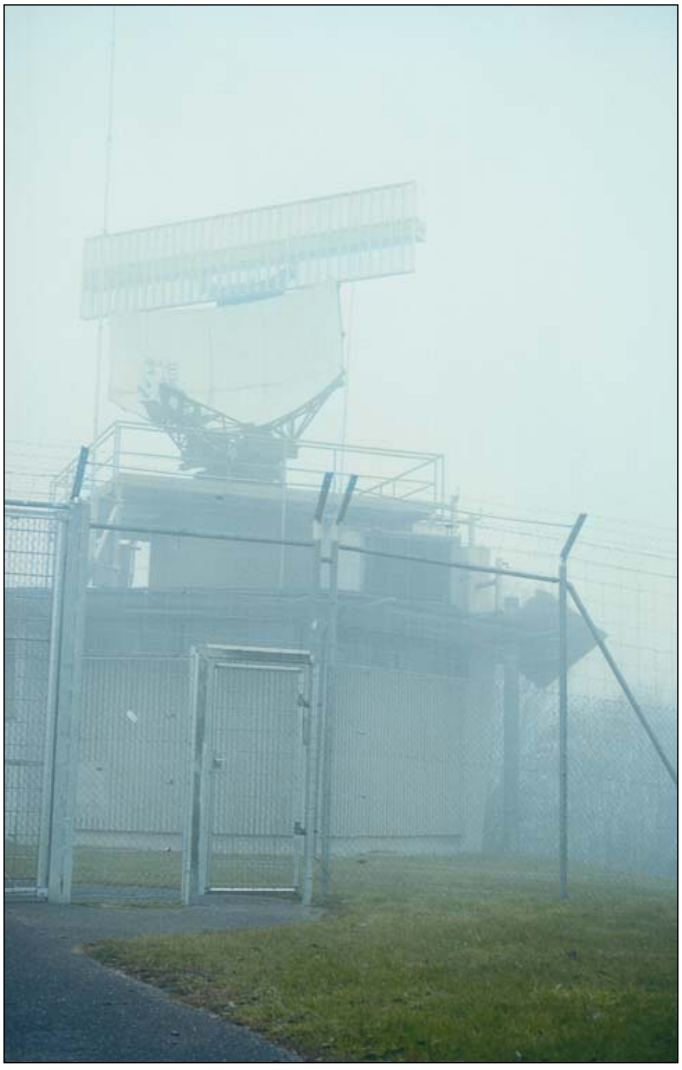
8 – Oct/Nov/December 2004

Safety Bulletin

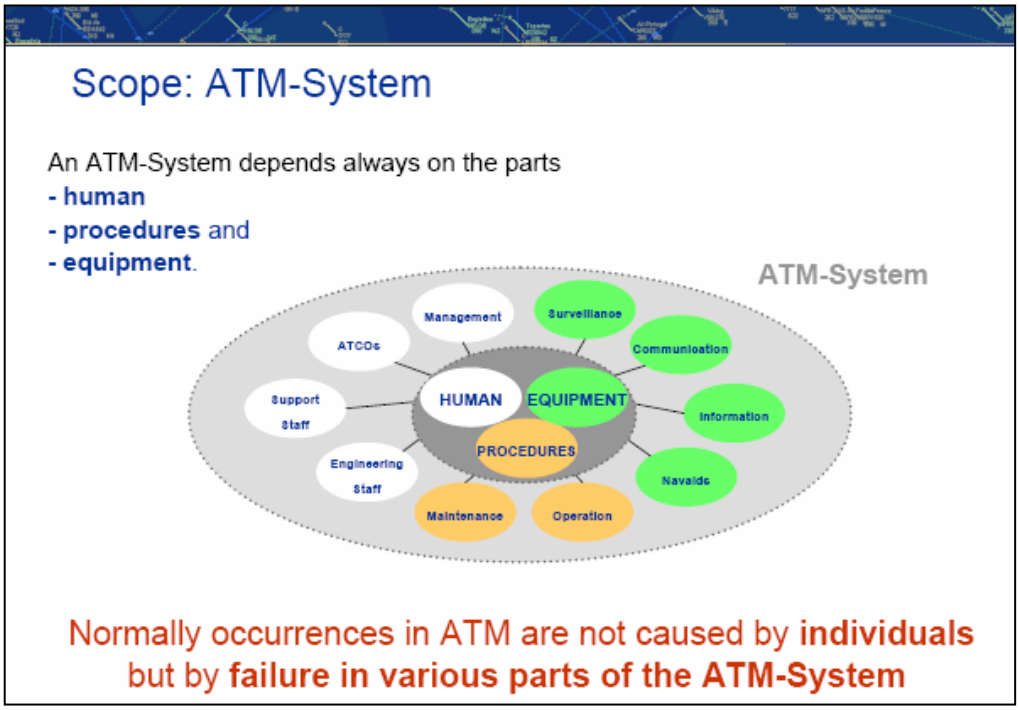
e-mail: s.b@skyguide.ch
Intranet: SWAN/management/safety/safety bulletin

