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Safe airspace thanks to skyguide and the Swiss Air Force

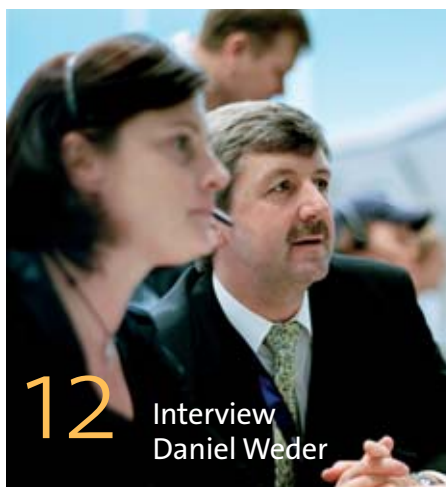


› **Interviews:**

Daniel Weder and Bernhard Müller

› **Safety:**

Safety culture



impressum

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Skyguide completes its first decade



Zurich control tower: the "Fachstab skyguide" in action.

It was on 18 August 1999 that Swiss Federal Councillors Adolf Ogi and Moritz Leuenberger, ministers of defence and transport respectively, resolved to integrate Switzerland's civil and military air navigation services into a single organisation. Skyguide was duly founded on 1 January 2001; and Switzerland became the first country in Europe to entrust all its air traffic management – including the tactical command of its military jets – to a company organised under private law. One year later, skyguide welcomed 108 new colleagues from the Swiss Air Force. And in 2005 skyguide and the Swiss Air Force became the co-habitants of the new Air Navigation Center in Wangen, near Dübendorf.

Delays cut by 80%

In the first ten years of its existence, skyguide has significantly enhanced its punctuality record. In the 1980s and 1990s, air traffic volumes had grown so fast that capacity was often unable to cope, and delays frequently resulted at various points in the system. In its first ten years, skyguide has invested substantially in expanding the existing capacity; and, as a result, the company has reduced the numbers of delays attributable to air traffic management by a sizeable 80%. Skyguide today has an excellent punctuality record in any international comparison, and its Geneva and Zurich area control centres are among Europe's best performers in punctuality terms.

An optimised airspace structure and additional controller staff

Skyguide has achieved these substantial performance improvements by fundamentally restructuring the airspace under its control, adopting innovative new efficiency-raising technologies and significantly expanding its operational workforce: the company now has 15% more civil air traffic controllers and provides instruction for 48% more trainees than it did ten years ago.

Sizeable fluctuations in traffic volumes

Air traffic volumes have shown strongly fluctuating trends in skyguide's first ten years. The air

transport sector is particularly sensitive to the general economic mood, and the major economic crises of 2001 and 2008 both had a sizeable and immediate impact on the numbers of flights handled. All in all, air traffic volumes have grown by only 2.7% in skyguide's first decade. But between 2002 and 2008 – up until the financial and economic crisis at the end of the latter year – traffic volumes grew by a far more substantial 15.5%. Military air traffic remained stable over the whole period but was subject to some fluctuations.

A services agreement with the Air Force

Since 2002, skyguide and the Swiss Air Force have enshrined their collaboration in a bilateral services agreement which is revised and adapted each year. The approach has proved its worth, providing both greater cost transparency and a better appreciation of the quality of the services provided. The close collaboration between Switzerland's civil and military air navigation services has also proved its worth, enabling various airspace protection missions to be flown smoothly and without incident every year (during the Davos World Economic Forum, for instance) and as and when required (such as during the 2008 European Soccer Championships, the G-8 summit in Geneva or the Francophonie Summit in Montreux). For skyguide, the Swiss Air Force is a particularly important and reliable partner.

Ready for tomorrow's challenges

Skyguide today is well prepared to meet and master the many and varied challenges that are sure to lie ahead. Progress on the FABEC programme is leading to more and ever-closer contacts among the air navigation services organisations of the six FABEC countries. And further enhancing air navigation services and continuing to make steady improvements in safety, efficiency and environmental terms are the challenges that are now being tackled together by skyguide and its fellow FABEC members. ■

The Air Force and skyguide secured the airspace over the Francophonie Summit in Montreux

No fire in the sky



Heads of states and governments at the 13th Francophonie Summit in Montreux.

“Smoke On The Water, Fire In The Sky” – forty years ago, the rock stars in Deep Purple poured the fire at the casino in Montreux into their world-famous song – and in the English language! However, the 13th Francophonie Summit was held in October 2010 in Montreux, on the banks of the beautiful Lake Geneva. But this time there were no signs of fire in the sky. The great event, attended by 70 heads of states and governments, passed off without incident in the sky or on the ground. And that does not happen of its own accord. Ten years of daily co-operation between civil and military air navigation services form the foundation for this success. A glance over the shoulders of the air navigation service professionals.

