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2007 ECAC ATM Safety Framework Maturity Survey

A Report for EUROCONTROL

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Engineering, Safety & Risk

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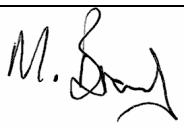
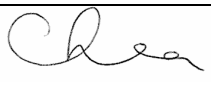
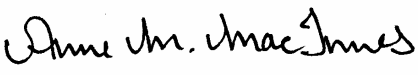
Author	**Maurice Bromby** 	15 October 2007
Reviewed	**Christine Shea** 	15 October 2007
Authorised	**Anne MacInnes** 	15 October 2007

Executive Summary

This survey report provides a comparative overview of the extent to which ANSPs and Regulators in each State of the ECAC region have developed their safety management and safety regulatory frameworks. The ATM safety frameworks within ECAC have been evolving over a number of years in order to comply initially with the Strategic Safety Action Plan (SSAP) requirements from 2002-2006 inclusive and in 2007 with the first year of the European Safety Plan. The 2007 safety maturity survey was carried out using methods which were fully compatible with those used during the previous SSAP surveys. The 2007 survey received excellent participation with 39 ANSPs, 34 Regulators, and 2 User groups completing their interviews.

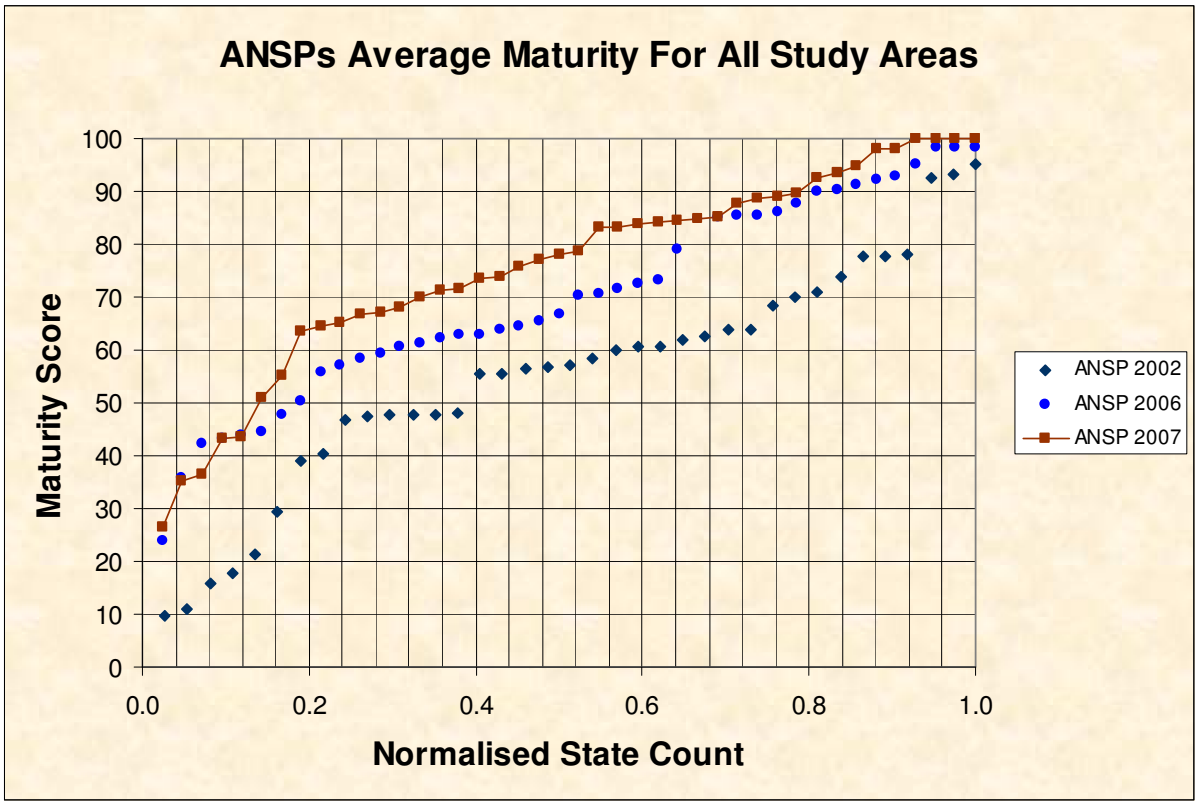
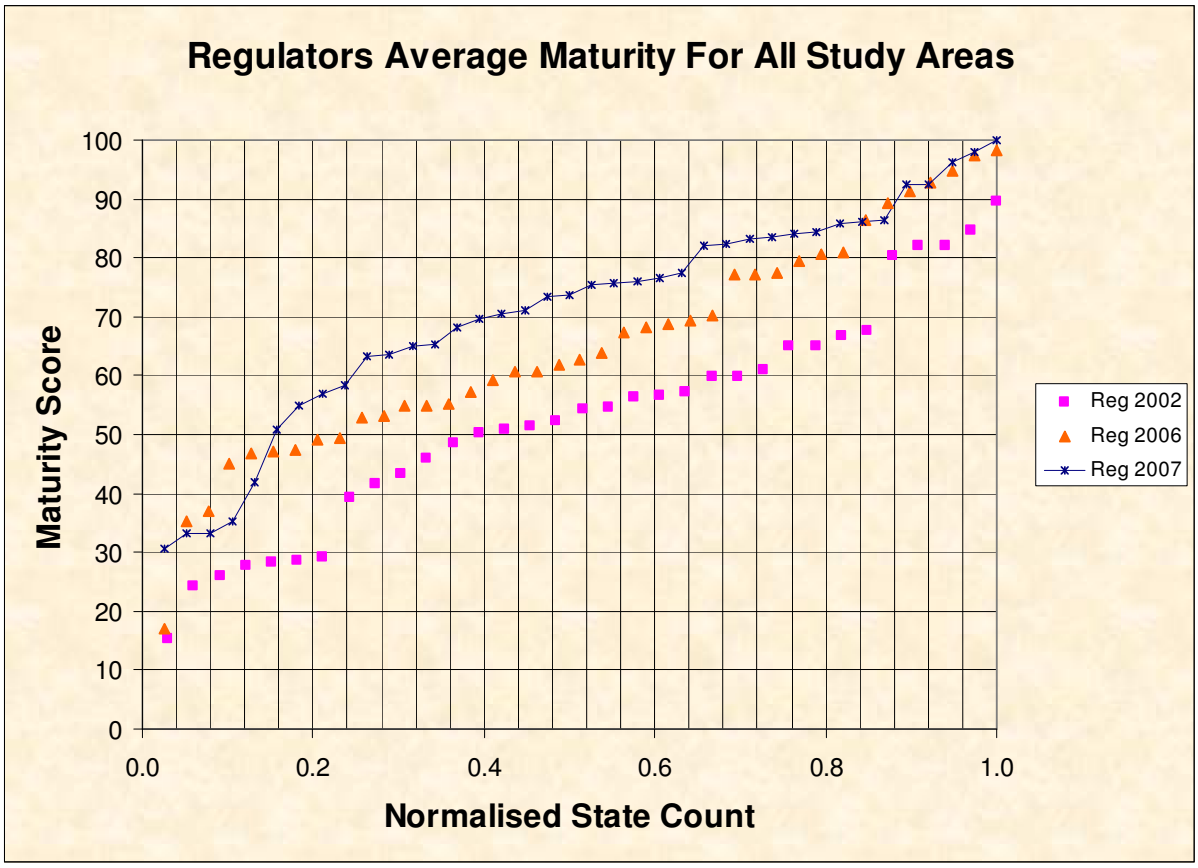


Figure 1A – ECAC ANSPs overall safety framework maturity graphs

Figure 1A and 1B show normalised graphs for 2002, the first SSAP year's survey, 2006 as the final SSAP survey and 2007 as this year's survey of both the ANSPs and Safety Regulators who participated in each survey. No comparison should be made between individual points between years as they do not relate from year to year but are a normalised profile of each year to show how the maturity of all States has improved.



Figures 1B – ECAC Regulators overall safety framework maturity graphs

Overall conclusions of this 2007 survey are that:

- The previous SSAP project and the associated focussed support efforts have made a real difference in establishing the formal safety management development process. During the SSAP surveys, the maturity of ATM safety mechanisms in ECAC had improved from an overall average of 55% in 2002 to 70% in 2006 according to the ANSPs and from 52% in 2002 to 65% in 2006 according to the Regulators. The 2007 survey results show that in just the one-year period from 2006-2007 (SSAP surveys were over a two-yearly interval), the ANSP average maturity rose to 76% (6% rise) and to 71% (6% rise) according to the Regulators.

- Deploying sufficient numbers of suitably qualified staff for safety roles remains difficult in many States. Just as in previous surveys, it is clear that this situation affects the Regulators to a larger extent than the ANSPs, as many struggle to obtain the necessary budgets and to offer attractive remuneration and career prospects for potential applicants, particularly where the oversight role is a new process. Offering training alone will not resolve this situation.

- EUROCONTROL's efforts in terms of guidance, tools, training, support projects and the ESARR Implementation Monitoring and Support (ESIMS) Programme. The ESIMS audit are all very much appreciated by the Regulators. Two of the ANSPs had reduced their maturity marking compared to 2006 and when this was queried during the interviews they admitted that it was as a result of a EUROCONTROL visit which had shown that they were not as mature as they thought they were.

- There appears to be some improvement in the area of risk assessments where several examples of ATM operations or systems safety assessments were mentioned.

- The confusion that was mentioned in earlier studies about the usefulness and practical implementation of the national Target Levels of Safety (TLS) remains. There is a very common view that it would be useful for EUROCONTROL to provide some form of framework and guidance for TLS to ensure a consistent approach. During this 2007 survey, safety indicators, safety performance management and change management have come up as a particularly difficult process to introduce.

- One of the key remaining legislative issues is establishing a "Just Culture", i.e. 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. Conceptually, the introduction of a "Just Culture" within ANSPs depends on whether the following Critical Success Factors (CSFs) have been met:
  - Ensuring that a "Just Culture" environment is reinforced through the national judicial system. The penal code should protect staff who report occurrences unless there is a situation of gross negligence or wilful violation;
  - Ensuring that a positive safety culture exists within an ANSP with a positive attitude towards those that report occurrences;
  - Ensuring that the reporting system is User friendly and that data is protected in such a manner that staff put their trust in the system;
  - Ensuring that reports are being investigated with a systemic view, actions followed up and that any improvement actions are communicated to all affected.

- Little progress in changing the necessary national criminal legislation has been reported. A few States still have it in their legislation that anyone making a mistake will be punished, but most States appear to be reliant on what could be called a "Just Culture" in terms of an understanding between the key stakeholders (Ministry of Justice, Aviation Regulator, AIB, ANSP) that the person reporting the incident is not subject to identification or prosecution except in the case of a wilful violation (complete disregard of the rules/procedures) or negligence. In most cases, these are working arrangements which have not been fully tested in the event of a major incident, and there is no legal protection. Relatively speaking, most of the progress in this area has been from the ANSP in addressing the remaining CSFs, rather than by the Ministry of Justice and Regulators addressing the national penal code.

- ANSPs and Regulators mention the difficulty in gaining access to the EUROCONTROL Training Centre for relevant courses, and it would appear that demand is exceeding supply. A further (inevitable) complication is emerging in that the current guidance and training is felt by some mature States to be too basic in scope and they would like to be trained on a more advanced level.

- The total number of Slow Starters has steadily dwindled down to 5 States according to the ANSPs and 5 according to the Regulators participating in this 2007 Survey. These graphs show that the presumed link in the 2002 survey between low maturity and, relatively little traffic but hi-growth of the traffic volume is no longer present. In 2007, only 2 States remain in the Hi-Growth and Small group according to ANSPs and only 1 remains according to Regulators. This survey also clearly shows that neither

traffic volume nor traffic growth rates are a determining factor in achieving maturity rates of more than 80%.

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1 INTRODUCTION

1.1 BACKGROUND

The European Safety Programme for ATM (ESP) was issued in February 2006 to provide ECAC States with a range of safety recommendations. These safety recommendations follow on from the requirements presented to States in the Strategic Safety Action Plan (SSAP) that started in 2003 and was completed in 2006.

Throughout the SSAP, and now during this survey, the maturity of safety frameworks and progress against the plans has been monitored for each ECAC State's main ANSP and Regulator, using the independent surveys presented in this report.

The methods used to carry out the survey and prepare this report are consistent with those used during the three previous SSAP surveys. For ease of comparison, the results of this 2007 survey are presented in a similar way as those that were obtained in the 2002, 2004 and 2006 SSAP maturity reviews.

1.2 OBJECTIVES AND APPROACH

This survey establishes the extent of the progress made by the ANSP and Regulator in each ECAC State with respect to the introduction of ATM safety systems against the requirements of the ESP. To create this report, the situation established by means of the 2002 survey "Overview of the Safety of European ATM" and the 2006 survey "SSAP 2006 ATM Safety Maturity Survey" has been used as a basis for comparison.

The approach of this survey was to focus on a review of the status of the development and implementation of safety management and safety regulation mechanisms within the ECAC region. This has allowed us to form a fact-based opinion regarding the status of current and future ATM safety in ECAC.

The chosen approach was exactly the same as in the previous studies. It reflects the view that organisational safety management provides a practical approach to safety assurance. This view is largely undisputed, and organisational safety management is widely accepted as an important contributor to the overall ATM safety performance. All elements of the ATM system, people, procedures and equipment pose potential risks. Safety management practices and systems provide a mechanism for the improvement of safety levels and the control and reduction of risks. As such, the maturity of these safety systems provides an indicator for current and future safety performance.

1.3 STRUCTURE OF THE REPORT

This report consists of four main sections:

- Chapter 1 – The Introduction, with descriptions of objectives, scope and limitations;
- Chapter 2 - The Results and Analysis, which summarise the main findings of the report;
- Chapter 3 - The Conclusions, which provide a basis on which EUROCONTROL can make judgements concerning the current safety maturity level within ECAC States and develop or adjust the plans that help improve European ATM Safety;
- The Appendices, that include a detailed description of the Methodology, examples of questionnaires and the survey repository and other relevant details that underpin the main section of the report.

1.4 SCOPE AND LIMITATIONS

1.4.1 Survey Target Group

This survey aims to review the implementation status of organisational safety management arrangements in ECAC at Air Navigation Service Providers (ANSPs) and State Regulators (Regulators).

The survey targeted 42 ECAC States and Maastricht UAC. The same ANSPs and their respective Regulators were included in the previous studies, except for Georgia which is a new addition to this survey. In 2004 the CEATS project team and the future CEATS Regulator also participated in the survey. Because of the continuing uncertainties surrounding the CEATS project, it was decided that further participation was not appropriate. CEATS was therefore not included in the 2006 SSAP and 2007 surveys.

In addition to the ANSPs and their Regulators, the following stakeholder organisations (representatives of the airlines and ATCO unions) were also invited to participate in the 2007 survey:

- AEA/SAS
- IATA
- IFATCA
- ATCEUC
- IFALPA
- ICAO

For a detailed overview of States and Stakeholders included in the survey and their responses please refer to Appendix 5.

1.4.2 Comparability with 2002, 2004, and 2006 SSAP studies

To ensure comparability with the previous studies, this survey was limited to the review of safety systems within the ECAC region. The survey only addressed the status of organisational arrangements for ATM safety; a review of the number and nature of actual recorded safety related ATM incidents within ECAC was outside the scope of this project.

Changes agreed following a joint EUROCONTROL and ESR Technology review at the beginning of the survey were:

- Minor changes to the definitions for complete maturity of the Study Areas;
- Minor changes to the weightings allocated to some of the questionnaire question responses;
- The decision not to address Study Area A8 as it was effectively a sub-set of Study Area A3.

These changes are discussed in more detail in Appendix 1.

1.4.3 Basis for the survey and validation of the information

This report is based on data and information collected through a combination of electronic questionnaires (different questionnaires were designed for ANSPs, Regulators and Users respectively) and telephone interviews.

The results presented in this report are based on the views and perceptions of the safety professionals contacted in the ECAC States. There has been no attempt to edit the views in any way, except that, in order to consolidate the wealth of information received in more than eighty hours of telephone interviews, it was necessary to classify and abbreviate comments.

Questionnaires for each State were prepared (pre-marked) prior to issue to the Regulator or ANSP on the basis of their LCIP 2006-2010 report (and in a few cases from the 2007-2011 report where these had been produced), and any changes made to these and comments added were noted following the 2007 questionnaire's return. Any differences between the scoring on the basis of the LCIP information and questionnaire returns were extensively explored during the telephone interviews by means of targeted questions. The interviews also served to harmonise the basis for scoring between States, as the reasoning behind questions would be explained and examples provided for the sort of arrangements that would have to be in place if maturity were achieved. In some cases the previously submitted scoring was changed during the interview with the agreement of participants.

To limit the possibility that participants would let themselves be guided by the scoring in their organisation's previous SSAP submissions, it was intended that only those participants who specifically requested to receive a copy were sent one. However, during this survey no-one requested any previous questionnaires.

2 RESULTS AND ANALYSIS

2.1 OVERALL RESULTS OF THE SURVEY

2.1.1 General comments

All the observations and conclusions are based on the dataset obtained by means of the questionnaires and the interviews. In order to preserve anonymity no comments have been made or conclusions drawn on named individual States. The results in the Study Areas have all been normalised to percentages (of non-nil responses) in order to eliminate the effects of non-respondents.

The scores are presented in the overall maturity graphs in Figures 2 and 4 below in increasing order on a normalised State count. Note that the State numbers on the horizontal axes on the ANSP and Regulator graphs do not necessarily represent the same State and neither does each number represent the same State for each of the survey years. These graphs therefore, represent the safety maturity within ECAC on an overall level, ranked by increasing maturity in each of the survey years.

2.1.2 Overall average safety maturity

The following table shows how the overall average ATM safety maturity[1] as reported by ANSPs and Regulator participating in each of the surveys has changed.

Overall average maturity	ANSPs %	% Change	Regulators %	% Change
2002 SSAP Survey	55		53	
2004 SSAP Survey	62	7	62	9
2006 SSAP Survey	70	8	65	3
2007 Survey	76	6	71	6
Total change 2002-2007		21		18

Table 1 - Overall maturity scores

It is clear that in the eyes of both the ANSPs and the Regulators a significant improvement has been made since 2002.

In the next sections the extent and shape of this improvement will be further explored. During the SSAP analysis from 2002 – 2006 inclusive the States were categorised into three groups. That allowed common features of States in these groups to be expressed. These groups were:

- Uncertain Starters with maturity levels of less than 35%;
- Willing Developers with maturity levels between 35% and 70% (both inclusive) and
- Confident Adopters with maturity levels higher than 70%.

[1] Overall average ATM safety maturity is the average score of all ANSP participants and of Regulator participants, as shown above.

For this survey, with only 1 ANSP below 35% according to the ANSPs and 3 below it according to the Regulators, it was decided to introduce groupings that more accurately reflect the increasing maturity of the participants' SMS arrangements, as well as the evolving significant groupings, and the following categorisation was adopted:

Category	Maturity %	Meaning
Slow Starters	0-45	States in this category typically suffer from a lack of resources and leadership for the implementation of safety management frameworks compatible with the EUROCONTROL philosophy.
Active Developers	46-80	With maturities between 46% and 80%, States in this category typically move constructively through the steps of the implementation of a mature safety framework and several have now reached the target minimum maturity level of 70%. Individual States suffer occasional set-backs but there is now enough local expertise and management determination within organisations to keep the process going.
Continuous Improvers	81-100	States in this category report maturities over 80% and dedicate their efforts to efficiency and effectiveness of the safety frameworks they have embedded, usually over a number of years. The focus is on fostering a coherent and positive safety culture across all parts of the ANSPs organisation.

Table 2 – Revised Maturity Categorisation

It is important to note that the target of minimum maturity remains at 70% for all ANSPs.

2.1.3 Overall State maturity classification

The ANSPs' and Regulators' assessment of numbers in each maturity classification (based on the average scores over all Study Areas of those who responded) are presented below:

According to:	Slow Starters 0%-45%	Active Developers 46%-80%	Continuous Improvers 81%-100%	Stakeholders below the 70% target	Comments
ANSPs 2002	8	26	3	28	37 participated
ANSPs 2004	9	17	9	19	35 participated
ANSPs 2006	6	21	15	21	42 participated
ANSPs 2007	5	17	20	13	42 participated
Regulators 2002	11	18	4	28	33 participated
Regulators 2004	3	19	4	16	26 participated
Regulators 2006	3	27	9	25	39 participated
Regulators 2007	5	20	14	15	39 participated

Table 3 - State maturity classification by survey year: Number of States in each maturity classification.

2.1.4 Safety Progress in the ECAC States according to the ANSPs

The following graph shows the reported overall maturity level of the ANSPs who have submitted a response to the questionnaire for 2007 and the previous SSAP survey results from 2002 and 2006. To improve the clarity of the data, the 2004 data (as the mid-term SSAP results) has not been displayed. The information is presented in order of increasing maturity. There were different numbers of respondents in each of the surveys. To present the data such that any progress can be shown in a meaningful manner, the States are displayed in the normalised order of their State Count by dividing their maturity ranking by the total number of respondents in each of the years[2].

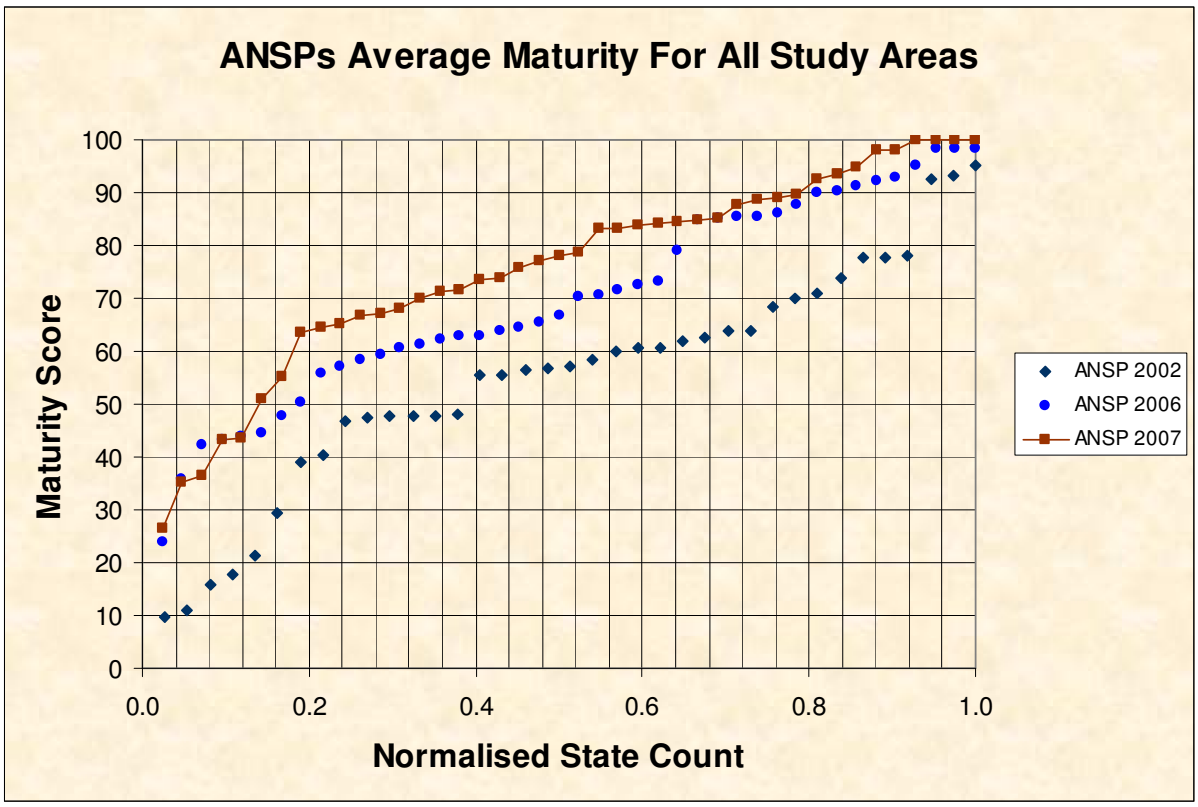


Figure 2 – Normalised ANSP Overall Safety Framework Maturity

Figure 2 shows that most of the ANSPs have continued to make good progress throughout the period 2002 – 2007.

[2] (i.e. the 21st State by order of its maturity from lowest to highest of a total of 42 respondents has a normalised State Count of 0.5)

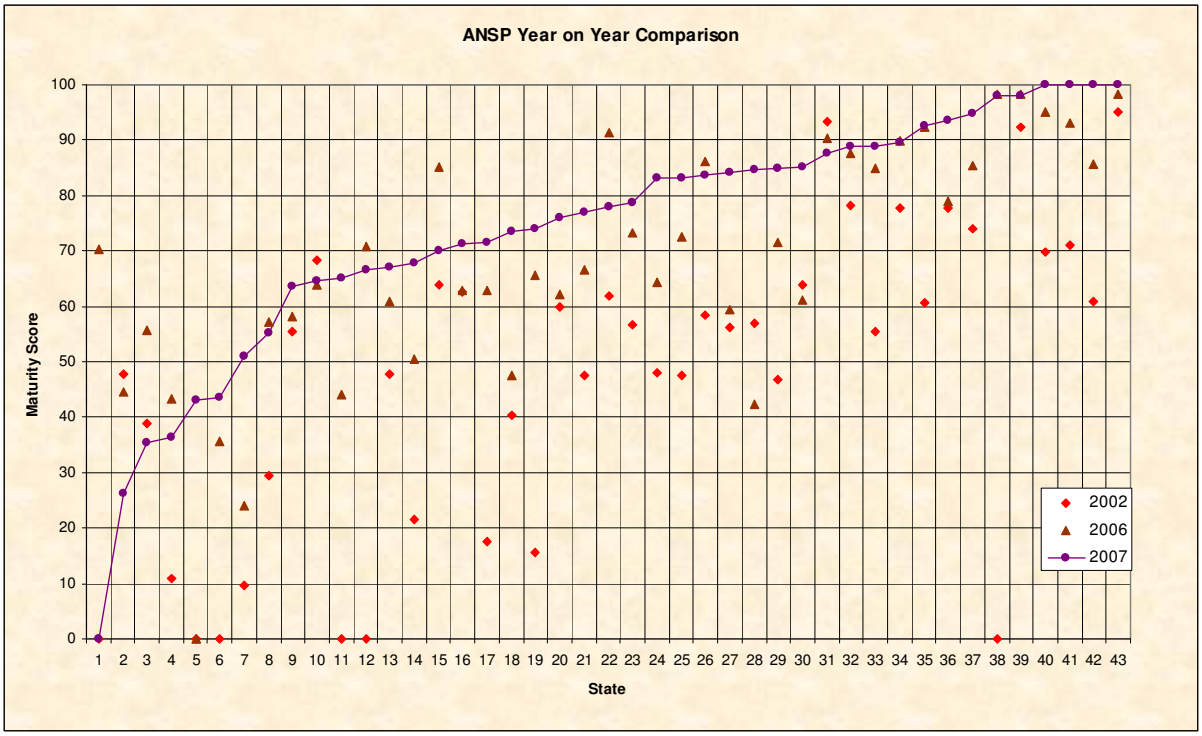


Figure 3 - ANSP Year-on-Year Comparison

The above graph (Figure 3) presents a comparison of the ANSP reported maturity between 2002 and 2007 on a State by State level. To improve the clarity of the data, the 2004 data (as the mid-term SSAP results) has not been displayed. There were 42 States plus Maastricht UAC included in the 2007 survey and these are numbered but de-named along the horizontal axis. Where States did not participate, their score has been listed as 0 and is plotted on the horizontal axis.

On the lower end of the scale, only one of the "Slow Starters" with maturity scores below 45% has shown any improvement in maturity since 2006. The rest in this group are showing a decrease in maturity since 2006 with two of them being significant decreases of up to 20%, presumably due to a clearer real maturity status being recognised.

Those States in the "Active Developer" (46%-80%) category now have made a lot of progress towards implementing formal safety frameworks. Whilst the reasons for this are variable, these key factors have emerged as drivers for this process:

- Following the SSAP programme, ANSPs are very much more familiar with the requirements and the ESP programme is a natural extension of this work;
- The SES Common Requirements, with their similar scope, have provided a legal requirement for implementation (as EU statutes) which the ESARRs lacked, and in some cases this has released some resources and raised the priority of the work;
- Many of the activities previously described as "Planned" or "Developing" have now been implemented and they have enhanced the SMS's maturity;
- More staff are being trained in the new skills required, and are enhancing the maturity development process.

Those in the “Continuous Improvement”” category (>80%) are firmly into the improvement process, but some of these are beginning to express frustration with the lack of training and guidance to help them develop further.

Four ANSPs reported maturity levels in 2007 that were significantly lower than in 2002 and three of these included maturities which were lower than in 2006. Two others show a significant drop in maturity between 2006 and 2007. Our interview discussions revealed that this reduction is due in part to a better understanding of the requirements allowing a more realistic view of the gaps to be addressed, and/or a change in interviewee with a different opinion of the ANSP’s current maturity level. We also recorded repository comments showing that those responsible for improving the safety management in some ANSPs were disappointed with a lack of progress in key areas such as:

- The incident reporting cultural development;
- Regulatory oversight and support;
- The availability of suitably qualified staff for safety roles;
- Lack of TLS and other State derived safety indicators;
- Establishing an ESARR4 compliant change management process;
- The Quantitative Risk Assessment (QRA) process.

2.1.5 Safety progress in ECAC States according to the Regulators

The following graph shows the reported overall maturity level by the Regulators who participated in the survey for 2007 and the previous SSAP survey results from 2002 and 2006. To improve the clarity of the data, the 2004 data (as the mid-term SSAP results) has not been displayed. The information is presented in order of increasing maturity. As with the ANSP overall maturity graph, there is no correlation in the order in which the data is presented for the different survey years. This overview is suitable for showing changes in development of the ECAC overall safety framework maturity level only.

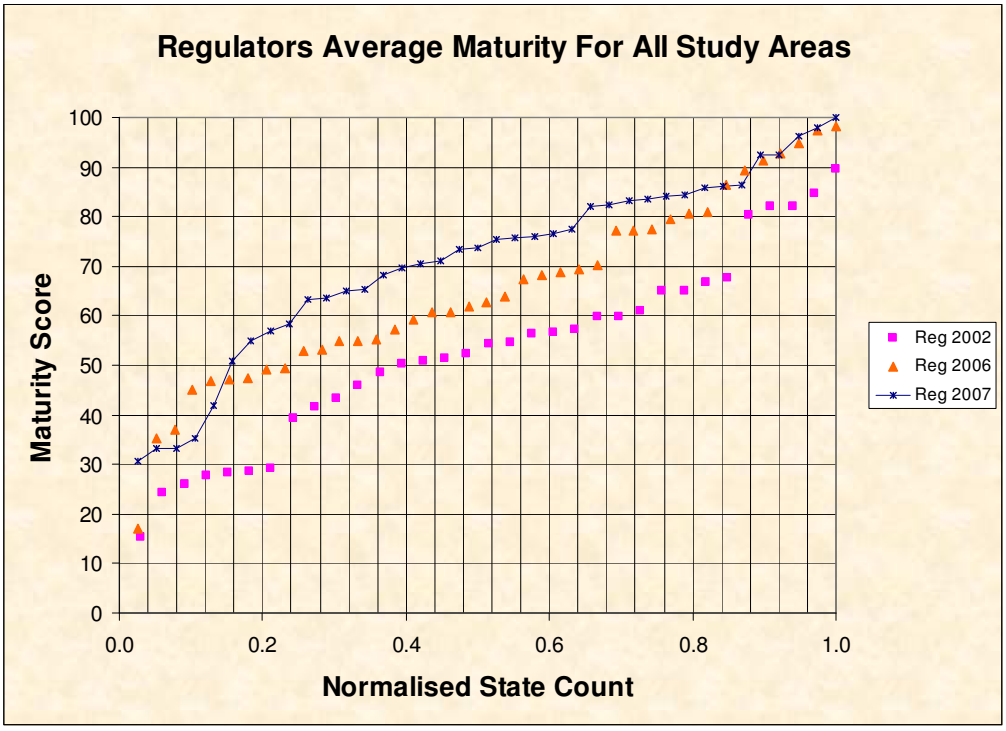


Figure 4 – Normalised Regulator Overall Safety Framework Maturity

Overall, the level of safety maturity across ECAC as reported by the Regulators has risen considerably since the first survey in 2002.

The following graph (Figure 5) presents a comparison of the Regulator reported maturity between 2002 and 2007 on a State by State level. To improve the clarity of the data, the 2004 data (as the mid-term SSAP results) has not been displayed. There were 42 States plus Maastricht UACC included in the 2007 survey and these are listed along the horizontal axis. Where States did not participate, their score has been listed as 0 and is plotted on the horizontal axis.

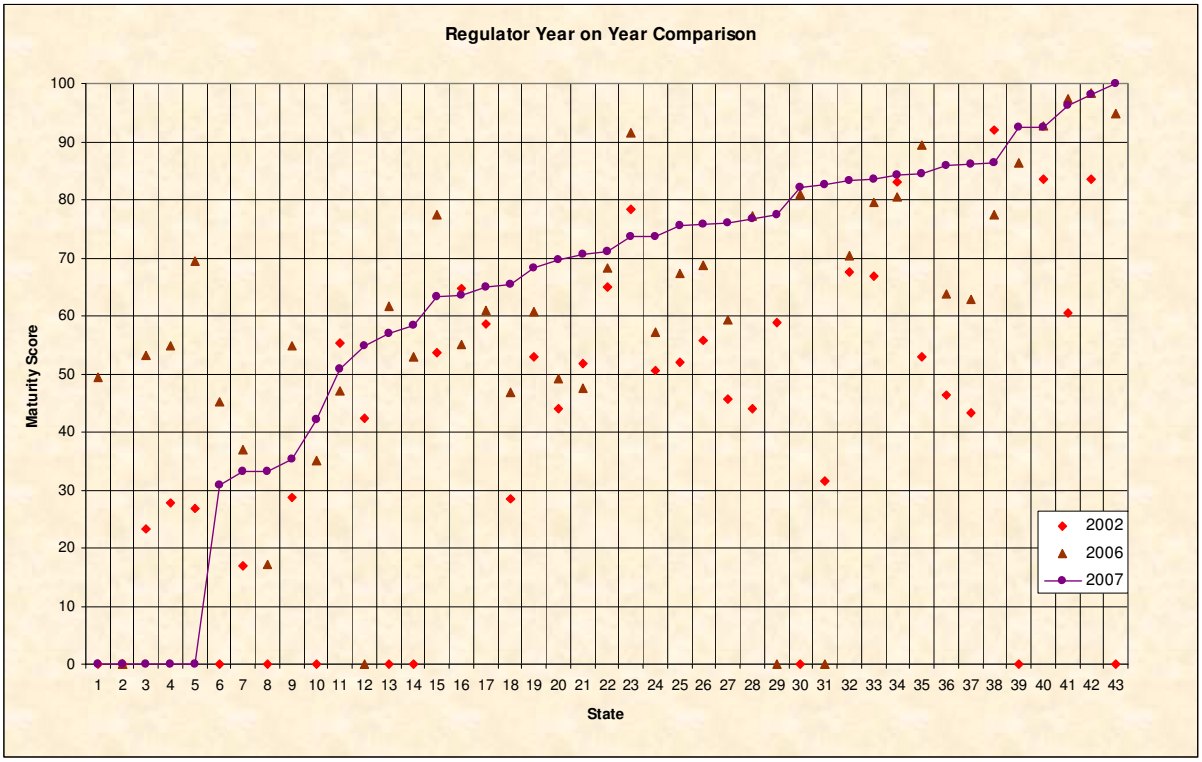


Figure 5 - Regulator Year on Year Comparison

The Regulators were, in general, a bit more consistent than the ANSPs regarding the progress made in their State over the years. This is illustrated by the fact that there are only seven Regulators where the reported maturity levels have declined since the 2006 survey, and three who indicated they were slightly less than in 2002, their comments in the repository (the comments database) indicate this is due now to a better understanding of the required development process and/or a change in the interviewee. One extreme example shows a 2002 maturity of 78%, a 2006 maturity of 91% and a 2007 maturity of 74%. That State reports it is still implementing ESARRs (and still learning) and the Regulator also has a new CEO and COO, both are factors which can lead to revised maturity figures. One State also has a significant fall in maturity between 2006 and 2007, but this State's reversion is probably due to major reorganisation in both the ANSP and the Regulator. One Regulator described the downgrading of their maturity marking as being due to the results of an ESIMS audit which showed that the arrangements were not as mature as they considered they were.