Inside this issue



Editorial

For the last decades it has been a known fact, that to make progress on safety and to be able to act in a proactive way, it is vital to know about the problems we encounter. One way to acquire this knowledge within an ATM-unit is through incident reporting. The first hand knowledge of the events leading up to the increased risk, how the problem was detected, and what ideas the involved persons have to avoid this from taking place, is essential information.



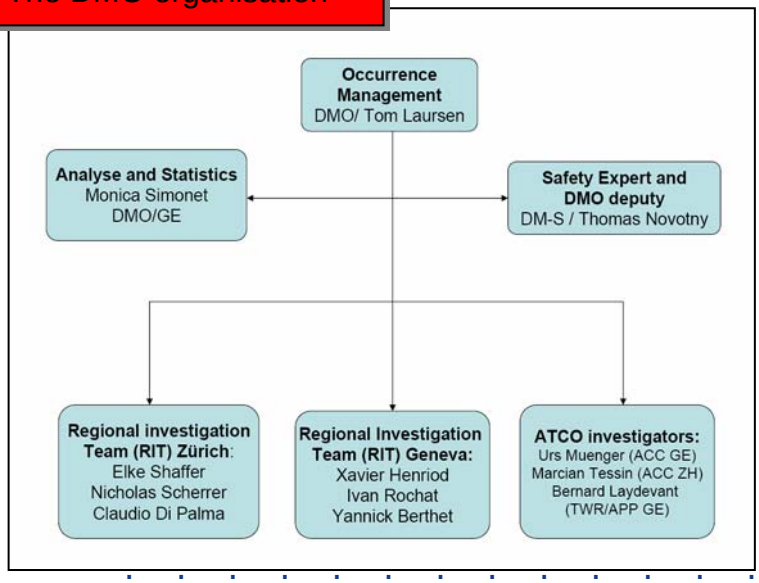
On the 17th of January Skyguide is implementing a new way of handling incidents within the company. So far we have treated incidents as the property of the people directly involved in the incidents and we have been looking for measures that mainly concentrate on repairing the "human errors" committed.
The new way of handling incidents will concentrate on the ATM system (see fig above). Based on the philosophy " It takes systems to fail, just as it takes systems to succeed ". First of all it is not only the individual that is responsible for making the system work. Secondly "human error" or as we like to call it, the potential failure of the system, is a property of the system. It is not the single person that brings the system to the edge of break down. The system is defined by the Human, Procedures and Equipment (see fig above).

In the new way of handling incidents it is foreseen that after ATCO's have reported an incident to the supervisor the incident will be handled in by the safety management (DMO). The analysis of the incidents will then be done by controllers who have received the adequate education and who will act according to the above philosophy. The goal of this is to make people feel free to talk about safety threats and to create awareness of where the boundaries of safe performance lie.

Please help us to help Skyguide and yourself to a better understanding of why incidents happen and how to prevent them from taking place again. We (the DMO-team) will do our best to achieve these ambitious goals.

