Assessment team will reach the same level of understanding of the problem and save time later on during the assessment.



After completion of this initial task, the team will be able to concentrate more efficiently on the formal identification of **Hazards** (or potential unsafe conditions) and classify the consequences of their occurrence in terms of severity. This provides a concrete answer to the question "What can go wrong and what are the consequences ?"

Thanks to the experience of the System experts involved in the Safety Assessment, it is then possible to estimate the likelihood of every Hazard and to establish a **Risk constellation** by the means of an adequate Risk Tolerability Matrix. At this stage of the assessment, it is to be noted that the availability of well defined and agreed Target Levels of Safety is extremely important in order to ensure a realistic and representative classification of Risks.



The so-established Risk constellation is then used as the starting point for an intense brainstorming resulting in the identification of a set of **Key Risk Factors**. In other words, all the individual Risks are, whenever possible, grouped into similar categories each of which being then described by a "generic high level" Risk. This important synthesis will allow the problem to be addressed in a more comprehensive and understandable way.

To avoid or the development of the Key Risk Factors, a set of **Safety Barriers** is then established by the team and the **Safety Recommendations** that are necessary to their implementation formulated together with a description of their predictive impact. In a more concrete way, a Safety Barrier can be seen as an expected status (for example "closed airspace") that may be implemented by specific actions formally expressed by the means of Safety Recommendations (for example "classify airspace into A category") resulting in a positive effect on an associated Key-Risk Factor (for example "Illegal controlled airspace penetration") himself derived from a particular Risk constellation.

Finally, the process will be completed by the definition of **Performance Criteria** ensuring the effectiveness of the implemented Safety Barriers during the entire lifetime of the assessed System. More precisely, a Performance Criterion is a statement, expressed unambiguously in qualitative or quantitative terms, of the performance required and which is used as the basis for managing the identified Hazards through the life-cycle of the System under consideration.

Even if all this seems to you to be very theoretical, the experiences made on the subject within skyguide during the last months clearly showed that it works ! This formal approach has been successfully applied to ZAP-DVO2 and ASR-10 GVA Safety Assessment Programs and is continuously improving with new experiences. More on this in next issues !

Stéphane Barraz
Risk Manager

Safety Assessment

What is actually going on ?

The following table provides a short overview of the main activities that are running in the Risk Management domain **under the control of DMR**. For any question you may have or for deeper details on the subject, please contact directly the person in charge of the related Safety Assessment.

Safety Assessment Programs status			
System	Responsible	Status	Target date
PRIMUS	JM. Bory	Running	31.03.2004
sTSA	S.Barraz	Running	30.04.2004
ZAP-DVO2 (Step 2)	S.Barraz	Running	30.04.2004
ZAP-DVO3	S.Barraz	Initialized	2004
ATMAS	F.Balda	Initialized	2005
UAC/Radio concept	--	Standby	--
FDP-ZRH	--	Standby	--
SAMAX	--	Standby	--
ASR-10 GVA	S.Barraz	Achieved	09.12.2003
ZAP-DVO2 (Step 1)	S.Barraz	Achieved	29.10.2003
SETInet	JM.Bory	Achieved	30.09.2003
TWR-ZRH	S.Barraz	Achieved	10.06.2003
IFREG	JM.Bory	Achieved	11.02.2003

Running

Mandate officially attributed by the skyguide Safety Steering Group, Safety Program Plan validated, Safety Assessment Program team constituted and working sessions planned.

Initialized

Mandate officially attributed by the skyguide Safety Steering Group and Safety Program Plan under preparation.

Standby

Evaluation of feasibility, added value and resources necessary to the completion of a Safety Assessment done. Decision from the skyguide Safety Steering Group required.

Achieved

Safety Case Document delivered and officially endorsed by the skyguide Safety Steering Group. Safety Implementation Plan under preparation by the Program Manager.

Technics - SIR process @ Work

Ghosts blips at INI South sector

Initial event

On September 15th 2003, an incident has been reported by an ATCO from Geneva APP (sector INI South) regarding a nuisance track detected in the area of Martigny. This track (ModeA Code 2522) has been circling erratically in this area for 5 minutes at an unstable flight level (many ModeC were missing but some occurrences were identified as FL190).

