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2010/2011 ICAO EUR Region ATM Safety Framework Maturity Survey Report

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ABSTRACT
This Report summarises the findings of the 2010/2011 ICAO EUR Region ATM Safety Framework Maturity Survey.

KEYWORDS			
ANSP	Safety Maturity	Assessment	SES
Regulator	Coordination	Roles and Responsibilities	Common requirements
NSA	Safety Regulation	Safety Management	Critical Elements
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DOCUMENT APPROVAL

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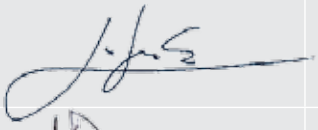
Head of Oversight Division DSS	Juan VAZQUEZ-SANZ 	
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Commission Regulation (EU) No 691/2010 lays down a performance scheme for air navigation services and network functions within EU. In addition the remaining ICAO EUR and AFI regions Member States are adopting similar principles through ICAO SSP/ S<S requirements. Overall those frameworks set out the necessary measures to improve the overall performance and to monitor such improvements.

European Union-wide targets have been established and will be monitored using Key Performance Indicators (KPI) in four areas:

- Safety;
- Environment;
- Capacity; and
- Cost-efficiency.

Note that there will be no EU-wide safety targets for the first reference period (2012-2014).

The first national or Functional Airspace Block (FAB) safety KPI is to be the effectiveness of safety management as measured by a methodology based on the ATM Safety Maturity Survey Framework. This document summarises the findings of the 2010 survey, the first comprehensive use of the methodology in this form.

The methodology for Regulators is aligned with the ICAO's 8 Critical Elements and with ESIMS Strategic Steps. Specifically the aims are to:

- Determine the level of ATM Safety Regulatory Oversight within the industry;
- Determine the extent to which learning is transferred across the industry;
- Establish a path along which ATM Regulatory Authorities can focus their activities for continuous improvement.

As this is the first comprehensive use of the current methodologies after their redevelopment by EUROCONTROL SAFREP TF during 2007-2009, the specific objective for this year is to establish a baseline from which progress can be monitored.

53 States, plus Maastricht UAC, from across the ICAO EUR Region were invited to participate. Of those 85% of ANSPs and 77% of Regulators returned questionnaire. Over 90% of organisations who returned a questionnaire also agreed to be interviewed and provide further information to support their written response.

The mean Safety Maturity Score for ANSPs within the SES States is 68.6%, compared with 60.8% for those outside of the region, giving an overall mean score of 67.4%. 28 ANSPs in the ICAO EUR Region are at Maturity Level 2 or below.

The mean Safety Maturity Score for Regulators within the SES States is 50.2%, compared with 39.4% for those outside of the region, giving an overall mean score of 49.0%. 39 Regulators in the ICAO EUR Region are at Maturity Level 2 or below.

The average Maturity Score considering the average percentage for participating organisations within the SES region are shown in Figure E1.

It is important to note that the organisations are ordered independently on the two categories by score, therefore there is no correspondence between a certain ANSP position and the REG one.