During the 2006 survey the Regulators reported an improvement in the safety framework maturity mostly at the "Slow Starter" lower end and at the "Continuous Improvement" upper end of the maturity range. In this 2007 survey, the Regulators and the ANSPs both reported most of the improvement in the central "Active Developer" category (typically ~10% compared with 2006). The "Continuous Improvement" category generally show little change since the 2006 survey, which was to be expected from mature organisations where the law of the diminishing returns inevitably plays a role. One State beats this trend and reports a very significant improvement in maturity.

There are 10 States in the "Slow Starter" category, but the first 5 of these States are at 0 due to a non-response. On the whole the "Slow Starter" (0%-45%) category is not well ordered, with 3 out of 6 of the 2006 scores above the 2007 maturity score. A review of the repository data for these States suggests that again a better understanding of the requirements has led staff to downgrade their scores in 2007.

The Regulators' opinion is less optimistic overall than the ANSPs' opinion. This is supported by the 5% difference between the Regulator and the ANSP in Section 2.1.2. as shown in Table 1 – Overall Maturity Scores and is similar to previous years' results.

If we consider the 2006 maturity levels of those States that have not responded in 2007, it is probable that they are all in the "Active Developer" category, unless previously their safety maturity had been significantly over-reported.

Issues identified by the Regulator as commonly affecting the further implementation of safety management in those States were:

- A general lack of knowledge or priority affecting the ability of States to achieve legislative progress, but the SES Common Requirements appears to have helped this;
- Conceptual problems and lack of skills with the subject of quantified safety indicators, TLS and Quantified Risk Assessment ;
- Pay differentials and budget restrictions at the Regulator affecting the ability to train and recruit experienced staff and to fully carry out the oversight process. This is still a large issue in many States, but in comparison with previous years, in a few States there have been pay rises and/or extra staff recruited to the Regulator.

2.1.6 Effect of Traffic Volume and Forecast Growth

The effect of the forecast future traffic volume[3] and the forecast growth rate between 2007 and 2013 was examined. The results are shown on the graphs below. Small States were defined as less than 500,000 forecast IFR flights in 2013, large States as greater than 1,000,000 IFR flights in 2013. The average rate of growth for all ECAC is forecast to be 3.4% p.a. over the period 2007 to 2013. Low growth States were defined as less than 2.8% pa; high-growth States were defined as having an average annual growth greater than 4.3% growth p.a. The results are presented separately for each of three chosen maturity categories: "Slow Starter", Active Developer", and "Continuous Improver".

[3] The forecast 2013 IFR traffic volume and the 2007 – 2013 growth average rate are based on STATFOR publication EUROCONTROL Medium Term Forecast: IFR Flight Movements 2007 - 2013, Annex F: Summary table and average growth per annum, Baseline Scenario (B). For the Maastricht UAC the annual report was used.

2.1.6.1 "Slow Starter" category States

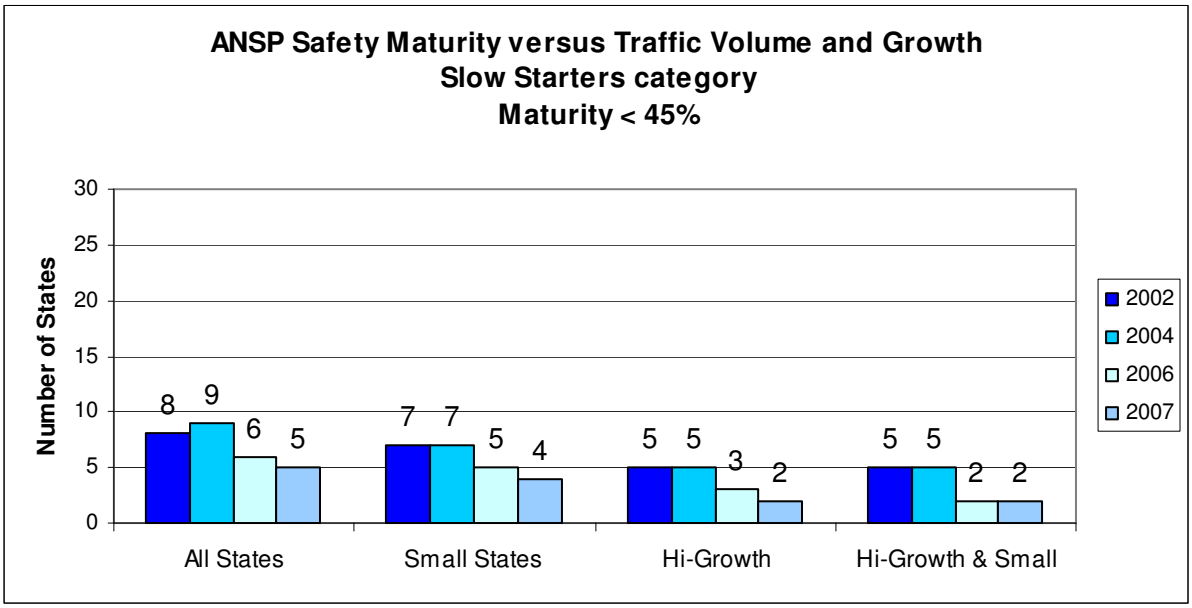


Figure 6 – ANSP Safety Framework Maturity versus Traffic Volume and Growth (Slow Starters)

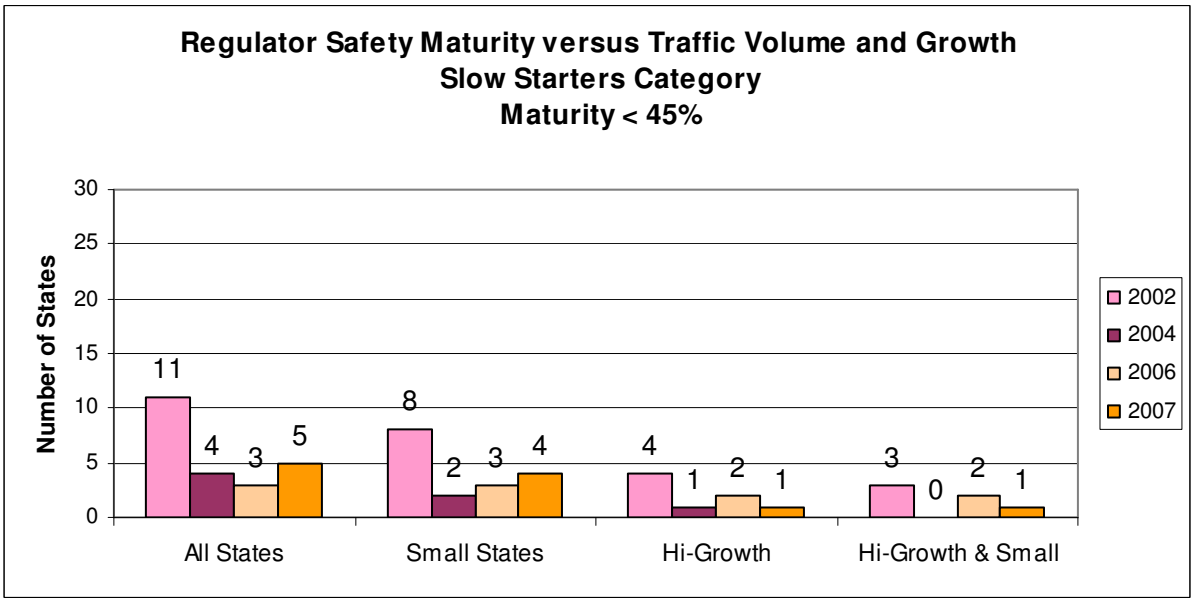


Figure 7 – Regulator Safety Framework Maturity versus Traffic Volume and Growth (Slow Starters)

The total number of Slow Starters has steadily dwindled down to 5 States according to the ANSPs and 5 according to the Regulators participating in this 2007 Survey. **These graphs show that the presumed link in the 2002 survey between low maturity and relatively little traffic but hi-growth of the traffic volume is no longer present**. In 2007, only 2 States remain in the Hi-Growth & Small group according to ANSPs and only 1 remains according to Regulators.

What is still striking though is that the majority of States with the least developed safety frameworks are Small States (4 out of 5 according to ANSPs and 4 out of 5 according to Regulators).

2.1.6.2 "Active Developer" category States

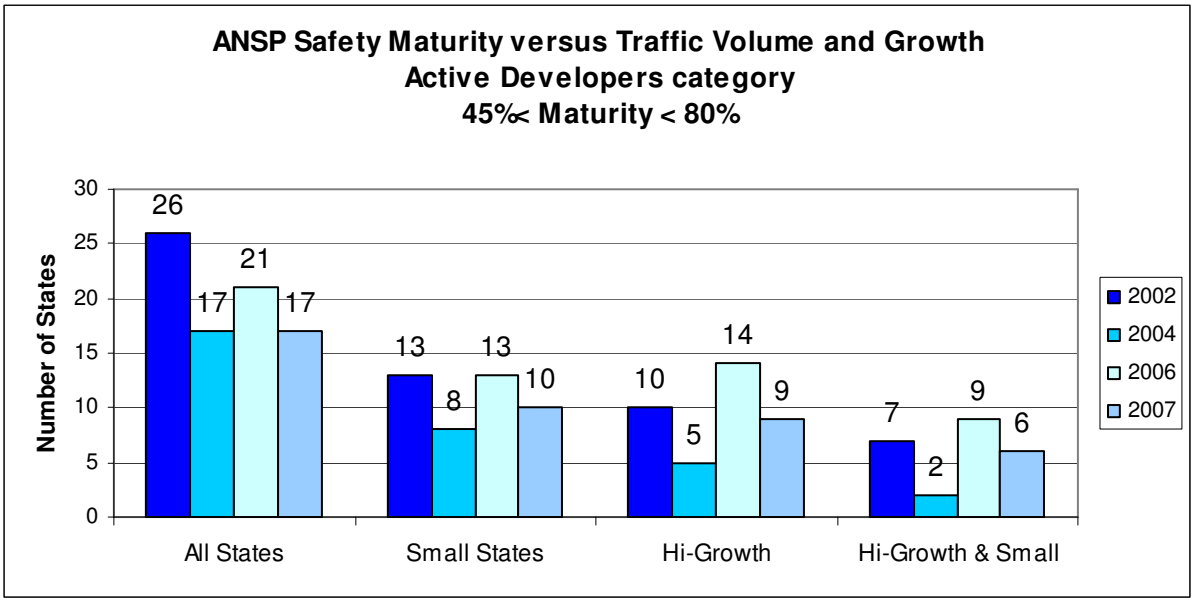


Figure 8 – ANSP Safety Framework Maturity versus Traffic Volume and Growth (Active Developers)

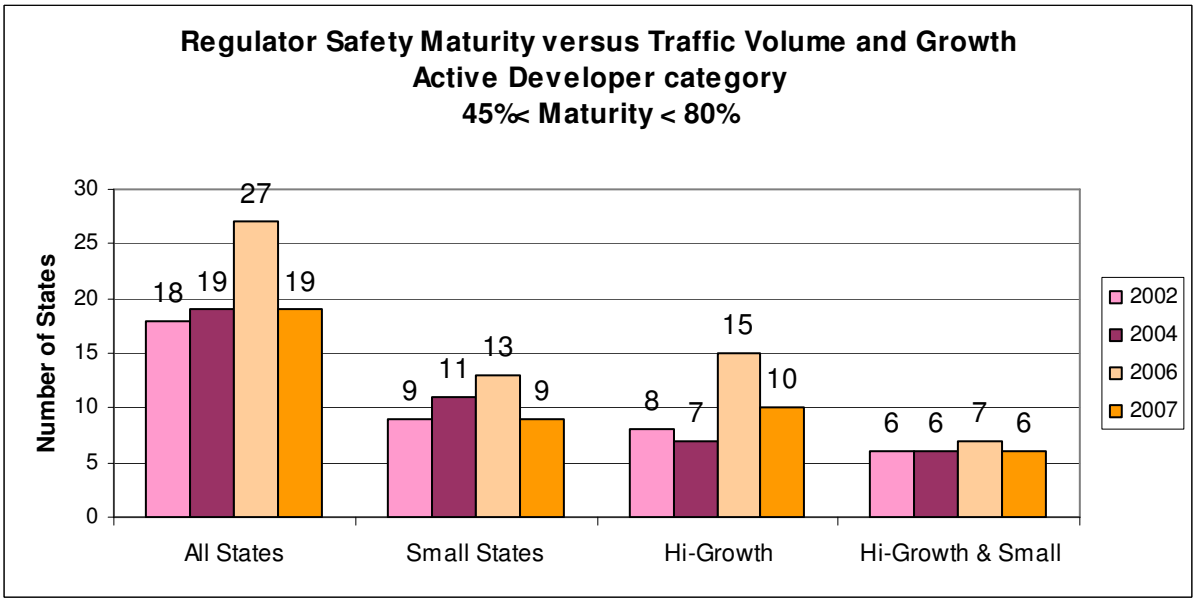
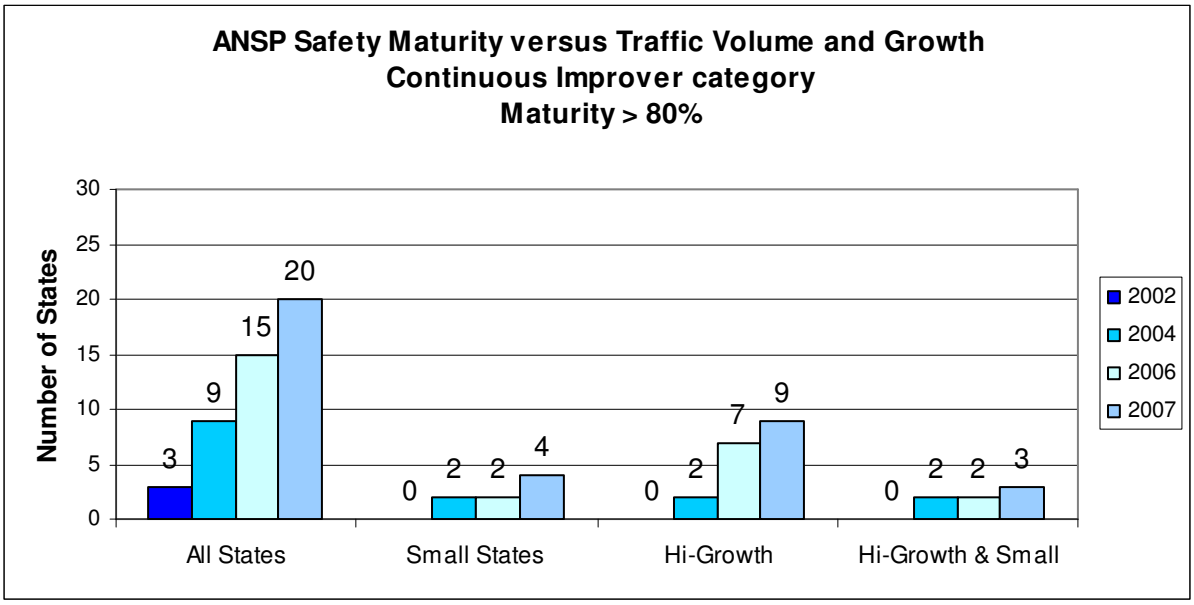


Figure 9 – Regulator Safety Framework Maturity versus Traffic Volume and Growth (Active Developers)

The graphs of the Active Developer group, which now includes several mature States with an average score between 70% and 80%, shows a remarkably stable number of Hi-Growth & Small States in this category (6 according to ANSPs against 7 in 2002 and 6 according to

Regulators against 6 in 2002). **Both Small States and Hi-Growth States represent about half of all States in this category where impressive progress in maturity scores is being made. This shows that a State's progress once 45% maturity has been achieved is largely independent of a State's size and growth**.



2.1.6.3 "Continuous Improver" category States

Figure 10 – ANSP Safety Framework Maturity versus Traffic Volume and Growth (Continuous Improvers)

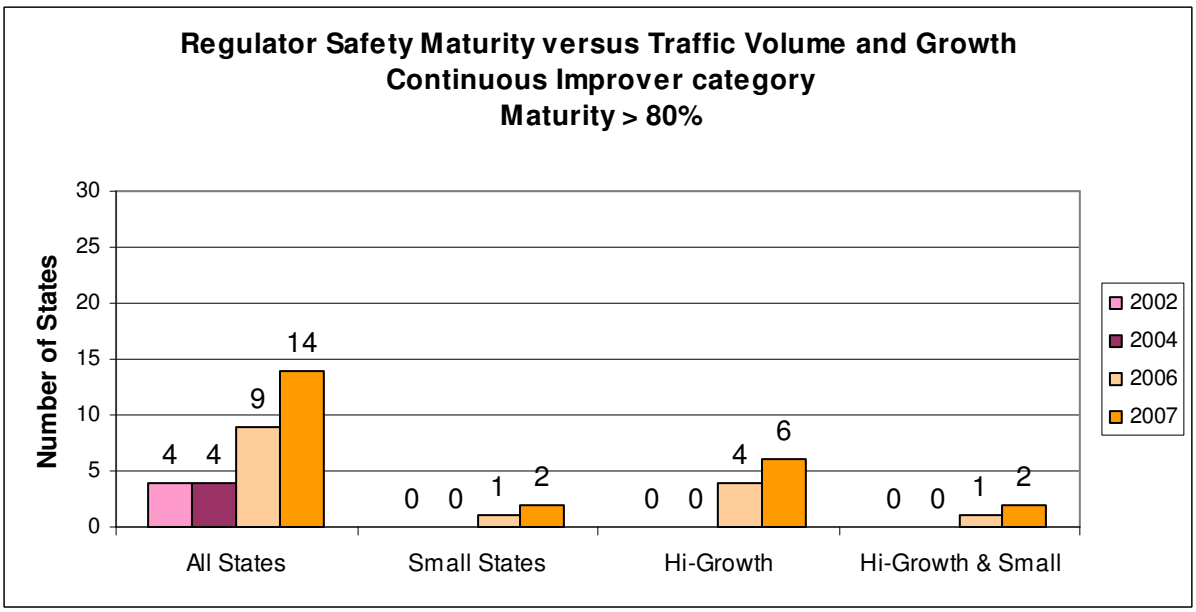


Figure 11 – Regulator Safety Framework Maturity versus Traffic Volume and Growth (Continuous Improvers)

In the continuous Improver category it is encouraging to see that there has been a build up in each of the size and growth groups. **This clearly shows that neither traffic volume nor traffic growth rates are a determining factor in achieving maturity levels of over 80%**.

2.2 PARTICIPATION

2.2.1 Overall participation

The participation from States in the 2007 survey was very high as shown in table A8 in Appendix 5.1. 40/43 ANSPs and 38/43 of the Regulators have returned their questionnaires, and 39/43 ANSPs and 34/43 Regulators participated in the interviews. In addition to the feedback by Regulators and ANSPs, a limited number of stakeholder organisations (Users) were included in the surveys. The participation in this group is shown in the table, and 2 out of 6 have been interviewed.

For a detailed overview of the 2002-2007 State's participation, please refer to Appendix 5.

2.2.2 Responses to the telephone interviews

The total number of interviews held in 2007 was higher than in previous surveys. 34 Regulators (79%) and 39 ANSPs (91%) participated in the follow-up interviews held between 6th March and the 31st August 2007, which was the cut-off date for this report. Two Users also participated in interviews. The average length of each interview was approximately 1 hour and 15 minutes with some lasting over 2 hours. As with previous surveys, all interviewees were very open and honest in their views. Confidentiality has been respected at all times, and no comments in this report have been or should be attributed to individuals.

Telephone Interview Participation	Survey	ANSP	Regulator	User	Total
Interviewed	2007	39	34	2	75
	2006	37	28	2	67
	2004	29	26	2	57
	2002	29	27	3	59
Comments recorded from questionnaire and interview	2007	969	791	22	1782
	2006	334	172	33	539
	2004	213	157	28	398
	2002	170	124	34	328
Share in total interview comments	2007	54%	45%	1%	100%
	2006	62%	32%	6%	100%
	2004	54%	39%	7%	100%
	2002	52%	38%	10%	100%
Participation factor	2007	1.03	0.97	0.46	N/A
	2006	1.12	0.76	2.05	N/A
	2004	1.05	0.86	2.01	N/A
	2002	1.05	0.83	2.04	N/A

Table 4 - Interview participation

There has been a significant increase in the number of comments recorded in the 2007 repository. This is due mainly to the fact that the survey data is also being used in

conjunction with LCIP by the Survey Programme to measure the implementation progress, and an effort was made to standardise the interview basic content for greater consistency. This resulted in a semi-structured interview framework where certain topics were always addressed, but the interviewer was still free to explore any other issues arising.

It is to be regretted that only two of the User group's representatives participated in this survey, but the participants' contribution (from IATA and IFATCA) was very much appreciated and useful. Despite repeated efforts from the ESR-T and EUROCONTROL project teams, there appeared to be problems in identifying and/or emailing the appropriate post-holder in the other User organisations to receive the questionnaire and for them to respond.

The table shows the division of the number of comments made during the telephone interviews. The Participation Factor is the average number of comments per interview in group (ANSP, Regulator or User) divided by the average number of comments per interview overall. A factor larger than 1 indicates a higher than average participation by a group, and a factor lower than 1 indicates a lower than average participation by a group.

2.3 RESULTS OF THE ANALYSIS IN SURVEY AREAS A1-A10 AND B1-B2

A total of 17 Study Areas A1-A7, A9, A10 and B1-B8 were defined as described in Appendix 1, Section 1.1. The results to the questions posed in each of the first 11 of these Study Areas (A1 to A10 inclusive (except A8) and B1 to B2 inclusive) are presented in the following series of graphs and associated commentary. Following a review by the EUROCONTROL and ESR project teams after the 2006 survey, it was decided that Study Area A8 was a sub-set of Study Area A3 and it was decided to no longer report separately on this survey area.

The quantitative results of the questionnaires have been used to categorise each State into one of the three groups described in Section 2.1.2 – "Slow Starter", "Active Developer" or "Continuous Improver".

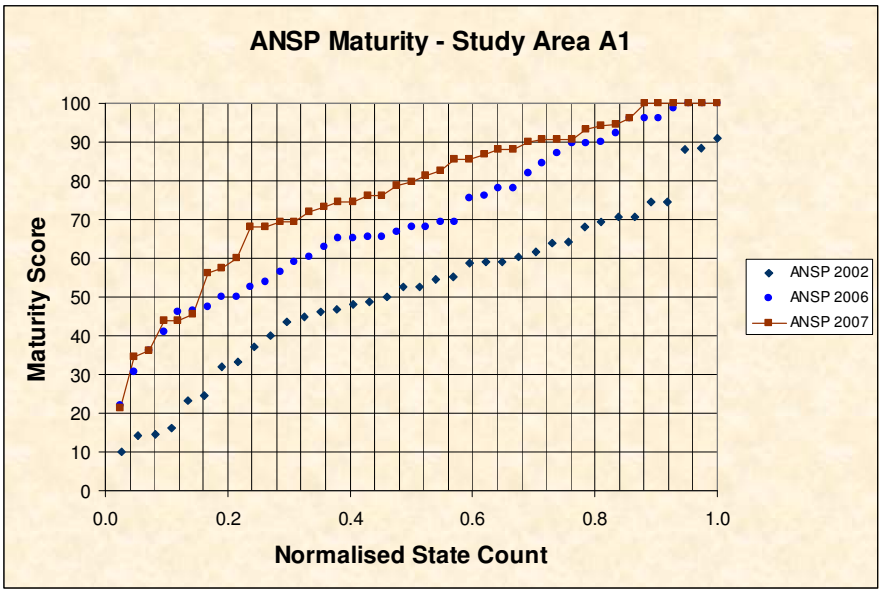
For each of the Topic Areas, the results reported by ANSPs and Regulators are shown on separate graphs so that the situation can be easily compared. The first two graphs in each section show the normative results which indicates the maturity development for each year in that Topic Area and the second two are the actual results for 2002, 2006 and 2007 for each State (denamed). Relevant comments from the interviews have been included in each section, thus combining the quantitative information obtained by means of the questionnaire with the qualitative information obtained by means of the interview and LCIP.

The results from the remaining 6 Study Areas B3 to B8 inclusive, are to be found in Section 2.4 and presents qualitative information only. These were not part of the statistical analysis presented in this section 2.3. The comments collected through "Yes/No" questions, free format text input in the questionnaires and the interviews in relation to these 6 Study Areas, are discussed in a qualitative manner only.

2.3.1 Study Area A1 ECAC States Safety Objectives

2.3.1.1 Maturity would be if:

"There is a civil aviation policy and management structure at State level that has the capability to accommodate new international standards and applicable legislation into national law. The State defines a safety management program and promotes the implementation of safety management systems that are compliant with the relevant international standards."



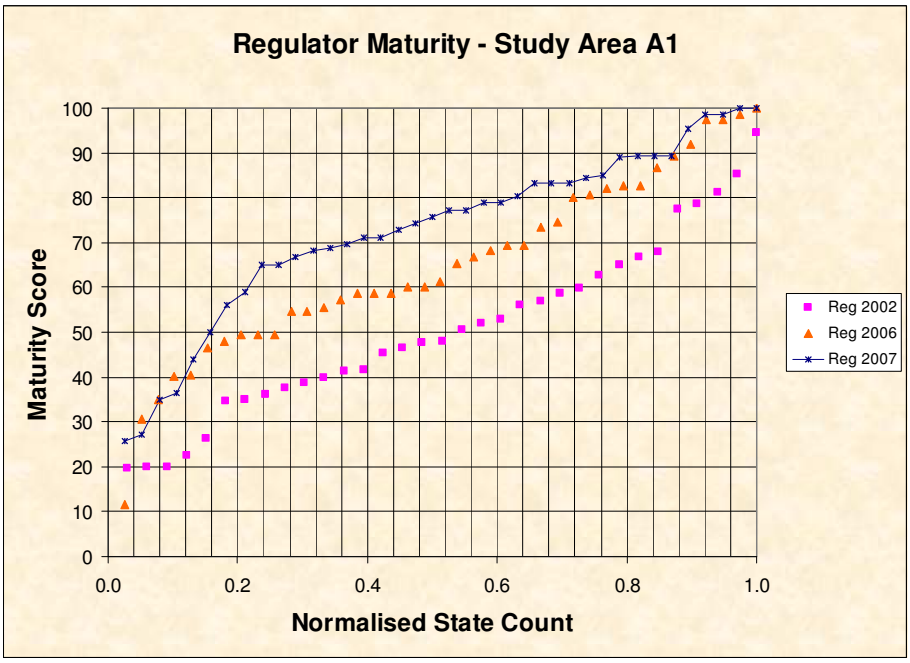
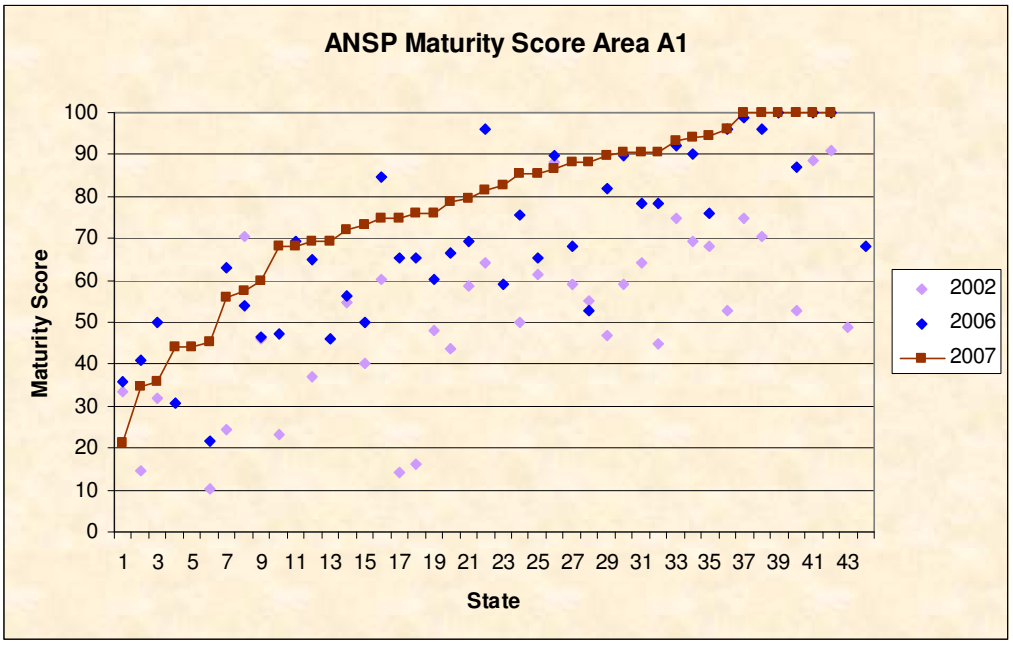


Figure 12 A and B ANSP and Regulator Normalised Overall Maturity for Study Area A1



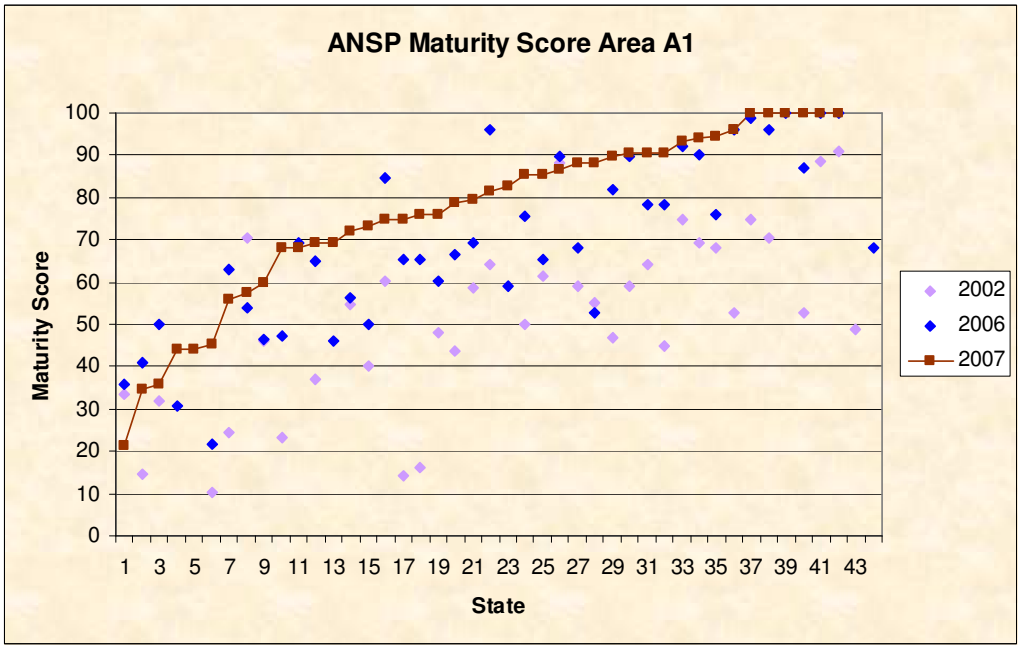


Figure 13 A & B ANSP and Regulator Overall Maturity by State for Study Area A1

According to:	Slow Starters	Active Developers	Continuous Improvers	Stakeholders below the 70% target
Regulators 2006 (of 39)	5	23	11	25
Regulators 2007 (of 38)	5	19	14	15
ANSPs 2006 (of 42)	4	24	14	24
ANSPs 2007 (of 42)	5	15	21	12

Table 5 – Number of ANSPs in each category for Study Area A1

2.3.1.2 Comments on the results

Considering that the survey interval for this survey is only one year (the SSAP surveys were at two-year intervals), there has been a significant increase in maturity levels in the "Active Developer" categories in both the ANSPs and Regulators opinions. However, there was virtually no improvement in those in the "Slow Starter" category. For those participants in the "Continuous Improver" category with >80% maturity there was also little movement, but as their name implies these are in a slower "continuous improvement" regime.

Several of the ANSPs have gone ahead without much Regulatory oversight, and implemented the ESARR compliant safety and risk management as best practice. This is entirely praiseworthy, but has potentially left the Regulator in those States poorly prepared for an ESARR1 compliant regulatory oversight process.

2.3.1.3 Comments from interviews

In 2007, 17% of the comments relate to this section, which is close to half of the percentage in 2006 (33%).

Whilst a good understanding of the topics compared to the early years of the SSAP programme is apparent, the previously identified issues in earlier surveys are still very applicable, such as the lack of Regulatory resources due to relatively low pay compared to the ANSP, Government restrictions on recruitment, or simply the lack of suitably qualified personnel. Whilst these issues were still very often commented upon and they remain significant, a few States now reported that they had been given permission to recruit new regulators and/or that pay had been increased to make recruitment easier.

Whilst much of the improvement will be due to the legislative process eventually making the necessary legislative changes after a lengthy development, the emergence of the SES Common Requirements has also provided an impetus to this process in many States. However a few EU member States appear to have used the argument of what they consider to be differences in requirements between the ESARRs and SES Common Requirements as a reason to halt all development until this is resolved. One positive aspect of the emergence of the SES Common Requirements is that extra funding is reportedly more available for this than it was for just ESARR development. Whilst the Common Requirements are obligatory for only 27 EU member States amongst the 43 ECAC States, in practice many of the non-EU ECAC States appear to follow elements of the Common Requirements on a best-practice basis.

Many of the States for which the Regulatory oversight process was now in the law are still only setting up the oversight and most still have resource problems. For many States the oversight process is a significant increase in the regulatory workload and recruitment is still an issue for many States, but the more pragmatic ones have doubled the number of regulatory staff.

Little progress has been made in the development of a "Just Culture" through legal protection being provided to the reporter, and this is discussed fully in Topic Area A2.

There is still a wide variation with regard to how easy it is to implement the ESARRs in national legislation, and the evolution of the SES Common Requirements has had the effect in some States of enforcing the ESARRs implementation. Some States have legislation that

recognise ESARRs as legally binding upon issue, or can readily issue their own regulations to match the ESARR requirements, and at the other extreme are some States where the relevant Ministry does not recognise the importance of the ESARR programme (and usually doesn't have the necessary resources to develop the legislation). In a very few States which are not EC members, there is no intention yet of adopting the ESARRs and ICAO compliance is sought instead.