The 13th Francophonie Summit was held from 22 to 24 October 2010 in Montreux, one of the most important diplomatic events in Switzerland in recent years. Around 5000 men from the army and the police assured the security of the 70 heads of states and government as well as the 3000 members of delegations and the 600 journalists. President Nicolas Sarkozy flew in from France and prime minister Stephen Harper from Canada. They and the other heads of state were personally welcomed to Switzerland by federal president Doris Leuthard. The

airspace over Montreux was secured by the Swiss Air Force and skyguide, a great example that demonstrates the success of the daily partnership between the civil and military institutions. There were seven violations of the restricted airspace zone, but no incidents.



Hot mission for the Air Force.



“Mission: not impossible”



Closed zone over Montreux. Civil locations in blue, military locations in yellow.

Bases all over Switzerland

All aircraft in service take off from the air force base in Payerne ①. The military air traffic controllers in the control tower give them permission to take off. As soon as the pilots have left the air force base zone, they are taken over by the controllers at the MEZ position in the area control centre in Geneva ②, from which they are directed to the holding zones. There, they circle in what are known as temporary segregated areas. If they have to make a high-speed interception, they are guided precisely to their targets by the fighter controllers in the Air Defense and Direction Center (ADDC) in Dübendorf ③. Skyguide air traffic controllers also provide support to the operations centre in Dübendorf during their military refresher courses.

Airspace closed

The air force closed the airspace in a radius of 46 kilometres around Montreux and monitored it from the ground and in the air in order to exclude any threat to summit participants from the air. F/A-18 Hornets, PC-7s and helicopters were on permanent alert. They are able to react within the shortest of time if any unauthorised aircraft intrudes into the closed area. We will look over the shoulders of the specialists from the air force and skyguide. They operate from various locations.

550 employees of skyguide work here at its headquarters to the west of the characteristic control tower. The

Area Control Centre Geneva is also here. It controls the airspace over western Switzerland and deep into France and Italy. It controls around 3200 flights every day, including more than 500 landings and takeoffs at the international airport of Geneva-Cointrin.

Military pilots are guided to their operational areas from the MEZ control position in the control room in Geneva and then back to the

Important events like the Francophonie Summit or the World Economic Forum in Davos bring special risks with them. It is easy to imagine how the worldwide media would report it if the security of the airspace over the venue of an international summit meeting was breached. The demands on the security services are gigantic. But, at the same time, civil air traffic cannot be restricted. In the case of the Francophonie Summit, the narrow limits of Swiss airspace and the proximity of Montreux to the airport at Geneva posed an enormous challenge to the Swiss Air Force and skyguide. Only thanks to the cooperation between the military and civil partners, which is tried and tested every day, could such a complex mandate be fulfilled successfully. And appear almost as light-footed as a rock concert.

air force base at Payerne. During their airborne operations, the pilots of the F/A-18 of the Swiss Air Force – like their French colleagues in their Mirages and Rafales – communicate with the Air Defense and Direction Center that supports them on their tactical missions.

There is also great activity at Geneva Airport. Political events of this nature bring a higher and operationally more complex volume of air traffic with them. The members of the delegations normally arrive in private aircraft or on scheduled flights. State flights are notified by a Prior Permission Required (PPR), which necessitates a temporary restriction of operations. A state flight transporting a head of government enjoys priority. It has right-of-way and may not be delayed. Capacity planning then becomes essential to prevent longer delays.

David Galley, Verena Reymond and Jérôme Berchier normally work at the air force base in Payerne as military air traffic controllers. However, they do not wear uniform but are employees of skyguide and so civilians. Today, they are controlling the MEZ and DELTA sectors at the outer perimeter of the control area. The DELTA sector is responsible, among other





missions, for civil aircraft in airspace Charlie. That means that the air traffic controllers stack the civil aircraft so that they comply with the prescribed minimum separations and do not cut across each other. The MEZ position controls military aircraft that take off and land in Payerne until they have reached their planned areas of operation.

The Air Defense and Direction Center (ADDC) in the Air Navigation Centre at Dübendorf stands



shoulder-to-shoulder with the area control centre Zurich. The Air Navigation Centre is the actual nerve-centre of air navigation operations. It is operated jointly by the Swiss Air Force and skyguide. Giant screens in the Air Operation Centre show a permanent picture of what is happening in the airspace. This “air situation” is generated by radar information from the air force and the information that skyguide delivers in real-time. This is the coordination centre where the airspace in the region is monitored, military surveillance flights are coordinated with the air navigation services and the effectiveness of operations is analysed.

The 30-year old from Berne, Sirius Shojai, is one of a group of eight Swiss air traffic controllers who are militarised by the air force in case of special regulation of the airspace, such as the World Economic Forum in Davos or the Francophonie Summit. His appearance is calm and the military uniform does not stand out, as only one among many. Only the insignia on his arm tells us what function Sirius is performing today: “Fachstab skyguide” or skyguide special staff. The military relies on civilian specialists frequently, when it needs additional personnel for large-scale operations. Although he wears a uniform during his deployment in the operations centre at the Francophonie Summit, Sirius is not a military air traffic controller or fighter controller, responsible for tactical air traffic control, guiding jet pilots to their targets. Today, the Bernese air traffic controller is on a military service refresher course working in the ADDC in Dübendorf.

From their desks in the control tower, landing and takeoff controllers maintain an overview of the



runway at the most important air force base in

Switzerland. They grant takeoff and landing permissions and guide the pilots within their control zone.