The incident was reported to the technical supervisor (SYMA) and then submitted to the Data Processing support for investigation..

First analysis

After replay on the REC-01 (legal recording tool) the nuisance track was identified as coming only from the GV1M radar (GVA ASR10-comounted MSSR). Due to

past concerns with ghosts tracks with regards to this radar, the incident was described like "ASR-10 track jump".

One month later, a SIR (Safety Improvement Report) was submitted to the Safety Panel Board for discussion. The SIR was proposing to address "the poor quality of the GV1M detection". This SIR was justified by the case of September 15th. After investigation by the OPS investigation group the following results were recorded in the SIR tracking:

- 1) the September 15th case was more of an OIR than a SIR,
- 2) the track detected was most probably resulting from a real traffic in this area.

The OPS group focused its analysis on the geographical area (Martigny) directly related to the nuisance track.

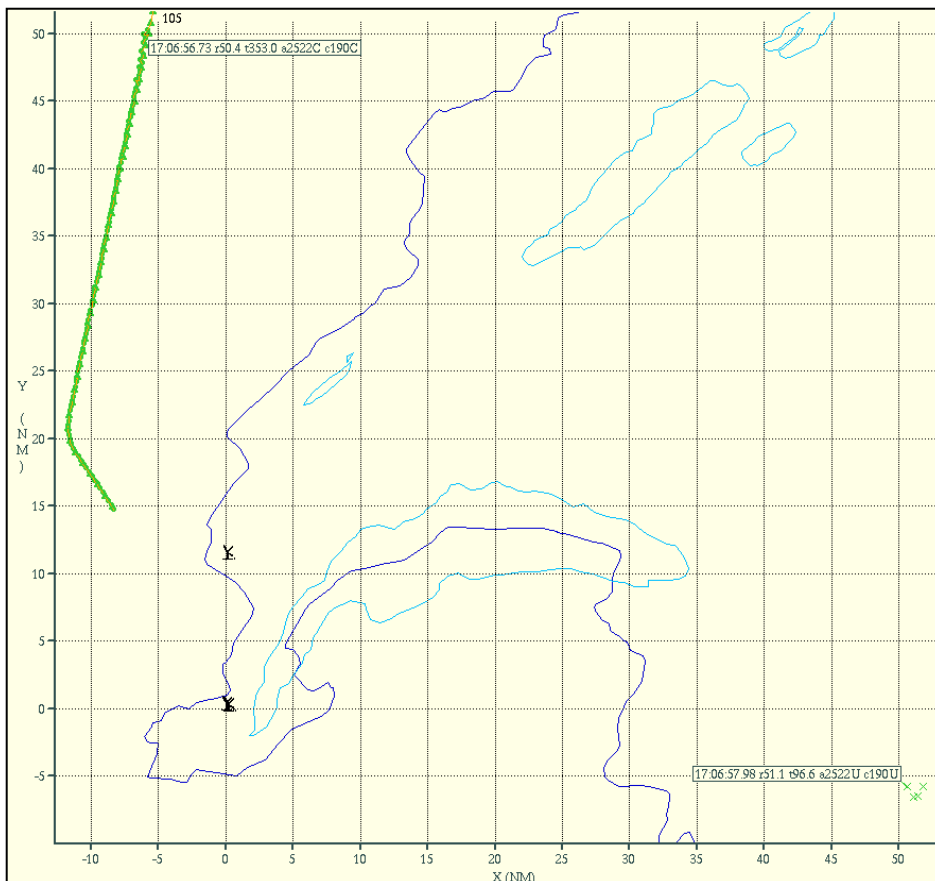
The Safety Panel was not satisfied with the response and requested by the Technical Safety Group further investigations.

Deeper into the details

The technical investigation started beginning of December. Unfortunately the previous investigations were closed and due to the amount of time spent since the incident itself all the relevant data have been overwritten. 3 months were gone since the incident itself and more than one month after the close of the investigation.