2.3.1.4 Conclusions from this Study Area

A lot of effort was driven by the Common Requirements Directives of the Single European Sky, forcing National Supervisory Authorities to be in place and to have certified the ANSPs before the end of 2006. The 6 month extension to June 2007 for implementation was extensively used.

It is clear that progress has been made, but there is a lack of maturity growth in the State in the "Slow Starter" category. Many States are still struggling to introduce appropriate National legislation because of a lack of competent resources, local priorities for ATM safety and the difficulty in translating into practice some of the more contentious (ESARR 2) or technically challenging (ESARR 4 and 6) safety processes.

The extent of the changes to the Regulator is still very variable; with the most "Mature" ones being able to best evolve into a strategic organisation, with auditing of the ANSP just a part of its role. The majority of the Regulators are meeting what for a lot of them is an enlarged regulatory oversight role. Some have taken a realistic evaluation of what is required in organisational terms and have had the government backing to effectively double their staff, but these are in a minority. The majority of States cannot (for various reasons) recruit enough new staff and so have started an oversight process which is not complete in terms of scope or frequency or both. The situation is more positive than in 2006 with more oversight activities in place but for those in the "Slow Starter" and for several in the "Active Developer" categories, little has changed. There is a healthier situation with regard to more of the ANSP's internal audit processes being reportedly in place.

The skills required for the oversight role and development of the ESARR/SES requirements do not fit in with existing Regulatory or ANSP staff skills in several States. As a result much retraining has been done or will be required. This is especially relevant to auditing and QRA skills. Once again this is well recognised and is being addressed in several ways (such as external consultancy support), but several participants reported problems in getting on to the EUROCONTROL training courses.

There are still a number of States where the Regulator is paid much less than their equivalent in the ANSP and this remains a significant problem for Regulator recruitment. Although not quite as significant as it was in 2006, there are only a few States who have addressed this.

The lack of provisions for safety oversight within the existing legislation, and how this is addressed by the Regulator is still an issue in some States. There are several reports from ANSPs in States where ESARRs are not a formal requirement in National legislation yet, but a safety management system has been introduced independently by the ANSP.

The first FABs are being developed and it is clear that the multi-State ANSP organisation is a situation which will become more common in the future. Consequently, the multi-State ANSP

probably deserves closer scrutiny now. CEATS development has been seriously slowed by inter-State failure to allow a lead-State or easily agree decisions.

During the SSAP programme, several ANSPs found their Regulator very short of staff with the necessary skills to provide regulation and guidance on ESARR/SES implementation, especially the more specialised aspects (e.g. ESARR4). So the ANSP has done its own development and simply presented the Regulator with the results for approval. It has been reported that generally since then, the Regulator has also made an effort to get staff trained and recruit graduates with the necessary skills, and now is in a much better situation, but in some States Regulatory approval (e.g. for ESARR4 changes) is hampered by the lack of necessary skills.

In some States the ANSP has been delegated as Regulator for (typically) all ground-based equipment.

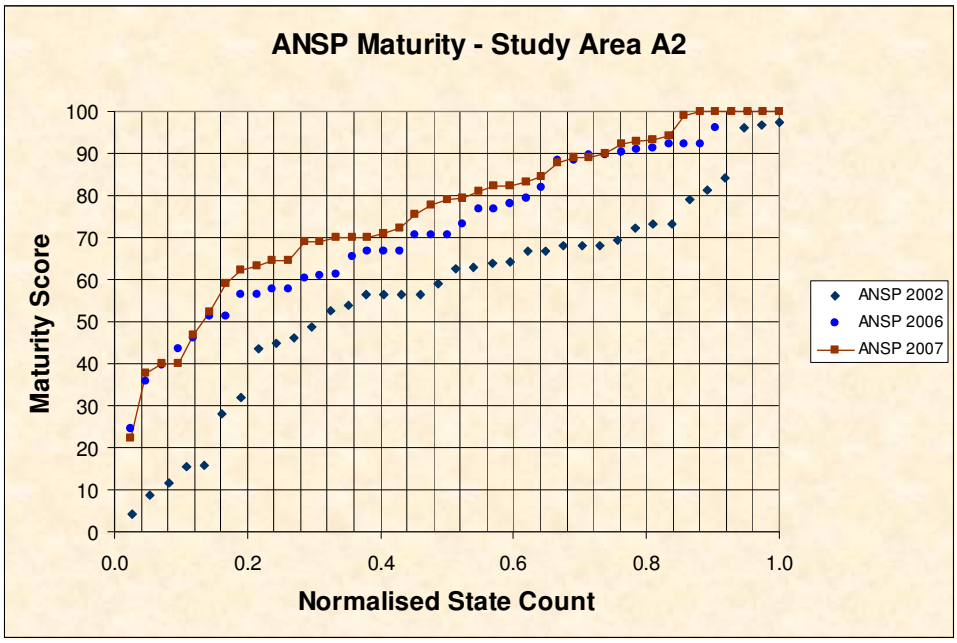
Several States have taken the programme implementation to the stage at which they are setting up an NSA regime, and once again this is potentially a major organisational change for those Regulatory organisations.

Some States, in particular those ECAC States not immediately affected by the Single European Sky Directives, appear to have been left behind and may need further targeted support to develop the necessary maturity and compliance. Several Regulators commented upon the workload that the development of the ESARR compliant legislation had imposed upon the major stakeholders.

2.3.2 Study Area A2 - Data Collection and Dissemination

2.3.2.1 Maturity would be if:

"There is a well-established structure in place for collecting and recording incident data, analysing and acting on the results of the analysis."



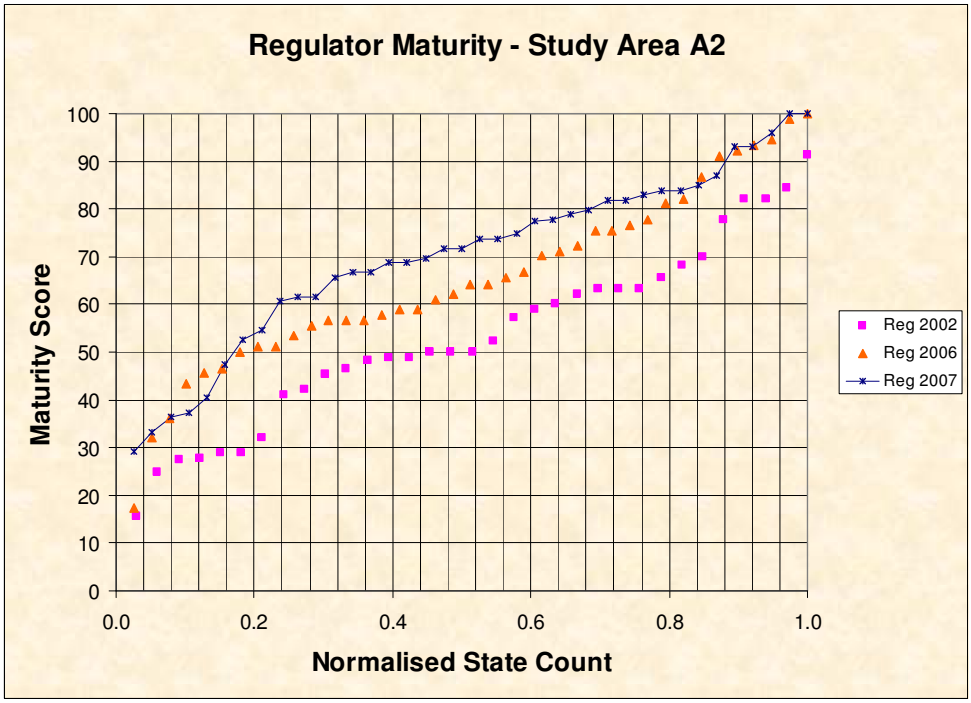
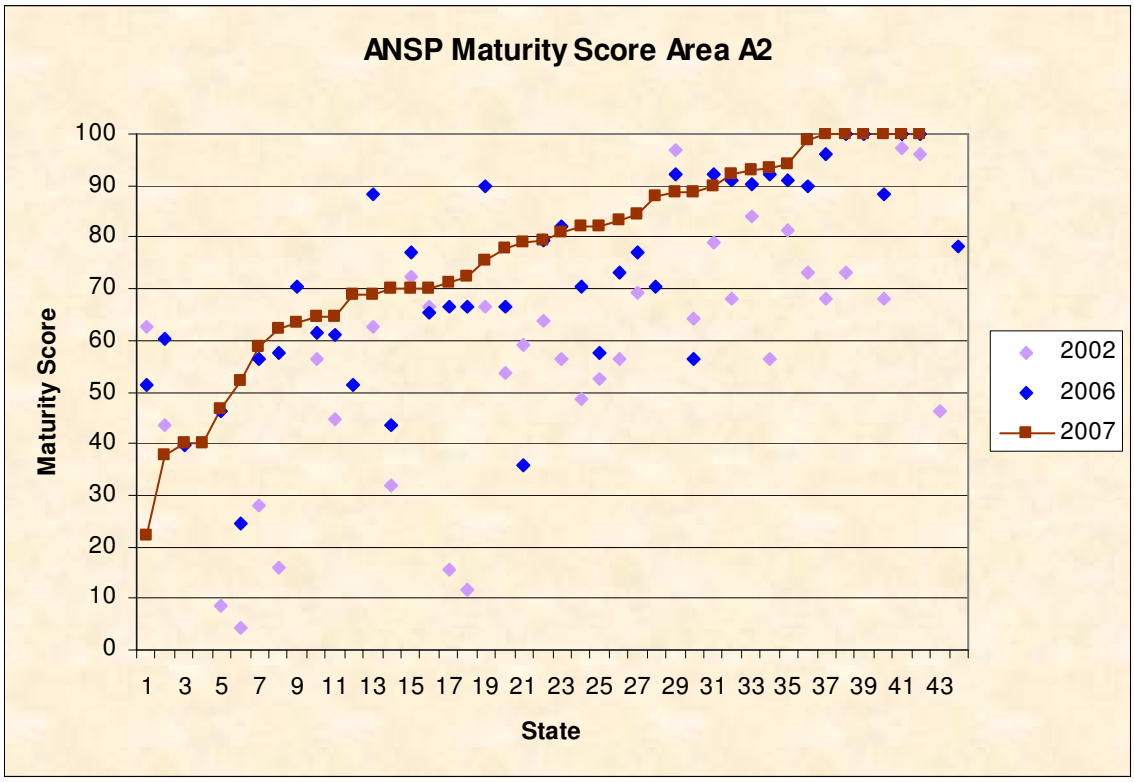


Figure 14 A and B ANSP and Regulator Normalised Overall Maturity for Study Area A2



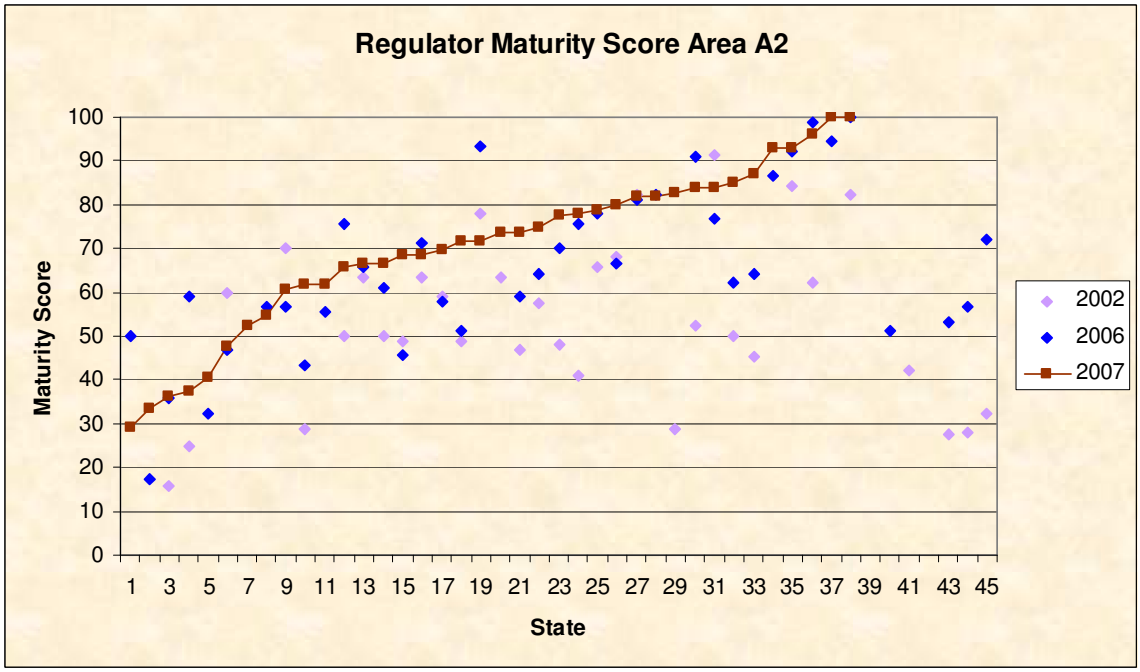


Figure 15 A and B ANSP and Regulator Overall Maturity by State for Study Area A2

According to:	Slow Starters	Active Developers	Continuous Improvers	Stakeholders still below 70% target
Regulators 2006 (of 39)	4	26	9	23
Regulators 2007 (of 38)	5	21	12	18
ANSPs 2006 (of 42)	4	22	16	18
ANSPs 2007 (of 42)	4	18	20	12

Table 6 – Number of ANSPs in each category for Study Area A2.

2.3.2.2 Comments on the results

In comparison with 2006 there is some improvement in maturity scores from both the ANSP and Regulator in the category of "Active Developer. However, in the "Slow Starter" and "Continuous Improvement" categories, there appears to have been little or no improvement.

This Study Area addresses a very wide spectrum of approaches and issues, and there are large differences in the ability, culture, and tools available to a mature ANSP when compared to one in the "Slow Starter" category.

2.3.2.3 Comments from interviews

In the 2007 survey some 17% of the comments relate to this section compared to 12% in 2006 and the previously identified issues still remain. There is still a wide spectrum of reporting methods and follow-up, but there is more ESARR2 compliance claimed, with the benefits being recognised. Importantly, most States are now collecting relevant data, even if they do not all yet fully know how to investigate, analyse and address findings.

EUROCONTROL initiatives such as SASI support project and the use of TOKAI tool have been seen as very useful in this area.

There is a current ESP initiative that seeks to set up a national forum for all aviation stakeholders to attend and discuss and hopefully resolve issues. Several States already have this in place, but there were some comments against this as some information passed to the Regulator is confidential and/or may have business financial implications if shared.

Similarly there has been very little done to set up a State's national central database for actions sharing etc. and only a few States have any form of automatic reporting tools. Several States were actually against automatic reporting tools being used, as it was felt that there would be a reliance on them and people would not bother to report.

Several participants would like international best practice or guidance material about standardising safety data and its exchange.

More ANSPs are also providing an e-reporting system on the intranet, as well as the paper-based form. Less significant events are now getting reported. Anonymous reporting is also allowed in many ANSPs.

One of the key issues remains the "Just Culture" of not subjecting the reporter of the incident to criminal prosecution, and little progress in implementing this by changing the legislation has been reported. A few States still have it in their legislation that anyone making a mistake will be punished, but most appear to be reliant on what could be called a "Just Culture" protocol in terms of an understanding between the key stakeholders (Administration of Justice, Aviation Regulator, AIB, ANSP) that the person reporting the incident is not to be subjected to identification or prosecution except in the case of a wilful violation (complete disregard of the rules/procedures) or gross negligence. In most cases, these are working arrangements which have not been fully tested in the event of a major incident, and there is no legal protection.

Relatively speaking, most of the progress in this area has been from the ANSP rather than the Regulators. Younger ATM controllers appear to be more confident with the reporting system, even when there is no legal protection.

2.3.2.4 Conclusions from this Study Area

While most respondents in principle support reporting and dissemination of data and good progress is being made especially with ANSP organisations, there are still cultural, legal and process problems that need to be overcome before effective systems can be implemented. The implementation of a "Just Culture" within ANSPs is overall making progress, but full legal protection in most States is seen as a long-term objective. Comments received indicate that many States have little expectation that full legal protection will ever be achieved, as the Government would then be subjected to similar claims from other professional bodies (e.g. medical).

The effectiveness of the reporting system and data recording, analysis, and follow-up is still widely variable, but more compliance with ESARR2/EC Directives is being claimed, and importantly, relevant data is being collected and interviewees from 6 States quoted that an ECCAIRS[4] compliant format is being used. Support in this area is still needed by several States (both the ANSP and the Regulator).

Occurrence reporting is one aspect of the SMS which links very strongly to the safety culture, and the achievement of at least a "Just Culture" regime will help to develop the safety culture (and reporting levels) considerably.

Several participants indicated that they would like EUROCONTROL to provide international best practice or guidance material about standardising safety data and its exchange.

[4] European Co-ordination Centre for Aviation Incident Reporting Systems Hazards (ECCAIRS)

2.3.3 Study Area A3 - The Use of ATM Safety Indicators

2.3.3.1 Maturity would be if:

"The Safety Performance is known and based on an active system of monitoring using suitable safety indicators such as safety occurrences as well as pro-active monitoring processes e.g. audits, surveys and inspections etc."

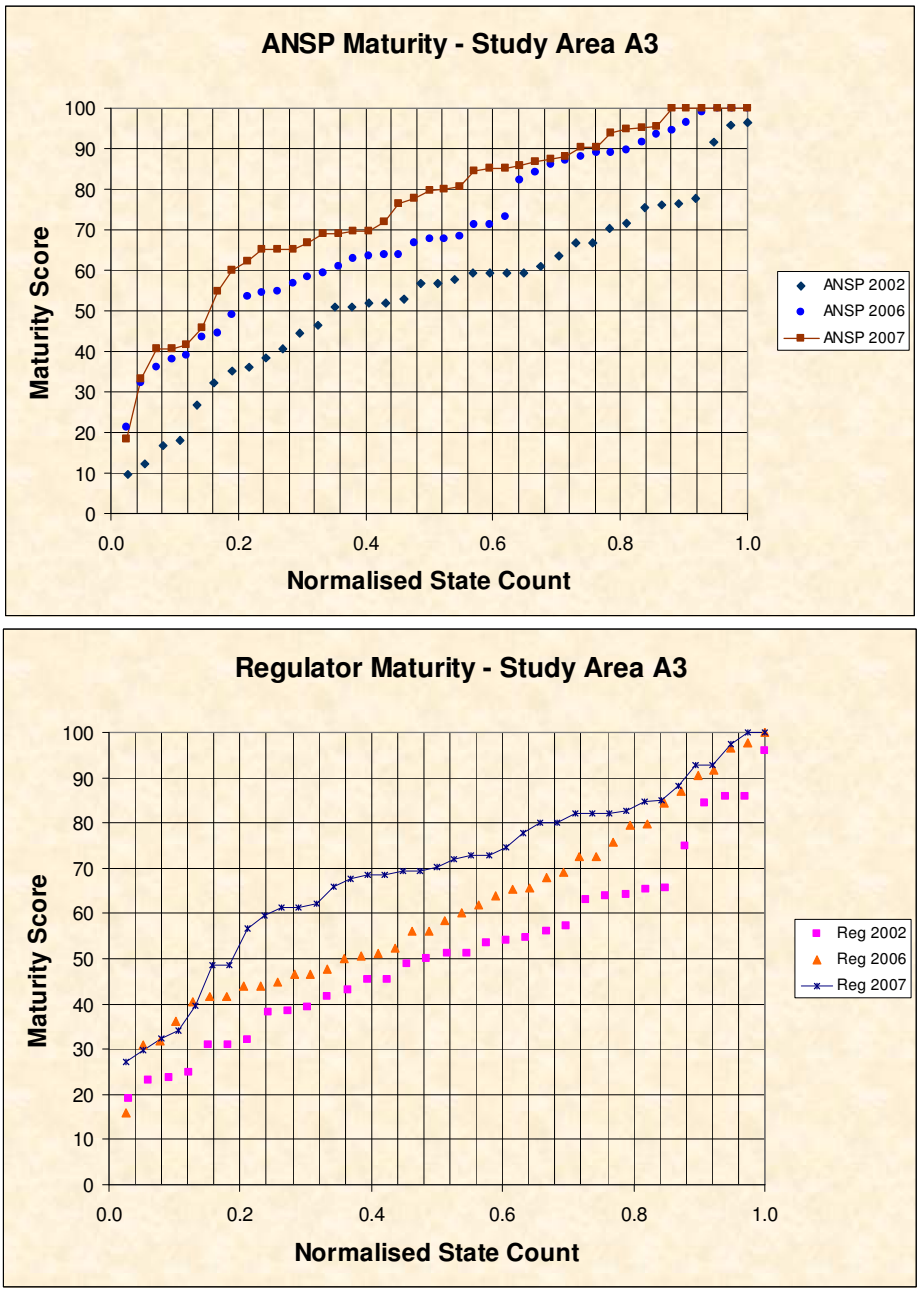
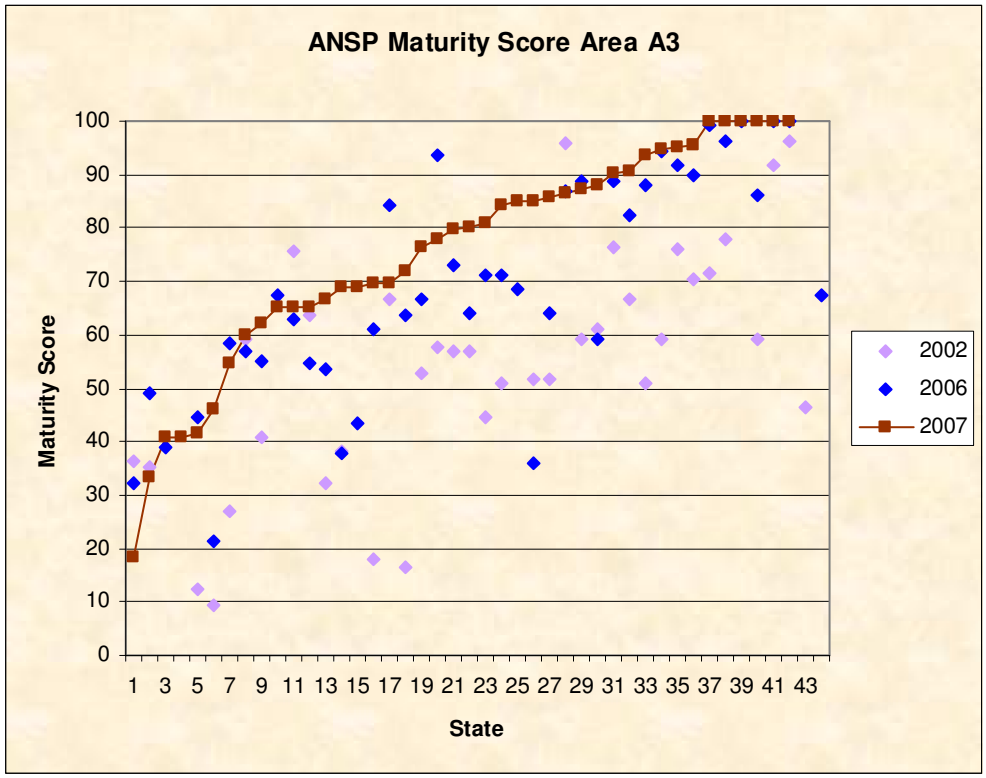


Figure 16 A and B ANSP and Regulator Normalised Overall Maturity for Study Area A3



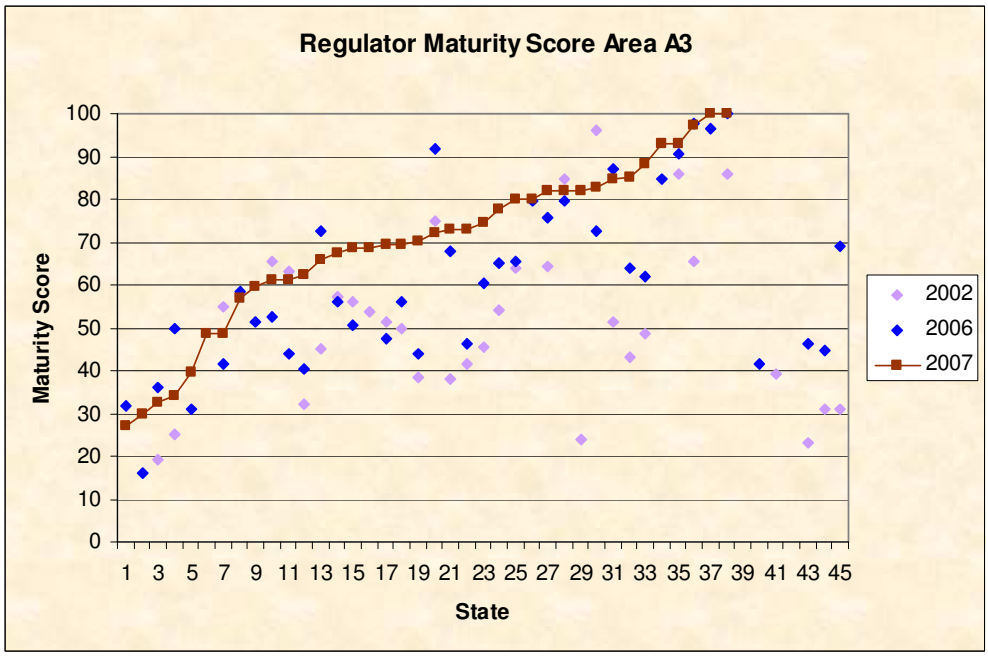


Figure 17 A and B ANSP and Regulator Overall Maturity by State for Study Area A3

According to:	Slow Starters	Active Developers	Continuous Improvers	Stakeholders still below 70% target
Regulators 2006 (of 39)	4	26	9	27
Regulators 2007 (of 38)	5	19	14	18
ANSPs 2006 (of 42)	4	22	16	23
ANSPs 2007 (of 42)	5	16	20	17

Table 7 – Number of ANSPs in each category for Study Area A3.

2.3.3.2 Comments on the results

Both the Regulators and the ANSPs show a similar response in 2007, with virtually all of the increase in maturity being in the "Active Developers" and the lower part of the "Continuous Improvers" categories for both the ANSP and the Regulator. Only one of the relatively few ANSPs and Regulators still in the "Slow Starter" category has not improved since 2006.

In our view, there is appearing an evolving situation which is not being accurately captured by the numerical results. Broadly, there are some stakeholders who are fully familiar with the theory and practice of developing and applying safety indicators and who are taking a view on their maturity on that basis. Their safety indicators address not just equipment performance but also people and procedures. These correctly mark themselves as "Mature" in the questionnaire. Other stakeholders still lack any approach and are waiting the developments of SAFREP TF.

2.3.3.3 Comments from interviews

The 2007 survey showed that 6% (11% in 2006) of all comments made related to this Study Area, and that there is still a wide disparity of competence, understanding, and implementation.

A few States that are fully mature have had safety indicators for many years and do not see any problem.

Some of the least developed States are making efforts to understand the principles of safety improvement, either by training their staff or hiring local experts (e.g. QRA academics from local universities) or by hiring consultants (including other ANSPs/NSAs). They are training staff and are now collecting the necessary data, but these States are only able to fully address qualitative targets at this stage. Two Regulators had developed safety indicators and then withdrawn them again, due to a lack of assurance that their methodology was correct.

The development of Safety Indicators is an area that in many States are being led by the ANSP rather than the Regulator, usually due to lack of Regulatory skills and/or resources.

2.3.3.4 Conclusions from this Study Area

Many of these ANSPs and Regulators (~50% in 2007) feel that more guidance and examples should be provided by EUROCONTROL to help them understand the derivation of safety indicators. There are a significant number of ANSPs and Regulators who feel that they cannot develop their safety indicators further, and the comments received on this extend well into the “Continuous Improvers” category. It is only the most mature ANSPs and Regulators who have implemented ESARR compliant safety indicators for some time and who are totally comfortable with their management.

2.3.4 Study Area A4 - Promotion of Best Practice

2.3.4.1 Maturity would be if:

"There is an established system that gathers information on best practice evaluates its applicability to different situations and disseminates the information."

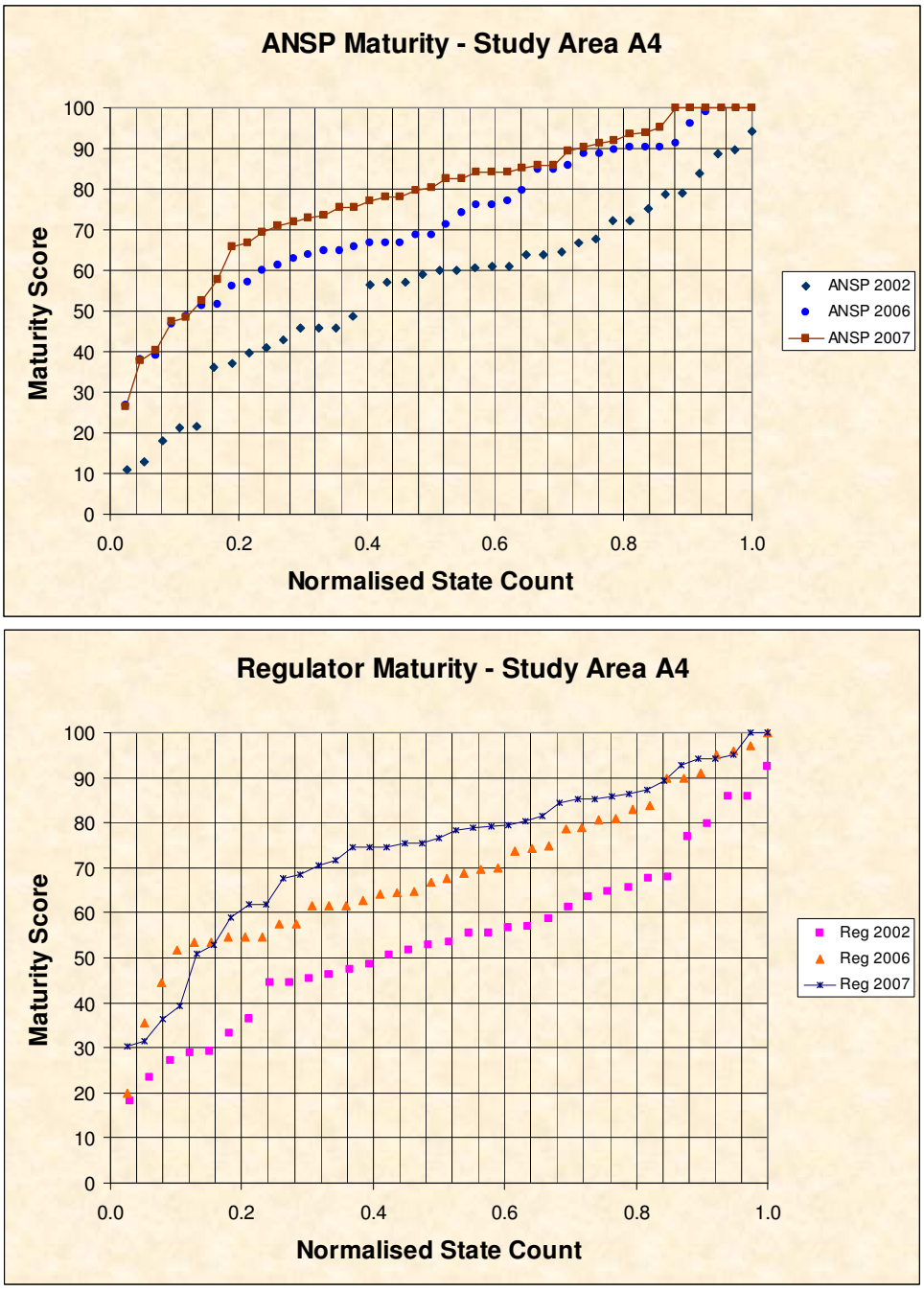
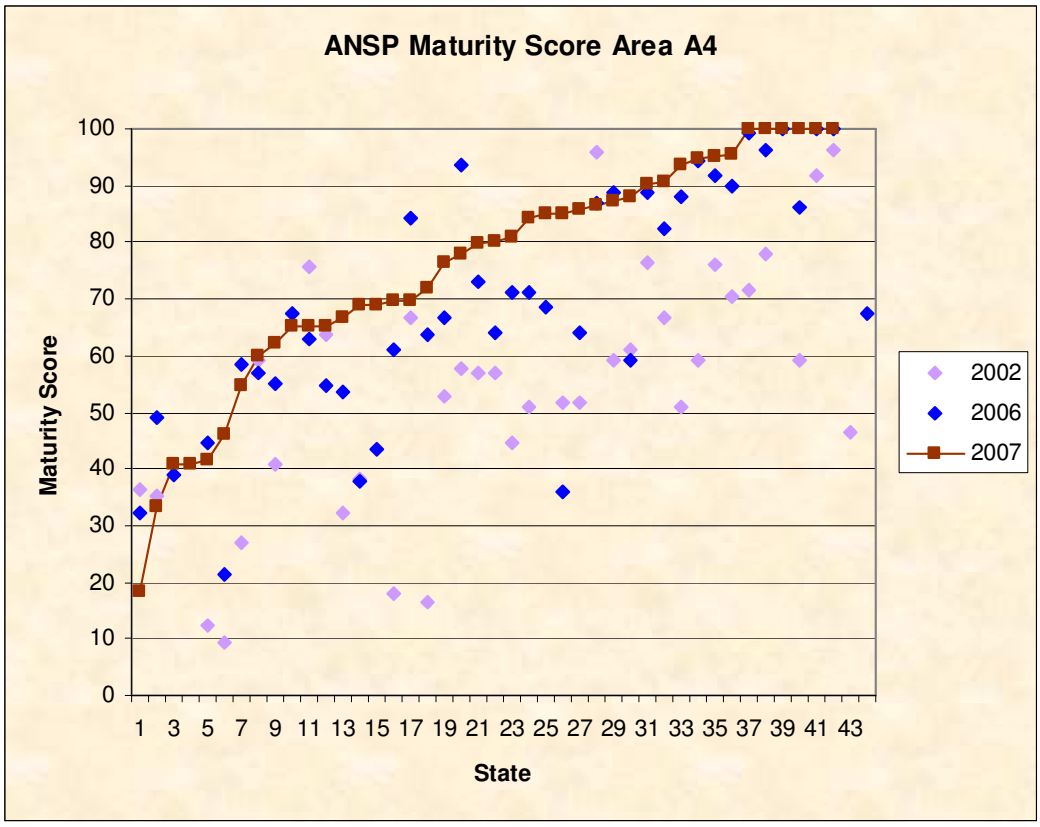


Figure 18 A and B ANSP and Regulator Normalised Overall Maturity for Study Area A4



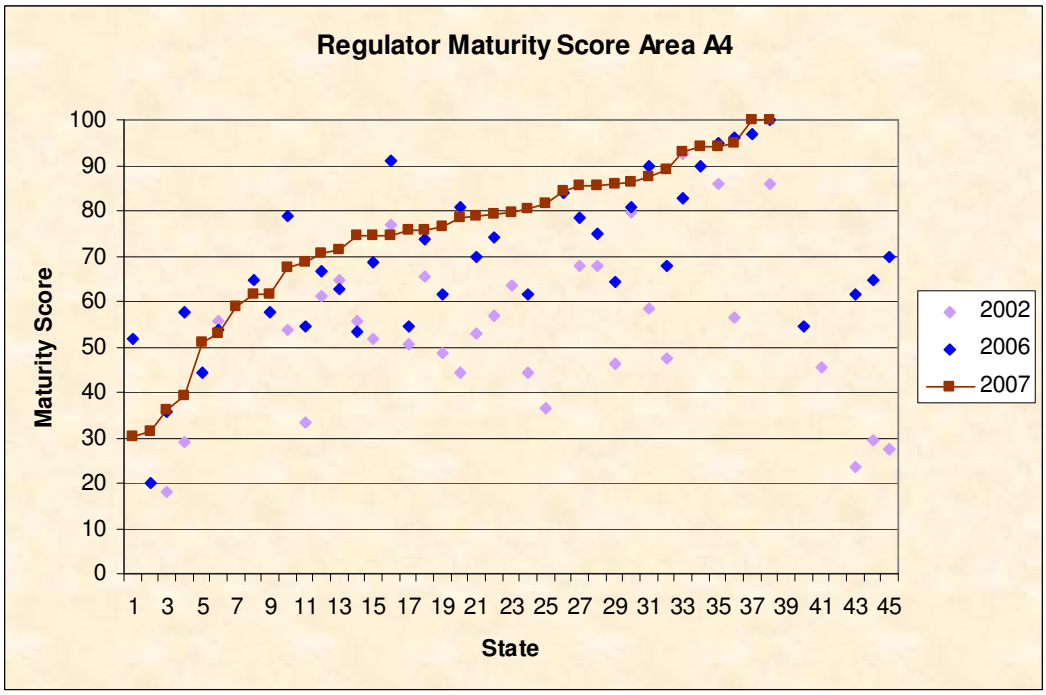


Figure 19 A and B ANSP and Regulator Overall Maturity by State for Study Area A4

According to:	Slow Starters	Active Developers	Continuous Improvers	Stakeholders still below 70% target
Regulators 2006 (of 39)	3	25	11	23
Regulators 2007 (of 38)	4	19	15	11
ANSPs 2006 (of 42)	3	24	15	21
ANSPs 2007 (of 42)	3	17	22	10

Table 8 – Number of ANSPs in each category for Study Area A4.