The squadrons of jets or helicopters that carry out air police, air defence and air transport missions are based here. All the F/A-18s and PC-7s that implement the airspace restrictions over Montreux take off from here. In conjunction with the French Armée de l’Air, they monitor the whole area of Lake Geneva and pursue intrusions into the airspace. 570 members of the Armed Forces and 19 skyguide employees work here in normal times.

The task for Sirius’ is to identify the aircraft in the closed airspace. As an approach and aerodrome controller at



Berne airport, he is very well qualified as he controls both civil and military traffic in the airspace around Berne. “As a controller in Berne, I have to deal with very different customer profiles”, says Sirius. It’s just this mixture of flying machines, from private pilots through schedule and business jets to air force helicopters and fighters that is the attraction of Belpmoos and makes him able to carry out such special missions.

09:15 The sun is shining. An F/A-18 military jet reports in. David gives it a clearance for FL 190, or permission to fly at flight level 19,000 feet. As soon

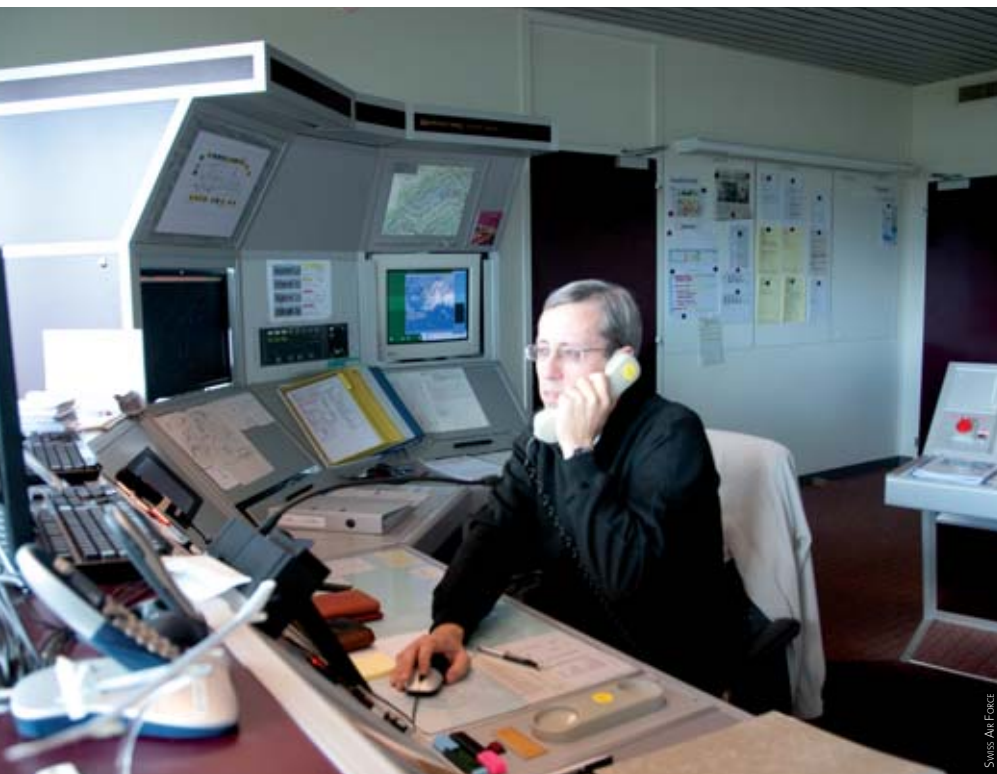


as it has reached the height of 13,000 feet, his colleague in the ADDC in Dübendorf will take over the F/A-18. Time and time again, the printer next to the radar screen spits out control strips. Civil aircraft fly in the INI East sectors up to FL 245. Ascending and descending traffic is labour-intensive, as crossings have to be controlled in three dimensions. David also knows how the commercial traffic flying on instruments is positioned in sector G5. This is important, because his military jets on the way from Payerne and back will fly through this airway.

David explains: “We are in constant telephone and radio contact with our colleagues and the pilots. The control tower in Payerne tells us that an aircraft is taxiing onto the runway and will soon take off. The operations centre follows and gives me the prescribed flight level and radio frequency. Now I can activate the flight plan. As soon as the aircraft has reached its target zone, the frequency changes.” He then



Members of the “Fachstab skyguide”.



Jean-Luc Raymond, supervisor of air navigation services in Payerne.

contacts his colleagues at the French Air Force base at Mont-Verdun near Lyon and informs them that this aircraft is flying according to plan and that there is no intrusion into the airspace.

The conversion to the different technical systems used by the air force now comes easily to Sirius. “During our first military operations a few years ago, we needed longer to get used to the change. Now we are fully operational in only a few days”, says Sirius. After some theory training on the special characteristics of the airspace restrictions in Montreux, he continued his training for a further two days until he had mastered all of its characteristics. “The air force and skyguide are now used to working closely together. The frontiers melt away”, says Sirius about his work in the ADDC.



