One Safe Sky for Europe

ATM Safety Enhancement in ECAC States 2003 - 2006

EUROCONTROL

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FOREWORD

by the Co-Chairmen of the SSAP Implementation Co-ordination Group

Aviation is among the safest means of transportation, but any human activity is associated with risk and de facto aviation incorporates risks that can lead to accidents. ICAO sets down standards and recommended practices. Other organisations, such as EUROCONTROL, lay down regulations and issue guidance material for their implementation. However, despite every effort that is made by the aviation industry towards safety enhancement, accidents do occur. In the early years of the 21st Century, European aviation received a wake up call that showed more needed to be done to enhance ATM (Air Traffic Management) safety in Europe. In October 2001, a runway incursion at Milan's Linate Airport caused loss of life; then, in early July 2002, Europe awoke to the terrible news of a mid-air collision at Ueberlingen. Not since 1976, and the safe transit of some 150 million flights thereafter, had Europe suffered this type of disaster. EUROCONTROL took immediate action to address issues arising from those accidents and instigated a programme to raise the awareness of ATM safety requirements and speed up implementation of ATM Safety Management Systems (SMS) in Europe.

The safety programme instigated by EUROCONTROL was the European Strategic Safety Action Plan (SSAP), designed to be the first step in a long-term ATM safety enhancement initiative. The SSAP provided a unique opportunity to take ATM safety forward and for the first time looked systematically at safety regulation and management together with a view to raising standards. That programme is now complete and a new safety plan has been launched.

This brochure looks at the progress made in enhancing ATM Safety in ECAC States from the beginning of 2003 up to completion of the SSAP implementation programme at the end of January 2006. We are very pleased to report that overall State ATM Regulators and Air Navigation Service Providers (ANSPs) gave very good support to the SSAP implementation programme and analysis of monitoring data has shown that the programme has had a positive impact. The implementation of regulations has improved and the awareness of ATM safety requirements in general, particularly in those States that have less mature safety frameworks, is now very much improved. However, monitoring safety enhancements has shown that there is a need to continue to concentrate efforts, particularly in the area of incident reporting and data sharing.

This brochure is intended for all stakeholders in ATM and for the general public. We trust that you will consider the enhancements that have already been achieved carefully and do whatever you can to ensure that efforts are continued to be concentrated into those areas that require increased attention and in particular support the European Safety Programme for ATM (ESP), launched in February 2006.

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INTRODUCTION

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EUROCONTROL is an inter-governmental organisation whose full title is the "European Organisation for the Safety of Air Navigation"; its raison d'être is therefore the safety of air traffic management operations in European airspace. Much work has been done over the past decade or so to enhance Air Traffic Management (ATM) safety by harmonising as far as possible airspace structure, ATM procedures and technology.

This work has been undertaken by EUROCONTROL in cooperation with the European Civil Aviation Conference (ECAC), another inter-governmental body set up in 1955 to promote the continued development of a safe, efficient and sustainable European air transport system. ECAC currently consists of 42 European States. Improvements have been achieved through several programmes in which ECAC States have cooperated to enhance ATM safety.

ECAC Ministers agreed an ATM Strategy for the Year 2000+ that foresees great changes in the way that airspace is managed and much closer cooperation between the different European States. More recently, the European Union (EU) launched a programme for the establishment of a Single European Sky, which will eventually mean that airspace over EU Member States will be treated as a single continuum. This concept will also have implications for the way that ATM in Europe is regulated.

The EUROCONTROL bodies that monitor ATM safety in ECAC Airspace on behalf of the EUROCONTROL Provisional Council are the Safety Regulation Commission (SRC), composed of States Safety Regulators, and an ATM Safety Team comprising Safety Managers from Air Navigation Service Providers (ANSPs).

As a result of the aircraft accidents in 2001 and 2002, the Provisional Council established a high-level European Action Group for ATM Safety (AGAS), which was charged with proposing concrete improvements in European ATM safety management and regulation. In 2004 the Provisional Council established a Safety Data Reporting and Data Flow Task Force (SAFREP TF) specifically to address shortcomings in the way that States and ANSPs were reporting safety occurrences and sharing the lessons learned from those accidents and incidents.