Tom Laursen, DMO

The DMO organisation



skyguide

REPORT, LEARN, IMPROVE

On the 1st of January,
skyguide is changing the
Occurrence Management Concept

Please, read the service order

Your DMO-team

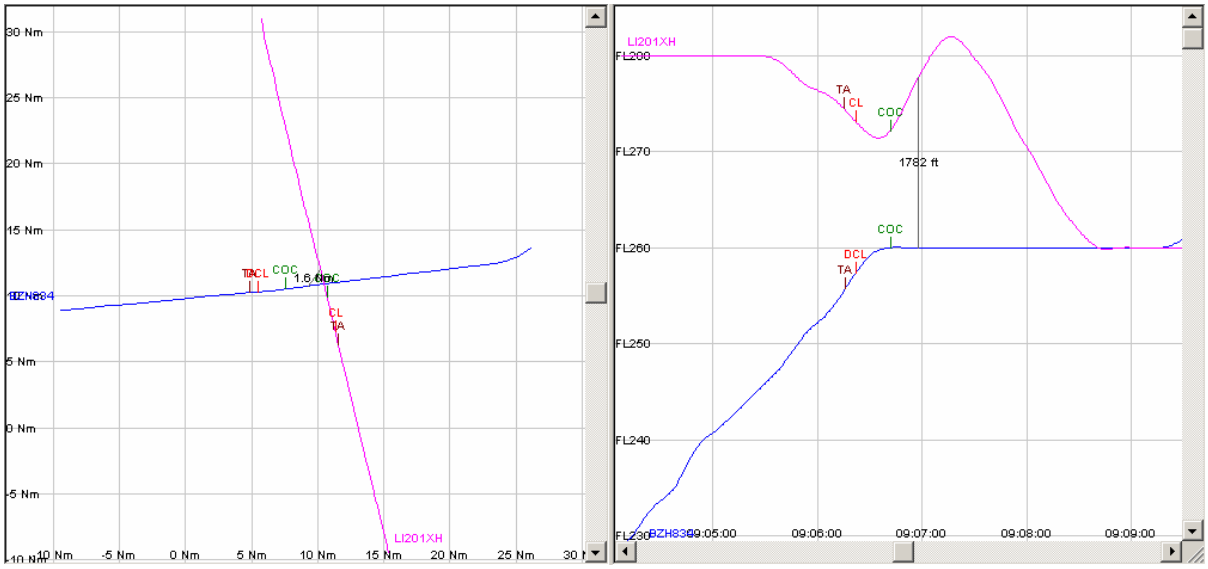
ACAS analysis within skyguide

Eurocontrol specialists have provided ACAS analyses until the end of 2003. For the purpose of such investigations, they have created a tool called InCAS, Interactive Collision Avoidance Simulator. This tool enables states to make ACAS analyses on their own. Skyguide has taken this opportunity and InCAS analyses are established nowadays by local specialists.

InCAS simulations allow us to illustrate and analyse all occurrences which are related to ACAS. In case of a doubt about the result or in case of a deviation from the standard ACAS behaviour, these analyses are forwarded to the Eurocontrol Experimental Centre (EEC) for expertise and advice. As ACAS can have a significant effect on ATC, there is a continuing need to monitor its performances and collect diagnosis results at an international level.

