

# safety bulletin

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# Dear colleagues



As you all know by the publications from Our CEO Daniel Weder our company will be reorganized in different areas. Also the Safety department received a mandate: Safety, Quality and Security should be reevaluated and organized in a way so that skyguide has a safety department which is state of the art. Trying to avoid a top down approach I decided to call for a seminar with all respective heads of our Safety, Quality and Security organization in operations, technics and corporate units. As a control group, direct subordinates of the heads worked on the same topic and in the evening of the first day we compared the results. Two weeks later the heads and few other participants met for another two days as we had to present the results to the board of management.

## Vision

As a vision we formulated three basic goals:

- from **Conformity** to **Safety Culture**
- from **Fragmentation** to **Company Safety Thinking**
- from **Compliance** to **Proactive Safety Risk Management**

Following that vision we used a strategy in which we tried to determine the overall process for skyguide's Safety Management System, looking for an optimal Safety Organization to cope with such a process and to elaborate a transition from the existing organization to the new Safety Organization.

Before moving we looked first at the current weaknesses. It is one of the main goals to eliminate as many from them as possible. We basically identified 4 areas.

## Current Weaknesses

- We have a compliance structured Safety Management System with an increasing complexity and a lack of coherence between developed solutions
- The ESARR3 TRINet Audit from October 2007 stated clearly a weakness in Leadership in the actual organization combined with a lack of coordination, resulting in an inconsistent SMS development
- The safety framework version 2 (SAF V2) revealed discrepancies in the application between O and T and some coordination weaknesses between O,T and D
- The occurrence management has to be developed in the technical area and improved in the operational one.

With all that in mind we developed a proposition which was presented to the board of management November 28th 2007.

## Functional Safety Organization

This proposal contained a unit for **Risk Assessment & Mitigation** for

the entire company, a **Safety Reporting & Investigation** unit for operational as well as technical occurrences and a decentralized unit for **Technical System Safety and Quality**. Those three units will be enforced by a unit for **Strategic Planning and Policies** responsible for managing skyguide's system safety risk portfolio, developing and updating the Strategic Safety Plan and amongst others integrate safety regulatory requirements in skyguide's process landscape. This think tank should also have the possibility to look ahead and finally lead out of the reactive compliance mode into a proactive safety risk management.

The board of management accepted the direction we moved, but proposed to go further ahead.

## Next Steps

Mid December an other seminar has taken place in order to reach management board's expectations. That means that beside technical and operational safety also security and quality, including company risk management have to be integrated. Probably our audit organization will stay outside and will not report to the head of that united safety organization. This sort of change has to be introduced stepwise as no interruption of our normal work will be tolerated. But the time will be short and not measured in years, but much more in months.

## Strategic Safety Plan

Parallel to this rather challenging activities we reach our last rounds in the development of a Strategic Safety Plan. This will be a high level docu-

ment for the board of management to deal with the ETTO (Efficiency Thoroughness Trade Off) principle, to have a Safety Plan on one side to counterbalance a Business Plan on the other side. It will be the art of management to keep this balance on the same level. The draft of this plan will be presented to the board still this year, but as it is built on the current safety organization, adaptations have to be made pending of the outcome of the reorganization, then it will be published.

## Wishes

Another quite stressful year comes to its end. Ups and downs kept us all busy and even if we moved a big step forward, that what we see on our street is not the end, its just a bend. I thank you for your efforts, and the willingness to take the challenge. I wish you all a few relaxing, maybe thoughtful days during the coming season.

*with my best regards*

JÜRIG SCHMID  
HEAD OF CORPORATE SAFETY MANAGEMENT

# Deviation to the North

Within a couple of months during the second half of 2006 DSO in Zürich received two reported cases of aircraft suddenly turning right towards the North after being airborne from runway 28 in Zürich. The assigned Standard Instrument Departure (SID) should have led them straight ahead followed by a slight left turn towards the South-West, hence the opposite direction of the one picked up by the concerned aircraft.

A third identical incident led to an infringement of the minimum separation to an arriving aircraft established on the ILS of runway 14. Upon receipt of this last incident, it was decided to start a thorough analysis as a proactive action towards possible future incidents/accidents.