SAFETY ENHANCEMENT PROGRAMMES

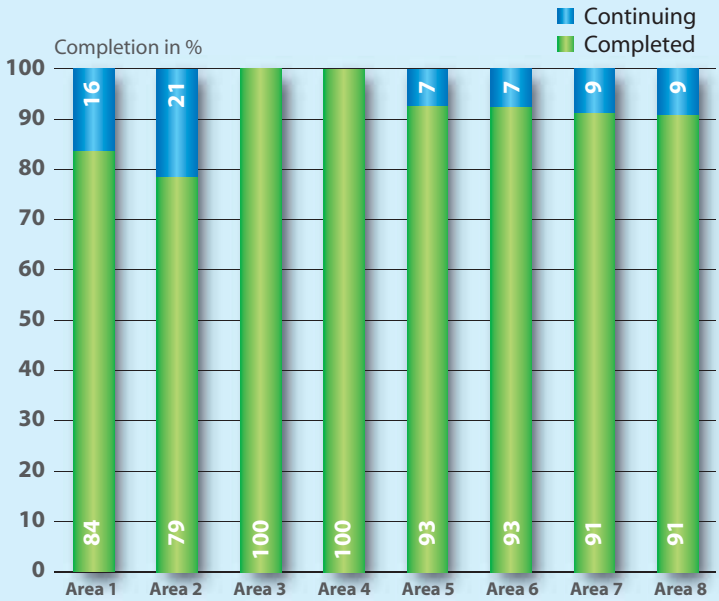
AGAS proposed a European Strategic Safety Action Plan (SSAP). An Implementation Plan was endorsed by the EUROCONTROL Provisional Council and the Commission in January 2003; the formal SSAP implementation programme was launched in February 2004 and completed at the end of January 2006. Some actions could not be completed by the planned end date due to manpower and dependency on other actions being completed. Those actions were moved to the follow-up programme, the European Safety Programme for ATM (ESP).

*More than **90%** of SSAP requirements have been completed*

States and ANSPs gave very good support to the SSAP implementation programme. The programme contained work packages in eight High Priority Areas[1] and, to ensure that implementation progress was tracked, a monitoring system was established that used existing means of monitoring together with ad hoc reports. It is clear from the results of the monitoring that considerable progress has been made and the requirements set out in the SSAP and approved by the Provisional Council have to a large degree been implemented. Monitoring indicates that more than 90% of SSAP requirements are complete. Three percent of work packages have been moved to the ESP, taking into account that in some areas work is already progressing and some work packages are nearing completion.

The most disappointing area in the SSAP in terms of progress made is Incident Reporting and Data Sharing; the lack of progress was caused by a variety of reasons that have been addressed in the SAFREP Report[2]. Incident Reporting and Data Sharing is therefore a priority field within the ESP. In the area of Ground-Based Safety Nets, good progress was made towards establishing standards for Short Term Conflict Alert (STCA), however due to the length of time required to draw up and agree standards, the work will be completed during ESP implementation.

OVERALL COMPLETION OF SSAP WORK PER HIGH PRIORITY AREA



SSAP: 8 high priority areas

1- The 8 High Priority Areas are:
1. Safety Related Human Resources in ATM;
2. Incident Reporting & Data Sharing;
3. ACAS;
4. Ground-Based Safety Nets;
5. Runway Safety;
6. Enforcement of ESARRs and the Monitoring of their Implementation;
7. Awareness of safety Matters;
8. Safety & Human Factors R&D.

2- SAFREP Report - Edition 1 - Reference DAP/SAF/126 dated 13 October 2005

ANALYSIS OF THE OUTCOME OF SSAP IMPLEMENTATION HAS SHOWN:

- The EUROCONTROL Strategic Safety Action Plan (SSAP) and associated focussed support efforts have made a real difference and safety has improved;

- Further improvement is still possible and most States are ready to continue their efforts.

Overall the safety enhancement measures taken in ECAC States since 2003 have had a positive impact. However the following lessons were learned during the SSAP implementation programme.

WHAT WAS GOOD:

- The SSAP was seen as necessary to "kick-start" safety enhancement in some areas and concentrated attention on safety requirements;

- A high visibility programme such as the SSAP, which focuses on safety enhancements in areas where the most benefit would be achieved, produces tangible results;

- Such programmes succeed when the efforts of all stakeholders are combined and focussed;

- Results are measurable when performance driven against identifiable milestones.

WHAT WAS NOT SO GOOD:

- Although necessary to speed up ATM safety enhancements in Europe, the SSAP implementation Programme was perceived as being too prescriptive and detailed, with too many work packages;

- Monitoring of the SSAP could not be completely achieved through the existing EUROCONTROL monitoring mechanisms. This caused a large overhead in terms of monitoring effort, with ad hoc reports difficult to get back from States, with some States complaining of an unacceptable workload;

- Implementation of the SSAP was perceived by some organisations as being too resource intensive.