2.3.4.2 Comments on the results

The 2007 survey results show that the increase in maturity as reported by both the Regulators and the ANSPs has been in the "Active Developers" and "Continuous Improvers" categories, with little improvement in the "Slow Starter" category.

It could be reasonably argued that an ANSP or a Regulator would have to be fairly mature in order to be able to effectively monitor and recognise "best practice", and to be able to implement it. A less mature State's priorities will be on more fundamental issues, even though the recognition and adoption of best practice is an essential development tool.

2.3.4.3 Comments from interviews

In 2007 this Study Area generated 9% of the comments (8% in 2006), and there was an even wider range of "best practice" related issues than had been previously identified in the SSAP surveys, and given the increasing maturity of both the ANSPs and the Regulators across the ECAC this is to be expected. Relevant issues and initiatives mentioned include:

- ANSPs could organise themselves around CANSO, in a similar way to how airlines have organised the safety improvement actions around IATA;
- The ESARR4 process is addressed using a software tool, which gives a more consistent approach;
- Safety culture is recognised as a key safety enabler and indicator;
- On-line in-house database sends automatic emails to NSA to alert them regarding safety assessments for minor changes;
- For small ATM businesses there was no perceived problem, as the Regulatory certification team also provide development advice;
- Participants looking at other "Mature" ANSPs and Regulators for examples of "best practice" which can be adopted;
- Standardised safety performance information and how/where to publish would be useful;
- An ESARR4 compliant system is in place and the SAM in use is more developed than the EUROCONTROL version;
- Use of the ECCAIRS database for occurrence reporting management;
- Ensuring that Human Factors elements in incidents are being specifically addressed;
- Proposing to use a Safety Culture Maturity Assessment as a standard monitoring tool;

- There are safety indicators for equipment, procedures, people and performance so that full monitoring can be implemented;

Previous examples of best practice which were reported in the 2006 SSAP survey and are still relevant include:

- Multi-national consortia to develop legislative requirements and other common developments;
- The use of multi-national audit teams;
- Using the suppliers to develop ESARR4 material change safety submissions and use that as a training aid;
- Putting ANSP safety performance information routinely on the internet;
- Implementing the “ASATC/CARDS” and “SASI” projects;
- Use of the “balanced score card” approach;
- Mature ANSPs helping less mature/smaller ones.

2.3.4.4 Conclusions from this Study Area

Whilst in several States the lead appears to be taken by the ANSP, it is clear that most stakeholders recognise the benefits that can be gained by considering best practice approaches.

Depending upon the resource and skill levels available to ANSPs and Regulators, a best-practice approach to an issue may not be viable without appropriate support and guidance. The best practice methodology must be practicable for the ANSP and/or Regulator to apply, in order to achieve the desired objectives. Therefore there may well be a range of best practice options to address a particular issue, and their sophistication must match the abilities of the ANSP/Regulator to implement the most appropriate best practice for them.

There is currently a lack of a formal review process to establish and recommend what constitutes best practice and for whom it would be appropriate to adopt. This is linked to the situation that States appear to be drifting away from standard approaches that are well understood by all.

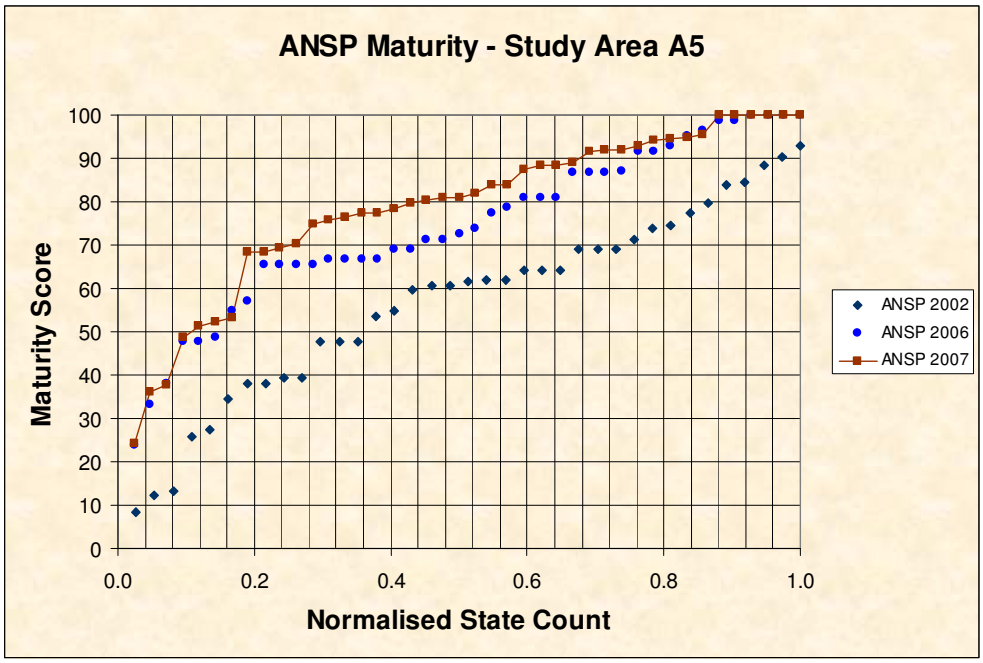
Logically, the most mature ANSPs and Regulators will be more likely to offer improved approaches, as they will have been spending more time in researching and developing them.

This situation mirrors the whole ESARR implementation process if we (quite correctly) take the ESARRs/SES as the best practice application of ATM safety management.

2.3.5 Study Area A5 - Organisational Structures for Safety

2.3.5.1 Maturity would be if:

"There is a formal system for the management of safety that has a clear management structure with unambiguously defined responsibilities and accountabilities."



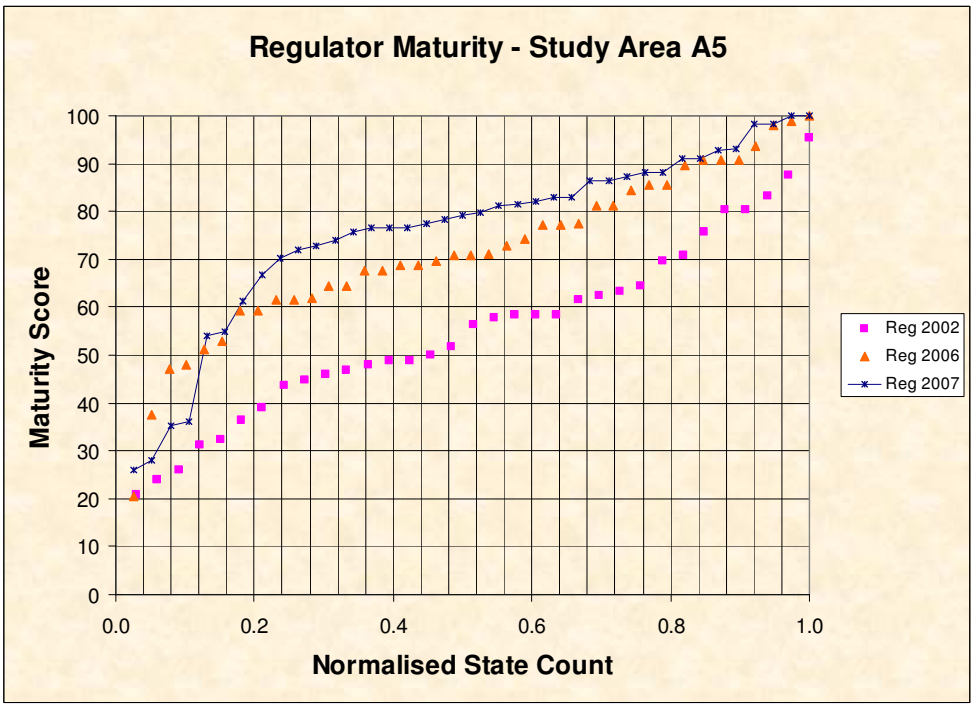
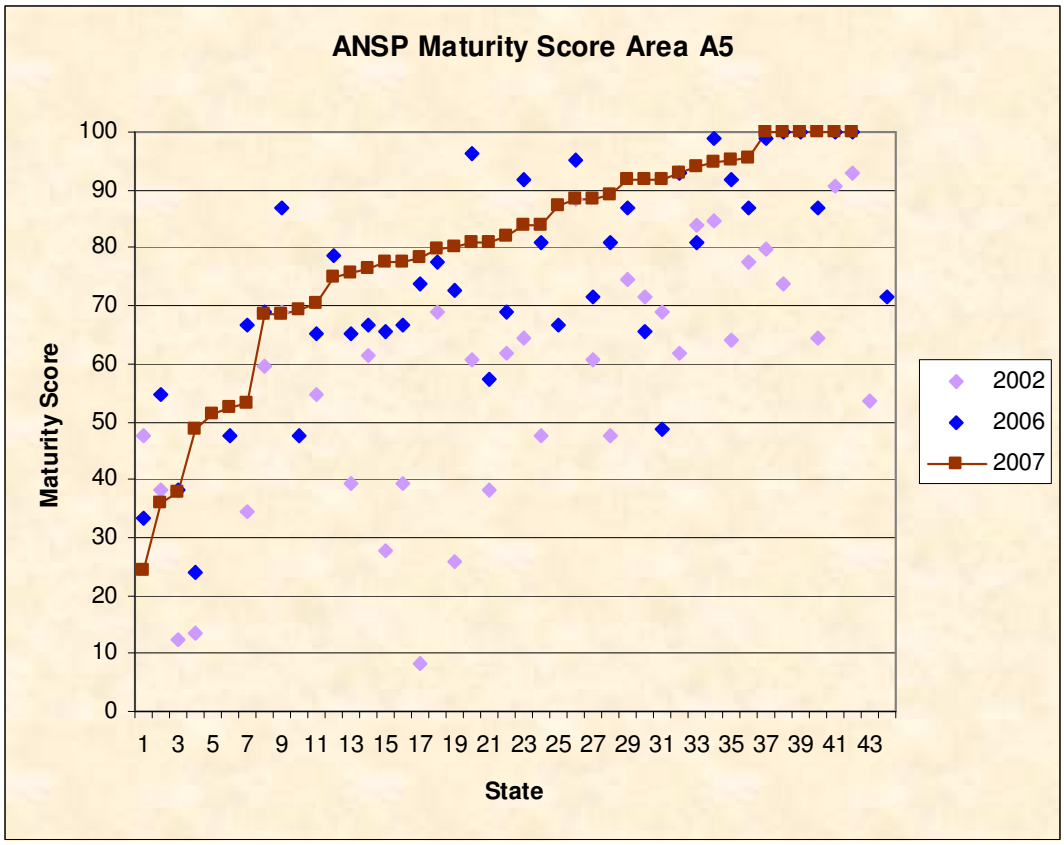


Figure 20 A and B ANSP and Regulator Normalised Overall Maturity for Study Area A5



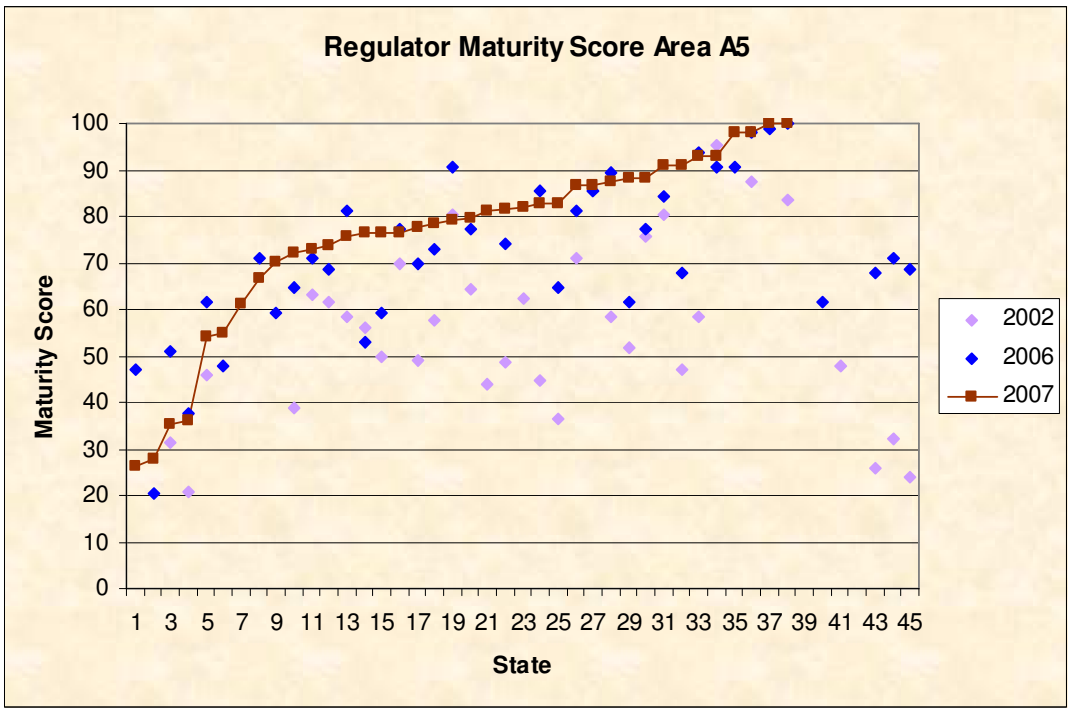


Figure 21 A and B ANSP and Regulator Overall Maturity by State for Study Area A5

According to:	Slow Starters	Active Developers	Continuous Improvers	Stakeholders still below 70% target
Regulators 2006 (of 39)	2	24	13	18
Regulators 2007 (of 38)	4	16	18	8
ANSPs 2006 (of 42)	3	21	18	18
ANSPs 2007 (of 42)	3	15	24	10

Table 9 – Number of ANSPs in each category for Study Area A5.

2.3.5.2 Comments on the results

The 2007 survey results show that the increase in maturity for both the Regulators and the ANSPs has been in all categories, but with some reductions in maturity marking which repository comments indicate are due to increased awareness of the requirements or new respondents having a differing opinion of their organisation's maturity. This survey area best reflects changes in SMS development in terms of organisational change and formalisation in responsibilities.

2.3.5.3 Comments from interviews

In 2007, this Study Area received the second largest percentage of comments (48%, with 49% in 2006). This is not surprising, as it is addressing not only the internal ANSP and Regulatory management functions, but also external changes such as separation and the creation of an NSA.

The following comments are relevant to this survey area:

- Some "Mature" ANSPs and Regulators are finding it difficult to achieve further progress and report that most guidance/resource and training is aimed at supporting lower maturity organisations and therefore is inadequate to these more mature organisations.
- The concept of local "safety commissions" at each location that include each stakeholder is a potentially powerful one if applied properly, and would address concerns about potential misalignment of SMS between for example local airports and ATM.
- At small organisations and regional airport units there simply is not the level of dedicated resource to manage the introduction of a formalised safety system locally and often staff do not see the point of it.
- Where the safety manager is a new role within the organisation, in some States this has been well managed, but some ANSP's management are not clear who is now responsible for safety and what the relative responsibilities are.

2.3.5.4 Conclusions from this Study Area

Progress is being made in the implementation of organisational structures for safety, but there still remains a wide spectrum of approaches to the regulatory regime, and of the availability of resources (skills and people) to address it adequately. Those in the “Slow Starter” categories do not appear to have developed within the last year.

None of the Regulators explicitly mentioned having implemented a Regulatory safety management system and their comments focussed on the implementation of SMS at their ANSPs instead.

2.3.6 Study Area A6 - Current Safety Rules and Standards

2.3.6.1 Maturity would be if:

"Within the safety management system there are well-defined and accessible standard operating procedures (SOPs) that are known to staff and regularly reviewed and maintained."

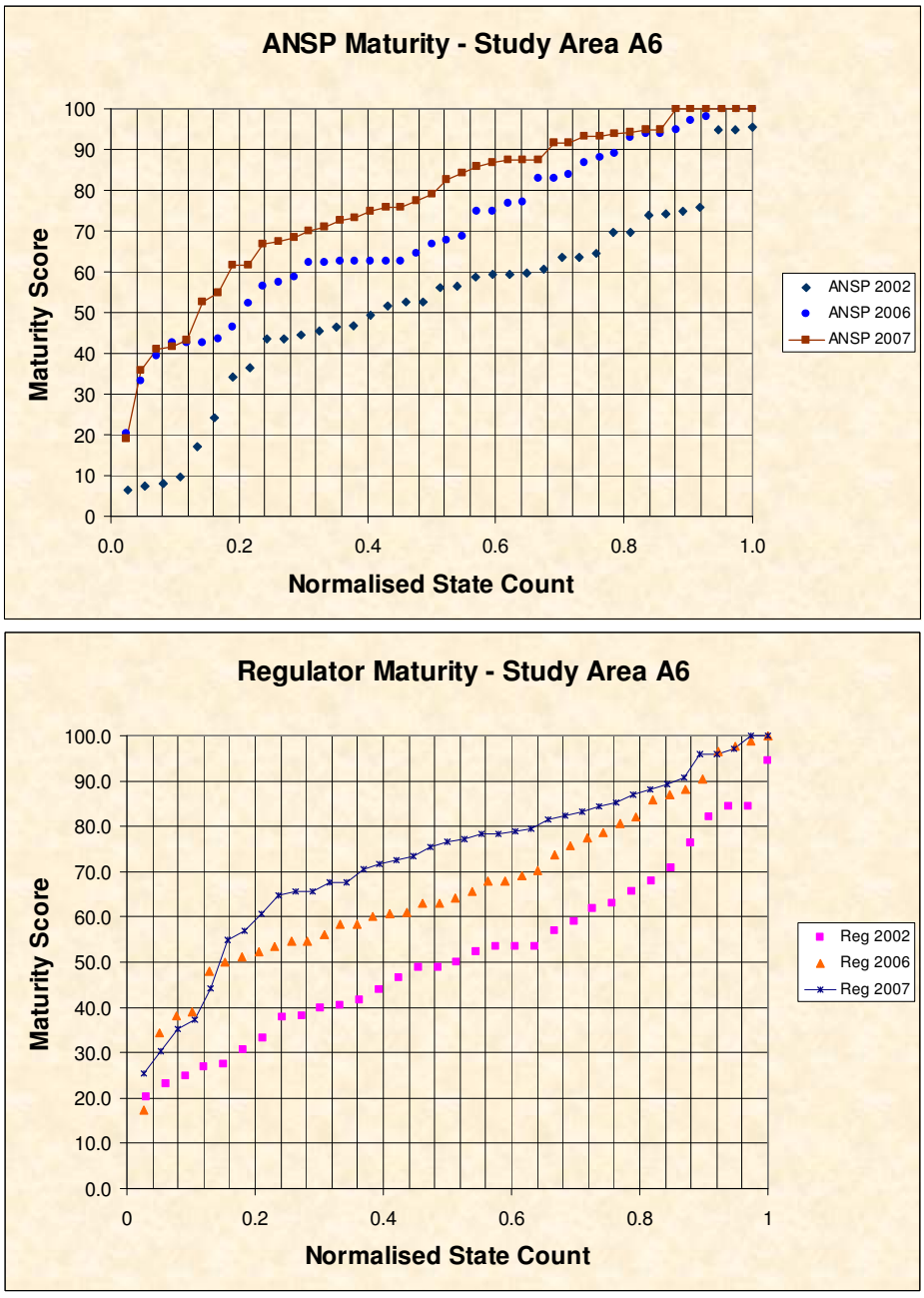


Figure 22 A and B ANSP and Regulator Normalised Overall Maturity for Study Area A6

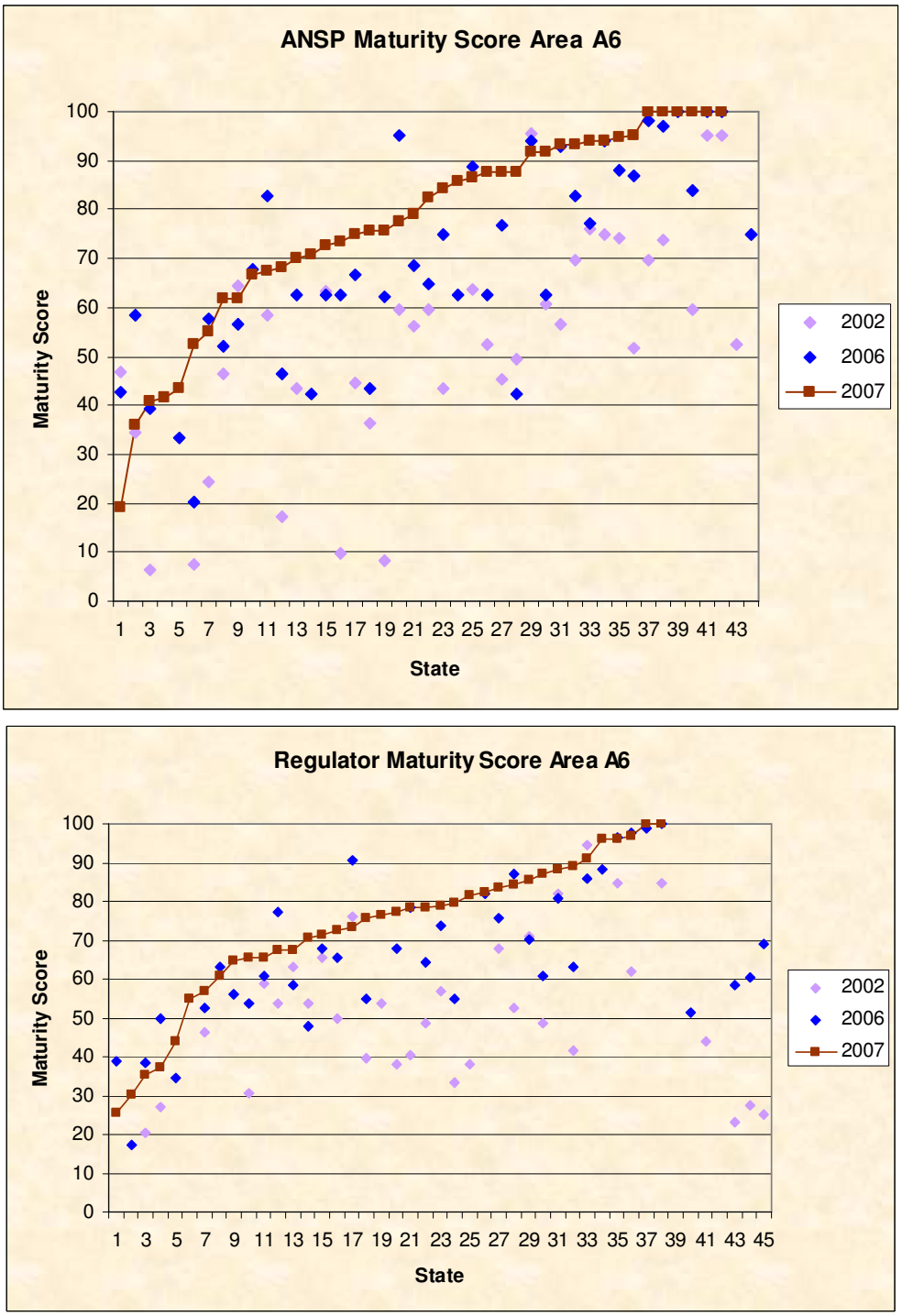


Figure 23 A and B ANSP and Regulator Overall Maturity by State for Study Area A6

According to:	Slow Starters	Active Developers	Continuous Improvers	Stakeholders still below 70% target
Regulators 2006 (of 39)	4	25	10	24
Regulators 2007 (of 38)	5	19	14	13
ANSPs 2006 (of 42)	7	20	15	23
ANSPs 2007 (of 42)	5	16	21	12

Table 10 – Number of ANSPs in each category for Study Area A6.

2.3.7 Comments on the results

Both the ANSP and the Regulator generally show a steady improvement in maturity within this Study Area, but the Regulator shows a more limited maturity increase than the ANSP in most cases. Four States (from the ANSPs) have shown a significant decrease in maturity since 2006, and a review of the repository indicates that these are due to various organisational changes, legislative changes or a better awareness of their maturity which means the previous 2006 marking could not be justified in 2007.

2.3.7.1 Comments from interviews

This Study Area had 64% of the comments relating to it (67% in 2006), addressing a range of different aspects. However, some of these were not critical, but merely reflecting that the contributor felt that they had all they needed to go on developing.

Most comments reflected a good understanding of the ESARR/SES Common Requirements and which procedures and standards were required, and in contrast to 2006, several States mentioned the adoption of the Quality Management System as the framework for the standards and procedures document control process, and most of these also mentioned the objective of ISO9001:2000 certification. A few States however, stated that there was no intention of developing a QMS in support of the SMS, which leaves the question as to how the SMS documents are going to be adequately managed.

Virtually all ANSPs now have a safety policy in place. Whilst an ESARR3 compliant SMS is claimed by many ANSPs, the interviews often revealed that the Safety Manual was incomplete, with some key procedures not yet developed. Typically the topics of which the ANSP felt they had inadequate skills would be missing such as QRA, change management, safety indicators and TLS.

The increasing maturity of the ANSPs and Regulators is also bringing its own issues, in areas such as:

- For ESARR4, agreeing what is a minor and a major change in risk terms and the correct process to be applied (both internally within the ANSP and with the Regulator);
- The lack of standards, guidance and training for the more mature ANSP or Regulator in order to develop further;

- It was suggested that it could be desirable to develop standards which should be applicable for the ATM personnel providing safety oversight and safety management at the Regulator and ANSP.

In terms of keeping procedures up to date, there were several comments about the complexity of the overall ATM Regulatory framework and how difficult it is to make sense of the sometimes conflicting or at best not quite harmonised regulation coming down from ICAO, EUROCONTROL, JAA, EU and local CAAs. The SES Common Requirements were again cited by several States, though most were not as negative as in 2006, and the need for a review to provide full comparability was mentioned by several (e.g. would like to see ICAO operational standards reviewed and updated e.g. doc. 4444).

2.3.7.2 Conclusions from this Study Area

There is an improvement in maturity for almost all participants, with only four States showing a reduction in their maturity compared to 2006. Virtually all States have the basic fundamentals of the SMS in place, with a safety policy and the start of the Safety Management Manual. The barriers that remain are mostly of a development and technical nature (typically ESARR4, quantitative risk assessment - QRA) and could be resolved through training, good practical guidance materials and hands-on support. Sometimes barriers are also of a resource nature (more commonly for the Regulator).

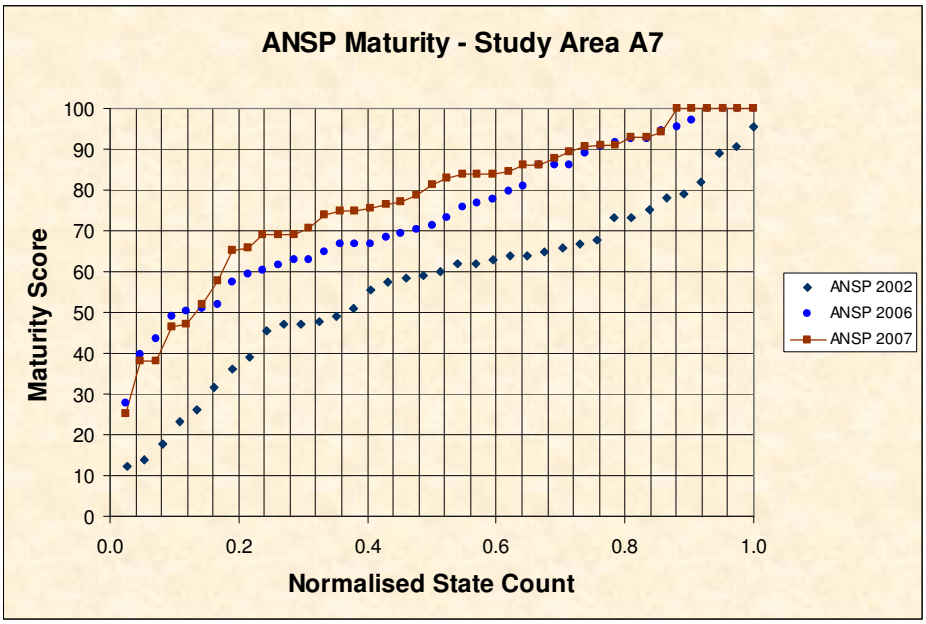
The QRA procedures remain a significant issue with many States, and the general impression is that no consistent approach has been made, even between those “Mature” States that have implemented them.

The ESARR/SES issue is not seen to be as conflicting as it was last year, and where State resources and approval were required, the SES initiative has been beneficial in several cases.

2.3.8 Study Area A7 - Current Safety Culture

2.3.8.1 Maturity would be if:

"There is a positive safety culture that is driven by the management in ensuring that all staff are aware of and believe in the organisation's shared beliefs, assumptions and values regarding operational safety. There is support for staff and promotion of an active safety climate for the reporting of incidents and the improvement of safety."



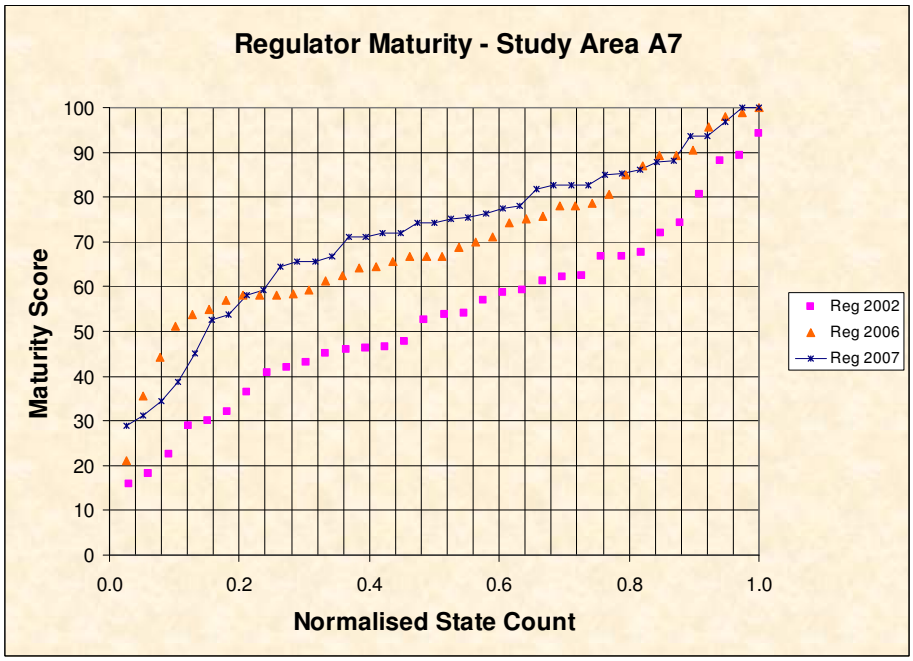


Figure 24 A and B ANSP and Regulator Normalised Overall Maturity for Study Area A7

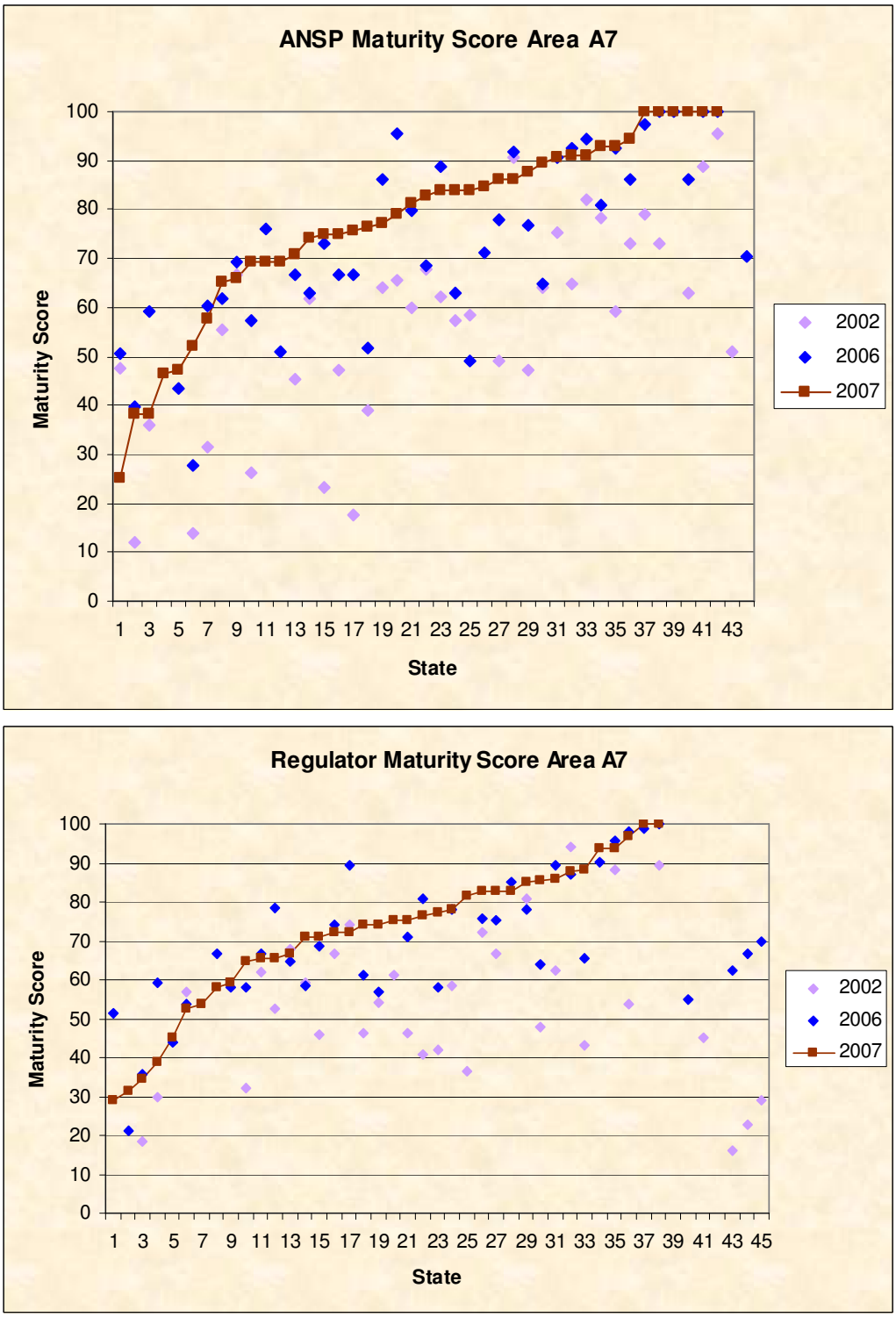


Figure 25 A and B ANSP and Regulator Overall Maturity by State for Study Area A7

According to:	Slow Starters	Active Developers	Continuous Improvers	Stakeholders still below 70% target
Regulators 2006 (of 39)	3	26	10	22
Regulators 2007 (of 38)	4	20	14	13
ANSPs 2006 (of 42)	3	23	16	19
ANSPs 2007 (of 42)	3	17	22	12

Table 11 – Number of ANSPs in each category for Study Area A7.