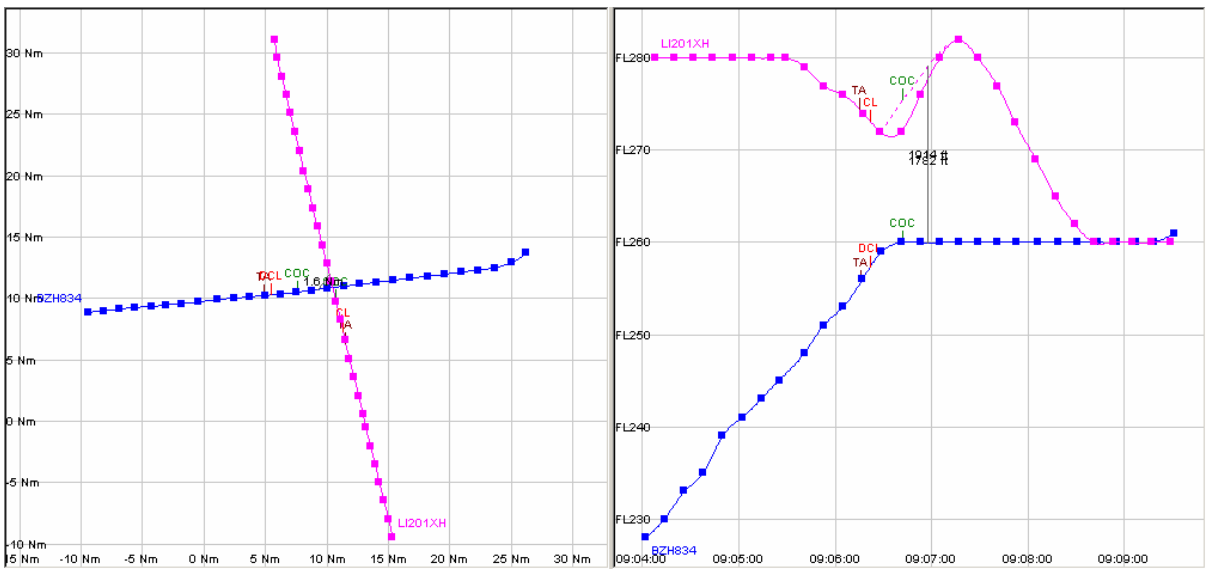
Short description of the tool

InCAS is a flexible and fully integrated ACAS simulator, including all features required to prepare, run, and analyse ACAS simulations of aircraft encounters taken from real radar data. Encounters can be prepared from standard radar track data, ACAS scenarios can be configured, simulations run or played back, and ACAS events can be viewed through simulated pilot and controller displays. The InCAS tool allows users to analyse and diagnose ACAS behaviour, and print hardcopies of the various views of the ACAS simulation.



ACAS scenario

Several scenarios can be created from the same original encounter, with different ACAS equipments, event models, models of pilot reactions, etc. On the second scenario the ideal trajectory to be flown after the first RAs has been introduced. This ideal flight path is represented with a dotted line.



ACAS diagnosis

This view provides textual diagnosis information of an ACAS simulation, from the point of view of a selected ACAS equipped aircraft. During a simulation InCAS captures trace information at critical points in the ACAS logic. The information is presented in plain language to help understand the ACAS response during an encounter. The information is tagged with the time, and intruder aircraft identifier, and provides both concise and detailed diagnoses for four of the main ACAS logic processes: detection, resolution, co-ordination, and traffic detection.

					Green arc	Red arc	Own aircraft		Intruder		TCAS Parameters						
Time	from start	Alert, Strength	Duration	Type	Min/Max	Min/Max	FL	Vert. speed	FL	Vert. speed	Range	Range rate	TAUR	Δ Alt.	Δ Alt. rate	TAUV	VMD
	min:s	ft/min	min:s		ft/min	ft/min		ft/min		ft/min	NM	Knots	s	ft	ft/min	s	ft
19:29:24	00:16	Traffic advisory	00:07	-----	----- / -----	----- / -----	125	-1335	64	8520	4.71	-384	43	6101	-9856	0	-944
19:29:31	00:23	RA Climb	00:13	Corrective	1500 / 2000	-6000 / 1500	123	-1419	75	9209	3.96	-460	30	4856	-10627	27	-406
19:29:44	00:36	RA Don't descend	00:15	Corrective	0 / 300	-6000 / 0	121	-1025	93	8550	2.35	-553	14	2779	-9576	27	331
19:29:59	00:51	Clear of conflict	-----	-----	----- / -----	----- / -----	122	2280	105	238	1.31	267	0	1783	2042	0	1783

Time	from start	Event	Duration	Type	H. Sep. (NM)	V. Sep. (ft)	FL	Vert. speed	FL	Vert. speed
19:29:54	00:46	CPA	-----	-----	1.02	1691	121	663	104	5040

Tool's application within skyguide

According to ESARR 2, all air traffic incidents must be reported and analysed.

For all ACAS and AIRPROX events an InCAS report is established. These reports are joined to the investigation dossiers.

A scenario, made by an InCAS specialist, can also be viewed and replayed with basic knowledge of the program on any PC on which InCAS has been installed. Such visualisation can be interesting for the purpose of instruction or for a circumstantial event analysis by an evaluation team.