The European Safety Programme follows up on the success of the SSAP

SAFETY ENHANCEMENT INITIATIVES

During the course of SSAP implementation a number of safety enhancement initiatives have been successfully initiated. Prevention Plans were launched to:

- reduce Level Busts;
- reduce Airspace Infringements;
- improve Air Ground Communications.

An annual publication named Hindsight has been launched to pass on lessons learned and other safety information to Controllers.

The EUROCONTROL Agency has also established the Support to ANSP Safety Management System (SMS) Implementation (SASI) project to assist those ANSPs who had urgent support needs in implementing SMS. To date 22 ECAC ANSPs are participating.

RUNWAY SAFETY

Part of the SSAP covered the "European Action Plan for the Prevention of Runway Incursions" (EAPPRI). Implementation of this plan has been widely achieved. Examples of the degree of implementation of recommendations contained within the EAPPRI are:

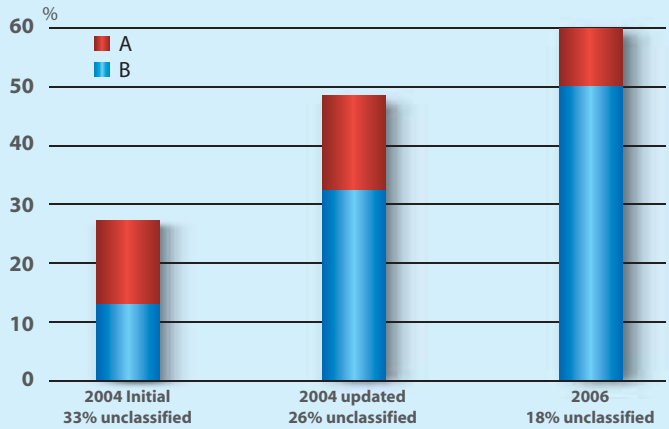
- 73% of airports have introduced formal driver training;
- 92% of airports have established Local Runway Safety Teams;
- 92% conduct awareness campaigns;
- 80% of airlines promote best practices for pilots' planning of ground operations.

Due to the awareness campaigns conducted by EUROCONTROL and the Local Runway Safety Teams, now established at 92% of airports in Europe, the reporting of runway incursions has increased significantly. Reported data identifies that there were almost two runway incursions per day in the ECAC area in 2005. For the first time, it is possible to have an idea of the real number of runway incursions taking place. The total number of reported runway incursions increased by 11% in 2005 compared to 2004. The increase in numbers of reports does not indicate a deterioration of safety performance but better reporting awareness. The numbers of serious incursions in category A has decreased since 2004, as can be seen from the Figure below.

However, an increase in severity classification B incursions is mainly accounted for by the improved use of the severity classification scheme (74% of runway incursions were received classified in the 2004, and 82% in 2005) and a change in the severity classification method in one country.

The severity B increase reveals the possibility that further risk bearing Runway Incursions could be "hiding" in the total number (i.e. reported Runway Incursions). Progressive classification by States has shown that this may well be the case, but until all occurrences are fully classified, the extent of the "undiscovered risk" cannot be fully assessed. For this reason, focus on the Runway Safety Programme will be maintained. However, the critical need in this context is to improve States' efforts in the reporting and analysis of occurrences. This will then ensure that annual summary reports will be more complete, and the full extent of risk can be assessed.

REPORTED HIGH RISK RUNWAY INCURSIONS IN ECAC STATES



MATURITY OF EUROPEAN ATM SAFETY FRAMEWORKS

In 2002 EUROCONTROL commissioned an independent study of ATM safety framework maturity among ECAC Member States. This "Overview Study of ATM Safety in ECAC States" showed that the level of maturity of ATM Safety Frameworks was uneven across the ECAC area, and that leadership and commitment to safety issues was lacking in some States. The study was repeated in 2004. At the end of the SSAP Programme implementation, in January 2006, a further study, which used the earlier studies as benchmarks, was commissioned.

The 2006 survey received excellent participation with all 42 ECAC States' ANSPs and 39, out of 42, ATM Regulators returning their questionnaires. The general findings of the survey are:

MATURITY

The maturity of ATM safety frameworks in ECAC has, for ANSPs, improved from a global average of 55% in 2002 to 70% in 2006. The Regulators rose from an average of 52% in 2002 to 65% in 2006. Only one State remains below the 35% maturity level whilst, since 2002, those above 70% have risen from 9 to 21 for ANSPs and from 5 to 14 for Regulators.