In a first step all three happenings were analysed. Curiously enough, neither of the flight crews in question had the impression to be flying away from the assigned SID. The voice recordings showed that they were all following the Flight Director (FD) [see apposite box «Flight Director»] which is fed – among others – by data out of the Flight Management Computer (FMC).

But this three reported incidents proved to deliver a rather marginal amount of data. So in a second step, I had a closer look onto all registered RWY28-departures of the concerned aircraft in the past. Additionally, the flight paths of all departing aircraft

from runway 28 on the days of the reported incidents have been reviewed one by one. Unfortunately, no anomalies were found.

So finally, the status of our technical equipment at the moment of incident has been challenged with the involvement of the Expert Technical Occurrences. No anomalies could be found in the TechLOG for the days/times of the 3 incidents. We also checked whether maintenance work at one/several of our technical installations was being undertaken at the times of the 3 incidents, with a negative result.

As a last possibility, we tried to contact the operators of the concerned aircraft. It proved to be rather difficult, since two of the aircraft were registered abroad. Luckily we got an answer from one pilot of the HB-registered aircraft. Thanks to his thorough explanation, it got to the point where we felt the need to contact the supplier of the FMC-data for that actual aircraft. After long discussions and analysis of their FMC-data, the responsible person found out that for a particular type of NAV-instrument (which – not surprisingly – was installed in all three mentioned aircraft), there was a bug in the «turn left/right» command data.

As this kind of information matched the picture we had gathered so far, it was giving the impression to have found the starting point of those deviances. As a mat-

ter of fact, the affected SIDs would have asked for a left turn which made no sense to the instruments affected by the erroneous data. That is why they provided the FD with the shortest way, hence a turn towards the right-hand side.

The regulator was contacted in order for him to take over the supervision of the necessary amendment of the FMC-data by the supplier.

CLAUDIO DI PALMA  
DSO Zürich

## Flight Director

The green horizontal and vertical line on the artificial horizon of the PFD (Primary Flight Display) represent the visual cue from the Flight Director. The two black lying «L» represent the aircraft silhouette. In this display the Flight Director has processed computed data and sensed a right turn to keep the aircraft on track. The pilot or auto-pilot must turn right until the silhouette fits the cross which will be formed by the horizontal and vertical green lines.

Pilot / auto-flight has turned the aircraft to the right and satisfied the visual cue given by the Flight Director.



# Airspace Infringement? What is done and what could be done!

As we all know, Airspace Infringement is one of the biggest threats in aviation. Unfortunately the amount of those incidents reported is growing every year. During the summer peak, there is a new incident almost every day in our region. Statistics show 199 infringements until end of october 2007, and as we said above, that is only for the reported one, we can assume that there are many more that are not.

That's why skyguide is participating actively with Eurocontrol and other stakeholders in the Airspace Infringement Initiative which started in 2006.

The initiative was launched by EUROCONTROL in 2006 with the ultimate goal to develop a European-wide risk reduction action plan and assist airspace users, ANS providers, regulators and military authorities in implementing the agreed actions.

The focus of this safety initiative is the infringement of controlled airspace, which can be defined as «a flight into notified airspace made without prior approval from the designated controlling authority of that airspace in accordance with international and national regulations.»

Safety data analysis performed by skyguide and many European states, SISG (Safety Improvement Sub Group) and EUROCONTROL SRC (Safety Regulation Commission) indicates that airspace infringements

represent a severe threat to aircraft operations. Numerous ATM incidents have occurred between IFR and VFR flights in controlled airspace. Some of them presented a high risk of collision.

In addition to that risk, Airspace Infringement can also lead to disruptions of traffic such as delays to airport arrivals and departures, aircraft operating costs (a B747 flight time costs about 250 CHF per minute), in case of a second approach for example, therefore due to additional fuel burning it leads as well to more pollution. It can also lead to injuries in the worst cases where airliners have to perform abrupt avoiding maneuvers. This without speaking about the accidents that already occurred in the past.