Results

The result of an InCAS analysis must be considered with prudence, because the event is simulated and re-constructed on the basis of recorded radar data. The more accurate the radar data is (length of the renewal period) the closer to reality the outcome of the analysis will be.

The crew's reports giving an indication about the type of the ACAS equipment and its working status must be integrated meticulously when establishing InCAS analyses.

The ACAS recording on board of the aircraft provides the only indisputable proof of the course of an event, but as these recordings are secured in case of serious risk occurrences only, the investigators mostly base their analyses on the result of the ACAS (InCAS) simulations.

What events are analysed

Every ACAS encounter, which is reported by a pilot or a controller is analysed by skyguide, also "Unnecessary" RAs during level offs. The results of these analyses are forwarded to the concerned companies. Awareness of ACAS events, which are the result of a too high vertical speed when approaching the cleared flight level, is an important safety relevant issue (possible chain reaction).

InCAS simulations are established by skyguide nowadays for all AIRPROX investigations. Considerations such as did the crew get a TCAS alert and if, did it follow the RA correctly, must be taken into account when assessing the severity and the causes of such events.

Monica Simonet, OPS safety reporting management

SIR number 200

A BOUQUET FOR A WOMAN

Within the operation of the Safety Management System, the ATM service-provider *(1) :*

a) shall ensure that **all staff are actively encouraged to propose solutions to identified hazards**, and

b) shall ensure that changes are made to improve safety where they appear needed.

The easiest way to propose improvements is to tell your superior. But if - for any reason - you prefer to address your proposal directly to the Safety Management, you have the possibility to write a Safety Improvement Report *(2)*. Most of the proposals and concerns we receive are justified and sent (de-identified) to the management concerned.

Not all problems can be fixed immediately, some need quite some time to be solved. But over all it gives Skyguide the opportunity to improve safety and we from Safety Management receive a better overview of safety-related problems in our organisation. The SIR programme started two years ago and at the beginning of October we received the 200st report. Almost 200 hints for Skyguide to improve safety.

Thanks to all of you who have contributed with a report. And keep on reporting!

All who have written a SIR and did not get an answer or were not satisfied by our feedback, please contact us or the Safety Panel member of your unit *(3)*and ask for further information. Help us as well to improve our Safety Improvement Reporting Process.

Peter Scheuber from Safety Management and Pascale Guglielmetti who wrote the 200th SIR.

(1) ESARR3 : use of safety management systems by ATM service providers
(2) The Safety Improvement Reporting form and more information can be found on the SWAN under management/ safety/ SIR
(3) see " Members of Safety Panel" on the same location as mentioned above

More reading

In the intranet under operations/technique (or Betrieb/Technik)/ safety infos / external you can find following interesting articles concerning safety :

- **ACAS II 5th bulletin**
  Focussing on ACAS regulation and training
- **Air-ground communication safety letter (draft version)**
  Eurocontrol safety improvement initiative
- **Safety matters 7 (NATS safety bulletin)**
  Including full digest of the Linate accident
- **Skymag magazine November 2004 (p16-21)**
  Sydney Dekker speaks about human factors and system safety

Happy reading to all of you !

Systems Safety Management

What is actually going on ?

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

Safety Assessment Programs status

ATM-System	Program Manager	Safety Manager	Status	Target date
SAMOPS	G.Bailue	M.Vettovaglia	**Running**	25.01.2005
VISTA	L.Chevalley	S.Barraz	**Running**	21.02.2005
ZAP-DVO3	W.Vogt	HU.Glauser	**Running**	17.03.2005
LSZH WLT	J.Haenni	HU. Glauser	**Running**	31.12.2004
UAC-CH	Y. Le Roux	F.Balda	**Running**	31.03.2006
LSZH NAPP	H.Wipf	HU.Glauser	**Running**	31.01.2005
P-RNAV	T.Buchanan	S.Barraz	**Requested**	2005
EMRA DUB	J.Büchi	M. Vettovaglia	**Requested**	2005
Stsa	A.Maag	tbd	**Requested**	2005
KLODUB	P.Stampfli	tbd	**Requested**	2008
ZAP-DVO2	W.Vogt	S.Barraz	**Achieved**	30.04.2004
PRIMUS	P.Kuenzli	JM. Bory	**Achieved**	31.03.2004
ASR-10 GVA	Ph.Chauffoureaux	S.Barraz	**Achieved**	09.12.2003
SETInet	D.Epp	JM.Bory	**Achieved**	30.09.2003
TWR-ZRH	A.Heiter	S.Barraz	**Achieved**	10.06.2003
IFREG	Y. Le Roux	JM.Bory	**Achieved**	11.02.2003