The airspace in a radius of 25 miles (46 km) around Montreux is restricted, but there are still more than 40 flight movements per hour. As well as military flight traffic for security and surveillance flights and passenger transport, a few civil aircraft also fly through this special airspace. “They have received permission from the air force in advance otherwise they may not fly into the closed airspace”. The majority of

them are known as hook missions or freight flights with civil helicopters. Nevertheless, the conversion is the greatest challenge of the specialist staff deployments. “Even though we have experience from the WEF and other military operations, it is only our professional experience that allows us to get used to the local topography, the specific working tools and procedures so quickly.”

Many of the operations rehearsed by the air force in the days before the big event were, however, not used during the summit. “Happily”, adds the air traffic controller, “because that would have meant a dangerous serious incident.”

How does French President Nicolas Sarkozy fly to Montreux?

09:20

“As a rule, a head of state flies in to the airport at Geneva. Then to Montreux in a helicopter”, David explains to us, “and that is when the ADDC activates the closed zone on the Lake Geneva. No other aircraft may be in the airspace. Even aircraft flying visually are evacuated. As soon as the helicopter has landed, we can free the airspace once again. Our airspace in Switzerland is limited, even in normal times. To cater for all users fairly, we are used to working flexibly and cooperatively.”



The supervisor Jean-Luc Raymond from skyguide air navigation services also works in Payerne: “I



am the link between the air force, my colleagues in the control tower and the control centre in Geneva. There, they have no access to the air force flight information system. As supervisor, I coordinate the traffic directly with the Chief Flight Operation.” His work during the Francophonie Summit is basically no different from the everyday. “The duty hours are somewhat longer. During the summit we are on duty 24 hours.” Before the integration of military and civil air navigation services, Jean-Luc was a member of the armed forces. “Our



working hours were a little more flexible. Now as employees of skyguide, we have to respect the international regulations for civil air traffic controllers. That affects personnel deployment planning, but the work has not changed.”

In the squadron building next door, where the pilots are based, the atmosphere is relaxed. Lieutenant-Colonel Jérôme “Geronimo” D’Hooghe is the squadron commander. He explains that the preparations for the operation were particularly thorough. “Otherwise, it’s almost the same as in a military refresher course: the commands come from the Air Operation Centre in Dübendorf. But great flexibility is required. Our tasks can change very quickly, depending on the situation, for example when suddenly we had to have four F/A-18s permanently in the air instead of two.” Does it not upset him that he has to stay on the ground while others are able to fly? It doesn’t seem to: “I know the feeling from the many times I have taken part in the WEF. And the younger ones have to get their experience as well.”

09:25 Jérôme holds the DELTA sector. “Normal ops”, he says, “apart from the closed zone, of course.”



He is responsible for joinings, aircraft that take-off on the visual flight rules and then look for an airway through Swiss airspace under instrument flight rules. During the Francophonie Summit he also controls approaches to Les Eplatures aerodrome in Neuchâtel Canton, joinings for parachute flights, visual flights in airspace Charlie, coordination with the approach control in Sion in the Valais and takeoffs and landings of several instrument flights from and to Payerne. That sounds a lot. “Anyone who thinks that the Francophonie Summit has swept the heavens clear is making a mistake. In Switzerland, there are many more aircraft flying than you would expect in our small country. So it’s all the more important that everyone sticks to the rules or the airspace would be too tight for everyone.”

09:30 A PC-7 is flying west in the zone. As a visual flight it is autonomous.

09:40 An F/A-18 returns to Payerne. The MEZ tells the pilot that the traffic restrictions do not apply to him.

10:10 David is informed by the tower controller in Payerne that a jet is taking off in

the direction of Thun. Tactical call sign Murphy. “With or without post combustion?” That defines the speed and is, therefore, important for the planning.

10:30 A civil helicopter from the Federal Aircraft Accident Investigation Bureau is flying under instrument flight rules.

10:45 A C340 from France wants to land in Lausanne. The ADDC forbids it from flying through the closed zone. The regulations were made known very clearly. Anyone who wants a special permission for the closed zone must request this with a PPR 24 hours before the flight. The aircraft circles, turns round and finally flies to Geneva.

10:50 Everything going to plan. Jérôme takes a break, Verena takes over DELTA. A glance over the shoulder to the other sectors that are controlled by the area control centre. At this time, there are about 20 aircraft in approach control, and nearly 100 overflights. Everything going to plan.

Just like in a spy thriller

The Air Defense and Direction Center in Dübendorf, where the skyguide military air traffic controllers, acting as tactical fighter controllers, control Swiss Air Force air police and hot missions is secret territory. Only those with special permission may take a look inside it.



14:30 The working shift of skyguide supervisor, Thomas Zweifel, in the Air Defense and Direction Center of the military air traffic control has just begun. The ADDC is a windowless dark room with numerous working places with radar and computer screens. In front of the screens sit men in military uniforms, also employees of skyguide, who otherwise work in civilian clothes. They are under the command of the air force for the duration of their deployment.

The only woman in the room is the liaison officer of the French Air Force. She ensures the connection with the operations centre in Lyon. As a counterpart, during the Francopho-



Pilot briefing at the Air Force base of Payerne.