Solutions exist, but can only be implemented in collaboration with all actors concerned. By now the reporting of incidents relies almost entirely on air traffic controllers, since GA pilots flying under visual flight rules (VFR) tend to be constrained by less mature reporting systems than those implemented today in military or commercial air transport organisations. The challenge will be to provide simple means of informing GA pilots of the need to submit reports on such events as we know that about 70% of the infringements are made by them, the rest can be imputed to commercial and military aviation.



(Picture extracted from a Eurocontrol presentation )

This initiative is one step in the risk reduction of Airspace Infringement, but there are many things to do here in Switzerland as well.

As Eurocontrol is suggesting, we could present a «road show» within the GA pilot community, there is nothing better than the direct communication.

We could also imagine an internet site dedicated to the Airspace Infringement, with direct links to NOTAM, VFR charts, discussion forum, radar replays of infringements, specialized articles, statistical graphs and a «on-line» reporting system for example.

It could be a good idea as well to work together with France, Germany and FOCA as most of the infringements include GA pilots of these three countries.

To resume, there is a lot that can be

done in order to try to reduce the amount of incidents related to Airspace Infringement but it takes time and resources to do so, but isn't it worth it?

The impact on Air Traffic Control like additional work and stress is managed by our controllers but we should not wait until the real impact happens, we shall act **NOW!**

Here below you can find the direct link to a Eurocontrol case study made about Swiss Airspace Infringements.

XAVIER HENRIOD  
DSO Geneva

[http://skyline/Livelink/livelink.exe/Airspace\\_infringement\\_risk\\_analysis\\_Switzerland.doc?func=doc.Fetch&nodeId=1036839&docTitle=Airspace+infringement+risk+analysis+Switzerland](http://skyline/Livelink/livelink.exe/Airspace_infringement_risk_analysis_Switzerland.doc?func=doc.Fetch&nodeId=1036839&docTitle=Airspace+infringement+risk+analysis+Switzerland)

(Following source has been used for this article : Eurocontrol Airspace Infringement Initiative)

# Mechanical failure or human error?

During a recent Safety Assessment training course, I've been told with plenty of conviction that «80% of aviation accidents are due to human error». This is indeed a very popular statement you certainly had the opportunity to hear or read many times. But is that really so? I would like to use the opportunity I've been given to be the first author writing in this new «Human factors» rubric to push the debate a step further<sup>1</sup>.

Affirming that 80% of aviation accidents are due to human error relies on the fundamental assumption that we can reliably count and categorize errors by means of observation or investigation techniques. Unfortunately, it is not so easy. Let's consider first the case of observation techniques. As a prerequisite to any experiment, observers have to agree about what an error is. Easy? Not at all. Recent research conducted in Air Traffic Control showed that what observers considered as errors were most of the time deliberate strategies applied by controllers who attempted to manage challenging traffic situations. In addition, the same study proved that different observers identify different errors. So what is an error? As an alternative to error observation experiments, incident and accident investigation are sometimes considered as very seductive sources of data. Especially because plenty of these very demanding and costly inquiries poorly conclude that the mishap was caused by human error. Unfortunately, such conclusions are based on the belief that people had the opportunity to err or not to err and that they just made the wrong choice because they are the «bad

apples» in an otherwise ultra-safe system. This is called the «illusion of free-will». But this is not the way it works: people usually don't go to work to do a bad job. What they normally do make sense to them given the circumstances and goals they have to achieve. This is the «local rationality principle». So are investigation reports reliable sources usable for the purpose of counting and categorizing human errors? Certainly not.

Safety is not «something out there» which can be easily measured and managed by counting errors. It is created everyday by people making their job while trying to anticipate pathways toward failure. Human error is the inevitable by-product of the pursuit of success in an imperfect, unstable and resources-constrained world. Human error shouldn't be the conclusion of an investigation report but rather a starting point, something that demands an explanation. But constructing an explanation requires the ability to understand people's context while resisting to the temptation to retrospectively judge them for their acts. And what becomes very interesting when you try to do it is that the more you dig out,

the more you realize how difficult it is to make the distinction between mechanical failure and human error; as they become rather interacting components in a complex system. But let's try to illustrate this by a simple example:

*Passenger aircraft have «spoilers» – panels that come up from the wing on landing, to help brake the aircraft during its roll-out. Before landing, pilots have to manually «arm» them by pulling a lever in the cockpit. Many aircraft have landed without the spoilers being armed, some cases even resulting in runway overruns. Each of these events gets classified as «human error» – after all, the human pilots forgot something in a system that is functioning perfectly otherwise. But deeper probing reveals a system that is not at all functioning perfectly. Spoilers typically have to be armed after the landing gear has come out and is safely locked into place. The reason is that landing gears have compression switches which communicate to the aircraft when it is on the ground. When the gear compresses, the logic tells the aircraft that it has landed. And then the spoilers come out (if they are armed). Gear compression, however, can also occur while the gear is coming out, because of air pressure from the enormous slipstream around a flying aircraft, especially if landing gear folds open into the wind (which many do). This would create a case where the aircraft thinks it is on the ground, but it isn't,*

*really. If the spoilers would already be armed at that time, they would come out too - which would be really bad if you are still airborne. To prevent this from happening, all these aircraft carry procedures that say that the spoilers may only be armed when the gear is fully down and locked. It is safe to do so, because the gear is then orthogonal to the slipstream, with no more risk of compression. But the older an aircraft gets, the longer a gear takes to come out and lock into place. In some aircraft, it can take up to half a minute. By that time, the gear extension has begun to seriously intrude into other cockpit tasks that need to happen by then - selecting wing flaps for landing, capturing and tracking the electronic glide slope towards the runway, and so forth. These are items that come after the «arm spoilers» item on a typical before-landing checklist. If the gear is still doing its thing, while the world has already pushed you further down the checklist, not arming the spoilers is a slip that is only too easy to make. Combine this with a system that, in many aircraft, never warns pilots that their spoilers are not armed; a spoiler handle that sits over to one, dark side of the center cockpit console, obscured for one pilot by power levers, and whose difference between armed and not-armed may be all of one inch, and the question becomes: is this mechanical failure or human error?*

STÉPHANE BARRAZ  
Safety Program Manager

<sup>1</sup> The following sources were used for the elaboration of this article: - Dekker, S.W.A. The field guide to understanding human error. England: Ashgate publishing (2006)  
NTSB. Runway Overrun During Landing American Airlines Flight 1420 McDonnell Douglas MD-82, N215AA Little Rock, Arkansas June 1, 1999. AAR-01/02

► Mechanical failure or human error?

On June 1, 1999, American Airlines flight 1420, a McDonnell Douglas DC-9-82 (MD-82), crashed after it overran the end of runway 4R during landing at Little Rock National Airport in Little Rock, Arkansas.



Fig 1 - Airplane Wreckage

After departing the end of the runway, the airplane struck several tubes extending outward from the left edge of the instrument landing system localizer array, passed through a chain link security fence and over a rock embankment to a flood plain and collided with the structure supporting the runway 22L approach lighting system. The captain and 10 passengers were killed; the first officer, the flight attendants, and 105 passengers received serious or minor injuries; and 24 passengers were not injured. The airplane was destroyed by impact forces and a post-crash fire. The National Transportation Safety Board determined that the probable causes of this accident were the flight crew's failure to discontinue the approach when severe thunderstorms and their associated hazards to flight operations had moved into the airport area and **the crew's failure to ensure that the spoilers had extended after touchdown.**

This conclusion was based on 36 findings from which the following are at best illustrating the case discussed in this article:

- The autospoiler system operated properly, and the spoilers did not automatically deploy because the spoiler handle was not armed by either pilot before landing.
- The lack of spoiler deployment was the single most important factor in the flight crew's inability to stop the airplane within the available runway length.
- The flight crewmembers' performance during the flight was degraded, as evidenced by their operational errors and impaired decision-making.

The spoiler arming system consists of a small handle located in the central console which has to be pulled-up during flight to initiate automatic deployment after touchdown. There is no warning system which draws the pilots' attention about the spoilers unarmed status. Here is how it looks like in the MD-82 cockpit – imagine night and stress conditions.