2.3.8.2 Comments on results

The Regulators and ANSPs have reported significant maturity gains since 2002, but progress has slowed significantly since 2006 for many organisations, which is understandable as the safety culture is the most intangible aspect of the SMS, and cultural development can take several years to achieve. 8 ANSPs report a reduction in their maturity in this Study Area, and reasons for this include a better understanding of the requirements, new respondents with differing views on the maturity of their organisation, and in a few cases the adoption of a wider organisational perspective, when previously only the HQ function was considered and now smaller, geographically separate parts of the organisation were being addressed.

2.3.8.3 Comments from interviews

16% of the comments referred to this Study Area (It attracted a much larger 56% in 2006), addressing a range of topics relating to the safety culture.

There are still many Regulators reporting that they are short of people and pay is a lot less than the ANSP which affects recruiting and the safety culture.

The reporting system was addressed by many participants, and there is a lot of evidence that most ANSPs have implemented an ESARR2 compliant system, and they were starting to see the benefits. Cultural acceptance was still an issue, with the younger staff more willing to report than the older staff. The relationship between having a true Just Culture with legal protection for reporters and a high level of reporting and thus a stronger safety culture is well recognised.

The importance of addressing and developing the safety culture appears to be increasingly recognised, with some mentioning the use of safety culture audits (but many more wishing they had the necessary skills). Several ANSPs and Regulators reported that there are different cultures in different units and reporting levels vary between them, with the larger units being better than the smaller ones.

Several ANSPs and Regulators felt fully competent on the equipment change and other approval processes but are less confident on the Human Factors aspects, and their direct link to the safety culture.

Only a few States recognised that the safety culture of the organisation would need to be addressed as part of the organisational change process, such as in the formation of an NSA or the separation of the Regulator and the ANSP.

2.3.8.4 Conclusions from this Study Area

Clearly, progress is being made in several aspects of this Study Area, with the safety culture of organisations gradually improving, as staff now have a recognisable safety management and Regulatory framework to work within.

Safety Culture is still widely regarded as an area where specialist expertise is needed, but there is much that can be done within normal management activities to promote it.

Organisational changes will inevitably have an effect on the safety culture, and unless it is well managed, the effect will usually be negative, as there is a decreased understanding of how safety is managed and who is responsible for what. More of the ANSPs and Regulators than in 2006 recognise the importance of Human Factors as an integrated part of SMS or made any reference to maintaining or improving the safety culture during what in some cases were large changes in the organisational structures of one or both organisations, but this is potentially a growing issue.

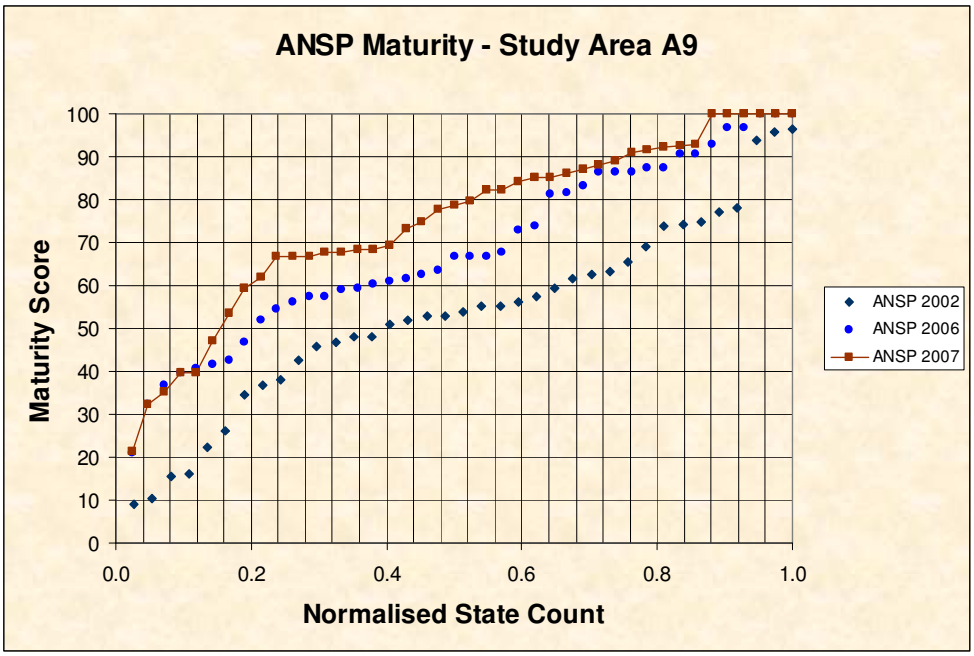
2.3.9 Study Area A8 - Currently Achieved Safety Performance

Following the SSAP survey project, at the post-project review meeting, it was agreed that this Study Area was effectively a sub-set of Study Area A3. As such, it was decided that for this survey this Study Area would not be addressed, except as part of Study Area A3.

2.3.10 Study Area A9 - Current Perceived Safety Levels

2.3.10.1 Maturity would be if:

"Internal and external stakeholders perceive the level of aviation and ATM safety as adequate."



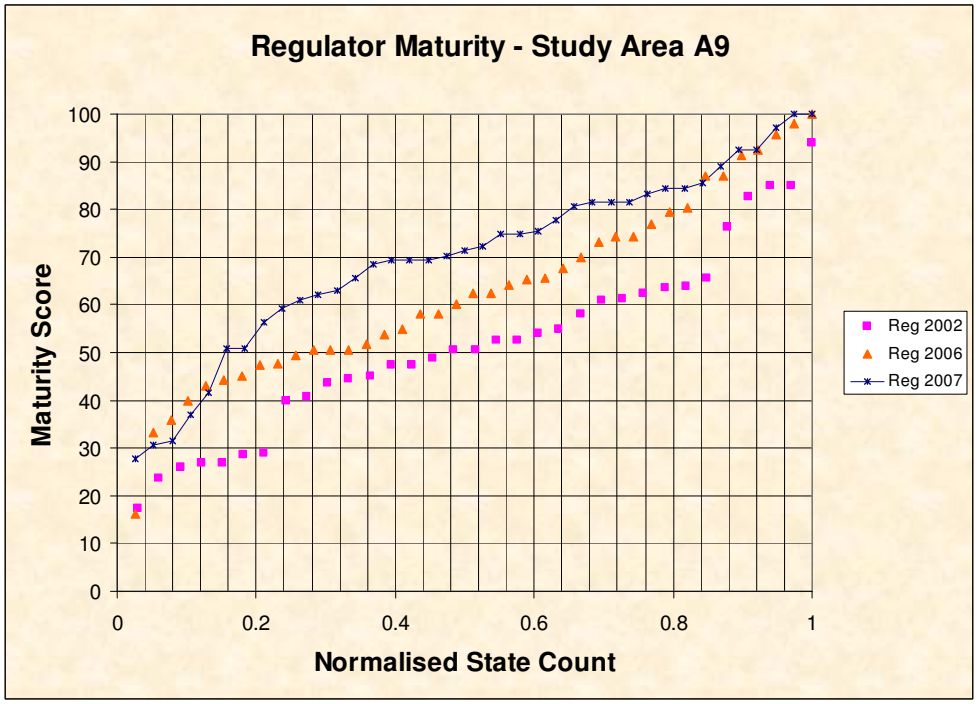
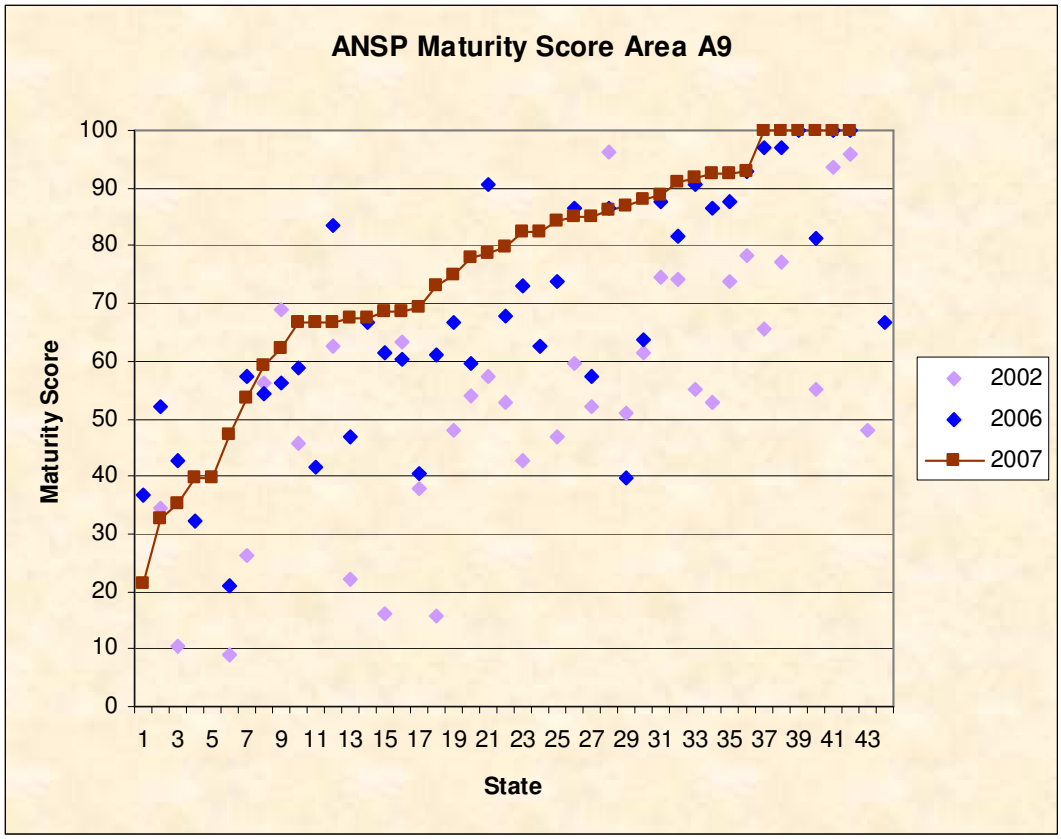


Figure 26 A and B ANSP and Regulator Normalised Overall Maturity for Study Area A9



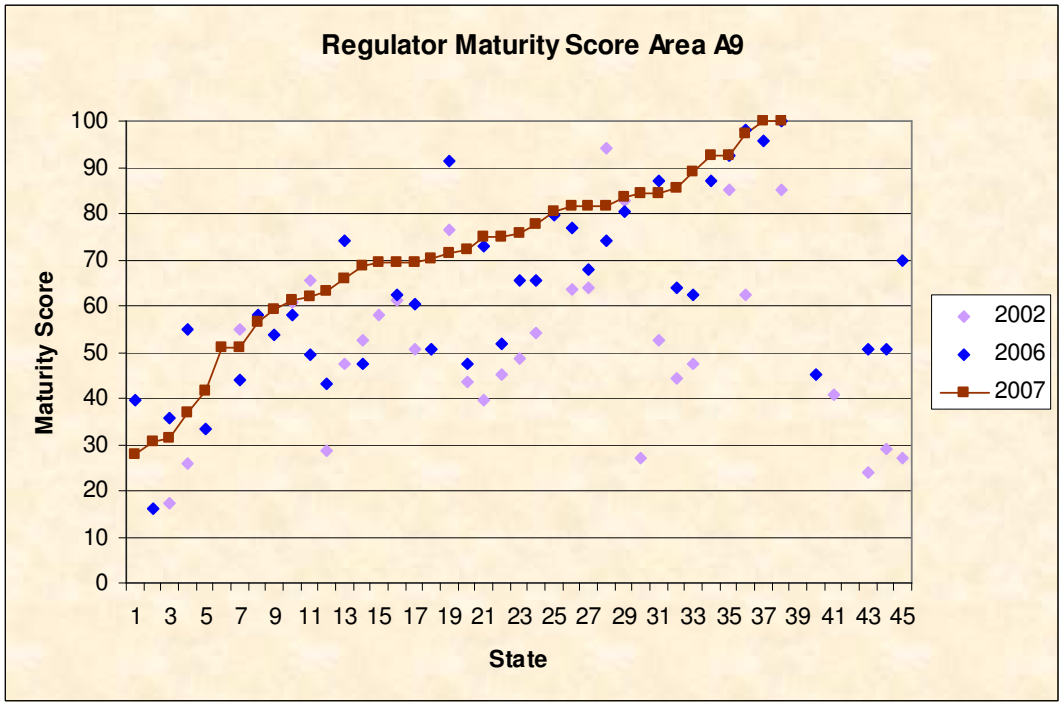


Figure 27 A and B ANSP and Regulator Overall Maturity by State for Study Area A9

According to:	Slow Starters	Active Developers	Continuous Improvers	Stakeholders still below 70% target
Regulators 2006 (of 39)	6	25	8	26
Regulators 2007 (of 38)	5	19	14	17
ANSPs 2006 (of 42)	7	19	16	24
ANSPs 2007 (of 42)	5	17	20	17

Table 12 – Number of ANSPs in each category for Study Area A9.

2.3.10.2 Comments on the results

Apart from 5 ANSPs indicating a reduction in maturity since 2006, there has been a general improvement in maturity in this survey area. This is not surprising, as this Study Area addresses the implementation of the whole SMS as perceived by the outside world and its related issues such as the interface with the Regulator and the legislation. It reflects cumulatively the many individual developments in maturity that ANSPs and Regulators have made and their opinions on this.

2.3.10.3 Comments from interviews

This area attracted 1% of the comments (with 3% in 2006).

Topics varied and many gave reasons for why it was difficult to provide a view on the safety of their State's ANSP operations, such as the context of the question. They may know where they stand in relation to neighbouring States (and in most cases this was only some of their neighbours) but in an ECAC-wide context they had very little idea.

One of the Users suggested in the "benchmarking" context:

- It would be good if the ANSPs could organise themselves around CANSO, in a way similar to how airlines have organised the safety improvement actions around IATA.
- The User would like to see improvement monitored by means of an agreed set of safety Key Performance Indicators.
- Safety information should be made available to the industry but not to the general public. The airlines will eventually get the information from ANSPs/States but it is still difficult for them.
- Benchmarking data is produced annually for IATA airlines, and this could be done for ANSPs in a similar manner.

Some participants offered concerns, which will be dealt with in Study Area B5.

2.3.11 Conclusions from this Study Area

For future surveys, it is suggested the main question relating to this area be reviewed because several comments referred to how the response to this question would depend upon how well one knows other States' ANSPs development status, etc.

Overall, it remains clear that States are sensitive to comparisons in this area and are reluctant to make judgements. Any form of benchmarking is, for most States, not a desirable option. As their maturity increases this may change, but to date there has been little sign of this.

2.3.12 Study Area A10 – Public Access to Safety Performance Information

2.3.12.1 Maturity would be if:

"The general public and stakeholders have easy access to the performance of their ANSP through routine publication of achieved safety levels, incidents reports and overviews of improvement actions. All such information is neutralised (i.e. names are not included) to promote a "Just Culture" and the controls on the release if information is compliant with the requirements of ICAO annex 13 attachment E."

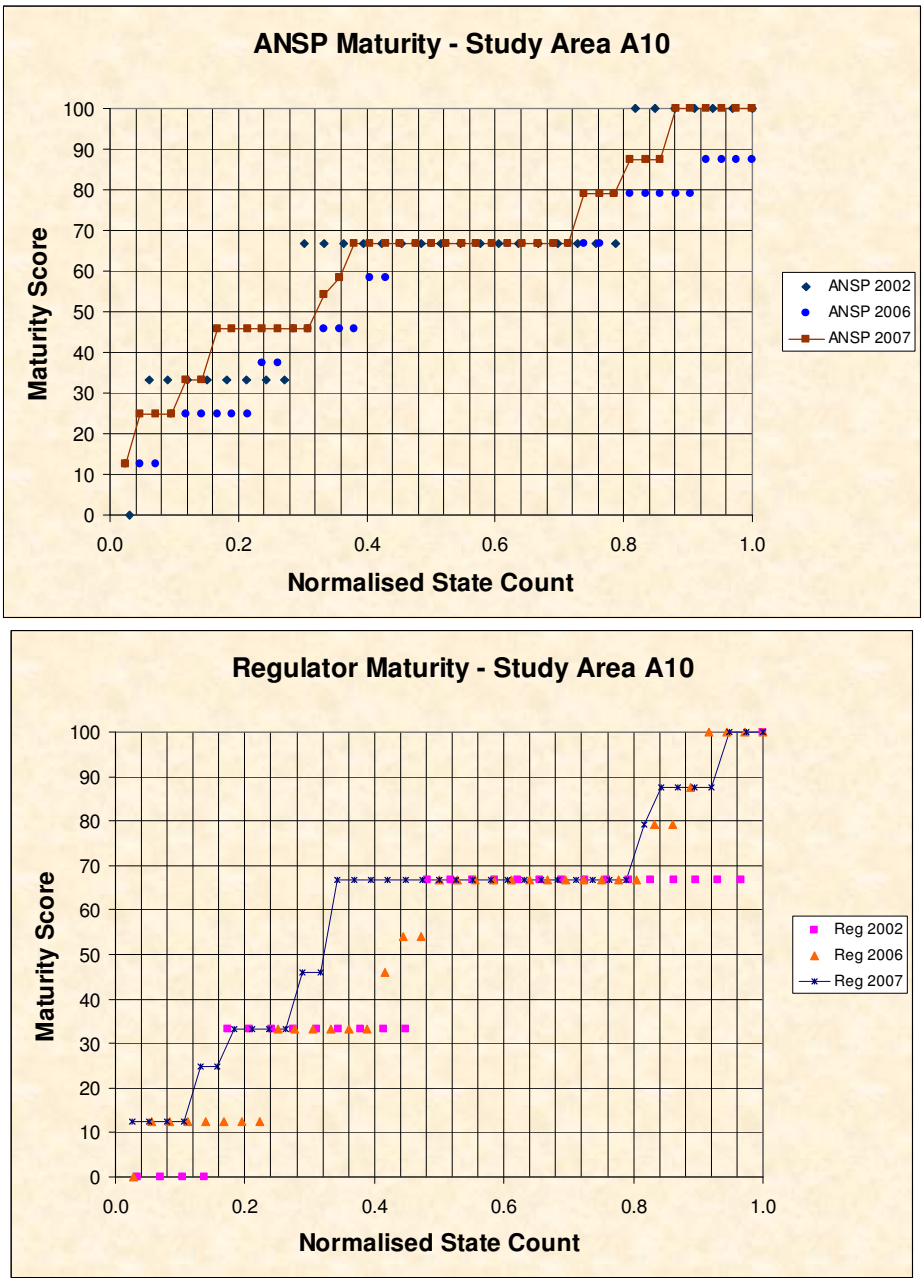
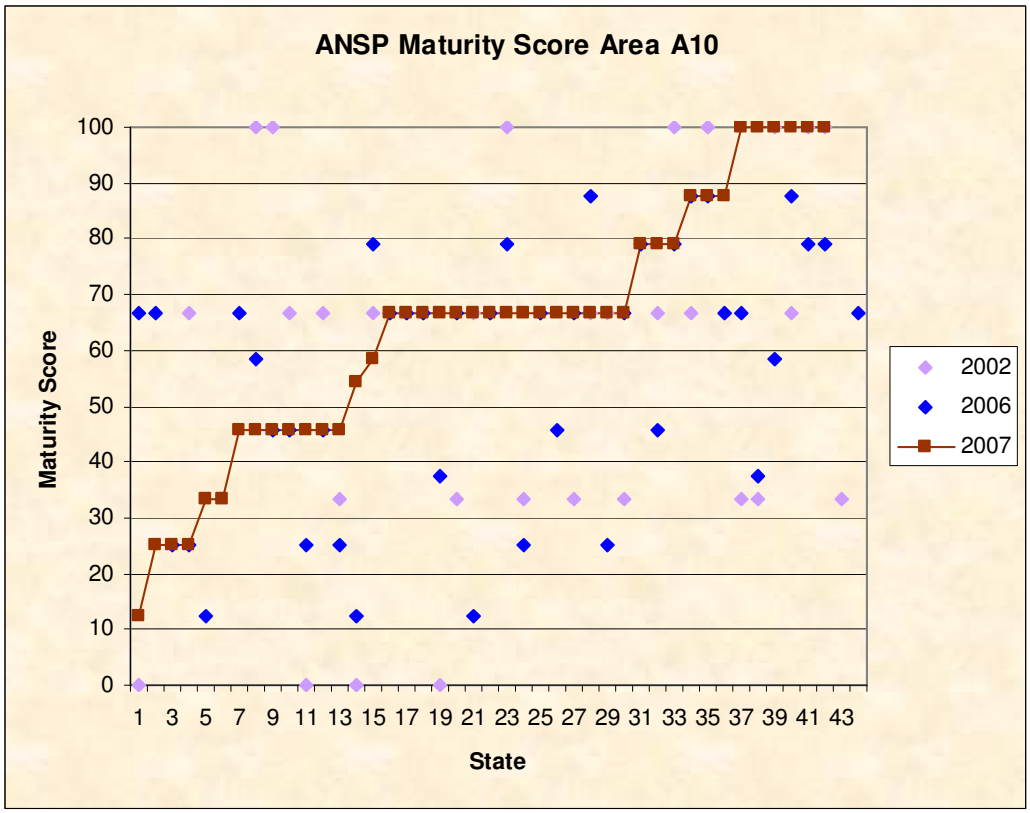


Figure 28 A and B ANSP and Regulator Normalised Overall Maturity for Study Area A10



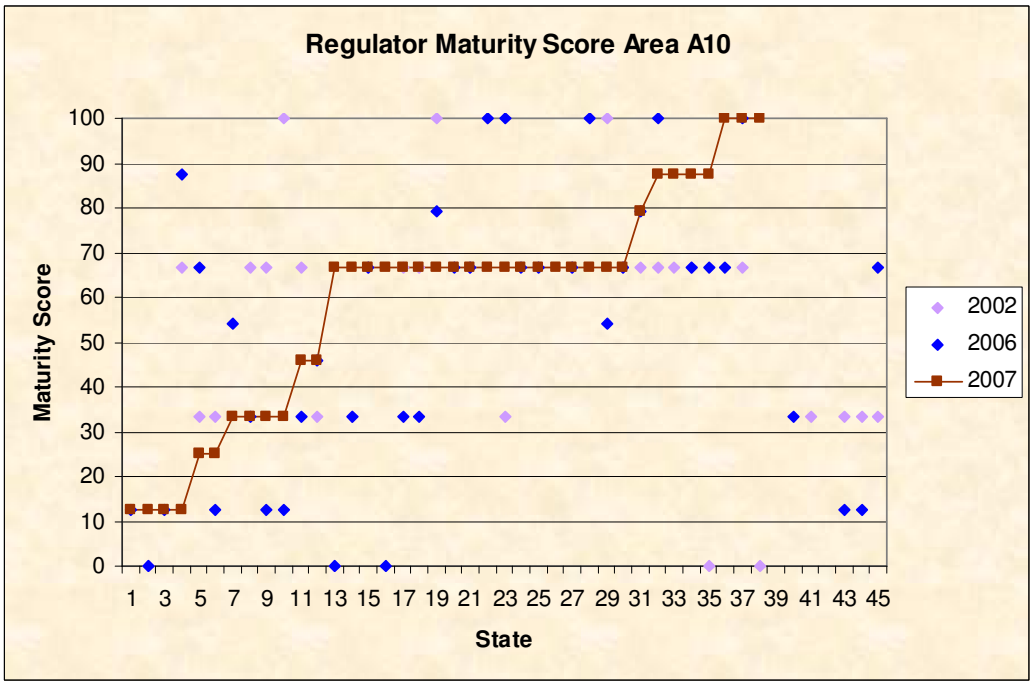


Figure 29 A and B ANSP and Regulator Overall Maturity by State for Study Area A10

According to:	Slow Starters	Active Developers	Continuous Improvers	Stakeholders still below 70% target
Regulators 2006 (of 37)	14	17	6	28
Regulators 2007 (of 38)	10	21	7	30
ANSPs 2006 (of 42)	7	19	16	32
ANSPs 2007 (of 42)	6	27	9	30

Table 13 – Number of ANSPs in each category for Study Area A10.

2.3.12.2 Comments on the results

Like the 2006 data, the 2007 data suggests that very few ANSPs and Regulators hold the view that they are adequately mature regarding openness of ATM safety performance information, and 2 more Regulators than in 2006 now believe their ANSP does not meet the 70% maturity in this Study Area. However, since 2006 18 ANSPs indicate that some increase in maturity has been achieved, and in many cases this is a significant improvement of up to 20%. This is probably due to the alignment of this Area maturity definition for the 2007 measurements with the content of Attachment E of ICAO Annex 13.

During the SSAP survey many States expressed the intent to make some information available and it would appear that this has been done to a certain extent.

6% of the comments related to this Study Area, compared to 8% in 2006.

2.3.12.3 Comments from interviews

This Study Area received a relatively low number of comments but an increasing number included several references to information sources and public web-sites.

Several ANSPs and Regulators indicated that there are a number of conditions to be fulfilled before safety information could be made public without undesirable effects. The most common concerns expressed were media manipulation and the inability of the public to understand the information provided.

The general situation is that there are few States where the general public can easily access safety performance information, and little stated intent by the respondent to change. The most common situation was that some statistical information would be publicly available in the ANSP's annual report which would also be available on their website, and the AIB would publish incident reports (denamed) on their website, but some States did not even do this. Even in States where there is officially openness of public information, there are barriers in place that make it difficult for the general public to obtain clear feedback on their ANSP's performance. In some States the ANSP is prohibited from responding, as it is seen as a Ministry of Transport or Aviation Regulatory function.

In those States with a Freedom of Information (FoI) Act, ANSPs and Regulators took pains to ensure that the context of the information was fully explained to the recipient, but even in this category there were States for which the FoI legislation did not apply to aviation.

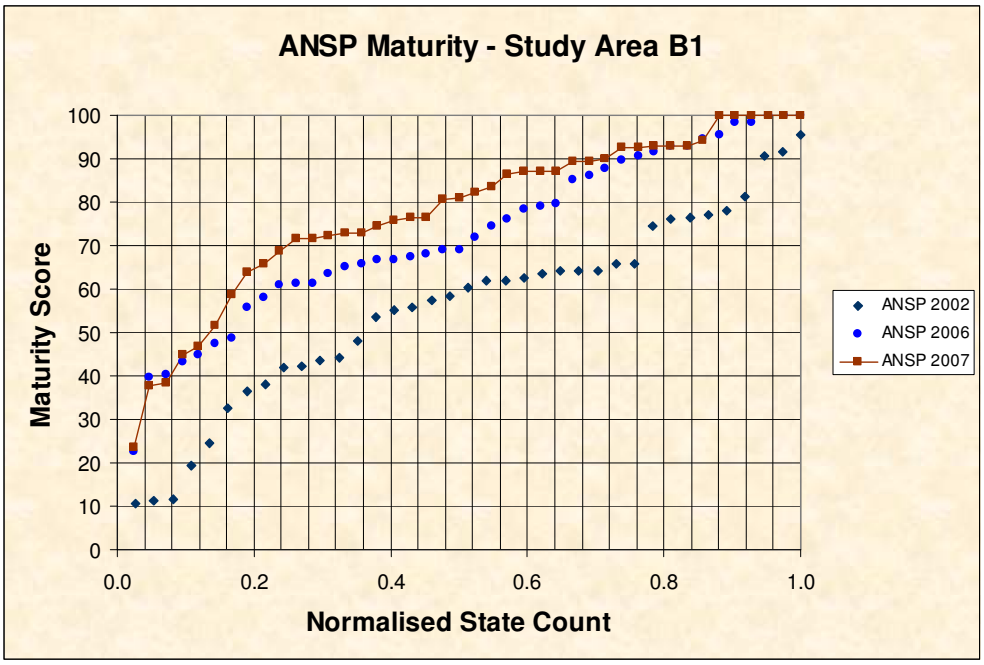
2.3.12.4 Conclusions from this Study Area

This is a contentious area and not a priority to the majority of the participants we have spoken with, most of whom seem happy with the *status quo,* at whatever level that was.

2.3.13 Study Area B1 - The Implementation of SMS

2.3.13.1 Maturity would be if:

"There is an awareness of the need to operate a formal system to manage safety including its future development."



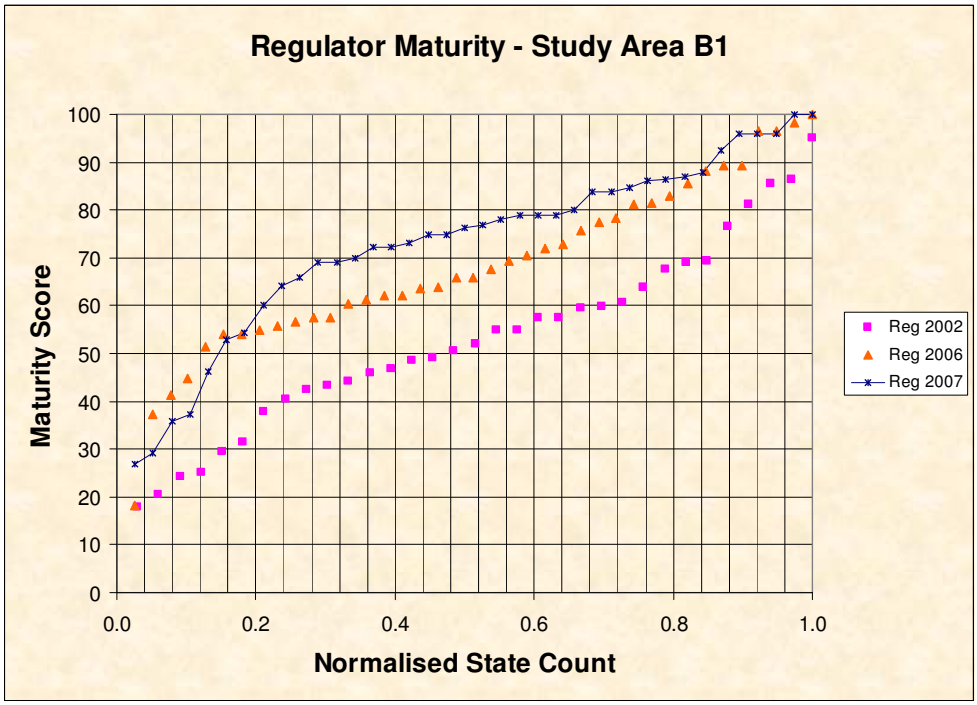
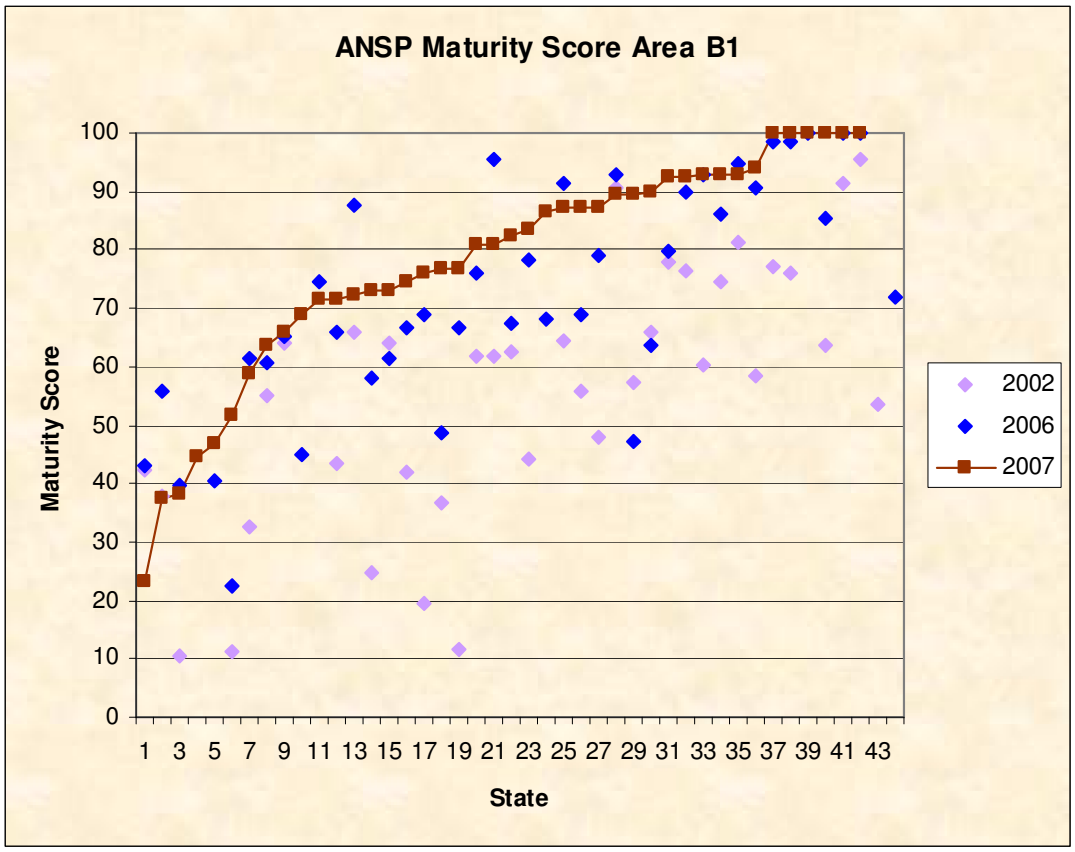


Figure 30 A and B ANSP and Regulator Normalised Overall Maturity for Study Area B1



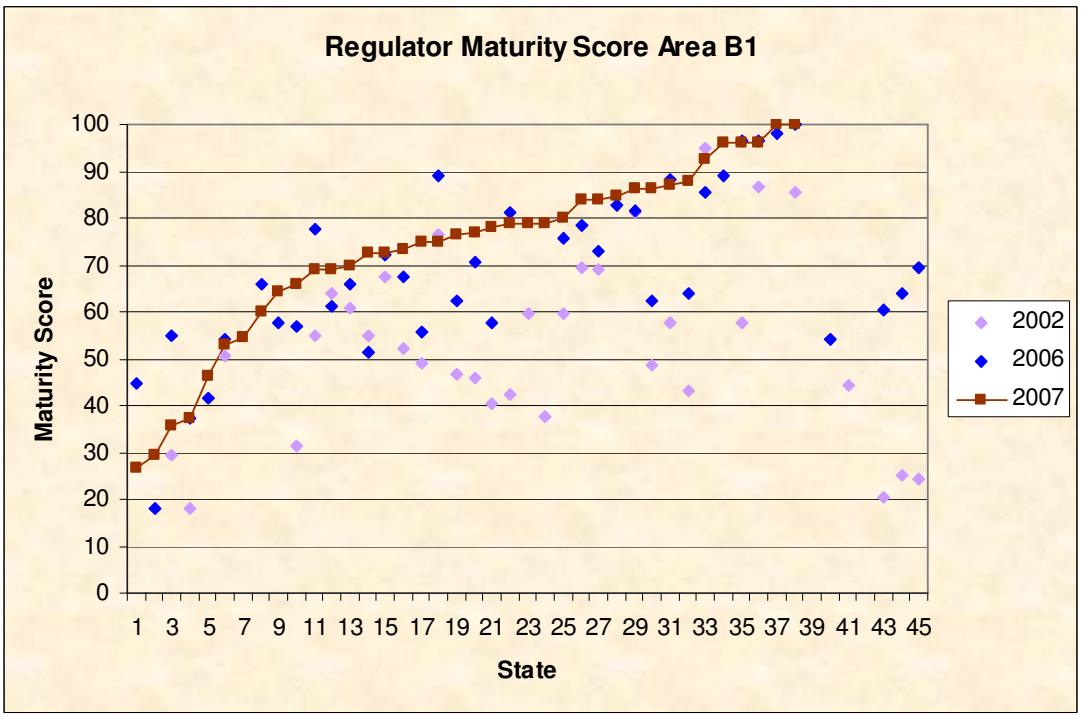


Figure 31 A and B ANSP and Regulator Overall Maturity by State for Study Area B1

According to:	Slow Starters	Active Developers	Continuous Improvers	Stakeholders still below 70% target
Regulators 2006 (of 39)	4	24	11	22
Regulators 2007 (of 38)	4	20	14	13
ANSPs 2006 (of 42)	7	19	16	21
ANSPs 2007 (of 42)	4	15	23	10

Table 14 – Number of ANSPs in each category for Study Area B1

2.3.13.2 Comments on the results

The general impression is that States have made good progress, with a general understanding of the ESARR/SES requirements, and the results support this. With 63% of Regulators and 76% of ANSPs considering that they have achieved the minimum target maturity of 70% in this Study Area, this is a significant achievement.