ANSPS

Since 2002, most ANSPs have established a firm grasp on further development of their EUROCONTROL Safety Regulatory Requirement (ESARR) compliant safety management organisations and report that most obstacles to further improvement relate to practical implementation problems. These include, introducing a workable reporting system to monitor meaningful changes in safety performance, turning the safety procedures described in their safety manual into a working safety organisation and performing safety assessments on changes to the organisation and its infrastructure.

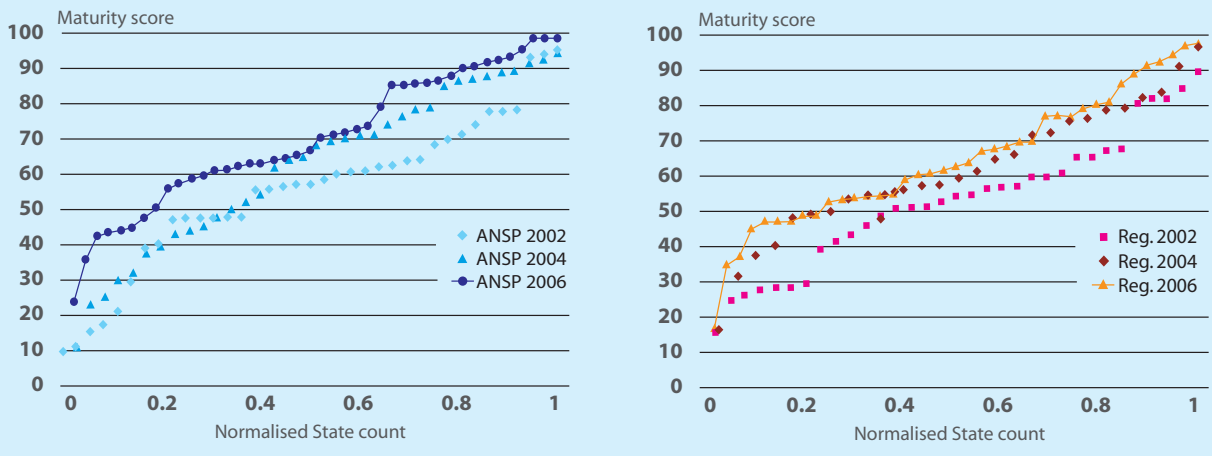
3- The Global Average ATM Safety Maturity percentage is the sum of all participating State's safety maturity levels divided by the number of participating ANSPs or REGs. The participants are shown in ascending order for each year. REGs & ANSPs cannot therefore be directly compared for each year as they may fall in different position on the graph.

REGULATORS

With ATM Regulators the situation is mixed. On the one hand Regulators appear to be impressed and satisfied with the improvements made by their ANSPs; on the other, many are frustrated with their inability to introduce the legal requirements to facilitate further progress. They also say that they are not provided with sufficient competent staff to carry out the ATM regulation and supervisory roles properly. Issues at the heart of these problems range from a lack of priority for aviation within an already overburdened national legislative system, to government pay systems that do not attract the limited personnel equipped with the right competencies for the regulatory function.

Significant improvements since 2002

NORMALISED FRAMEWORK MATURITY GRAPHS FOR ANSPS AND ATM REGULATORS[3]



CURRENT AND FUTURE SAFETY ENHANCEMENTS

Whereas the SSAP was reactive based on the accidents of 2001 and 2002, the current European Safety Programme for ATM (ESP) is proactive so as to help prepare European ATM for future challenges. It aims to meet the safety requirements of the Single European Sky and enhance safety within the growing complexity of the ATM system.

Experience and lessons learnt with stakeholders during the course of the SSAP were taken into account in formulating the ESP. Focus is given to those issues considered essential from the perspective of safety experts in ANSPs and Regulators, based on their detailed input. The five fields of activity are:

1. IMPLEMENTATION AND SUPPORT TO EUROPEAN SAFETY LEGISLATION/ REGULATION.

This field is one of the most requested by Stakeholders. States, as well as ANSPs, have expressed a strong need to receive support for timely implementation of SES legislation. Developing and delivering safety management and safety regulation support, such as training, oversight of ESARRs as well as support to ANSPs and National Supervisory Authorities (NSAs) to fulfil the Single Sky commitments, simultaneously with ESARRs commitments, is a key deliverable.

4- A "just culture" in Safety Reporting can be defined as follows: a culture in which front line operators or others are not punished for actions, omissions or decisions taken by them that are commensurate with their experience and training, but where gross negligence, wilful violations and destructive acts are not tolerated.