Fig 2 - Spoiler handle in the unarmed position

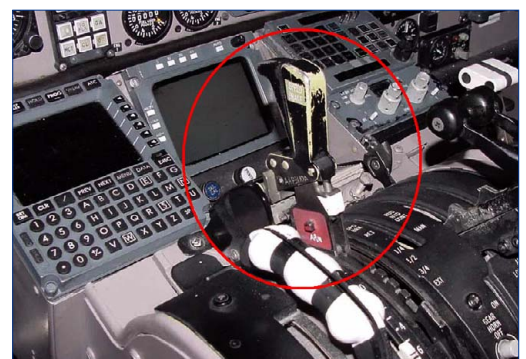


Fig 3 - Spoiler handle in the armed position

# Our 500<sup>th</sup> SIR!

## General

We are pleased to report that we passed a new milestone in October: we received our 500<sup>th</sup> SIR since this tool was introduced in 2003. We are delighted that our reporting system is being used with such high and still-increasing frequency. And we

have now received SIRs from all departments and units within our O and T divisions.

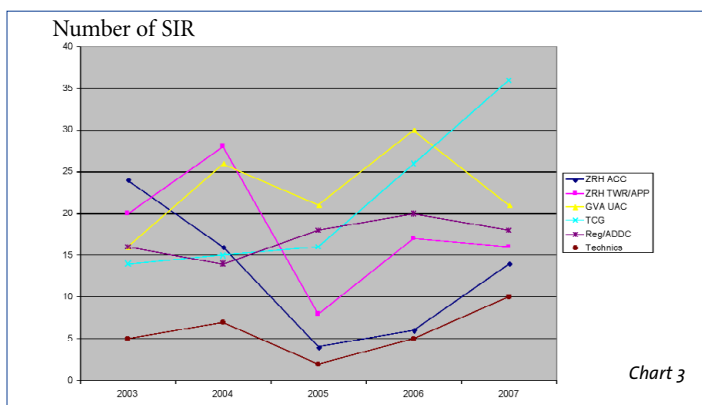
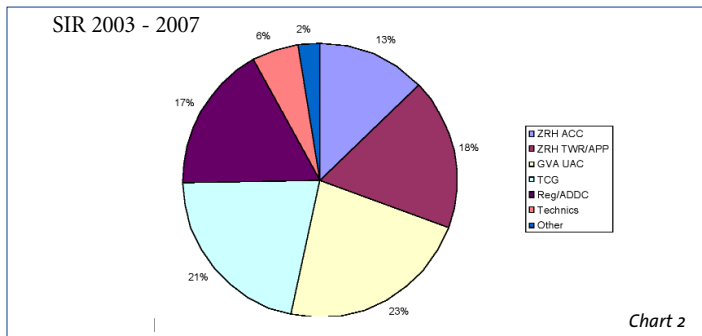
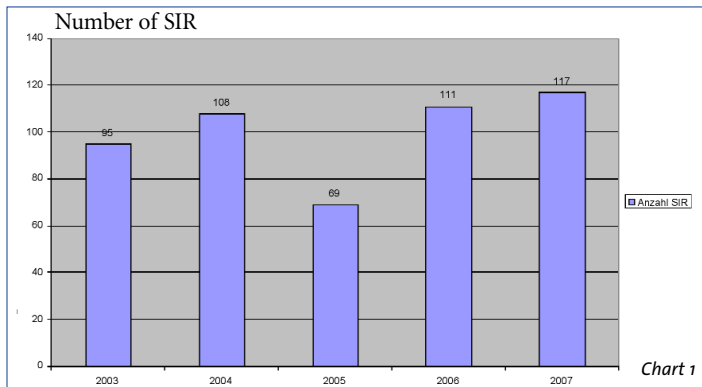
In view of this landmark 500<sup>th</sup> SIR, I have compiled a brief summary of all the SIRs we have received to date:

What is particularly noticeable in the above overview is the frequency with which our ATCOs in Geneva and Zurich have used the SIR tool. The number of SIRs we have received from our technical units is somewhat lower by comparison (see Charts 2 and 3), though the reasons for this are unclear. What is also noticeable, however, is that our ATCOs submit many reports that have to be subsequently acted on by our technical personnel.