The apparent fall in maturity for the very few States is more difficult to explain, and is most likely due to a change of interviewee, or that the States have only just started participating fully in the development process and/or the Regulator has only been separated from the ANSP in 2006. Other survey areas have reflected decreased maturity scoring from the same States.

2.3.13.3 Comments from interviews

60% of the comments related to this topic (48% in 2006), and relevant comments have been addressed elsewhere in the report, relating to lack of staff, not understanding risk management, slow legislative change, etc.

Most organisations now have a good understanding of the SMS requirements and all but a few have made some significant progress towards implementing ESARRs and the SES Common Requirements, with a variable role from the Regulator, mainly dependant upon their current legislative requirements and skills/resources.

Several small organisations still struggle to see the relevance of the EUROCONTROL guidance material for the implementation of SMS to their situation and this includes airport ATS units.

2.3.13.4 Conclusions from this Study Area

There is good progress in the implementation of SMS within the ANSPs and although in some organisations the processes need yet to be formalised and properly embedded, it is just a matter of time before most will become mature. There are still a number of States where there is little progress. In these States the usual reasons apply: ICAO compliance addressed instead, no legislation, a lack of suitable resources and training for

implementation of the SMS, little guidance material in their own language, lack of regulatory support and guidance, and lack of relevant skills (e.g. QRA) or resources.

2.3.14 Study Area B2 - Timely Compliance with International Obligations

2.3.14.1 Maturity would be if:

"There is an awareness of the implications of the international obligations related to safety in ATM in particular SES legislation, ICAO SARPS, ESARRs and the requirement to implement them within each State by a known deadline date is achieved."

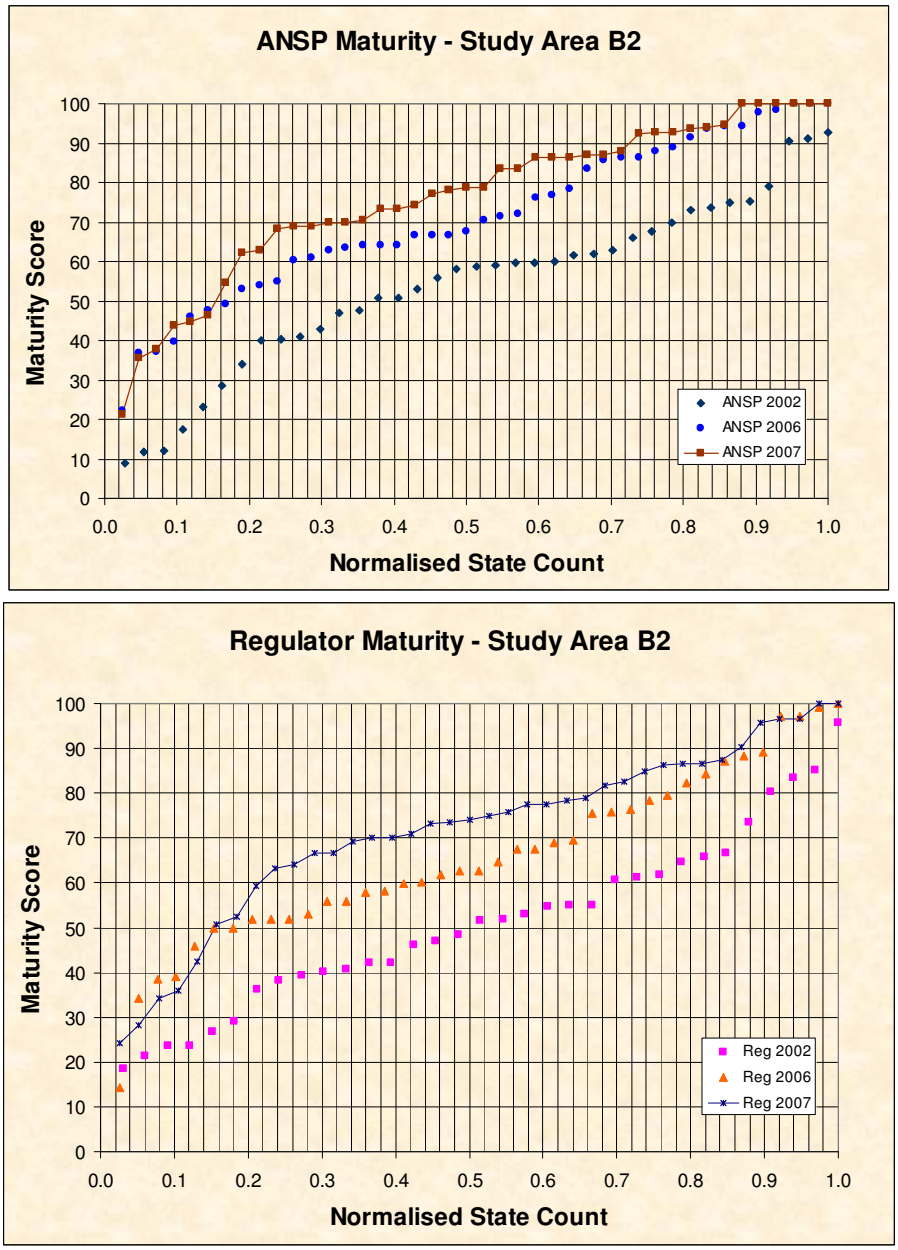
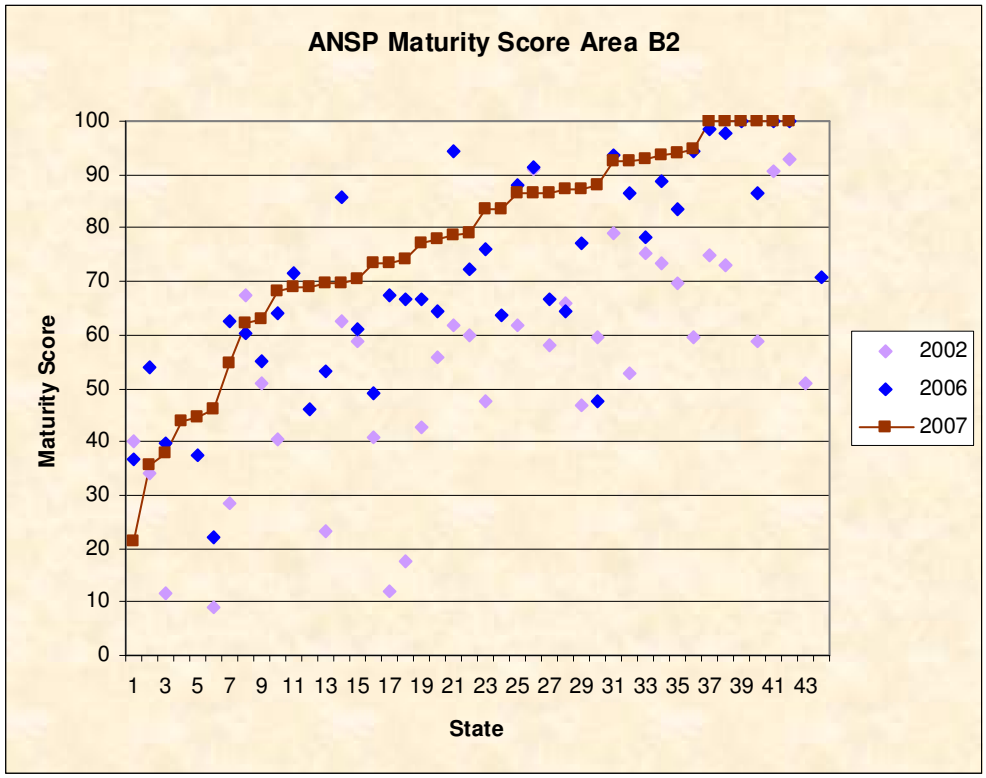


Figure 32 A and B ANSP and Regulator Normalised Overall Maturity for Study Area B2



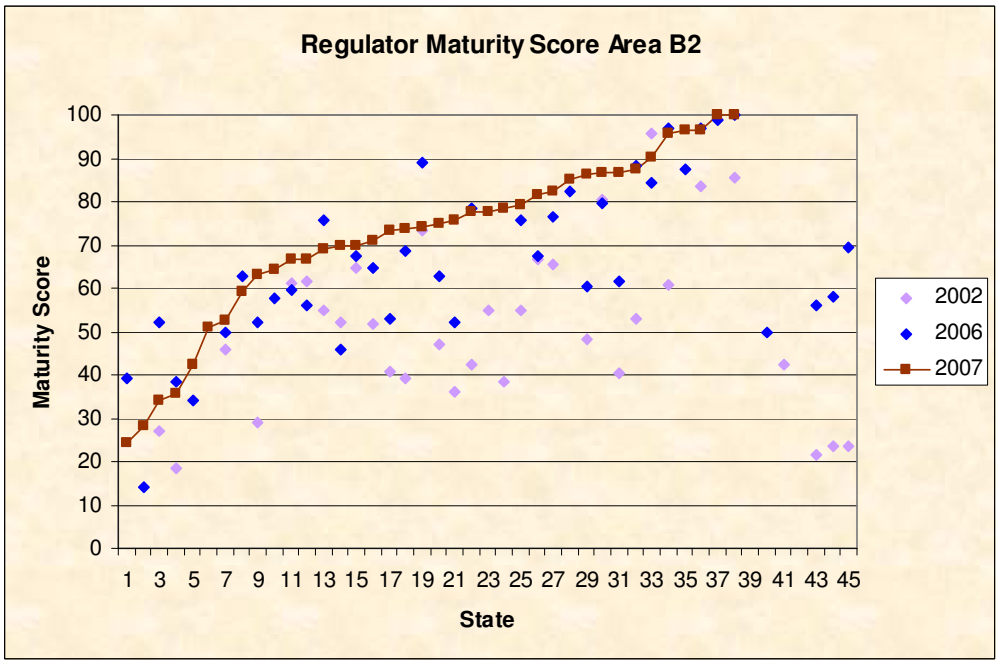


Figure 33 A and B ANSP and Regulator Overall Maturity by State for Study Area B2

According to:	Slow Starters	Active Developers	Continuous Improvers	Stakeholders still below 70% target
Regulators 2006 (of 39)	4	26	9	25
Regulators 2007 (of 38)	5	20	13	13
ANSPs 2006 (of 42)	4	23	15	21
ANSPs 2007 (of 42)	5	17	20	14

Table 15 – Number of ANSPs in each category for Study Area B2

2.3.14.2 Comments on the results

Both the Regulator and the ANSP graphs show very similar results, with a steady improvement in maturity in most States, with the usual few who have actually reassessed and reduced their maturity since 2006.

2.3.14.3 Comments from interviews

This Study Area received one of the highest number of comments at 36% (but not as high as 2006 with 74%), which is explained by the fact that this Study Area covers all reasons, positive or negative, affecting the timely implementation of ESARRs/SES CRs. The most common are:

- There is a now a good understanding by virtually all ANSPs and Regulators of what they must do in order to improve their maturity.
- The SES Common Requirements have an obligatory requirement to be implemented (in the EU States) and therefore have provided an impetus which the ESARRs could not achieve by themselves. Other non-EU ECAC States have also adopted the Common Requirements as a best practice.
- The difficulties of the implementation of ESARR 4 receives many comments, with more comments on the difficulties associated with Safety Assessments and other comments related to TLS and the link with safety indicators and statistics. Underlying this is the lack of expertise with QRA, but these problems are not as serious as were reported in 2006, as more staff are getting trained. Auditing skills are also short in some ANSPs and Regulators, but once again this is being addressed in many States.
- We have examples of less mature ANSPs and Regulators seeking assistance from other, more mature similar bodies, consultancies, or local expertise in setting up associates in academia (mainly for QRA work).
- Several main ANSPs in their State have mentioned that they mentor the small independent ANSPs to help them develop, but the small ANSP SMS development is an ongoing problem.

- The difficulty in being able to obtain training due to lack of places available on the EUROCONTROL training centre courses is stated as a problem by several ANSPs and Regulators.

- Regulatory lack of resources, both in terms of numbers and skills is still a key issue, but more States are addressing this. Reasons for this lack of resources include poor pay compared to the ANSP and Government restriction on recruitment. In many States the lack of resources is limiting the extent to which the Regulator can carry out his full range of Regulatory activities, especially in the oversight role. This has an equally serious secondary effect in several cases in that the ANSP is getting more mature than the Regulator in the more technical aspects of the ESARR/SES compliant SMS (e.g. ESARR4 approval) yet the Regulator is still required to carry out a formal assessment and approval process.

- The difficulties associated with ESARR2 reporting, the development of a "Just Culture" and the gaining of legal protection for Occurrence reporters are also a common source of comments.

- The notion that ESARRs are no longer the main Regulations to comply with and that the SES Common Requirements are now prevailing is also a fairly common comment.

- More mature States are now making comments that the existing guidance, training and tools do not adequately address their state of maturity and make it difficult to further develop their maturity.

These issues have all been discussed in some detail in previous Study Areas.

2.3.14.4 Conclusions from this Study Area

Virtually all ANSPs and Regulators now have a good understanding of the requirements for implementing ESARRs, but in some cases their abilities to do this have been curtailed by several factors as described in this report. The good news is that most of those ANSPs whose legislation does not yet support ESARRs are trying to implement ESARR compliant management system changes. The SES Common Requirements has added a welcome impetus to this process.

There is a clearly demonstrated general improvement in safety management systems due to the implementation of ESARRs/SES, but one of the next priorities must be the appropriate information and guidance from EUROCONTROL specifically for small organisations.

The requirement for advanced level guidance, training and tools for the more mature ANSPs and Regulators is expected to increase as the maturity of all participants' increases.

2.4 RESULTS STUDY AREAS B3 - B8

These Study Areas were not part of the statistical analysis. The comments in these Study Areas are therefore based on the written comments provided by participants on the questionnaires or on the issues that were raised during the telephone interviews.

2.4.1 Study Area B3 - Specific Safety Programmes within States

Explanation of the issues explored during the interviews:

"ATM Safety programmes are primarily driven by Regulations from ICAO and EUROCONTROL. This Study Area sought to identify which programmes a State was pursuing above the regulatory minimum."

Most ANSPs and Regulators do not carry out any additional programmes over and above the Regulatory minimum. Examples of programs in place at the few ANSPs and Regulators that reported to have additional programmes and supporting activities are:

- Formal Programmes - USOAP, ESIMS, ESP, SES Peer Review (planned) are being applied;
- National SRG Safety Plan in addition to LCIP;
- Participation in an ad-hoc fashion in things like SAFREP;
- Establishing a central reporting centre to interface with their AIB;
- In addition to the LCIP information, also ensuring that Human Factors elements in incidents are being specifically addressed through the Team and Responsibility Management programme;
- Further development of military ATM co-ordination. At the working level there is no problem but further up the management chain there is not a good understanding;
- A safety evaluation team will be implemented;
- Developing safety cases 'experimentally' - working towards harmonisation of approaches and standards - using EC125 and safety assessment methodology (as requested by Regulator). Since 1996-97 the Regulator has explained safety case approach based on ICAO annexes. (Operational impact determines extent of the safety case. They are using 2 approaches - compliance demonstration vs. simulations and using calculations of TLS against the 'real' level of safety in relation specifically to what the ANSP is expected to deliver and what it is really possible to deliver);
- There is a national Aviation Safety conference held annually by the Regulator to allow all stakeholders to discuss and resolve issues;
- Part of the modernisation project includes external consultancy assistance on Ops and Safety issues from international experts;
- The main ANSP is mentoring the smaller airport ANSPs for the development of their SMS;
- The organisation has plans for medium term conflict detection tools which will be based on accurate trajectory prediction and use of enhanced Mode S down-linked parameters;
- Significant capacity increases are expected from the introduction of new controller support tools after 2010;
- Over the last two years significant changes have been made to the basic and rating training courses and to the structure of initial training, which have not only ensured compliance with Common Core Content, but have also reduced initial training time

whilst improving ab-initio learning. Consequential changes to unit training are now being progressed, along with alterations to the recruitment and selection process, which taken all together are expected to increase ab-initio success rates whilst reducing the time to first validation;

- Safety Culture Maturity Assessment is now routinely carried out.

In comparison with 2006 and earlier SSAP reports, many of these internal programmes are increasingly sophisticated and mature.

Many of the participants report on the usefulness of existing focussed improvement and support programs such as the "European Action Plan for Runway Incursion Prevention", the SASI[5] project and ASATC/CARDS[6].

[5] Support to ANSPs for Safety Management System (SMS) Implementation. Project managed by DAP/SSH

[6] Community Assistance for Reconstruction, Development and Stabilisation (CARDS); the ASATC II project is to adapt air traffic and aviation conditions in the five CARDS countries to those in the rest of Europe, thus paving the way for the timely implementation of the Single European Sky.

2.4.2 Study Area B4 - Issues Affecting the Implementation of the International Regulations (such as ESARRs/CRs/SARPs)

Explanation of the issues explored during the interviews:

"Both positive and negative factors can affect the implementation and application of ESARRs, CRs and SARPs. This Study Area sought to identify these factors."

This question cross-checks the responses made to earlier questions and the issues raised are largely the same. These are the ten most reported issues that restrict progress in ESARRs, SES CRs or SARPS compliance:

- Many Regulators are still reported to be understaffed and underperforming. Resource issues - budget, pay and availability of suitable staff - still limit the effectiveness of the Regulatory rule making and oversight processes (ESARR 1). Although some progress has been made in this area since 2006 it is still a significant issue;
- There are remaining resource issues at several ANSPs. These issues are mainly related to the difficulty in finding suitably qualified staff. As a result, the (further) development of the more technical areas of the safety systems such as risk assessment and safety performance measurement and improvement is difficult;
- Absence of legal protection for the voluntary reporting and a lack of a "Just Culture" in many working environments restrict ATM occurrence reporting (ESARR 2). Many States have adopted a Just Culture without the formal legal protection, but with a protocol agreed by the key stakeholders that the reporter would not be prosecuted except where criminal negligence had occurred;
- Safety Indicators, particularly their design and implementation is not understood (ESARR 2);
- Although most organisations now appear to have a SMS on paper, many still need to develop the safety culture to properly embed the system. Some ANSPs have the SMS in place in the Headquarters but not in the small ATM units. This issue cuts across all areas and raises queries about managing organisational change (ESARR 3 and 4);
- SMS implementation issues: perhaps a sign of improvement is that several participants now reported to have questions about the detail of introducing a functioning SMS. Questions addressed many aspects such as how customisation can be achieved to make the manual suitable in practice, how to create a "Just Culture", how to introduce a SMS of the appropriate size and weight for a particular organisational entity, how top-management can be made to see the big picture and be involved in a positive manner and how the SMS can be made to integrate better into the existing organisation;
- The Target Level of Safety methodology is still disputed and the relevance of the TLS for day to day ATM operations is unclear. Many participants reported having difficulties understanding how TLS can be introduced in a meaningful manner (ESARR 4). A majority of ANSPs and Regulators see it as a EUROCONTROL function to provide a suitable framework and guidance which can be adopted by them;
- The ESARR 4 Risk Assessment process is seen as requiring too much specialist skill. Many managers regard the process as costly and find it difficult to base decisions on the outcome of risk assessments – this appears to be out of their comfort zone as previously decisions were based on approved specifications and procedures (ESARR 4);

- Several organisations quote unwelcome cost implications and implementation issues as a reason for delay in the introduction of ESARR 5.2 - Requirements for technical and engineering personnel undertaking operational and safety related tasks;
- Some States initially waited for the transposition of the ESARRs into the Single European Sky legislation before acting upon the ESARRs in general. The transposition has caused further reason for concern as there are marginal differences between the ESARRs and the EU regulations. Recent developments should help resolve this issue.

The following five reported issues that helped organisations implement safety according to the ESARR's have not changed much from those reported in the earlier studies:

- Starting early. Those ANSPs that started at least 5 years ago with implementing some form of safety management are most likely to comply with ESARRs;
- Organisational cultures where safety and quality management are embraced with enthusiasm. These ANSPs often make progress in spite of the Regulator;
- Organisations that have an ISO 9000 type of quality management organisation find that there is a good fit with safety management;
- Leadership and support for safety management by the ANSPs management team;
- EUROCONTROL's safety training, support projects, tools and regional workshops.

2.4.3 Study Area B5 - Weaknesses Deserving Special or Immediate Attention

Explanation of the issues explored during the interviews:

"Potential weaknesses could be anything that leads to repeated safety deviations, a lack of compliance with mandatory safety procedures or flaws or omissions in safety programmes."

The survey participants provided only a few contributions that can be seen as weaknesses that need urgent attention. Most of the weaknesses were similar to those reported in 2004 and 2006, and are still valid, although in a lesser number of States. Many relate to the management of interfaces between the different service providers or different elements of the aviation system. In several States, increasingly busy regional airport ATS units often follow a different safety regime or are not as well regulated as the main ANSP. A few ANSPs flagged-up the issue that the associated risk is increasing as low cost airlines specifically seek the less developed regional airports where safety management, equipment and standardisation are not as developed as at the major airports. A few ANSPs also mentioned the fact that the Military in their State are responsible for some airport ATS that in the eyes of the ANSP fails to meet up to required equipment standards.

One of the new States implementing ESARRs/SES in 2007 made the point that it could be desirable to make more deep focus, for example, in the area of the standards which should be applicable for the ATM personnel providing safety oversight and safety management at the level of Regulator and ANSP.

In 2007 one of the Users made the point that differences in level of implementation arises from how States drive these things. Often States only ensure that the absolute minimum requirements are met. In certain parts of the world the most significant deficiencies are on State and Regulatory level and not so much on the level of the ANSP, and when the ANSP has led the SMS development process there is much evidence that this is the case.

New for 2006 was the notion that the EU may not be properly addressing the impact on safety of the SES regulations. In spite of consultation through working groups and industry consultation groups, new regulations have been issued that reportedly potentially damage safety. An example is the new charging regime under which airport ATM is separated from upper airspace services. This could lead to closure of marginal airport ATM units and the introduction of remote service provision; a perceived less desirable solution from a safety point of view. This has not reappeared as an issue in the 2007 survey.

Probably the most significant issue is that, in the eyes of the ANSPs and their Regulators, airports with their integrated ATM organisations appear to lag behind in the implementation of safety management. This issue has come up in some form both in the 2004, 2006 and 2007 studies and, because of the sheer numbers involved, potentially poses a significant safety risk for ECAC aviation operations.

2.4.4 Study Area B6 - Identify Current Safety Concerns of Airspace Users

Explanation of the issues explored during the interviews:

"This Study Area was addressed to User groups and sought to identify either the perceptual or the actual concerns of these groups."

Only two User groups have responded, and their views on what they consider are of concern to them are summarised below:

2.4.4.1 Regulation versus implementation

The safety regulation in the European region is well developed but there are still a lot of differences in the level of implementation. It is effective implementation that matters most, and differences in level of implementation arise from how States drive these things. Often States only ensure that the absolute minimum requirements are met. In certain parts of the world the most significant deficiencies are on State and Regulatory level and not so much on the level of the ANSP.

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2.4.4.2 Perceived status of safety frameworks in Europe

There is a lack of transparency with regards to the maturity of implementation of the safety framework within Europe. EUROCONTROL publish the graphs, but fail to publish each State's position. The User indicated that it was worth noting that the airlines pay enough money for good systems everywhere. The User would be prepared to work with the poorer States and openness about the maturity of safety systems would help the User target collaborative improvement efforts together with EUROCONTROL.

2.4.4.3 Separation of Regulator and ANSP

Separation of Regulator and ANSP is a necessary step towards improved safety systems. Institutional change is needed in many States to make this happen. The view presented in some States is that after separation there will be a lack of competent staff for the safety Regulator, but in the User's view this is not valid. Lack of expertise may be a problem but the Regulator should be established properly and any gaps in expertise could perhaps be filled with external resources. More likely is that the new Regulatory function becomes ineffective because the inexperienced staff focus too much on the technical details. It is fair to say that the future Regulator will be carrying out a different role from the previous internal audit type of role.

2.4.4.4 Occurrence reporting

For occurrence reporting there are still a number of issues that need to be resolved. Regarding "Just Culture", where there is no legal framework protecting staff from prosecution, some States have found compromise solutions and in some cases they don't work too well. There are also still issues surrounding reporting within the ANSPs.

2.4.4.5 Safety information

The concern is that ANSPs do not provide data to airlines. Safety information should be made available to the industry but not to the general public. The airlines will eventually get the information from ANSPs/States but it is still difficult for them. Benchmarking data is produced annually for IATA airlines.

2.4.4.6 EC Commission feedback

This safety survey should also ask for feedback from the EC Commission because of the increasing influence of the EC Commissions Legislative and operational process for ATM.

2.4.5 Study Area B7 - Current Safety Concerns of ATCO Representatives

Explanation of the issues explored during the interviews:

"This Study Area was addressed to the Air Traffic Controllers' representative bodies and sought to identify either the perceptual or the actual concerns of these bodies."

2.4.5.1 The introduction of safety mechanisms at ANSPs

ANSPs still populate the full spectrum of maturity for the development of their SMS and compliance with ESARRs/SES. However, the number of ANSPs attaining the minimum maturity target of 70% is now 29 (the Regulator is less optimistic with their estimate of 23 attaining 70% maturity) and there has been a significant upward movement in maturity. The areas causing the most problems, for all but the fully mature ANSPs have been discussed earlier in this report, but can be summarised as:

- Development of TLS (also linked to Regulatory competencies);
- Development of safety key performance indicators and safety targets;
- ESSAR4 change management, especially when QRA is used;
- Lack of Regulatory guidance and potential delays in Regulatory approvals (e.g. ESARR4 changes), largely due to lack of resources and/or skills.

This is in spite of EUROCONTROL having done a lot of education and issuing a lot of guidance materials. They also see it as unfortunate that progress appears to have been limited by a lack of real external pressure on ANSPs to implement safety systems. There is no pressure from the market because even after commercialisation of ANSPs there is no real competition. EUROCONTROL has been lacking the enforcement powers and it is good to see that the EU Commission's intervention via the Single European Sky initiative appears to be making a difference.

In many States the roll out of new regulation is moving faster than what the ANSPs can cope with in terms of real implementation. Cultural aspects form powerful obstacles and change management and communication of benefits, progress etc. has not been properly addressed. Safety needs to be top down and bottom up. Now that the top down structure has been established in most places, bottom up is still missing as people continue to operate the same as they were under the old system.

Real implementation of safety rules is affected in some lagging Eastern ECAC States with a lack of political will and leadership to ensure that safety system changes intended are adapted to suit local circumstances. States and ANSPs take EUROCONTROL rules to be the prescriptive minimum and follow these to the letter. This is a very difficult thing to achieve because EUROCONTROL has produced a large number of rules and associated guidance materials. The picture is that changes are not well communicated, local implementation solutions are not defined, resistance to changes is not addressed and as a result changes are neither properly embedded nor potentially well understood. There is still a very diverse level of implementation of safety arrangements across the European Region. This is influenced by the large number of priorities with which ANSPs are confronted and the way in which priorities are set. SESAR for example is perceived to be putting a lot of pressure on ANSPs and to be moving much too fast so that not many people in the industry fully

understand which direction it is moving in. The result of the heavy workload at ANSPs is that new rules and regulations don't rank high enough in their perception and that the implications don't sink in.

2.4.5.2 Regulatory oversight – what role is there to perform?

The ATCO representatives and Regulators still have a view that there are fundamental issues with resources for the Regulator. The situation is made worse by separating ANSPs from Regulators, by pay issues and government refusal to recruit. Introducing separation between ANSP and NSA has made it more difficult to recruit the right staff at the Regulator.

For some States with what was previously mainly a non-auditing, limited, licensing oversight, the more pragmatic of them have doubled the number of Regulators for the full oversight process. However, most of the States appear to be attempting to introduce the full oversight process using the original number of Regulatory staff, which often means that only 1-2 Regulatory staff are responsible for all ANSP Regulation and oversight nationally.

This is linked to the discussion about the role of the Regulator. Is there a need for a strong involved Regulator or more of a hands-off Regulator? This discussion is also going on within ICAO within the "Safety for the 21st century" programme. In principle, staff with a good understanding of safety could do good work at the Regulator and provide the much needed independence in the system. There is however also a view that generalists would not understand the complexities and try resolve issues through a dogmatic and bureaucratic approach. So the debate is about how Regulators should deal with alternative means of compliance, how independence can be brought into the system and what sort of staff is required to fulfil these roles.

2.4.5.3 Reporting is still under siege

According to the ATCO representatives, it is now commonly agreed that robust reporting systems are necessary. The required legislation is now also in place at an EU level, through ESARR 2 and through the more recently issued ICAO Annex 13, Attachment E. Reporting is good but due to the absence of legal protection and assured confidentiality a “Just Culture” is still not in place universally i.e. there remains a clash between national penal codes and the requirements for a “Just Culture”. There are so many different national cultural and legal objections across the States in Europe that it seems unlikely that a true “Just Culture” with full legal protection for the reporter will soon be taken up across Europe as a fundamental change in the national legal systems. What seems to be evolving in most States is a pseudo “Just Culture” as a working protocol amongst the key stakeholders, in that it is agreed that the reporter’s name is not revealed outside of the ANSP (usually providing it is not due to criminal negligence). However in most States this has not been tested in law and practice and some uncertainty about this exists in many States.

2.4.5.4 ATCO shortages

Already there is a significant ATCO shortage - IFATCA estimates there is a need for about 1,000 ATCO's across ECAC (which implies a 5-10% on shortage on average and 50% in extreme cases!). To create meaningful draft regulation, the NSA needs to have properly skilled staff to work with the ANSP and they also find it difficult to recruit.

It is part of a broader change in the industry. Especially, younger ATCO's now no longer see this as a job for life and expect to move on after a few years. The profession is not seen as very attractive by the general public (stressful and shifts) and this has an impact on the training intake. The general public are also unhappy about the impact of industrial actions such as strikes, about flow restrictions and ATC delays. This doesn't help to make ATCOs feel good about their career and many just put in the hours.

Separation between ANSP and NSA is often incomplete with job descriptions still overlapping.

2.4.5.5 Safety Performance Information

Safety Performance Information is not visible to the general public and the question is still open as to how to deal with this. There are important issues to resolve such as which information should be issued and how the information can be made objective and harmonised. There is still a long road to go before these issues are resolved. The Users agree that communication should be accommodated up to a certain level and that reportable events should be harmonised. The devil is in the detail as was illustrated in the discussion about separation measurement. The usual fear is that this sort of information will be used for benchmarking activities, become the basis for performance based penalties or value assessment during corporatisation / privatisation.

EUROCONTROL should improve the communication on safety improvement. It would be good to communicate the links between the different programs and to provide progress updates to the general public and the workforce in a constructive manner.

2.4.6 Study Area B8 – Public Access to ATM Safety Information

Explanation of the issues explored during the interviews:

"The publication of ATM safety indicators with an aim of showing progress to the general public is supported by the ATM Industry and their stakeholders and any obstacles to openness of information have been resolved. This survey area takes stock of the opinion regarding openness of ATM safety information and of any obstacles, solutions and progress that has been reported."

The response in 2007 did not differ much from the response in 2006, which was very similar to earlier surveys. Overwhelmingly the view is that unless safety information is released to the general public in a generally accepted harmonised format and in a controlled fashion, there are too many risks associated with doing so. Some States suggested that EUROCONTROL should provide suitable guidance on what information should be released and in what form, to enable a consistent approach to be made. This may prove difficult in practice, as there is a wide variation in what is permitted to be released and by whom in different States.

With the exception of a few States where the national culture is such that this sort of public scrutiny is expected, not many participants supported the idea. Issues against ranged from the conviction that the general public will not be able to understand the information, to the role the press would play if information became available. Others queried what sort of information should be made available and worried about confidentiality and even personal harm following disclosure of incident information. There is also a clear view that this sort of information should not be used to benchmark the performance of individual ANSPs.

3 CONCLUSIONS

3.1 OVERALL CONCLUSIONS

- The ESP and associated focussed support efforts have made a real difference. The maturity of ATM safety mechanisms in ECAC has improved from an overall average of 55% in 2002 to 76% in 2007 according to the ANSPs and from 52% in 2002 to 71% in 2007 according to the Regulators.

- Deploying sufficient numbers of suitably qualified staff for safety roles remains difficult in many States. Just as in previous surveys, it is clear that this situation affects the Regulators to a larger extent than the ANSPs as many struggle to obtain the necessary budgets and to offer attractive remuneration and career prospects for potential applicants. Offering training alone will not resolve this situation.