Running
Safety Program Plan validated.
Safety Assessment Program team constituted .
Working sessions running.

Initialized
Safety Program Plan under preparation.

Requested
First contact between project management and Safety department established.
Need and scope for Safety Assessment under discussion.

Achieved
Safety Case Document delivered and endorsed by official instances.

Blocked Military Airspace

WHY DO MIL OPS NOT RELEASE THEIR AIRSPACE MORE OFTEN TO CIV ?

(see glossary at the bottom of next page)

If we are to appreciate why we should not talk of “blocked military airspace”, a certain amount of background information is required. All TSA requesters submit their needs to the AMC, which is responsible for managing Swiss airspace in accordance with the provisions specified in CFUA Level 1. The AMC will then decide, for all airspace users, which TSAs should be assigned and/or which CDRs should be activated or deactivated. The resulting TSA management is then passed on to the Swiss Air Force (AOC) and to the Zurich and Geneva Area Control Centres, which then release CDR-2s to the Brussels CFMU.

Once this has been done, the exercises to be conducted are ordered at the AOC, and the crews involved receive their instructions on the type of training to be performed and the scope of such activities. This process also involves the nomination of a mission commander. During training missions, this is generally a flight leader from one of the squadrons involved; in other cases, the mission commander will be incorporated into the ADDC command structure. The entire TSA planning will then be entered into the various AOC systems, and will finally be passed on to FLORAKO.

The ADDC air traffic controller will then see all the TSA planning for the current day in the airspace schedule on his FLORAKO console. He can also obtain the following information about the various blocks of airspace reservations.

- TSA users
- duration of the mission/exercise
- TSAs involved in the mission/exercise
- type of mission/exercise
- any leader of the mission/exercise
- point of departure and destination
- number of aircraft involved, etc.

Every morning (at 07:45 local time) and before every lunchtime (at 11:00 local time), TSAs which are not occupied (for 30 minutes and more) and can actually be used by civil ATC are released to civil operations. The entire operational workflow within the ADDC is regulated to ensure that any report of cancellation, delay or downgrading of a mission or exercise in the TSAs will reach the controller concerned. The controller can then immediately release the newly-available airspace (if it is free for 30 minutes and more) to civil operations.
For various reasons, however, news of the cancellation, delay or downgrading of a mission or exercise may not reach the ADDC, or may only reach it too late. This can happen for any of a number of reasons: TSA users may suffer delay at the airfield itself; or they may experience problems with their aircraft which may lead to delay, downgrading or even cancellation of their mission. A sudden deterioration in meteorological conditions can also prevent the commencement or the entire performance of a mission in the TSAs.

Ideally, these short-notice changes should be passed directly from the pilot to the ADDC, either via the local ATC or via the AOC. But, for various reasons, these modifications sometimes reach the ADDC late (and in some cases do not reach it at all). In other cases, they are only resolved because of various changes and developments (such as reports from pilots) within the ADDC chain of command. The Swiss Air Force is not unlike a fire brigade: by its very nature, it cannot function with a fixed timetable like an airline does. It relies on quick and short-notice decisions to perform its role and function, and it has a dynamic management process. And the ADDC is the tactical part of its mission management on the air defence front.

If the TSA users are in the TSAs assigned, the mission or exercise will be conducted according to plan. In such cases, the ADDC will only be partly aware of the scope and dimensions of the flight profile.