By contrast, the adoption of the new procedures needed to comply with DVO3, Germany's unilateral imposition of restrictions on the use of Southern German airspace, did not generate a single SIR.

Over the years, we have also seen the emergence of «specialist» SIR writers in almost all our units. There are many individuals among our personnel ranks who have submitted ten SIRs or more; and the current record stands at 25.

## Statistics



## Analysis

Once the SIR reporting process had been launched, a particularly large number of problems were reported that had actually existed for some time but had either not been resolved or had not even been adequately noticed: staff shortages, too many SOs and similar.

Since then, SIRs have been compiled on every imaginable issue. It has also been interesting to see that certain events have immediately triggered SIRs. If a service order is issued that is unclear, too extensive or too late or has errors in it, SIRs are almost instantly submitted in response. SIRs have also been prompted by the introduction of new technical equipment such as INCH or the stripless ATM system.

Further events that have triggered multiple SIRs have included the loss of tracks following transponder problems, modifications to STCA parameters and CA centralisation.

## Outlook

Certain issues have been repeatedly addressed in our SIRs over the years. For some of these problems we already have «stock» answers, because our management has already taken the decision not to change the procedure or make the investment concerned.

It is, though, encouraging to see that the SIRs received have played a part – a major part in some cases – in prompting the units involved to modify existing processes or procedures or introduce new ones.

We have now received a further 28 SIRs since our landmark 500<sup>th</sup> in October. We were delighted to get every one of them. And we are constantly surprised at the weaknesses our SIRs detect and the improvement possibilities they highlight, to the benefit of everyone concerned.

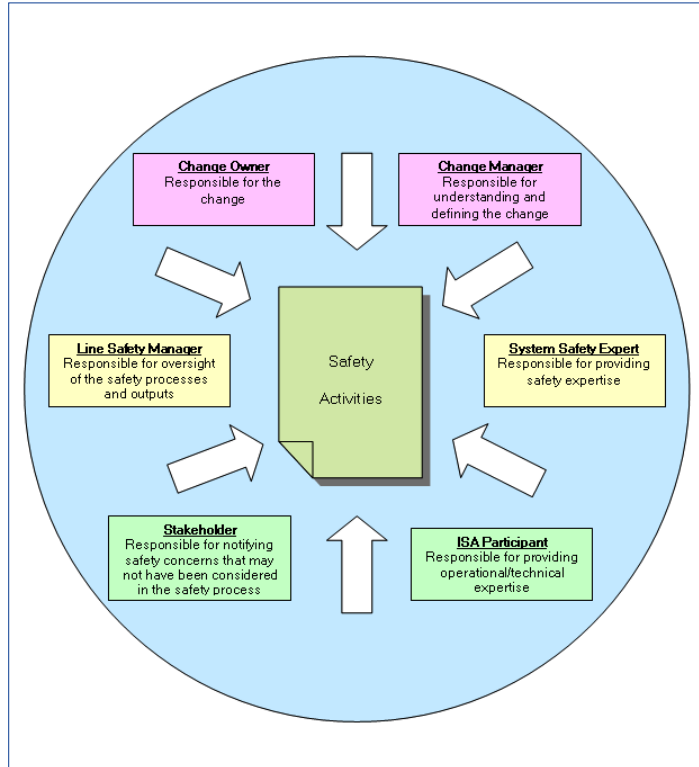
PETER SCHEUBER  
Head Audit Management

# Safety Assessments: What your role might be

By now, many of you may be aware of the existence of the skyguide Safety Assessment Framework (SAF). For those that are not aware of it, this framework describes the process to be undertaken to identify potential hazards that may exist as a result of changes to the ATM System. The framework consists of a number of documents which describe the systematic process skyguide has chosen to identify these hazards and includes tools, such as templates for the preparation of safety documents. If you are interested in the framework then it is available on the skyguide intranet [here](#).

This article is not going to go into any detail about the framework itself; instead it will focus on the applicability, particularly within the Operations Department, and what contribution you can play in the application of the framework.