- There appears to be some improvement in the area of risk assessments where several examples of ATM operations or systems safety assessments were mentioned. However the lack of skills with QRA is still limiting many ANSPs and Regulators in the development of the full implementation of ESARR4 compliant changes.

- In many States the roll out of new regulation is moving faster than what the ANSPs can cope with in terms of real implementation. This is especially true for some of the high growth (>15%) Eastern European States. The total number of Slow Starters has steadily dwindled down to 5 States according to the ANSPs and 5 according to the Regulators participating in this 2007 Survey. These graphs show that the presumed link in the 2002 survey between low maturity and, relatively little traffic but hi-growth of the traffic volume is no longer present. In 2007, only 2 States remain in the Hi-Growth and Small group according to ANSPs and only 1 remains according to Regulators. This survey also clearly shows that neither traffic volume nor traffic growth rates are a determining factor in achieving maturity rates of more than mature levels of over 80%.

- Participants report that there is a gap between documented implementation and real implementation of safety policies in some Eastern ECAC States. Cultural aspects form powerful obstacles if not managed as part of the process, and change management and communication of status, benefits, progress etc. has not been properly addressed.

- The confusion that was mentioned in earlier studies about the usefulness and practical implementation of the National Target Levels of Safety (TLS) remains. During this 2007 survey, these aspects have come up as a particularly difficult process to introduce. There is a very common view that it would be useful for EUROCONTROL to provide some form of framework and guidance for this to ensure a consistent approach.

- From an institutional point of view, the European Communities' Single European Sky (SES) initiative and the associated implementation rules are seen to have positive influence on the sense of urgency within States regarding implementation of the associated regulations. There is also hope (and reality) in many States that the SES

initiative will release the funds required for improvement of the safety oversight function by the often newly formed National Supervisory Authorities (NSAs).

- One of the key remaining issues is establishing a "Just Culture" that would protect the reporter of an incident from judicial proceedings. Little progress in changing the necessary national criminal legislation has been reported. A few States still have it in their legislation that anyone making a mistake will be punished, but most States appear to be reliant on what could be called a "Just Culture" protocol in terms of an understanding between the key stakeholders (Ministry of Justice, Aviation Regulator, AIB, ANSP) that the person reporting the incident is not subject to identification or prosecution except in the case of a violation (complete disregard of the rules/procedures) or negligence. In most cases, these are working arrangements which have not been fully tested in the event of a major incident, and there is no legal protection. Relatively speaking, most of the progress in this area has been from the ANSP rather than the Regulators.

- Many ANSPs and Regulators mention the difficulty in gaining access to the EUROCONTROL Training Centre for relevant courses, and it would appear that demand is exceeding supply. A further (inevitable) complication is emerging in that the current guidance and training is felt by some mature States to be too basic in scope and they want more advanced material to help them develop further.

- In some aspects of the SMS implementation process (e.g. use of software packages to manage ESARR4 change processes, or competence management), there are now several options in use in various States, and some form of comparative review may be useful to inform others who may be looking to adopt such an approach. It is important that the context is not comparative to identify the "best", as what is best for one ANSP or Regulator will depend upon their maturity, but rather to identify strengths and weaknesses so that a suitable choice can be made.

- Organisational changes will inevitably have an effect on the safety culture, and unless it is well managed, the effect will usually be negative, as there is a decreased understanding of how safety is managed and who is responsible for what. More of the ANSPs and Regulators than in 2006 recognise the importance of Human Factors and their need for integration in SMS system or made any reference to maintaining or improving the safety culture during what in some cases were large changes in the organisational structures of one or both organisations, but this is potentially a growing issue. This is an area which may need future attention, as the safety culture is only addressable indirectly (e.g. through improved communication, better procedures, etc.), and a different approach may be necessary.

3.2 KEY OBSTACLES

3.2.1 Inability to develop

Compared to previous surveys, there are a reducing number of States Regulators and ANSPs that report an inability to develop. These States are now all included in the Slow Starter category and cite the following reasons for their inability to develop:

- The existing national and/or company culture and the difficulty to change this into a "Just-Culture";
- A lack of ESARR3, ESARR4 (and ESARR6) implementation skills, in particular in small ATM units;
- An inability to recruit suitable staff for various reasons;
- ESARR guidance is lacking in relevance to some ANSPs and Regulators who are in non-EC States and who comply with ICAO requirements;
- Waiting for legislation (latterly also perceived incomparability between ESARRs and SES). This is typically the situation when the State's legislative body does not recognise the need to reflect ESARRs into the State's aviation legislation, and the Regulator therefore does not recognise them as requirements. Generally in these States, the ANSP has recognised that most of the changes are in terms of best practice safety management, and have progressed with ESARR implementation without the support of the Regulator. Whilst this is laudable for the ANSP, it means that an effective oversight process is not practised by the Regulator in ESARR terms.

3.2.2 Resources for the Regulatory function

In particular the Regulators mentioned there is still a lack of competent resources due to:

- Demands of legislative development;
- Difficult recruitment conditions due to pay differentials with the ANSPs;
- General government restrictions on recruitment;
- An increase in oversight activities compared to the previous regime;
- The lack of specific skills within the State;
- It often being unclear what role the Regulator should fulfil and which capabilities and competencies an applicant should have.

3.2.3 Common problems for ANSPs

While some of the interviewed ANSPs still struggle with:

- The staff with the necessary skills for auditing;
- The staff with the necessary skills for QRA to develop quantified TLSs, and for ESARR4 change management processing;
- Limited Regulatory oversight and obtaining technical approval (e.g. ESARR4) from the Regulator;
- Lots of other priorities such as SES, and corporatisation.
- Rigid bureaucracy;
- Lack of Regulatory support and guidance.

3.2.4 Concerns over the institutional framework and EUROCONTROL's role

The future role of EUROCONTROL is still regarded with a sense of unease by many. On the one hand most parties wish for the Agency to be divided into separate Regulatory and Operations organisations; on the other hand the support role provided by EUROCONTROL to Regulators and ANSPs received much praise and it is feared EUROCONTROL's possible transformation into another entity would potentially reduce the level of support.

3.2.5 The view of the stakeholders

Similar to the opinion in 2004, the stakeholders acknowledge that a lot of good work has been done but are still sceptical about the rate of change regarding the introduction of safety systems. They indicate that the changes at the front-line of the operations are still difficult to see. The stakeholders also are keen to make things move much faster and propose, for example, to provide funding to help develop those ANSPs who are in need of assistance.

The view of the User that the ANSPs are effectively devolving into two groups, (one group is the Slow Starters who are not developing and the other is the is the combined Active Developers and Continuous Improvers) is in our view is accurate and significant.

3.2.6 Providing ATM safety information to the general public

With regard to the question whether ATM safety performance data should be made available to the general public, the opinion is that this sort of information should only be shared in confidence within the industry amongst professionals. The release to the general public should only be considered under clear and controlled conditions to avoid negative reactions and media hype. This opinion remains unchanged from the 2004 survey.

3.2.7 Concerning the ESARRs:

ESARR 1 – Oversight is more intensive than many Regulators have been used to, and many lack the resources and skills necessary to fully implement it.

ESARR 2 Reporting – progress is being made. There is still a lack of non-punitive reporting and legal impediments are restricting reporting, but the situation is improving as a “Just Culture” protocol is introduced. In most States this does not provide legal protection. Introducing safety indicators is seen as difficult.

ESARR 3 SMS – Good progress has been made; most systems now need to be properly embedded and the associated positive safety culture is still to be developed in many organisations.

ESARR 4 - Risk Assessment:

- The development of TLS is still poorly understood and disputed
- Although risk assessments are often still seen as a burden and there remains to be a problem with finding suitable staff with the necessary skills, there are now signs of the process starting to function within many ANSPs. Unfortunately some of the Regulators still appear to have a lack of suitable personnel to carry out the oversight, certification or approval process of these risk assessments.

ESARR 5 Personnel Licensing – ATCO licensing Regulatory approach has been mostly introduced in spite of scheduling problems. The regulatory approach to Air Traffic Engineers has not been introduced in many places yet as there are problems associated with pay – unpopular with ANSPs, and of the balancing of experience with formal qualifications.

ESARR 6 - Is expected to become a problem with similar issues as those raised concerning ESARR 4 risk assessments. Some ANSPs intend to use the supplier to provide the necessary safety case for any software change.

3.3 KEY ENABLERS

The following appears to have a positive influence on the introduction and maintenance of safety systems in the experience of the participants:

- A management structure that enables a top-down approach to be taken which has assigned the necessary responsibilities, provided the competence management, and ensured that all staff are aware of the way the organisation is changing and have the necessary resources.
- Safety culture is addressed as a key part of the process;
- Recognition that for most of the introduction of safety management systems legislation change is not required;
- Having a Quality Management System;
- Support from friendly “neighbours” or more mature ANSPs;
- Support from the Regulator;
- EUROCONTROL and EU focussed support programs, tools and the provision of training;
- EUROCONTROL Guidance and Regional workshops;
- EUROCONTROL ESIMS audits;
- The ability of the aviation Regulator to implement their own law on the basis of ICAO, EUROCONTROL or JAA/EASA regulations and standards.

3.4 KEY SAFETY CONCERNS

The most common worries expressed by the participants concern dealing with interfaces and smaller units. ANSPs are concerned about the perceived lower safety standards especially at Regional Airports or adjacent non-ECAC States. Several participants point at the lower standard of equipment and associated managements systems of the military services provider in their State, especially where the military provide ATS to civil aviation.

3.5 RECOMMENDATIONS

3.5.1 Close any gaps between ESP and the 2007 Survey

EUROCONTROL should evaluate this report and establish whether there are any gaps between the findings of the report requiring remedial action and the areas targeted for improvement in the European Safety Programme for ATM (ESP).

3.5.2 Address the few “stalled” States

EUROCONTROL should review its current support strategy with regard to the few stalled States which have not made any improvement in maturity in the last year.

3.5.3 Ensure Military providers aim for the same standards

EUROCONTROL should investigate and define appropriate remedial action for claims from some ECAC State ANSPs that where military services are provided for civil aviation ATM, the equipment in use or the ATM processes applied are not compliant with current civil aviation standards and regulations.

3.5.4 Provision of guidance for TLS development

A majority of States feel that some form of guidance on the development of TLS would be useful, as this is not well understood by both ANSPs and Regulators.

3.5.5 Find solutions for small airport ATM organisations

Many regional airports, typically as the destination of new low-cost carrier services, are experiencing continuing high-growth. These airports usually have ATM services that can be classified as “small businesses”, which have repeatedly been identified (in these surveys) as being the ATM organisations that will have the most problems in implementing ESARRs. EUROCONTROL should consider the development of small business SMS development as a priority.

3.5.6 Ensure SES has the desired outcome for European ATM Safety

The impact of the SES implementation is very broad on all ATM organisations, and the safety management aspect is a sub-set of it. Many decisions will be made on a commercial basis which, at the time they were made, may have a less than obvious impact upon ATM safety. EUROCONTROL should continue to stress the importance of adopting formal change management processes to all decisions relating to the provision and regulation of ATM service.

3.5.7 Harmonise practices

Ensure that harmonised practices are achieved across ECAC and that assessment criteria are interpreted in such a manner that NSA's across ECAC will produce equivalent judgements regarding their State’s maturity level. Possible solutions include peer review of NSA practices, independent review of NSA, detailed guidance and training for NSA's, evidence based assessments instead of self reporting.

Appendices

Appendix 1 SURVEY METHODOLOGY

A1.1 SURVEY METHODOLOGY

A1.1.1 Introduction

Three factors have determined the approach:

- The methodology used in previous surveys in 2002, 2004 and 2006 for the SSAP maturity surveys was considered to be a practical approach that quickly delivered a comprehensive overview of the status of ATM safety mechanisms within each ECAC State;
- The requirement was to obtain and provide data such that a comparison could be made with the three SSAP surveys' situation in order to judge whether improvements were made;
- Any additional requirements should not affect the comparability of the present survey with previous studies.

These factors mandated an approach that was similar to the one used in the previous studies. During the 2007 survey some minor changes were made to questions to make them also suitable for ICAO to use in a survey, but there was no change of the intent of the question.

As a result, the 2007 review of ATM safety management was undertaken in the same manner as in the previous studies through the collection and analysis of data and information elicited from ANSPs, Regulators and User groups within the ECAC region.

A1.1.2 Study areas

In order to meet the survey objectives defined in Section 1.2 of the main report, the overall status of ATM safety management has been assessed through the review of a number of key elements of safety management (or "Study Areas"). These areas correspond with those specified in TRS170-05 Technical Specs, Sections 2.1 and 2.2. For the purpose of this survey, we created for each Study Area a clear underlying definition that acts as a sub-objective for the project. It is linked directly to both the quantitative and/or qualitative results.

The Study Areas, and a description of what would constitute a mature situation concerning systematic safety framework, are given below. In line with the previous studies, these Study Areas have been labelled "A" areas and "B" areas. This distinction is to identify that "A" areas are concerned with the safety mechanisms currently found to be in place within ECAC and "B" areas seek to identify issues related to the future situation with regards to safety in ECAC.

In 2004 we added two new Study areas which have been maintained also in 2006 and 2007. These are areas A10 and B8; both relate to Public access to ATM safety performance information and were added in the scope of the 2004 survey.

Following a post project review in 2006, it was decided that Study Area A8 was actually a sub-set of Study Area A3, and so was not addressed in this survey.

ESP ATM Safety Survey		
No	**TRS Study Areas**	**Maturity is when:**
A1	States' Safety Capability	There is a civil aviation policy and management structure at State level that has the capability to accomodate new international standards and applicable legislation into national law. The State defines a safety management program and promotes the implementation of safety management systems that are compliant with the relevant international standards.
A2	The collection and dissemination of incident data	There is a well-established structure in place for collecting and recording incident data, analysing and acting on the results of the analysis.
A3	Safety Performance Measurement	The Safety Performance is known and based on an active system of monitoring using suitable safety indicators such as safety occurrences as well as pro-active monitoring processes e.g. audits, surveys and inspections etc.
A4	Promotion of best practice	There is an established system that gathers information on best practice, evaluates its applicability to different situations and disseminates the information.
A5	Organisational structures for safety	There is a formal system for the management of safety that has a clear management structure with unambiguously defined responsibilities and accountabilities.
A6	Current safety rules and procedures	Within the safety management system there are well-defined and accessible standard operating procedures (SOPs) that are known to staff and regularly reviewed and maintained.
A7	Current Safety Culture	There is a positive safety culture that is driven by the management in ensuring that all staff are aware of and believe in the organisation's shared beliefs, assumptions and values regarding operational safety. There is support for staff and promotion of an active safety climate for the reporting of incidents and the improvement of safety.
A8	Current achieved safety performance - deleted	This has been combined with Study Area A3.
A9	Current perceived safety levels	Internal and external stakeholders perceive the level of aviation and ATM safety as adequate.
A10	Disclosure of safety information	The general public and stakeholders have easy access to the performance of their ANSP through routine publication of achieved safety levels, incidents reports and overviews of improvement actions. All such information is neutralised (i.e. names are not included) to promote a just culture and the controls on the release if information is compliant with the requirements of ICAO annex 13 attachment E.
B1	The implementation of SMS	There is an awareness of the need to operate a formal system to manage safety including its future development.
B2	Timely compliance with international obligations	There is an awareness of the implications of the international obligations related to safety in ATM in particular SES legislation, ICAO SARPS, ESARRs and the requirement to implement them within each State by a known deadline date is achieved.

Table A1 - Survey question areas explored in questionnaire and interview.

Study Areas A1 to B2 inclusive listed in Table A1 above were explored both by means of a questionnaire with closed response to each question and by open questions during a telephone interview. Study Areas B3 to B8 inclusive listed in the table below were explored by means of open questions, both in the questionnaires and in the telephone follow-up.

ESP ATM Safety Survey		
No	**TRS Study Areas**	**Maturity is when:**
B3	Identification of specific safety programmes within States that address national safety issues.	ATM Safety programmes are primarily driven by Regulations from ICAO and EUROCONTROL, in particular SES legislation, ICAO SARPS, & ESARRs. This Study Area sought to identify which programmes a State was pursuing above the regulatory minimum.
B4	Describe the current situation with regards to issues affecting the implementation of legislation.	Both positive and negative factors can affect the implementation and application of SES legislation, ICAO SARPS, & ESARRs.. This Study Area sought to identify these factors.
B5	Identify potential weaknesses in the safety of air navigation that warrant special or immediate attention.	Potential weaknesses could be anything that leads to repeated safety deviations, a lack of compliance with mandatory safety procedures or flaws or omissions in safety programmes.
B6	Identify the current safety concerns of the airspace users representative bodies.	This Study Area was addressed to user groups and sought to identify either the perceptual or the actual concerns of these groups.
B7	Identify current safety concerns of the Air Traffic Controller's representative bodies.	This Study Area was addressed to the Air Traffic Controller's representative bodies and sought to identify either the perceptual or the actual concerns of these bodies.
B8	Establish the position regarding whether or not the State's ATM safety indicators should be published annually to demonstrate that agreed targets are achieved?	The publication of ATM safety indicators with an aim of showing progress to the general public is supported by the ATM Industry and their stakeholders and any obstacles to openess of information have been resolved. This study area takes stock of the opinion regarding openess of ATM safety information and of any obstacles, solutions and progress that has been reported.

Table A2 - Survey question areas explored during interview.

A1.2 DETAILS OF THE APPROACH

A1.2.1 Link with the technical scope of work

The adopted methodology was designed to take account of a number of essential issues:

- Each Study Area was clearly defined as described in Section 2.1.2;
- The questionnaires were designed to answer questions relating to the Study Areas;
- The questionnaire was as concise as possible and the questions were mapped onto the Study Areas and objectives. Each question provided information on more than one Study Area;
- Consolidating replies from the Study Areas and across respondents allowed an opinion to be formed on the ATM safety maturity levels of ECAC States as a whole. Similarly, the maturity of selected groups of States could be studied.

A1.2.2 Respondent workload and validation

The ANSP and Regulator questionnaires were pre-completed using the most up to date LCIP 2006-2010 (and a few newly available 2007-2011) and any available other information for each State. The purpose of this was four-fold:

- To provide a mechanism for internal pilot testing of the questionnaires and to enable review and refinement of the questionnaires prior to issue;
- To ensure that participants would receive a positive feedback from earlier information they may have provided within the scope of EUROCONTROL's monitoring of the Local Convergence and Implementation Plans (LCIP) and the monitoring mechanisms;
- To ease the burden on respondents such that they simply had to check, edit and return the questionnaire; and
- To provide the basis for a limited form of validation (in conjunction with the telephone interviews) of responses provided by the survey interviewees.

The interviews were structured to obtain as much feedback as possible on safety related issues. The interviews were used to explore and validate respondents' answers on the questionnaire. In a small number of cases, it was agreed that responses should be revised and questionnaires were re-submitted.

A1.2.3 Targeting groups of respondents

Three respondent groups were defined: ANSPs, Regulators and Users. EUROCONTROL provided the ESP COMMS Plan contact list, which served as the master contact list for the survey. To ensure an appropriate level of importance would be allocated to the survey, EUROCONTROL's Director General sent a letter announcing the survey to all Director General's of Civil Aviation before the questionnaires were released. In each State one person within the ANSP and one within the Regulator were contacted. To ensure that all other people usually involved in contacts between States and EUROCONTROL were made aware of the survey activity, copy letters were sent to a further ~100 managers and senior officials. All communication with the target respondents was via email and telephone.

Where possible at the ANSPs and the Regulators, only respondents who had completed the questionnaire were interviewed. A limited number of participants received a more detailed

question set after the first questionnaire as they had indicated that they would prefer to respond to written questions to ensure that language would not become an obstacle during an interview.

A1.2.4 Analysis of the feedback

Analysis of the questionnaire feedback was built up as a statistical process with clearly defined logical links between the questions, mapping of the questions to the objectives and weighting of the questions within each Study Area.

Quantitative results were compared to the original survey objective, and to the results of the telephone interviews.

Qualitative and anecdotal comments were used in combination with the quantitative results in formulating the conclusions.

A1.3 METHODOLOGY FLOWCHART

The process of the implementation of the methodology is presented below.

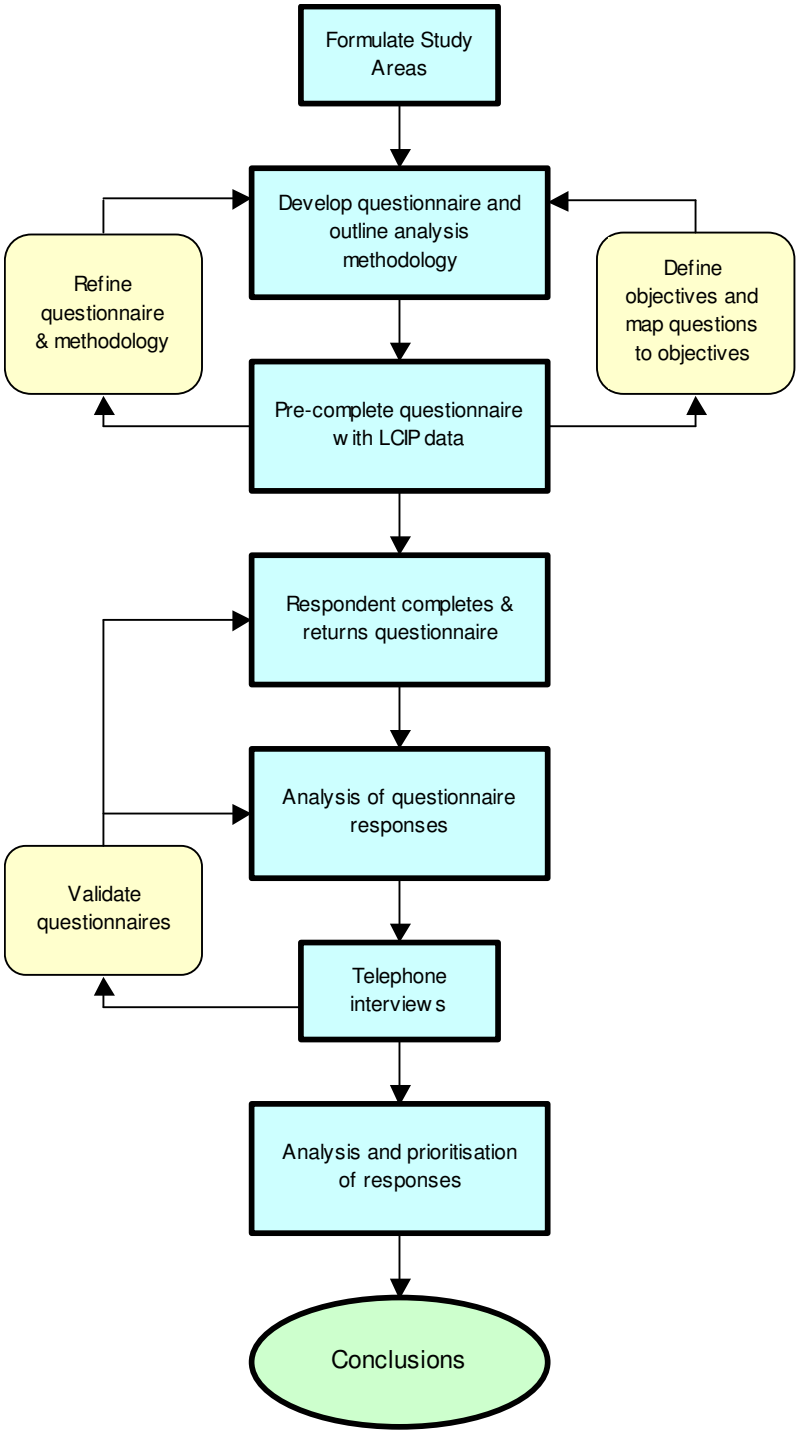


Figure A3 – The Methodology Flowchart

A1.4 INPUT-OUTPUT DOMAIN OF THE SURVEY

A1.4.1 Structure of the questionnaires

Different questionnaires were used for the Regulator, ANSP and User groups. The questionnaires used similar questions and were mapped across to the same Study Areas. The mapping used multiple questions to address each of the Study Areas as shown in para. A1.1.2. The questions were weighted on a scale of 0 to 5 to reflect the different contribution that each of the questions made to the particular objective being considered in each Study Area with a weighting of 0 giving no contribution and 5 giving the largest contribution.

The questionnaires had a graded scale of responses that corresponded to five categories of safety maturity. These categories were:

Category	Meaning
Initial	We are beginning the process; no specific actions are in place or planned.
Planned	A process has been planned and approved but little action has been taken.
Developing	Developments are underway but not completed.
Mature	The process is complete and will continue to be updated when required.
No Response	Unable or unwilling to answer this question.

Table A3 – Questionnaire Maturity categories

These categories were designed so that, using the specimen answers provided, the Regulator and service provider in each State could give the most appropriate graded answer to each question. By analysing the responses to a whole series of questions we were able to obtain an indication of the maturity in each Study Area. The answers from all respondents provided an indicative profile for that objective across all ECAC States.

A1.4.2 Structure of the telephone interviews

Whereas the questionnaires had been designed to generate almost a snap-shot picture of the current situation with regard to ATM safety mechanisms throughout ECAC, the telephone interviews were designed to generate as many issues as possible that influence the further development of organisational safety arrangements within ANSPs. A set of specific topics in question form was also produced to ensure that relevant information for other EUROCONTROL studies was also obtained.

We began by confirming the identity and role of the interviewee, to be followed with a brief explanation of the purpose of the interview. The language used during the interview (in most cases English was used but in some French, Spanish or Dutch were used in part or in whole), the structure of the interview and its expected duration were also explained and agreed before starting.

The interview would roughly follow the structure of the questionnaire the respondent had already completed. Open questions would be asked to stimulate the interviewee to elaborate on why a certain position in terms of maturity had been chosen (e.g." What made you decide that your organisation is in a …… stage of maturity?"); what sorts of issues were holding back further development (e.g." What sorts of things are holding up the further development of your organisation in this area?") And, in some cases, what issues or circumstances had helped the organisation to progress towards maturity (e.g." You reported to be in category "A" two years ago and now you are reporting to be in "D". How did you manage to make so much progress in this area?").

The essentials of the conversation were reported back by the interviewer at each stage to check that the message had been well understood (e.g." So, what you are telling us here is that....") and these essentials were captured in a hand-written document. None of the conversations were recorded by electronic means to allow interviewees to speak freely.

Without exception the interviewees participated in an open and constructive manner. They volunteered a lot of information that could be considered as sensitive and that would have been impossible to obtain in a written format.

A1.4.3 Structure of the results

The data from the survey can be grouped under two principal headings:

- Quantitative data developed from an analysis of replies provided by respondents;
- Qualitative data from the telephone interviews.

The data can also been grouped by the three survey groups of:

- ANSPs;
- Regulators;
- Users. (Data obtained from this group were not analysed statistically as it only represented a small sample).

A1.5 QUANTITATIVE ASSESSMENT METHODOLOGY

A1.5.1 Methodology introduction

A number of different approaches have been implemented in order to quantitatively assess the questionnaire responses. These approaches have been developed in order to elicit different types of information regarding the current status of safety management within the ECAC States. These methods are now described in turn.

Under this method, the performance of each State with regard to safety management is quantitatively assessed within each of the Study Areas through a normalised scoring system, such that a percentage score (i.e. a score from 0 to 100) is calculated for each State within each Study Area. The scoring system takes account of the fact that the various questions associated with each Study Area have different levels of significance. This is achieved through the application of weighting factors. Once the scores have been calculated, the States are then classified as being in the “Slow Starter”, “Active Developer” and “Continuous Improver” categories.

These categories are also described in more detail in the main report section 2.1.2.

This enables the percentage of ECAC States in each of the safety development level classifications to be identified, hence providing a picture of the level of safety management development of States within the ECAC region.

In addition, by taking the average score across all the Study Areas, the overall performance of the States can be estimated.

The precise details of the development of the scoring system are presented in the following sections.

A1.5.2 Question mapping and weighting system

A number of different approaches have been implemented in order to quantitatively assess the questionnaire responses. These approaches have been developed in order to elicit different types of information regarding the current status of safety management within the ECAC States. These methods are based on the mapping of the questionnaire questions with the 11 Study Areas. Under this mapping, subsets of questions are associated with each Study Area (each question may be associated with one or more Study Areas).

Additionally, within each Study Area the various associated questions will typically have differing levels of significance to that Area. For example, a response in the “planned” category is of greater concern if the question is critical to the Study Area than it would be if the question were of moderate importance to that Study Area. This variation of importance is handled numerically through the use of weighting factors. The mapping of the questions to the Study Areas and the associated weighting factors are presented in Tables A1 and A2 for the Regulator and Table A3 and A4 for the ANSP questionnaire questions respectively. In these tables, a blank cell indicates that there is no association between the particular question and Study Area.

	Regulator Questions
1.	Does your State have an efficient legislative process that enables the development of compliance with International standards, regulations, directives for aviation safety?
2.	Are the Regulatory and Operational functions of ATC clearly separated in your State?
3.	Has your State put in place an effective Regulatory framework for ANSP's?
4.	Have ATM safety targets been established in your State?
5.	As a Regulator do you believe ANSPs in your State have effective safety policies?
6.	Do you think that ANSPs have an effective structure for the management of safety?
7.	Do ANSP's in your State have a formal Safety Management Systems (SMS)?
8.	How well established are safety related reporting system in your State?
9.	Do you regularly review ATM safety indicators for your State?
10.	How widely is ANSP safety related performance information disseminated?
11.	How widely is ANSP safety related performance information made available to the public?
12.	How well is the implementation of compliant arrangements with International regulations, directives or standards for aviation safety progressing in your State?
13.	Do you think that there are safety issues that need to be urgently addressed by ICAO and/or EUROCONTROL?
14.	With respect to the management of safety, how do you feel your State's ANSP organisation(s) rank(s) when compared to ANSP's in other ICAO States?
15.	Do you perceive there are significant differences in the level of implementation and achieved safety level between En-route ANSP's, Airport ANSP's and/or Military ANSP's in your State (Yes/No)?
16.	Are there any issues that are delaying your State's implementation plans for International regulations, directives or standards for aviation safety requirements (Yes/No)?
17.	Is your State undertaking any ANSP related safety programmes not detailed in the State's LCIP or other sub-regional programme (Yes/No)?
18.	Does your organisation think that the current level of public access to ANSP performance information is appropriate (Yes/No)?

Table A4 - Regulator question set

REGULATOR WEIGHTINGS TABLE												
Quest	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2
1	5	2	3	2	4	4	2	0	2	0	4	5
2	0	1	0	2	5	0	0	0	0	0	1	0
3	1	3	3	2	4	5	2	0	3	0	4	4
4	2	3	4	1	2	2	2	0	4	0	2	3
5	2	2	2	4	3	4	4	0	4	0	3	3
6	3	2	3	4	5	3	3	0	3	0	5	4
7	2	3	4	4	4	4	3	0	3	0	5	4
8	2	5	4	3	2	2	3	0	3	0	5	5
9	0	2	5	3	1	2	3	0	4	0	3	3
10	1	5	3	3	1	2	3	0	4	3	2	1
11	0	0	0	0	0	0	0	0	0	5	0	0
12	3	3	3	3	3	3	3	0	3	0	4	5
13	0	0	0	0	0	0	0	0	0	0	0	0
14	1	2	3	3	3	3	3	0	3	0	3	3

Table A5 – Regulator Questionnaire mappings and weighting Factors

Note that question 11 was new for the 2004 survey and relates to public access to ATM safety information. Question 13 does not map onto any of the survey areas and therefore has a mapping score of zero throughout. Before the 2007 survey, the questions were reviewed and reworded as necessary to retain the original meaning but to enable them to be used in an ICAO survey, as shown above. The weightings were also reviewed and very slight amendments made.

	ANSP Questions
1.	**Does your State have an efficient legislative process that enables the development of compliance with International standards, regulations, or directives for aviation safety?**
2.	**Are the Regulatory and Operational functions of ATC clearly separated in your State?**
3.	**Has your State put in place an effective Regulatory framework for ANSP's?**
4.	**Have Safety targets been established?**
5.	**Does your Organisation have a Safety Policy?**
6.	**How is safety managed within your organisation?**
7.	**What is the Status of Safety Management Systems within your Organisation?**
8.	**How are safety procedures produced, maintained and applied within your organisation?**
9.	**Do you define safety indicators for your system?**
10.	**How do you establish the achieved levels of Safety within your organisation?**
11.	**How well established is your safety related reporting system?**
12.	**Do you share safety related information with other parties?**
13.	**How widely is ANSP safety related performance information made available to the public?**
14.	**How do you carry out safety assessment for changes and modifications to the system?**
15.	**How well is the implementation of compliance with International regulations, directives or standards for aviation safety progressing in your organisation?**
16.	**How do you feel your Organisation ranks with respect to the management of ATM safety when compared to other ICAO States?**

17.	**Do you think that there are safety issues that need to be urgently addressed by ICAO and/or EUROCONTROL?**
18.	**Are there issues which are delaying your implementation plans for compliance with International regulations, directives or standards for aviation safety (Yes/No)?**
19.	**Do you have safety programmes not detailed in your LCIP or other sub-regional programmes (Yes/No)?**
20.	**Does your organisation think that the current level of public access to ANSP performance information is appropriate (Yes/No)?**

Table A6 – ANSP Questions set

ANSP WEIGHTINGS TABLE												
Quest	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2
1	4	2	3	2	3	2	2	0	2	0	3	4
2	2	0	2	2	4	0	3	0	1	0	2	3
3	1	3	4	1	4	5	1	0	4	0	4	4
4	2	1	4	1	1	2	2	0	3	0	2	3
5	3	0	1	4	2	2	3	0	2	0	5	3
6	0	3	3	3	5	3	3	0	3	0	4	3
7	1	2	3	3	4	4	4	0	3	0	5	3
8	2	2	3	3	3	5	3	0	0	0	3	3
9	1	3	5	1	1	1	2	0	3	0	3	3
10	0	3	5	2	0	2	2	0	2	0	3	1
11	2	5	4	2	1	3	4	0	2	0	2	3
12	1	3	1	4	1	2	4	0	3	3	3	2
13	0	0	0	0	0	0	0	0	0	5	0	0
14	2	0	1	2	2	4	2	0	3	0	3	2
15	3	1	3	4	3	3	3	0	2	0	3	5
16	1	2	3	4	3	2	3	0	3	0	2	2
17	0	0	0	0	0	0	0	0	0	0	0	0

Table A7 – ANSP Questionnaire mappings and weighting Factors

Note that ANSP question 13 was introduced in 2004 and relates to public access to ATM safety information. Question 17 does not map directly onto any of the survey areas and therefore has a mapping score of zero throughout.

Before the 2007 survey, the questions were reviewed and reworded as necessary to retain the original meaning but to enable them also to be used in an ICAO survey, as shown above.

Broadly, three types of analysis are undertaken:

- Maturity scoring;
- Un-weighted classification;
- Weighted classification.

These are described in the following sections.

A1.5.3 Maturity scoring system

Under this method, the performance of each State with regard to safety management is quantitatively assessed within each of the Study Areas through a normalised scoring system such that a percentage score (i.e. a score from 0 to 100) is calculated for each State within each Study Area. The scoring system takes account of the fact that the various questions associated with each Study Area have different levels of significance. This is achieved through the application of weighting factors. Once the scores have been calculated, the States are then classified according to their score as being either “Slow Starter”, “Active Developer” or “Continuous Improver” categories..