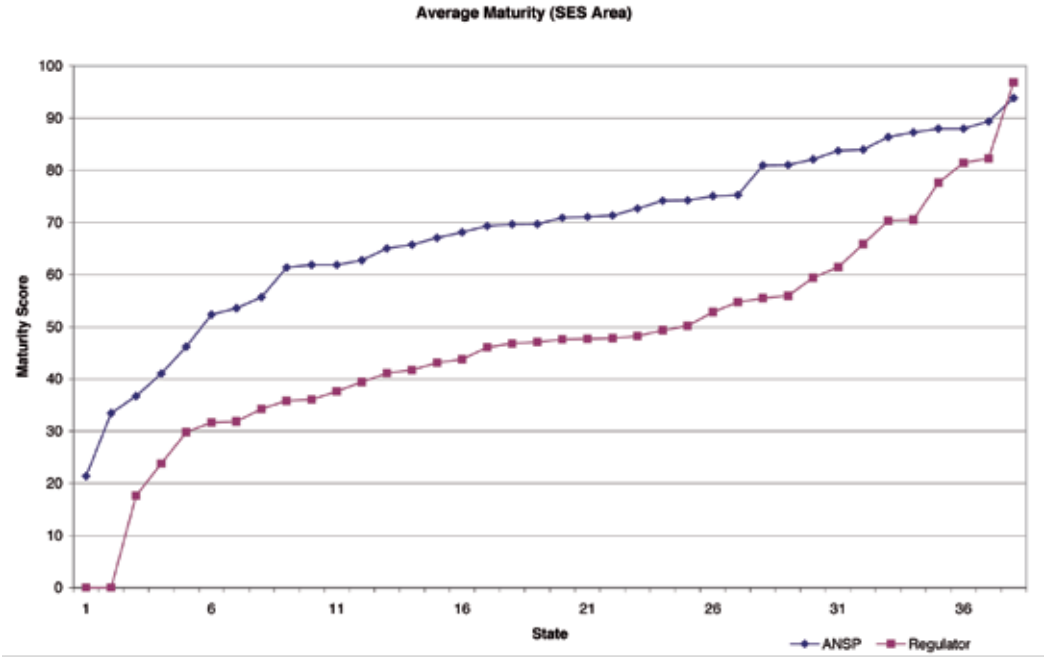

Figure E1: Average Maturity for ANSPs and Regulators

Based on the response category for each question, the graphs below show what are the minimum levels at which questions are answered for each organisation, the overall score and how many questions are still at that respective minimum level. In other words, this could be seen as the number of gaps the organisation has to sort out before moving to the next level.