2. INCIDENT REPORTING & DATA SHARING.

This is the SSAP area that made least progress and requires action to ensure that the Safety Data Reporting and Data Flow Task Force (SAFREP TF) proposals are implemented. The facilitation of introducing 'Just Culture'[4] reporting, development and implementation of one European mandatory ATM data flow (by the SRC in collaboration with the European Commission) to monitor European safety levels, identification and analysis of safety risk areas, sharing of lessons learnt and coordination of risk prevention actions will be implemented. ANSPs have requested the Agency to deliver support tools for incident investigation and prevention and these have also been included.

ESP proactively prepares European ATM for future challenges

3. RISK ASSESSMENT AND MITIGATION IN DAY-TO-DAY OPERATIONS.

Will deal with one of the key fields, i.e. ESARR 4 implementation, definition of Target Levels of Safety (TLS), tolerance to degraded modes of operations and change management. The SRC and the Agency will develop guidance material and give support on Safety Management System (SMS) elements such as the development of a Risk Classification Scheme to support ATM system

design, as part of ESARR 4 implementation.

4. SYSTEM SAFETY DEFENCES.

This field will develop, deliver and support implementation of more robust safety system defences combining ACAS with enhanced ground-based safety nets for controllers. R&D input, stakeholder consultation and engagement of industry are key.

By 2010, safety management systems will have been implemented in all Air Navigation Service Providers

5. SAFETY MANAGEMENT ENHANCEMENT.

To support and complement activity field 1, this field will develop SMS guidance material, specialist safety training, sharing state-of-the-art safety management best practices including integration of human factors in SMS as well as short term (shorter than 2-3 years) related R&D activities. Through this field the Agency, with stakeholders, will continue to identify and action safety improvement initiatives to mitigate risks such as runway incursions, air/ground communication, level bust, and airspace infringements.

The EUROCONTROL Provisional Council approved the ESP in November 2005 and the new Programme was launched in February 2006 to continue ATM safety enhancements after completion of the SSAP implementation.

Despite current traffic growth, safety performances are continuously improving. International Air Transport Association (IATA) data shows the hull losses rate has been consistently decreasing since 1998. However, traffic is expected to double by 2020, and therefore, despite ongoing ATM safety enhancements, additional safety improvements are required. The EUROCONTROL Agency is therefore currently developing a Safety Road Map for the future. The basis for the road map is that, as a result of ESP implementation, by 2010 SMS will have been implemented in all ANSPs. The SMS will be supported by a strong safety culture with well developed safety indicators and performance will be closely monitored. Moreover, ATM will be part of the overall aviation safety system in which all players will share information and seek continuous improvement.

SUMMARY

The independent surveys, carried out from 2002 in 42 European countries, measured safety management enhancement by determining whether a state has a well defined and mature framework for managing air traffic safety that meet the requirements set out in EUROCONTROL's Safety Regulatory Requirements (ESARRs).

The studies found that air traffic safety management frameworks in the States have been gradually strengthened over the past 4 years. Between 2003 and 2006, ANSPs improved their safety frameworks by almost 15% while the Regulators improved by 12%. As a result, the average level in Europe for air traffic management safety mechanisms is now 70% among Service Providers and 65% among Regulators. In 2002, the 70% level was set as the desired target to be achieved by every state; therefore, concerted and continued effort is required to turn these averages into absolute figures for all states.

Implementation of the European Action Plan for the prevention of Runway Incursions (EAPPRI) has been very successful and its pragmatic recommendations have been commented on favorably by both State ATM Regulators and Service Providers across Europe. Although reported runway incursions have risen over the past 3 years this is believed to be mainly due to a far higher understanding of the runway incursion problem and the need to report occurrences. However the numbers of more serious Category A incursions has fallen, thus an overall improvement in runway safety is observed.

There can be little doubt that the AGAS initiative and the subsequent implementation of the SSAP has brought improvements to ATM safety following the Linate and Überlingen accidents. Incident reporting and data sharing remains an area of concern and there is evidence to indicate that some States are holding back from implementing ESARRs until all the Single European Sky Regulations are clear. While the concept of "Just Culture" is largely understood by the aviation community at large, it is acknowledged that changing safety culture and introducing mature safety data reporting systems takes years. Of fundamental importance is the establishment of an appropriate domestic legislative framework to support "Just Culture" safety reporting practices.

2003 - 2006:
Improved safety management frameworks across Europe

The ESP continues proactively to tackle these matters and the EUROCONTROL Agency in conjunction with the EU is developing a Safety Road Map for the future beyond the ESP.

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ESP website: *www.eurocontrol.int/esp*

Printed at EUROCONTROL,DGS, Bureau LOG/Logistics & Support Services
96, rue de la Fusée - 1130 Brussels - Belgium

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