> dossier apollinaire



MEZ/Delta position in the area control centre of Geneva.

nie Summit, two representatives of the Swiss Air Force are stationed in Lyon in the French operations centre. Various pieces of information on the current airspace situation are projected onto the walls: a radar image of all flight movements in Swiss airspace, weather information and camera images of the aerodromes in the closed airspace. It looks a little like a spy film...

14:45 The airspace restrictions over Montreux has been active for a while, but no particular tension can be felt either in the control tower or on the air force base. “There are fewer flight movements than on a normal day”, explains Lieutenant Studemann, the base commander, “but the aircraft are deployed for longer than on a normal day”. Normally, the F/A-18s take off in formations of four or eight. Today, the hunter jets patrol the surveillance zone in pairs.



During the summit, as well as during the World Economic Forums, there are more people working in the ADDC than during normal operations. These are skyguide employees, military personnel and militia soldiers deployed in the ADDC during their military refresher courses. Their tasks are very varied: they control flights through the zone with air traffic restrictions, support the Swiss Air Force pilots on operation and give them instructions, are in contact with ground troops, police forces, aerodromes and representatives of foreign air forces. They control radars for the identification of aircraft and view images and recordings taken from the ground.



15:00 Thomas Zweifel attends the shift briefing, held in a meeting room outside the ADDC. The air force Chief Air Defense on duty, tells those present what they can expect in the coming hours. First the weather: it will continue to be cloudy but the cloud cover will rise to a greater height. That will restrict visibility: the air force F/A-18s will have to fly under the clouds.

15:20 The information officer explains which guests are expected that evening. Most participants will arrive on Friday evening

because the actual summit meeting begins the next morning. The information officer informs them further than the police of canton Vaud have knowledge of a wedding in Montreux at which it was planned to release sky lanterns. “That has now been banned by the police”, says the officer. The reason: the sky lanterns can rise to a great height and, depending on the wind and weather conditions, could be a hazard to air traffic.

15:25 Participants are given the details of the latest “hot mission”: the evening before, a light aircraft had to be intercepted by an air force PC-7. The light aircraft had taken off from Bex aerodrome in a northerly direction even though only takeoffs in a southerly direction were allowed. Bex aerodrome lies within the restricted airspace. On the instructions of the air force, the pilot landed again in Bex and was taken into police custody there. Because this incident was already the second breach of the applicable regulations, the federal Department of Defence, Civil Protection and Sport (DDPS) withdrew the approval for special flights from Bex aerodrome.

If it is not possible to make radio contact with a suspicious aircraft, the air force pilots can make themselves understood using internationally recognised signals. Usually, however, radio contact can be made. During special operations such as the Francophonie Summit, air force pilots carry a board with the words “Emergency frequency 121.5 Mhz” that they can show to the pilot if need be.

There is an air of concentrated calm in the control tower in Payerne. The Commander In Chief and the Chief



Flight Operation of the air force are working in the command centre of flying services with one eye on the overall airspace situation in Switzerland. There is a constant flow of pilots who collect current information before joining their aircraft.

“I oversee the deployment of the aircraft. If an aircraft has a technical problem, I must decide what is to be done”, explains Major Thomas “Pipo” Peier, now Commander In Chief. The Chief Flight Operation directs flight operations and flight services. A funeral will be held this afternoon in Bussy and he tells pilots at which time they should avoid taking off.

The French report a suspicious aircraft

15:45 Thomas Zweifel returns to the Air Defense and Direction Center and relieves his predecessor. The latter summarises the events of the past half hour for him. They say goodbye and Thomas takes his place in front of the radar screen and puts on his headset. As supervisor, he issues instructions to the military air traffic controllers and movement control. He is also the link to the Chief Air Defense, the actual head of the room. Movement control is a unit made up of military and civil air traffic controllers doing their military service in the ADDC. It is their job to identify flights through the restricted airspace and, when they have checked the aircraft successfully, to issue the through-flight permission. Every civil aircraft that wants to fly through the restricted zone during the summit must be accredited by the air force in advance. Without prior notification, no through-flight permission will be issued.



16:07 The French Air Force reports a “suspect”, a suspicious aircraft. It cannot be seen on Thomas Zweifel’s radar screen. He discusses the situation with the Chief Air Defense. They decide to send in an F/A-18. Perhaps it can pick up something on its radar. “The F/A-18 should descend at Aigle, Vaud into Tal in the Valais”, Thomas tells the duty military controllers. And adds: “We have only a 1605 at 242 20.” Translated, that means there is an unidentified aircraft at 242 degrees and 20 miles from the centre of the closed zone. 1605 represents a transponder code. Thomas contacts his colleagues in the operations centre in Lyon to learn more. Apparently a green-white helicopter had been sighted. On the Swiss side, there is still nothing to be seen.

A genuine threat or an error?

What happens when the situation comes to a head, when a suspicion suddenly becomes a genuine threat? How do they handle the pressure? “We are prepared for such situations.

We always undergo a few days training before each deployment. Several scenarios are played out”, Thomas explains. He adds: “It is almost more strenuous than the deployment during the actual summit meeting. It is the most intensive.”