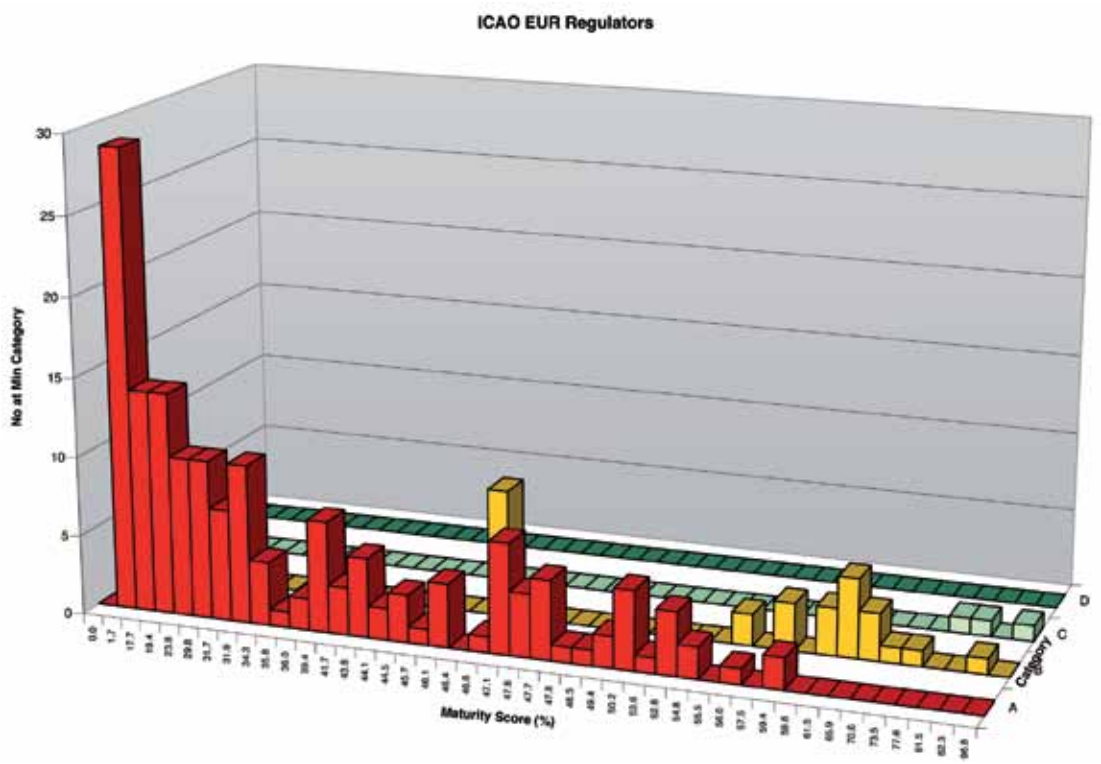

Figure E2: Minimum Responses and the Effect on Maturity for Regulators

EXECUTIVE SUMMARY

In contrast, the ANSP distribution shows a certain clustering towards the lower end of the score scale, but also another quite significant clustering towards the mid-range of the maturity score scale. Also, there are significantly more organisations having their minimum level at Level 3, even though their overall score is not the highest. Interestingly, four out of the top 5 ANSPs still have one or two gaps at level 2, although their score is quite high. This demonstrates that organisations can reach a high degree of overall maturity but still have significant problems in specific, punctual areas, which points to the need for detailed data and analyses to eliminate all such weaknesses.

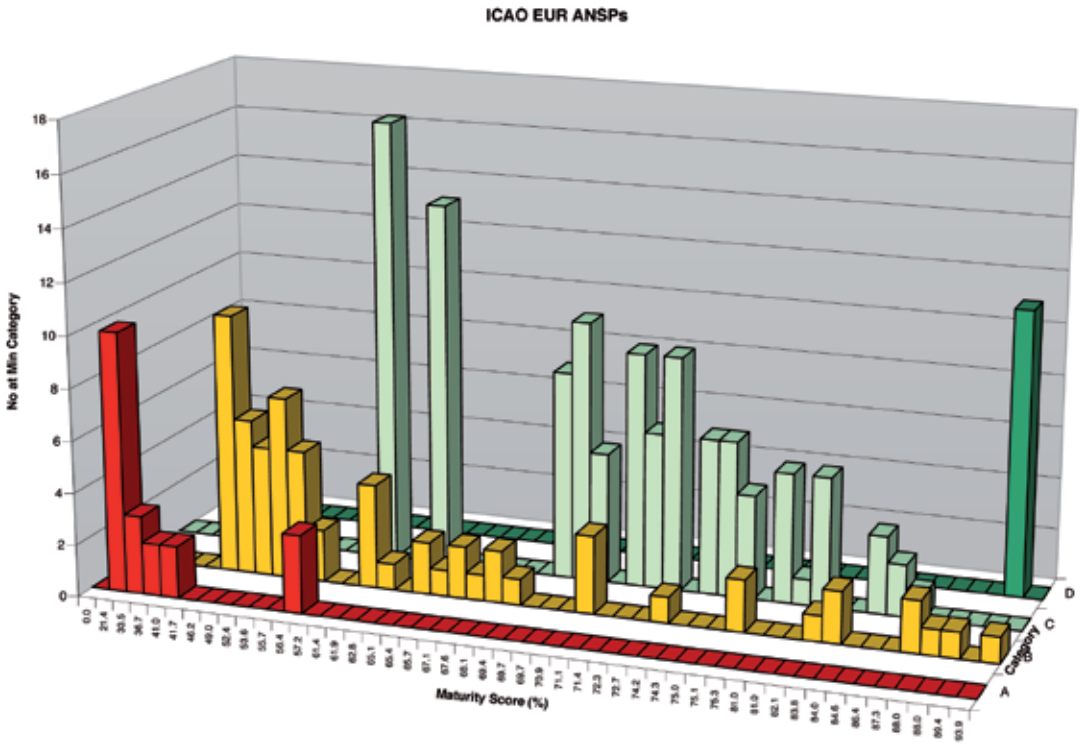

Figure E3: Minimum Responses and the Effect on Maturity for ANSPs

The range of Maturity Scores seen in each Study Area is presented below.

ANSPs

Study Area	Maturity		
	Minimum	Average	Maximum
SA1 – Safety Culture	22.0	67.1	94.2
SA2 – Organisational and Individual Safety Responsibilities	21.7	68.7	95.3
SA3 – Timely Compliance with International Obligations	26.5	71.8	95.6
SA4 – Safety Achievement	20.9	69.0	93.6
SA5 – Competency	22.0	67.1	94.2
SA6 – Risk Management	18.8	67.9	92.9
SA7 – Safety Interfaces	19.9	65.5	93.4
SA8 – Safety Assurance	22.2	68.6	93.2
SA9 – Safety Performance Monitoring	20.9	67.9	92.1
SA10 – Organisational Safety Surveys and SMS Audits	19.8	67.3	92.8
SA11 – Adoption and Sharing of Best Practices	20.6	68.0	95.0