This enables the percentage of ECAC States in each of the safety development level classifications to be identified, hence providing a picture of the level of safety management development of States within the ECAC region.

In addition, by taking the average score across all the Study Areas, the overall performance of the State can be estimated.

Before the 2007 survey the weightings were also reviewed and very slight amendments made.

A1.5.4 Implementation details

Mathematically, the maturity score is calculated from the questionnaire responses and the assumed weighted factors as follows:

$$S_{i,j} = \frac{100\sum_{k=1}^{n_{i,j}} r_{k,j,i} \cdot w_{k,j}}{3\sum_{k=1}^{n_{i,j}} w_{k,j}}$$

Where:
$S_{i,j}$ is the maturity score for State i in Study Area j.
$r_{k,j,i}$ is the numeric value of the response of State i to question k in Study Area j (“Slow Starter” response has a value of 0, “Planned” a value of 1, “Developing” a value of 2, and “Mature” a value of 3)
$w_{k,j}$ is the weight factor of question k to Study Area j
$n_{i,j}$ is the number of questions in Study Area j for which non-nil responses were provided by the State i.

An overall score for each State is then also estimated by taking the average of the scores over all Study Areas.

A1.6 LINKAGE OF OBJECTIVES, RESULTS AND CONCLUSIONS

Throughout the survey much attention has been paid to maintaining logical links between the objectives, the quantitative and qualitative assessment of responses and the conclusions. These links underline the credibility of the conclusions and provide traceability.

In this survey, the linkages and validation of the observations have been established in a number of ways:

The design of the 2007 questionnaires was tested in two iterative loops:

- From the survey requirements defined in TRS 170-05, objectives were defined and compared with those already used during the previous studies;
- Where necessary, new Study Areas were formulated. New and existing questions were mapped to these new Study Areas.

There was a team review to assess the changes compared to the previous questionnaires and the suitability of the retained questions and survey areas for release in 2007. Some minor changes were made to the draft questionnaire before it was released, relating to its use also by ICAO and no change to question context was made.

The telephone interviews were linked to the questionnaires and were used in part to validate the responses in the questionnaires.

The telephone interviews were focused on obtaining information on issues that would affect a State's ability to develop its ATM safety mechanisms (both positive and negative). These issues were recorded in a searchable Interview Repository and provided input for the conclusions for each Study Area.

A1.7 PRESENTATION OF RESULTS

The results are presented as a series of graphs and bar charts showing the percentage of responses and/or States within each level of maturity for each of the Study Areas. The results from all previous surveys in 2002 and 2006 are included for comparison (2004 was not included to reduce the scatter of the combined graphs). In the results section of this report, charts are presented for each of the twelve Study Areas. There are normalised line graphs for each Study Area for all participating States and State specific graphs so that the movement of maturity for each State can be monitored. In each case there are two graphs (one for the Regulator, one for the Service Provider).

Each graph is supported by:

- A brief comment on the results that highlight the main points of comparisons;
- Comments from the interviews that highlight issues raised by participants.

In addition to the charts, comments are provided on the remaining six Study Areas in which broader, more open, questions were asked.

Appendix 2 Example Questionnaires

A2.1 EXAMPLE QUESTIONNAIRES

A2.1.1 The Regulatory questionnaire

OVERVIEW OF ATM SAFETY

State		2007 Regulatory Questionnaire	
Name of Organisation		Name and Job Title of Respondent	

#	Categorisation	A Initial	(Dbl click)	B Planned	(Dbl click)	C Developing	(Dbl click)	D Mature	(Dbl click)	E No Response	(Dbl click)	Comments
1	**Does your State have an efficient legislative process that enables the development of compliance with International standards, regulations, directives for aviation safety ?**	There is little capability to address large changes to State legislation, we are still at the basic ICAO compliance level.		State legislation supports the further development of international standards, regulations, directives for aviation safety requirements and there are plans to amend it to take account of them.		State legislation is being prepared and we already have provisions in place which we believe are compliant with most international standards, regulations, directives for aviation safety.		State regulation has enabled the implementation of international standards, regulations, directives for aviation safety requirements and we apply these in full.		We are not able or willing to answer this question.		
2	**Are the Regulatory and Operational functions of ATC clearly separated in your State?**	We see no need to separate these functions.		We understand the need to separate the Regulatory and Operational functions but this has not yet been achieved.		The Regulatory and Operational functions are separate but ultimately report eventually to the same level of the State's government.		The Regulatory and Operational functions are separate and completely independently managed.		We are not able or willing to answer this question.		
3	**Has your State put in place an effective Regulatory framework for ANSP's?**	There is no dedicated Regulatory framework for the ANSP function and we have no dedicated resources to provide the Regulatory oversight.		We have a Regulatory framework that addresses the ANSP function in some detail but no dedicated resources to administer the oversight.		We have a developed Regulatory framework in place that addresses the ANSP function but do not have enough competent staff to administer the oversight effectively.		We have a developed Regulatory framework in place that addresses the ANSP function and sufficient competent staff and other resources to administer the oversight effectively.		We are not able or willing to answer this question.		
4	**Have ATM safety targets been established in your State?**	We have no formal safety targets that apply to our ATM operations.		Qualitative targets for all or parts of the ATM system have been established.		Quantitative and qualitative targets have been established for parts of the ATM system only.		We are reviewing ANSP performance against the quantitative and qualitative targets that have been established for both the overall ATM system and for individual systems and functions.		We are not able or willing to answer this question.		
5	**As a Regulator do you believe ANSPs in your State have effective safety policies?**	We know of no current intention to develop or publish a safety policy.		Policies are being discussed but have not yet been approved.		The policy exists but is not widely publicised.		The Policy is well developed and externally published.		We are not able or willing to answer this question.		
6	**Do you think that ANSPs have an effective structure for the management of safety?**	There is no formal structure for the management of safety.		Safety is a secondary responsibility of operational or engineering line managers.		There are separate safety functions within operational and engineering areas.		They have a developed management structure reporting independently to the Senior Management level.		We are not able or willing to answer this question.		

7	**Do ANSP's in your State have a formal Safety Management Systems (SMS)?**	We know of no plans for a SMS at this time.		There are plans for the introduction of an SMS but they are not yet implemented.		The ANSP's SMS('s) has/have been designed and implemented but is not yet mature.		The ANSP's SMS('s) is/are well established.		We are not able or willing to answer this question.		
8	**How well established are safety related reporting system in your State?**	We are developing a reporting system but we are experiencing difficulties.		We have a mandatory system but we don't believe we have the full confidence of reporters and our reporting levels are low.		We have a mandatory system which is well respected and non-punitive except in cases of culpable negligence.		We have both a mandatory and voluntary reporting system which we believe captures 90%+ of safety occurrences.		We are not able or willing to answer this question.		
9	**Do you regularly review ATM safety indicators for your State?**	We have no current plans to review safety indicators.		We plan to introduce a review process of ATM safety indicators but are unsure of how to proceed.		Yes we review some indicators but they are not available across all units in the ANSP.		Yes, we regularly review ATM safety indicators with the ANSP for equipment, procedures and people performance in our State.		We are not able or willing to answer this question.		
10	**How widely is ANSP safety related performance information disseminated?**	Safety performance information is not made available to third parties.		Safety performance information is made available only to selected third parties.		Safety performance information is made available to third parties on request only.		Safety performance information is openly and freely available to all parties.		We are not able or willing to answer this question.		
11	**How widely is ANSP safety related performance information made available to the public?**	Safety performance information is not made available to the public.		A limited amount of Safety performance information is made available only to selected public bodies.		Safety performance information is made available to the public on request only.		Safety performance information is openly and freely available to the public, and is regularly issued (e.g. on the internet, etc.)		We are not able or willing to answer this question.		
12	**How well is the implementation of compliant arrangements with International regulations, directives or standards for aviation safety progressing in your State?**	Progress has been slow and we do not think we can meet the deadlines.		For the most part we are making progress but we have difficulty in some areas.		Good progress is being made and we will probably meet all the deadlines that were agreed on a National level.		We have a well defined National Programme and we have been fully compliant with all of the requirements by the required dates.		We are not able or willing to answer this question.		
13	**Do you think that there are safety issues that need to be urgently addressed by ICAO and/or EUROCONTROL?**	Our local safety issues will be resolved without the involvement of ICAO and/or EUROCONTROL.		The mechanisms to make ICAO and/or EUROCONTROL aware of our safety problems are too weak.		Some issues are being addressed but there needs to be more specific focus on safety.		All the major issues that need to be addressed are already covered by formal Programmes.		We are not able or willing to answer this question.		
14	**With respect to the management of safety, how do you feel your State's ANSP organisation(s) rank(s) when compared to ANSP's in other ICAO States?**	We recognise that there are deficiencies in our ANSP's safety management systems that need to be addressed.		Our ANSP's are developing our safety management systems but we are behind other States.		Our ANSP's are developing our safety management systems well but we are not yet amongst the leaders.		Our ANSP's are amongst the leaders and few States if any have better safety management systems.		We are not able or willing to answer this question.		
15	**Do you perceive there are significant differences in the level of implementation and achieved safety level between En-route ANSP's, Airport ANSP's and/or Military ANSP's in your State (Yes/No)?**		**If so, please specify?**							We are not able or willing to answer this question.		
16	**Are there any issues that are delaying your State's implementation plans for International regulations, directives or standards for aviation safety requirements (Yes/No)?**		**If so what are they?**							We are not able or willing to answer this question.		

17	Is your State undertaking any ANSP related safety programmes not detailed in the State's LCIP or other sub-regional programme (Yes/No)?		If so what issues do they address?		We are not able or willing to answer this question.		
18	Does your organisation think that the current level of public access to ANSP performance information is appropriate (Yes/No)?		If no, what level of access do you consider to be appropriate?		We are not able or willing to answer this question.		

To complete this survey, we would like to obtain further clarification from you in a brief telephone interview. The interview takes around 45 minutes and aims to obtain your organisation's views on such issues as: obstacles that need to be resolved, best-practices in use, suggestions for further improvements or any actions you would like EUROCONTROL, ICAO, or other parties to undertake. Could you please complete the text in the box on the below to confirm whether you, or your representative, will be available for the telephone interview?			
Yes, please contact me on the following telephone number(s):		Name and position of contact person, if different from questionnaire respondent above:	
Please call us on one of the following dates & times within the next 3 weeks:		ESR Technology, please confirm the appointment by email to:	

Signed: Print name: Position or Role: Date, place:	

THE ANSP QUESTIONNAIRE

ESR Technology — Engineering, Safety & Risk

OVERVIEW OF ATM SAFETY

EUROCONTROL

State		2007 Service Provider Questionnaire	
Name of Organisation		Name and Job Title of Respondent	

		A		B		C		D		E		
#	*Categorisation*	*Initial*	(Dbl click)	*Planned*	(Dbl click)	*Developing*	(Dbl click)	*Mature*	(Dbl click)	*No Response*	(Dbl click)	Comments
1	**Does your State have an efficient legislative process that enables the development of compliance with International standards, regulations, or directives for aviation safety ?**	There is little capability to address large changes to State legislation, we are still at the basic ICAO compliance level.		State legislation supports the further development of international standards, regulations or directives for aviation safety requirements and there are plans to amend it to take account of them.		State legislation is being prepared and we already have provisions in place which we believe are compliant with International standards, regulations, directives for aviation safety.		State regulation has enabled the implementation of international standards, regulations, directives for aviation safety requirements and we apply these in full.		We are not able or willing to answer this question.		
2	**Are the Regulatory and Operational functions of ATC clearly separated in your State?**	We see no need to separate these functions.		We understand the need to separate the Regulatory and Operational functions but this has not yet been achieved.		The Regulatory and Operational functions are separate but report eventually to the same level within the State's Government.		The Regulatory and Operational functions are entirely separate and independent.		We are not able or willing to answer this question.		
3	**Has your State put in place an effective Regulatory framework for ANSP's?**	There is no dedicated Regulatory framework for the ANSP function and there appears to be no dedicated resource to provide the Regulatory oversight.		There is a Regulatory framework that addresses the ANSP function in some detail but there appears to be no dedicated resource to administer the oversight.		There is a developed Regulatory framework in place that addresses the ANSP function but it appears to be too under-resourced to administer the oversight effectively.		There is a developed Regulatory framework in place that addresses the ANSP function with sufficient competent staff and other resources to administer the oversight effectively.		We are not able or willing to answer this question.		
4	**Have Safety targets been established?**	We have no formal safety targets that apply to our ATM operations.		Qualitative targets have been established for overall ATM operations only.		Quantitative and qualitative targets have been established for overall ATM operations only.		We are monitoring the quantitative and qualitative targets that have been established for both the overall ATM system and individual systems and functions.		We are not able or willing to answer this question.		
5	**Does your Organisation have a Safety Policy?**	There is no current intention to develop or publish a safety policy.		We intend to develop a policy but this is not in place yet.		The policy has been developed and is used internally but not widely publicised.		The Policy is well developed, externally published and known to all staff.		We are not able or willing to answer this question.		
6	**How is safety managed within your organisation?**	There is no formal structure for the management of safety.		Safety is a secondary responsibility of operational or engineering line managers.		We have a separate safety function within our operational and engineering functions.		We have a well developed management structure that reports independently to the Senior Management level.		We are not able or willing to answer this question.		
7	**What is the Status of Safety Management Systems within your Organisation?**	We have no plans for a SMS at this time.		We have plans for a System but it is not yet implemented.		The System has been designed and implemented but is not yet mature.		The SMS is well established and has been in use for some time.		We are not able or willing to answer this question.		

8	**How are safety procedures produced, maintained and applied within your organisation?**	We have no specific safety procedures that are not part of our operations manual.		We have a few procedures but no current plans to develop a safety management manual.		We have some procedures in place but the system is not fully developed and the manual is incomplete.		We have a safety management manual which details the procedures and gives guidance on meeting national and international standards.		We are not able or willing to answer this question.		
9	**Do you define safety indicators for your system?**	We have no current plans to introduce safety indicators.		We plan to define safety indicators but are unsure of how to proceed.		Yes, we have some indicators defined but they are not in use in all units.		Yes, indicators are defined and regularly reviewed for equipment, procedures and people performance.		We are not able or willing to answer this question.		
10	**How do you establish the achieved levels of Safety within your organisation?**	We have no quantified and validated data.		We have started to implement some systems but do not yet have sufficient data.		We have reporting systems and follow up as many reports as our resources allow.		We have a well developed and validated, reporting, safety survey and auditing program.		We are not able or willing to answer this question.		
11	**How well established is your safety related reporting system?**	We are developing a reporting system.		We have a reporting system but we don't believe we have the full confidence of reporters and our reporting levels are low.		We have a reporting system which is well respected and non-punitive except in cases of culpable negligence.		We have a reporting system which we believe captures 90%+ of safety occurrences.		We are not able or willing to answer this question.		
12	**Do you share safety related information with other parties?**	We hold all data as confidential information and have no plans to release it in any way.		We share data internally but do not believe there are sufficient safeguards to sharing data more widely.		We share data internally and nationally and with international bodies when it is required by regulation.		We freely share all data internally, nationally and with approved international bodies.		We are not able or willing to answer this question.		
13	**How widely is ANSP safety related performance information made available to the public?**	Safety performance information is not made available to the public.		A limited amount of Safety performance information is made available only to selected public bodies.		Safety performance information is made available to the public on request only.		Safety performance information is openly and freely available to the public, and is regularly issued (e.g. on the internet, etc.)		We are not able or willing to answer this question.		
14	**How do you carry out safety assessment for changes and modifications to the system?**	We have no formal assessment methods but we think our systems are safe.		We design and develop our systems to recognised standards to ensure they are safe.		We carry out risk assessment only on systems that are safety critical.		We have quantified safety levels and no equipment is introduced or procedures changed without a full safety assessment.		We are not able or willing to answer this question.		
15	**How well is the implementation of compliance with International regulations, directives or standards for aviation safety progressing in your organisation?**	Progress has been slow and we do not think we can meet the deadlines.		For the most part we are making progress but we have difficulty in some areas.		We are making good progress and will probably meet all the deadlines that were agreed on a National level.		We have a well defined National Programme and we were fully compliant by the required dates.		We are not able or willing to answer this question.		
16	**How do you feel your Organisation ranks with respect to the management of ATM safety when compared to other ICAO States?**	We recognise that there are deficiencies in our system that need to be addressed.		We are developing our systems but we are behind other countries.		We are developing our systems well but we are not yet amongst the leaders.		We are amongst the leaders and few States if any have better Safety Management Systems.		We are not able or willing to answer this question.		
17	**Do you think that there are safety issues that need to be urgently addressed by ICAO and/or EUROCONTROL?**	Our local safety issues will be resolved without the involvement of ICAO and/or EUROCONTROL.		The mechanisms to make ICAO and/or EUROCONTROL aware of our safety problems are too weak.		Some issues are being addressed but there needs to be more specific focus on safety.		All the major issues that need to be addressed are already covered by formal Programmes.		We are not able or willing to answer this question.		

18	**Are there issues which are delaying your implementation plans for compliance with International regulations, directives or standards for aviation safety (Yes/No)?**		**If so what are they?**		We are not able or willing to answer this question.		
19	**Do you have safety programmes not detailed in your LCIP or other sub-regional programmes (Yes/No)?**		**If so what issues do they address?**		We are not able or willing to answer this question.		
20	**Does your organisation think that the current level of public access to ANSP performance information is appropriate (Yes/No)?**		**If no, what level of access do you consider to be appropriate?**		We are not able or willing to answer this question.		

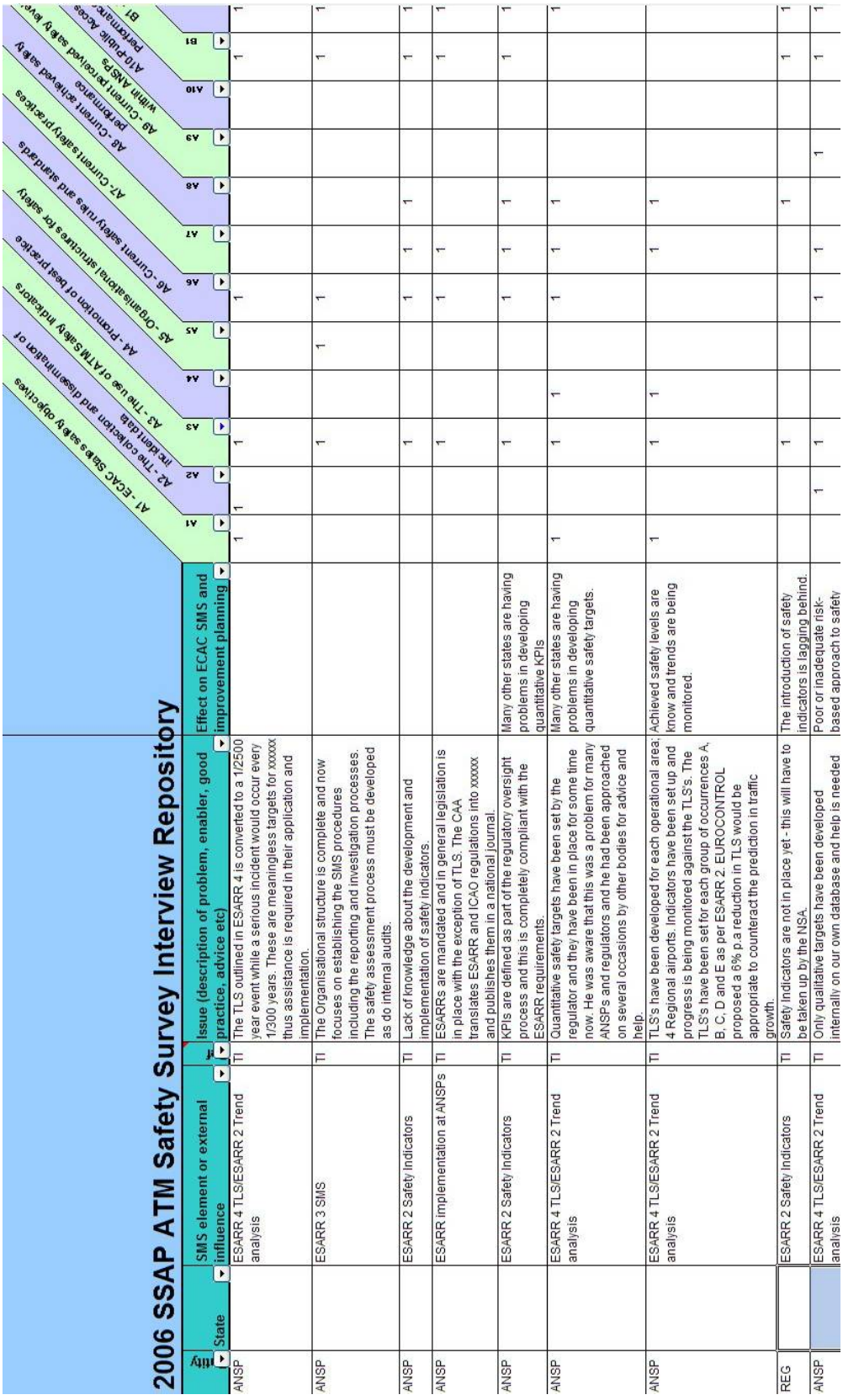
To complete this survey, we would like to obtain further clarification from you in a brief telephone interview. The interview takes around 45 minutes and aims to obtain your organisation's views on such issues as: obstacles that need to be resolved, best-practices in use, suggestions for further improvements or any actions you would like EUROCONTROL or other parties to undertake. Could you please complete the text in the box on the below to confirm whether you, or your representative, will be available for the telephone interview?

Yes, please contact me on the following telephone number(s),		**Name and position of contact person, if different from questionnaire respondent above:**	
Please call us on one of the following dates & times within the next 3 weeks:		**ESR Technology, please confirm the appointment by email to:**	

Signed:	
Print name:	
Position or Role	
Date, place:	

Appendix 3 Interview Repository

A3.1 THE INTERVIEW REPOSITORY FORMAT

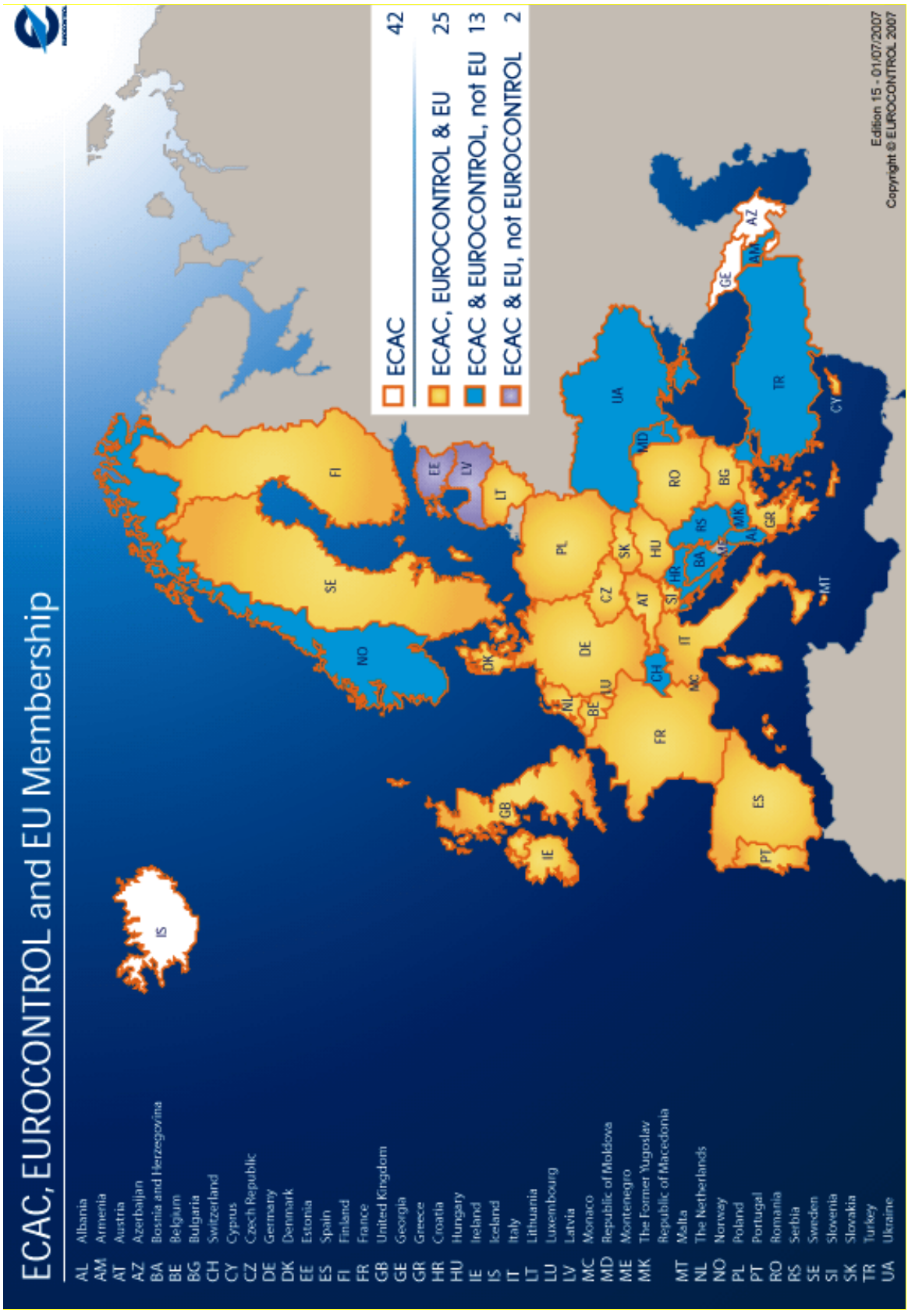


2006 SSAP ATM Safety Survey Interview Repository

Entity	State	SMS element or external influence	TI	Issue (description of problem, enabler, good practice, advice etc)	Effect on ECAC SMS and improvement planning	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1
						A1 - ECAC State's safety objectives	A2 - The collection and dissemination of	A3 - The use of ATM Safety Indicators	A4 - Promotion of best practice	A5 - Organisational structures for safety	A6 - Current safety rules and standards	A7- Current safety practices	A8 - Current achieved safety performance	A9 - Current perceived safety within ANSPs	A10 -Public Access	B1 -
ANSP		ESARR 4 TLS/ESARR 2 Trend analysis	TI	The TLS outlined in ESARR 4 is converted to a 1/2500 year event while a serious incident would occur every 1/300 years. These are meaningless targets for xxxxx thus assistance is required in their application and implementation.		1	1	1		1	1				1	1
ANSP		ESARR 3 SMS	TI	The Organisational structure is complete and now focuses on establishing the SMS procedures including the reporting and investigation processes. The safety assessment process must be developed as do internal audits.				1		1	1				1	1
ANSP		ESARR 2 Safety Indicators	TI	Lack of knowledge about the development and implementation of safety indicators.				1			1	1	1			1
ANSP		ESARR implementation at ANSPs	TI	ESARRs are mandated and in general legislation is in place with the exception of TLS. The CAA translates ESARR and ICAO regulations into xxxxxx and publishes them in a national journal.				1			1	1				1
ANSP		ESARR 2 Safety Indicators	TI	KPIs are defined as part of the regulatory oversight process and this is completely compliant with the ESARR requirements.	Many other states are having problems in developing quantitative KPIs			1			1	1	1			1
ANSP		ESARR 4 TLS/ESARR 2 Trend analysis	TI	Quantitative safety targets have been set by the regulator and they have been in place for some time now. He was aware that this was a problem for many ANSPs and regulators and he had been approached on several occasions by other bodies for advice and help.	Many other states are having problems in developing quantitative safety targets.	1		1	1		1	1	1			1
ANSP		ESARR 4 TLS/ESARR 2 Trend analysis	TI	TLS's have been developed for each operational area. 4 Regional airports. Indicators have been set up and progress is being monitored against the TLS's. The TLS's have been set for each group of occurrences A, B, C, D and E as per ESARR 2. EUROCONTROL proposed a 6% p.a reduction in TLS would be appropriate to counteract the prediction in traffic growth.	Achieved safety levels are know and trends are being monitored.	1		1	1			1	1			
REG		ESARR 2 Safety Indicators	TI	Safety Indicators are not in place yet - this will have to be taken up by the NSA.	The introduction of safety indicators is lagging behind.			1					1			1
ANSP		ESARR 4 TLS/ESARR 2 Trend analysis	TI	Only qualitative targets have been developed internally on our own database and help is needed	Poor or inadequate risk-based approach to safety		1	1			1	1		1		1

Appendix 4 Map of ECAC States

A4.1 MAP OF ECAC STATES



Appendix 5 Participation 2007

A5.1 STATE PARTICIPATION 2007

	Interview Completed	
	ANSP	REG
Albania	Yes	Yes
Armenia	Yes	No
Austria	Yes	Yes
Azerbaijan	Yes	No
Belgium	Yes	Yes
Bosnia & Herzegovina	Yes	Yes
Bulgaria	Yes	Yes
Croatia State FP	Yes	No
Cyprus	Yes	Yes
Czech Republic	Yes	No
Denmark	Yes	Yes
Estonia	Yes	Yes
Finland	Yes	Yes
France	Yes	Yes
Macedonia (FYROM)	No	Yes
Germany	Yes	Yes
Georgia	Yes	No
Greece	Yes	Yes
Hungary	Yes	Yes
Iceland	No	Yes
Ireland	Yes	Yes
Italy	Yes	Yes
Latvia	Yes	Yes
Lithuania State FP	No	Yes
Luxembourg	Yes	No
Maastricht UACC	Yes	Yes
Malta	Yes	No
Moldova	Yes	No
Monaco	Yes	Yes
Netherlands	Yes	Yes
Norway	Yes	Yes
Poland	Yes	Yes
Portugal	Yes	Yes
Romania	Yes	Yes
Serbia & Montenegro	Yes	Yes
Slovak Republic	Yes	Yes
Slovenia	Yes	Yes
Spain	Yes	Yes
Sweden	Yes	Yes
Switzerland	Yes	Yes
Turkey	Yes	No
Ukraine	No	Yes
United Kingdom	Yes	Yes
Totals	39	34

Table A8 - State's participation

A5.2 STAKEHOLDER PARTICIPATION 2007

ATM User Safety Survey - 2007 Participation	Questionnaire	Interview
AEA		
ATCEUC		
IATA	X	X
ICAO		
IFALPA		
IFATCA	X	X
Totals	6	6
Returns	2	33%
Interviews	2	33%

Table A9 - Stakeholder participation

Appendix 6 Glossary

A6.1 GLOSSARY

Acronym or Term	Meaning
AAIO	Aircraft Accident Investigation Organisation
AGAS	High-level European Action Group for ATM Safety. The AGAS activity has now been superseded by the SSAP.
AIB	Accident Investigation Board
AAIB	Air Accident Investigation Board
AirProx	Report to authorities by pilot or ATCO when separation standards have been compromised
ANSP (or ASP)	Air Navigation Services Provider. This is the operational organisation delivering service to airspace users.
APP	Approach
ARP	Future Arrangements and Regulatory Processes Task Force
ASRO	The EUROCONTROL Agency Safety Regulatory Oversight Unit
ASATC	Aviation Safety and Air Traffic Control Project. The main objective of the ASATC II project is to adapt air traffic and aviation conditions in the five CARDS countries to those in the rest of Europe, thus paving the way for the timely implementation of the Single European Sky.
AST	Annual Summary Template
ATCEUC	Air Traffic Control European Unions Co-ordination, a European body representing 16 independent Air Traffic Controller unions.
ATCO	Air Traffic Control Officer
ATM	Air Traffic Management
ATS	Air Traffic Service
ATSEP	Air Traffic Safety Electronic Personnel
BHDCA	Bosnia Herzegovina Directorate of Civil Aviation
CAA	Civil Aviation Authority
CAAct	Civil Aviation Act
CAD	Civil Aviation Department
CARDS	Community Assistance for Reconstruction Development and Stabilisation
CEATS	Central European Air traffic Services
Confident Adopters	Defined in the 2002 report as: Confident Adopters. These States typically introduced SMS more than five years ago. They are confident risk assessors and understand their safety requirements. Following review of the data in 2002, Confident Adopters were identified as having a maturity score of 70% or higher. This definition been maintained during all surveys even though some of the common issues reported by this group have changed.

COTS	Commercial Off The Shelf, often used in procurement specifications for ATM equipment.
CRs	Single European Sky Regulations of the European Community
DG	Director General
DGAC	Director General of Civil Aviation (Spain)
EASA	European Aviation Safety Agency
EC	European Commission
ECAC	European Civil Aviation Conference
ECCAIRS	European Co-ordination Centre for Aviation Incident Reporting Systems Hazards (ECCAIRS).
ESARR	EUROCONTROL Safety Regulatory Requirement
ESIMs	ESARR Implementation Monitoring and Support (ESIMS) Programme.
ESP	European Safety Programme for ATM
EU	European Union
FAB	Functional Airspace Blocks
FIR	Flight Information Region
FoI	Freedom of Information Act
GAT	General Air Traffic
High Growth States	High-growth States are defined as having an average annual growth greater than 4.3% p.a.
IATA	International Air Transport Association, a professional body established by the world's airlines.
ICAO	International Civil Aviation Organisation, a special United Nations division tasked with fostering safe and efficient international civil air transport.
IFATCA	International Federation of Air Traffic Controller's Associations.
IFR	Instrument Flight Rules
JAA	Joint Aviation Authority
LCIP	Local Convergence Implementation Plan
Just Culture	Not subjecting the reporter of an ATM incident to criminal prosecution. (It may be protection except in the case of a violation (complete disregard of the rules/procedures) or criminal negligence.)
KPI	Key Performance Indicator
MATIAS	new Hungarian ATC System (MATIAS)
MoT	Ministry of Transport
NANIP	National Airspace Modernisation Project
NSA	National Aviation Safety Authority
NTSB	National Transportation Safety Board
OAT	Operational Air Traffic
OII	Office for Incident Investigation
OJT	On the Job Trainer/Training
QAD	Quality and Data Analysis department (France)
QRA	Quantitative Risk Assessment
Regulator	Regulator, often the National Civil Aviation

	Authority.
RVSM	Reduced Vertical Separation Minima
Safety Culture	The safety culture of an organisation is the product of individual and group values, attitudes, perceptions, competences and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organisation's health and safety management.
SAForum	EUROCONTROL's web-based Safety Forum launched by the Safety Enhancement Business Division
SASI	Support to ANSP Safety Management System Implementation
SATCA	Sistema de Automatización del Tráfico Aéreo en España
SEE-FABA	South East Europe Functional Airspace Blocks Approach Project
SES	Single European Sky
SESIS	Single European Sky Implementation Support Project
SISG	Safety Improvement Sub Group
SLoA	Supplementary Letter of Agreement
Small States	Small States were defined as less than 500,000 forecast IFR flights in 2012.
SMM	Safety Managaement Manual
SMS	Safety Management System
SMU	Safety Management Unit
SRC	Safety Regulation Commission
SRU	Safety Regulation Unit
SSAP	Strategic Safety Action Plan, a safety improvement project co-ordinated by EUROCONROL.
TLS	Target Level of Safety
TMA	Terminal Control Areas – in particular here a EUROCONTROL project investigating the Restructuring of the Budapest TMA
TOKAI	Tool Kit for ATM Occurrence Investigation
VFR	Visual Flight Rules
User	Users and stakeholders of the Air Navigation Services Providers. This group include representatives from the airlines, the Air Traffic Controller organisations, and ICAO.