During the training days, various threat scenarios and the whole chain of command and decision-making are played out. The head of the federal Department of Defence, Civil Protection and Sport (DDPS) also takes part in the exercises because the Federal Council is the body that must decide on a possible shooting down. The head of the DDPS – the Swiss defence minister – is accompanied by an air force officer at all times. “For every unauthorised incursion, we in the ADDC must contact the accompanying officer and issue a situation assessment at regular intervals. So we would lose no time in case of escalation, if a genuine threat does arise”, says Thomas.

Luckily, no serious incident deployment necessary

16:27 The story of the suspicious aircraft has, so to say, disappeared into thin air – the helicopter has probably landed somewhere in the meantime. If an unidentified aircraft or one whose transponder or radio does not react enters the closed zone without authorisation, it will be intercepted. The jargon for this is “interception”. In such a case, internationally defined procedures are implemented. Every pilot knows them. In the extreme case, an interception could end with the intruder being shot down. Happily it did not come to that. Nevertheless, seven unauthorised intruders were intercepted during the summit.

16:43 Thomas Zweifel looks at the radar screen once more. He still has a little more than five hours of duty in the ADDC before the end of his shift.

The air stayed “clean” over Montreux. Before, during and after the Francophonie Summit. No smoke on the water, no fire in the sky. That probably will not make musical history. But from the skyguide point of view, the mission was a success story that rocks almost as well. ■



The Swiss Air Force trains with their French colleagues.

After ten years of skyguide and ten

Daniel Weder, CEO skyguide

In 2011, the Swiss air navigation service provider, skyguide, is celebrating its tenth anniversary as a company for the provision of civil and military air navigation services. What has the integration brought for the users of airspace, especially for the Swiss Air Force and for skyguide? What is the most significant outcome of the integration?

D. Weder: We understand our different roles and needs much better than we did 10 years ago. Since we have been working under one roof with the Air Force in Dübendorf, we have been able to intensify our networking with the Air Force. It has become a genuine partnership. If we take a look beyond our borders, we can get an idea of what this relationship has brought for the flexible organisation of our airspace. The fact that we in Switzerland can carry out such complex missions as the WEF and the Francophonie Summit with no restriction on civil air traffic is due in part to integration.

How has the integration changed the relationships between civil and military air traffic controllers?

D. Weder: I don't know what the situation was earlier, because I've only been with skyguide for a few years. So it's difficult for me to judge to what extent the relationship between air traffic controllers has changed. Of course, we meet each other within the building or on joint courses. But the operational work is mostly carried out in the two separate centres. Civil air traffic controllers have no access to the military part. We must not forget that the controllers in the Air Defense and Direction Center not only carry out military air traffic control duties, they also perform "air defense", directing aircraft to their targets and supporting military missions. That is a rather different task compared to purely civil missions. The same applies, of course, to military aerodromes but there, there is a greater mixture of military and civil tasks. So we'll probably never have any civil-military "single culture". We benefit from synergies among the air traffic controllers, but we gain most of all in the preparation and planning

processes. Mutual understanding is growing because we follow a shared corporate strategy and have developed a safety management system that applies to all. Mutual understanding is very, very important. We will do more to further this in the future.

Would we go through the integration process again? Has the effort been worthwhile?

D. Weder: Certainly. We have initiated something that is unique throughout the whole of Europe and which helps Switzerland to manage its very limited airspace efficiently and flexibly. Air navigation services from a single source, meaning not only better coordination but the binding of air navigation services into the sovereign tasks of the Air Force, is still new ground for many countries. Today, everyone is aware that the SES depends heavily on whether those responsible for the military and the civil air navigation services can work together to restructure the airspace. Skyguide is an example from which the others can learn.

Has the integration being completed or, if it is to go further, where will the building sites be in the future?

D. Weder: Yes, purely functionally, it has been completed. But there is always the potential for improvement. To identify the areas of potential and, above all, to realise them is the task for "skyguide national". We have created this business unit which specialises in air navigation services in the lower airspace and the military area. Looking at all our processes and the creation of a consolidated strategy with our partners will enable us to concentrate more closely on their special needs. But I want to say in this respect that we may have created a separate business unit but it is still fully joined in to the company. You could put this in a more belligerent way: "united we stand – divided we fall". That applies both to the business unit and to our partnership with the Air Force. I will do everything I can to ensure that the integration develops continuously, to the benefit of the Air Force and the benefit of civil air navigation services. ■



years of integration: what next?

Bernhard Müller, Chief of Air Force Operations

Major General Bernhard Müller, Deputy Commander of the Swiss Air Force and Chief of Air Force Operations, on collaboration with skyguide. What benefits has the civil/military integration delivered for airspace users in general and the Swiss Air Force in particular?