Fortunately, since the introduction of the technical Radar Data Quality analysis tools (SASS-C) in Skyguide, a technical recording of all sources is done daily on this platform and are kept for technical analysis for months. This recording has no "legal" dimension but is used for long-term technical investigations. After a discussion with radar source specialists on this September 15th case, it has been identified that this sort of track was typical of a radar reflection. As a consequence other geographical areas have to be considered in the investigation. With the help of the technical recording tools and data, an aircraft with code A2522 was as well established on an arrival route (DJL-ARBOS) above Jura, North of Geneva (see diagram) and far away from the area examined in the first investigation. The A2522 track above Martigny was a pure reflection of this aircraft.

The cause of this reflection is known to the Skyguide radar specialists and most probably linked to the Geneva Palexpo huge metal buildings. Normally, reflections are filtered by the radar by using dedicated software. But in this case, the reflection plot arrives BEFORE the original one !



This is linked to the Jura mountain, masking the real plot because of the higher elevation angle for the real plot than for the reflected one. This case is relatively rare, is linked to the topography of the Geneva area. The current GVIM MSSR or ARTAS technology cannot address this kind of problem. The ModeS introduction (COMOS) will soon provide us with the technology to address this kind of issue: by modulating the power emitted to the mountain and by using coverage/acquisition maps.

In order to benefit from all available cases of this nature so we address correctly this kind of problem with the future solutions, an information to the ATCOs was issued to reinforce their awareness (GC 02/2004 "Ghosts blips aux secteurs INI Sud").

Lessons learned

Some conclusions can be highlighted from this case:

1) the SIR process has fulfilled its main role: it has allowed to gather and identify a safety concern experienced directly by a Skyguide collaborator. It has allowed to trigger the additional actions needed to insure the complete investigation of the case and a full understanding of the roots behind the safety issue.

2) as we are living in a complex environment, any investigation has to be conducted with the right specialists to address all dimensions of the issue. These investigations often require knowledge from many sides and have to be conducted in a well structured and organized way.

3) even when investigations are first considered as closed, some later facts or events can request to keep access to the data used in the initial investigation. Data used in incident investigations should be archived. This could generate new needs for storage means but will prevent any trouble to re-assess cases when new facts are discovered.

The actions to address these lessons are currently under discussion. So, we will reinforce the quality of our diagnosis and investigation process and enhance further our safety culture.

TD & TN divisions

Quantitative Safety Levels

For Operations

ICAO, in its Annex 11 "ATS Safety Management", says that acceptable level of safety may be specified in qualitative or quantitative terms and gives also examples on how this could be measured:

- A maximum number of incidents per flight hour
- A maximum number of incidents per aircraft movement
- A maximum number of valid short-term conflict alerts (STCA) per aircraft movement

In this respect, skyguide receives from its owner objectives that are measured every year in terms of safety, but also of delays, completion of AF (Air Force) missions, cost efficiency and systems availability.

Regarding safety, the objectives for 2004 are expressed as follows for the part concerning ATC daily operations:

Number of accidents with skyguide involvement:
- none

Number of incidents with skyguide involvement:
- relatively no increase against the past years (average 2001-2003)

How can we achieve that ?

Saying simply that the number of incidents caused by skyguide has not to increase is of course not sufficient, and we have to settle measures that are going to help us reaching the safety objectives.

Therefore, for 2004 and 2005, skyguide operations have fixed 2 safety KPIs (Key Performance Indicators) and measures (already implemented or to implement) for incidents which causes are particularly recurrent :

KPI n°1:

Number of AIRPROXES, skyguide involved, which cause is a deficient coordination shall decrease (average for years 2001-2003: 4 AIRPROX).

Measures:

- safety campaign with effort on coordination
- SO O on coordination
- safety bulletin and safety letters with examples of bad coordination
- for each occurrence, verify if coordination was compliant with the published procedures (if not, apply individual training corrective measures)
- coordination as a permanent topic for refreshers

KPI n°2:

Number of AIRPROXES, skyguide involved, which cause is an assumption shall decrease (average for years 2001-2003: 4 AIRPROX)

Measures:

- safety campaign with effort on assumption
- safety bulletin and safety letter with examples of assumption
- for each occurrence, thorough analysis to detect if the cause is an assumption, (if not, apply individual training corrective measures)

In order to improve the safety and reduce the number of incidents with skyguide involvement, a third KPI will be settled during the year for 2005 and 2006. A future safety bulletin will inform you on this new KPI.

Denis Droz / OO