So-called “autonomous exercises”, which are held without tactical guidance of the ADDC (GCI/IND), can be carried out in various forms. In these cases, the pilot-in-command or the mission leader will decide how the TSAs should be flown and used in lateral and vertical terms. This occupation can also change in the course of the mission, since a wide range of preparations will usually need to be trained. The ADDC has no influence over the way in which the TSAs are used, since the TSAs have been placed entirely at the TSA users’ disposal. So in these cases, all the ADDC does is ensure the appropriate management of the TSAs concerned.

If, however, the pilot in command or the mission leader reports that a mission is being prematurely terminated or downgraded, the ADDC will immediately check whether the airspace concerned can be handed over to civil operations for more than 30 minutes. (see next page)

If the air traffic controller in the ADDC notices that the flight crews using a TSA are not using or do not seem to need its full dimensions for their mission or exercise, the controller will check with the pilot in command or the mission leader to see if parts of the TSA could be handed over to civil operations. If this can be done, and if civil ATC can actually use this airspace, these parts of the coordinated airspace will be immediately released to civil ATC.

So-called "controlled exercises" – i.e. missions in which the ADDC's tactical guidance is integrated into the squadron deployed (in BVR mode) to complete the mission concerned – cannot be planned in flight path terms. These exercises practise the control of the ADDC's own squadrons over a predefined "area of responsibility" or AOR. Under international norms, this generally extends to some 40-60 by 80-100 nautical miles, and may or may not be subject to an upper flight level limit.

The objectives of the opposing party, which is required to "improperly" use this airspace, can be extremely varied, and will depend on various factors in each such mission. Missions of this kind often develop their own dynamics. They are, by their very nature, impossible to predict: like the "fire brigade" role mentioned earlier, each side is called upon to act and react.

In some cases, a mission of this kind may be concentrated in a particular part or a particular level of the TSAs for its entire duration. Alternatively, it may develop in such a way that all the TSAs are temporarily or permanently used. Flight levels may be changed at high vertical speeds, and the lateral extent of such a mission may rapidly expand to the edges of the TSAs concerned. In these cases, the various squadrons involved can "explode" in terms of space.

The only controlled exercises that can be largely planned in terms of their lateral and vertical use of the TSAs assigned are interception exercises. In these exercises, the squadron will follow precise instructions from the INDs. This enables the INDs to coordinate the exercise with civil aircraft movements more easily.

Needless to say, the coordination procedures for individual off-airway requests from civil ATC to the ADDC are largely analogous to those described for the autonomous exercises. It should be noted here, however, that the scope for these is fairly limited. A restriction caused by an off-airway flight will often result in the abortion of an exercise, especially if it is a larger mission involving multiple aircraft. This in turn can mean having to get eight or more aircraft back to their predefined starting points and also organising them within their squadron. The time and fuel needed for these manoeuvres will usually prevent any repetition of the mission, meaning that the aircraft involved will simply have to return to their bases. This is, of course, hardly in the Swiss Air Force's interest – especially in view of the extensive preparation that such missions entail..

In all discussions over the occupancy and use of TSAs, it should always be remembered that the Swiss Air Force, skyguides main customer, defines the workflows and the procedures involved. The ADDC is subject to the Swiss Air Force's military command, and performs its functions in full compliance with CFUA Level 3. In doing so, the ADDC plays a pioneering role in coordinating between civil and military ATC operations.

Glossary:

-ADDC	Air Defence and Direction Center
-AMC	Airspace Management Cell
-AOC	Air Operation Center
-AOR	Area Of Responsibility
-ATC	Air Traffic Control
-ATCO	Air Traffic Controller
-BVR	Beyond Visual Range (i.e. operation of radar guided missiles)
-CDR	Conditional Route
-CFMU	Central Flow Management Unit
-CFUA	Flexible Use of Airspace Concept
-FLORAKO	Swiss Air Force Operation and Control System
-GCI	Fighter Controller
-IND	Intercept Director
-OPS	Operations
-PIC	Pilot in Command
-TSA	Temporary Segregated Area

To communicate,
pilots and controllers speak together…

Caution!
Everybody makes mistakes:

*"one out of a hundred times pilots do not proceed according to controllers expectations"****

To understand each other is a skill !!!

Listen to the pilot's acknowledgement and check that it is correct !!
Read back and hear back!!

*** according to a study made in USA by MITRE corporation