B. Müller: For airspace users and the Federal Office of Civil Aviation, the integration of our civil and military air navigation services has simplified all the processes, as they now only have to deal with one service provider. For skyguide and the Swiss Air Force it's a unique opportunity. If you're to police your airspace effectively, you must have instant access to any part of it at any time, to get the policing unit to the aircraft that has aroused your suspicions as quickly as possible. Doing so requires optimum collaboration between the civil and military air traffic controllers involved. The "restricted area" that was created recently when Russia's president paid a state visit to Switzerland is a good example of how these joint civil/military operations can perform such state duties in the shortest of times and, in doing so, meet the expectations of the Swiss Confederation, which is the ultimate owner of both the Swiss Air Force and the country's ANS provider.

What impact has the integration had on relations between the Swiss Air Force and the air navigation services?

B. Müller: The change is tending to happen top-down – and it's happening pretty slowly, I feel. It's only since we've been together in Dübendorf under the same roof that our people have really "got closer"; and we are seeing more contacts among them at break times, too. At the management level I'd say we already have a genuine partnership. Looking ahead, I hope that technological developments in areas like remote control and the virtual centre will help to further promote reciprocal understanding and appreciation at all levels, and will generally extend our collaborations. The civil and military sides may still have different objectives, but we do need to intensify our relations at

both the institutional and the personal level, and take full advantage – in all our interests – of the benefits our integration offers.

Has the integration been worth all the hard work? If you could turn back time, would you do it again?

B. Müller: lot of our Air Force people were very sceptical. Our military cadres found it hard to see why we should entrust major elements of our Air Force operations like fighter control to employees of a civilian company, even one that was owned by the state. But the Air Force fully acknowledges the strategic need to do so. The unique structures and processes we have jointly created really help us to use Switzerland's very limited airspace as efficiently and flexibly as possible while still enabling the Air Force to perform its state-appointed mission.

Is the integration now finished? And if not, what work still needs to be done?

B. Müller: The integration project has been completed, but the process is far from finished. We still see a lot of potential for improvement. This is primarily a management task. For over a year now we've been holding regular high-level meetings between skyguide and the Air Force. Skyguide's top management appreciates that, through the integration, it has also acquired a responsibility to further develop the military part of its operations. The operational air traffic competence is something that needs to be further developed and refined companywide. And we can benefit from each other not only in terms of technological development – as we are doing in the CHIPS project, for instance – but in our operational collaborations, too.

What impact are developments on the European stage having on the integration? Are they helping or hindering it?

B. Müller: The developments on the Single European Sky and FABEC fronts only underline how vital this integration was. It's also put us years ahead of our partner states in these



projects. And that will be a tremendous advantage in the future competition among the continent's ANS providers. I doubt, though, that we're going to see a similar kind of total civil/military integration at any other state any time soon. That would affect not only the sovereign operations of the states concerned but NATO's operations, too. What I could imagine seeing is a greater emphasis on areas like training and technology. After all, joint standards are a vital component in optimising safety and efficiency.

How does Switzerland's integration compare to other collaboration models in Europe?

B. Müller: Most of these collaborations are centred on flights from an air base to a training area or from one air base to another, though they sometimes extend to approach and tower functions, too. These en-route activities are either entrusted to civil ATC or are provided by a mixed civil-and-military controller team. What's unique about our Swiss model is the way we've delegated all the air traffic management expertise and functions to skyguide – even that of the tactical fighter controller at the Air Defense and Direction Center. ■

Safety and safety culture

Simon Maurer, Head of Safety, Security, Quality

How does skyguide define safety and safety culture?

S. Maurer: Skyguide has the task of providing safe and efficient air navigation services. Safety remains our most important watchword, under the motto “Safety is not everything, but without safety there is nothing”.

In our complex environment, safety can only be guaranteed with a commensurately complex palette of rules, activities, roles and responsibilities which must extend across all levels, not only within the skyguide enterprise but to all stakeholder groups.

Today, air navigation service provision is regulated and controlled by a dense network of national and international prescriptions with which, of course, skyguide must comply to the fullest extent possible. But for a company that has set itself very high goals in the area of safety, it is not enough simply to comply with the rules. Skyguide’s activities in the area of safety penetrated deep into its corporate culture – with the object of anchoring the demands of safety deeply into all levels of the company.

How does skyguide do that?

S. Maurer: Skyguide decided some years ago to create a central Safety department, whose head is a member of the executive board. The centralisation of safety-relevant activities brings many advantages as well as certain challenges with it. One important aspect of this is the clear definition of roles and responsibilities. Through the concentration of its resources, the Safety department and its 30 specialists are able to maintain the consistency of safety-relevant activities and products at a high level. The central contact to the supervisory authority, the FOCA, also plays an important role. Their independence from line activities also allows our experts to put safety aspects clearly before other demands, such as finance or production and capacity, and to keep them separate and independent.

On the other hand, “the line”, primarily the air navigation service operation and technology departments, retains responsibility for the assurance of safety in daily operations. That is obvious in relation to air traffic controllers and air navigation service technicians, but also applies to line management. Here, the Safety department has the task of supporting the line in the broadest sense in the fulfilment of its safety responsibility, while avoiding the confusion of responsibilities.

Can you explain how that happens specifically?

S. Maurer: Two significant safety “products” which also have to meet regulatory prescriptions are safety assessments of system modifications and the investigation of any incidents that occur.