The framework is being applied across the organisation by dedicated System Safety Experts (SSE). These experts are part of the TSS Group in Technics and the OOS Group in Operations. There are a number of reasons for having dedicated SSEs, as detailed in the previous safety bulletin ([September 2007](#)). The framework is applicable to any «change» within the organisation.



The first step in applying the new framework is determining whether it needs to be applied at all. That is we need to determine whether something is a «change» that requires safety assessment. For this purpose, the DSS team have developed the Alteration Traceability Form. This form asks a series of questions, with examples, to determine whether the «change» requires safety assessment.

Without going into too much detail there are some tasks which are clearly not a change (for the purposes of the SAF), such as, day-to-day decisions taken in the operations room. Generally, if you think it is a change that requires safety assessment, it probably is. Every new procedure, changes to existing procedures, every new tool, changes to existing tools, and the list goes on. Whether or not

an «alteration» is a «change» can be determined by the trained SSEs, so please talk to them first.

If it is determined that there is a change (for the purpose of the SAF), then the change manager contacts the respective safety area and an SSE is appointed for that change. Sometimes it might be more than one SSE depending on the size and scope of the change or, in the early stages of training, for mentoring purposes. The application of the SAF should be considered by the change manager as just another part of the change process that needs to be undertaken, such as writing procedures, altering airspace or having a technical component changed. The role and responsibilities of the Change Manager are quite well established within the SAF.

But what if you are asked to participate in a hazard identification workshop, what does this mean for you: what can you expect to do and what responsibilities do you bring with you? Essentially the workshop will be run by the SSE in conjunction with the Change Manager. You will have been invited because **you are seen to be an expert** in some field that is affected by the change. The workshop will commence with a thorough description of the change

► Safety Assessments: What your role might be

being implemented so that everyone will be working from the same knowledge base. If you have any questions about the scope, or any other details of the change, it is important to clarify them prior to the rest of the activities starting. It is vital that all participants have the same understanding of the change.

As an expert, your knowledge is incredibly valuable and for the SAF process to function well within the organisation it is crucial that you participate in the workshop to your fullest ability. Do not be afraid to say anything, your concerns will be well explored by the SSE and all items will be noted in the minutes of the workshop. If you do not agree with something that has been said or written during the entire SAF process, it is necessary that you communicate your concerns to the right

person. In the first instance this should be the Change Manager or SSE. But if you feel that your concerns have not been addressed fully, or you still have some concerns that have not been resolved with the change manager and/or SSE, then take it up with the Line Safety Manager (LSM) concerned. To find out who is the relevant LSM, refer to the safety assessment tracking file [here](#). Your concerns will be investigated and where necessary addressed prior to the change implementation date. This may be through the implementation of further mitigation or, if your concerns fall outside of the scope of the change, then through ensuring these issues are addressed by the appropriate authority.

Whether you are directly involved in the safety assessment activities or not

your input will be welcome if you have genuine concerns that a safety aspect may not have been considered. However, if you are aware of an issue please don't wait until the end of the process when everything is set to be implemented to notify your concerns. It is extremely difficult to take them into account the day before, or even several days after, the implementation.

Hopefully this has provided a brief overview of the safety assessment process, but if you want to know more about the application of the SAF within skyguide, please contact the line safety groups (Technics or Operations) who will be more than happy to discuss your participation in this process.

LISA DONNE  
Operations Safety Management

# Safety in Technics

A Safety Management System is a regulatory requirement that brings added value to Air Navigation Service Providers (ANSP). One of the most advanced Safety Management Systems currently in place is NATS's, devised 15 years ago. The main strength of this Safety Management System stems from the strong influence of the British regulator on the British ANSP. Skyguide was also put under pressure by FOCA to massively invest in Safety, Security and Quality so as to comply with the Single European Sky regulations.

As several other industries, the air traffic control industry has experienced a significant increase in regulations since the turn of the millennium. While skyguide was struggling to implement all of these regulations, FOCA consistently strove to keep it in the first league of European ANSP's by guiding the Swiss ANSP through cultural changes that would lead to better practices with respect to Safety.