Safety assessments are moderated by the experts from the Safety department, but the expertise is provided by air traffic controllers or technicians, in other words, the line. System modifications are assessed for risks in accordance with international standards before they are implemented and the risks reduced by appropriate measures if need be. In the end, line management receives a document that not only satisfies the regulatory prescriptions and has been approved by the FOCA as evidence that the change is “acceptably safe”, but also represents a basis on which safety decisions can be made.

The Safety department investigates malfunctions and incidents which must be reported by air traffic controllers. The independence of the investigation allows, first, a protected, safety-oriented discussion with those involved, which also serves as protection for them, and then as objective a description as possible of the incident and the findings from it as well as the definition of safety recommendations. The “product”, the investigation report and its recommendations is, in turn, passed on to line management to assist the definition and implementation of improvements.

And what do we mean by safety culture?

S. Maurer: The safety culture is a significant factor for success. All regulations, products and processes are useless if the great majority of all employees at all levels of the company do not have a good understanding of certain aspects of safety and want to promote safety. That is why it is important that safety is not considered in isolation, but as an integral part of the corporate culture and is expressed every day by all employees. Here too, the Safety department tries to play a central role. It wants to develop methods, initiatives and the like that will make it possible for the company to continue to develop and to internalise the safety culture. The safety culture cannot be bought off-the-peg. It is a question of values, attitudes and

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the environment. The demands on it change constantly and depend to a significant extent on the development of the company in other areas.

What challenges await the Safety department in the future?

S. Maurer: There are many of them. Safety does not exist in a vacuum; the demands of cost-efficiency, capacity and sustainability are equally as valid. It is a matter of integrating them together in order to find an overall optimum. This is at the core of the corporate culture of skyguide as a High Reliability Organisation. All four aspects must be in equilibrium. A reduction of the undoubted over-complexity in the air navigation service system today will

lead to an improvement in all four areas. Our safety experts try, whenever possible, to make a contribution to this end.

However, there are financial and time pressures on performance levels that can affect the manner in which our employees work. The safety culture must be constantly renewed and encouraged so that these pressures cannot put limitations on safety.

Many causes of the pressures are, however, to be found in the complex environment in which skyguide operates and can be influenced by the company either not at all or only indirectly with a great effort. The many varied and frequently contradictory, demands of other stakeholder groups within the aviation system, politics and the public represent great challenges. The Single European Sky and the

FABEC programme are striving towards a harmonisation of European air navigation service provision. From the safety aspect, this is unconditionally desirable in the long term. But in the short term, such projects can generate additional workload. As confirmed by internal and international surveys and comparisons, in terms of safety, skyguide is making constant progress in the right direction and is in a good position internationally. But, in the area of safety as well as other areas, we are never “finished” but rather constant and continuous improvement must be our goal. ■

Technological innovation in air navigation services

Robert Stadler, Head of Engineering & Technical Services

The skyguide Engineering & Technical Service department has the responsibility, among other things, for maintaining the air navigation services infrastructure.

What is the outlook for the development of new technologies? Is skyguide open to new solutions?

R. Stadler: Skyguide is not only open, but it is its responsibility to seek new solutions and to implement them in air navigation service operations. That is why we have created the CHIPS programme (CH Implementation Program for SESAR related Objectives) that we use to drive forward the introduction of new technologies, in cooperation with FOCA, the Air Force, airports, airlines and other associations. The focus of CHIPS is on satellite-supported landing and takeoff procedures. These will replace conventional navigation systems in the longer term, with the objective of making procedures more efficient and more flexible. But before we go on to further development, we must ensure that the existing system functions perfectly. So we work on the motto of “run before change”. That is reflected in our organisation, where around CHF 91 million will be invested in operations and CHF 23 million in further development.

Is navigation technology the focus of the new developments?

R. Stadler: No, there will be new technologies in all areas of air navigation service provision. Information technology has developed enormously in recent years. At present, we exploit only a minute fraction of the potential for our purposes. Our business is strongly segmented and regulated nationally. This and the fact that air navigation service provision is a very small market are the reasons why the implementation of new technologies goes so slowly. Information technology will, however, trigger an impulse in all ATM-relevant technologies which will bring about a profound change in the environment.

What does that mean specifically? What has been achieved and what has still to be done?

R. Stadler: In the CHIPS programme, we are working on new landing and takeoff procedures which will use satellite signals. The technology known as the ground-based augmentation system (GABS) is being implemented in various countries at the moment. In Switzerland, with its challenging topography, we are engaged at present in determining the limits of its usability. Various GPS-based procedures, such as for helicopter approaches to the Inselspital in Berne, are well advanced and a military procedure has already been launched successfully in connection with the Francophonie Summit. In one other area we are at the leading edge of

innovation and that is in the interfaces between control systems and decision-making aids for air traffic controllers. Our stripless system that is used to control the upper airspace in the Geneva area control centre has no equal and we will be implementing it in all sectors of our two area control centres as the next step.

Does this have an effect on the organisation?

R. Stadler: We now want to cooperate to a greater extent, in particular with our FABEC partners, on the realisation of technology projects. We will also be seeking close cooperation with industrial partners on selected projects. ■