## Developing Safety, ICT Security and Quality across T Dept.

To meet the Safety, Security and Quality challenges brought by the rapidly changing regulatory environment, skyguide engaged in various initiatives to ensure that suitable services were put into place. One of them was the creation, in September 2006, of the TS Division in the T Dept. This division is dedicated to the elaboration of T-related components of management systems. It builds on the expertise of two pre-existing groups in charge of the design and implementation of (i) a software methodology complying with Eurocontrol's ESARR6 standard, and (ii) a technical competence management framework complying with Eurocontrol's ESARR5 standard.

As most of skyguide's management systems are still at an early stage of development, grouping Safety, ICT Security and Quality activities together facilitates a consistent elaboration of processes, methods and tools. For instance, consider the procedure «Planned Work on ATM/ CNS and Infrastructure Equipment (WAC)», a quality procedure that is part of the Technical Service Provisioning process. It not only addresses quality, but also integrates safety mitigation measures pertaining to three types of risk: (i) the ATCO's unawareness of an intervention and its associated impact, (ii) a lack of communication between the various intervention stakeholders, and (iii) a lack of consistency between simultaneous interventions.

- Be an entry point to Safety, ICT Security and Quality for all divisions within the T Dept.
- Act as the point of coordination between D and T with respect to Safety, ICT Security and Quality.
- Ensure that skyguide-wide initiatives related to Safety, ICT Security and Quality are implemented within the T Dept.
- Coordinate and foster the fulfilment of regulations pertaining to Safety, ICT Security and Quality within the T Dept.
- Monitor and control services from Safety, ICT Security and Quality standpoints within the T Dept.
- Provide information related to Safety, ICT Security and Quality (e.g., using Key Performance Indicators) to the Head of the T Dept.

In terms of Safety, the following areas of responsibility lie within the TS Division:

- Develop and support Safety-related frameworks for implementing regulations that target software

and technical competence management.

- Provide resources to perform safety assessment according to skyguide's Safety Assessment Framework (SAF).
- Control Safety and manage improvements within the T Dept.

Improvements can take many forms, from audit management to the participation in technical occurrence investigations.

As a contributor to skyguide's safety organisation, the TS Division is a permanent member of the Safety Steering Group (SSG) and Safety Panel Group. Within the T Dept., it chairs the Technical Safety Group (TSG) and the Safety Management Meeting.

## A Matrix Organisation for Safety

A Safety Management System requires a matrix organisation covering every level, from corporate to individuals. Such an organisation necessarily overlaps with the line organisation. It is responsible for following up on safety-related matters.

Within the T Dept., the TS Division cannot have expertise in every technical domain. Support from lines is therefore essential to properly implement processes and tools and to collect end-users' feedback. To this end, the matrix organisation that was implemented in the T Dept. includes Safety Line Division Representatives, who are designated by Heads of Division. These representatives are competent both in their respective line's domain and in Safety. For the TS Division, they act as points of contact in lines.

So far, the TS Division successfully implemented a matrix organisation to follow up on Safety Improvement

Reports (SIR's), recommendations and audit findings, and technical competence management. Challenges for the next few years include software in ATM systems, ICT Security and Quality.

## Safety Committees

Safety committees are consultative bodies who advise decision makers. They consist of management and staff representatives. Examples of Safety committees include the following:

- The *Technical Safety Group* provides T-management with information from the Safety Steering Group (SSG), takes managerial decisions with respect to Safety, gets the necessary assurance that safety-related processes are suitably implemented within the T Dept., and decides what matters need to be escalated to the Safety Steering Group.
- The *WAC Advisory Board* is responsible for approving and validating developments of the WAC process. Its members originate mainly from O and T.
- The *Technical Competence Board* deals with matters pertaining to technical competence management for ATSEP's (organisation, administration and decision making).
- The *Technical Competence Operational Committee* is an intra-departmental working group consisting of TS members and Technical Competence Line Division Representatives. Its mission is to support, advertise and enforce the decisions made by the Technical Competence Board.
- The *Safety Assessment Review Team (SART)* ensures that the Safety Assessment Framework (SAF) is uniformly applied.

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Safety and Quality Line Controller TS