Regulators

Study Area	Maturity		
	Minimum	Average	Maximum
SA1 – State Safety Framework	16.4	53.3	97.2
SA2 – Safety Resources	18.2	51.9	97.1
SA3 – Safety Interfaces	17.9	50.4	96.2
SA4 – Safety Reporting, Investigation and Improvement	19.0	49.8	96.7
SA5 – Safety Performance Monitoring	16.8	49.5	95.9
SA6 – Implementation of Safety Oversight	18.6	52.4	97.2
SA7 – Adoption and Sharing of Best Practice	16.8	47.6	97.6
SA8 – Safety Culture	15.7	47.0	96.7
SA9 – Resolution of Safety Deficiencies and Concerns	19.6	51.2	97.0

EXECUTIVE SUMMARY

Key Findings

- Organisations are very supportive of the survey and frequently use it as an integral part of their own review and planning process.
- The introduction of Functional Airspace Blocks was seen, by ANSPs and Regulators alike, as a very positive step. The cooperation already taking place is helping weaker organisations to improve faster than they would otherwise be able to.
- There is a shortage of suitably qualified and experienced staff, which is affecting Regulators in particular.
- There appear to be a group of 'mature' States who are marking themselves based on a deep understanding of where they are and even where they would like to be. This generated quite a broad range of responses to survey questions reflecting a good understanding of their own strengths and weaknesses.
- A second group appear to mark themselves based on where they believe they should be, or would like to be, even if the exact requirements specified in the Maturity Category definitions of each Study Objective are not always met fully. This will be indicative of less mature organisations, regardless of their final scores, but such situations are practically always detected, at the latest at the interview stage. Such organisations were often required to change their scores to reflect reality.
- Statistically there is no distinction between the Safety Maturity profile of SES States and the Safety Maturity profile of those in the broader ICAO EUR Region.

CHAPTER 1 - INTRODUCTION

1.1 Background

In 2002 EUROCONTROL commissioned an independent survey of ECAC States' ATM Safety Regulators and Air Navigation Service Providers (ANSPs), to identify how well ATM safety requirements were being met. The objective was to provide a reference point for future development and measurement. In particular the survey sought to identify areas that would provide the most benefit if States and Service Providers were given support to enable them to meet the necessary requirements. These surveys were not audits, but provide an overview of how regulators and service providers saw their own system development.

The 2002 survey proved an extremely useful tool in understanding how well State Regulators and ANSPs thought they were implementing ATM Safety Requirements and it clearly identified the areas where support was required. It was therefore decided by the EUROCONTROL Provisional Council to continue this form of measurement.

Further surveys were therefore conducted in 2004, 2006 - 2009 with the 2002 study being used as the benchmark against which the later studies were compared. Reports have been published for the ECAC area since 2002 and from 2007 an additional report has been published for the whole ICAO EUR Region.

Commission Regulation (EU) No 691/2010 lays down a performance scheme for air navigation services and network functions within EU. In addition the remaining ICAO EUR and AFI regions Member States are adopting similar principles through ICAO SSP/ SMS requirements. Overall those frameworks set out the necessary measures to improve the overall performance and to monitor such improvements.

European Union-wide targets have been established and will be monitored using Key Performance Indicators (KPI) in four areas:

- Safety;
- Environment;
- Capacity; and
- Cost-efficiency.

While there are no EU-wide safety targets required for the first reference period (2012-2014), within the SAFREP TF of EUROCONTROL, a number of ANSPs, also in coordination with CANSO, have agreed to set voluntary targets applicable at ANSP and/or FAB level.

The first national or Functional Airspace Block (FAB) safety KPI is to be the effectiveness of safety management as measured by a methodology based on the ATM Safety Maturity Survey Framework. This indicator will be developed jointly by the Commission, the Member States, EASA and EUROCONTROL and adopted by the Commission prior to the first Reference Period. During this time, national supervisory authorities must monitor and publish key performance indicators, and Member States may set corresponding targets.

In EUROCONTROL, at the request of the Provisional Council (PC), the Safety Data Reporting and Data Flow Task Force (SAFREP TF) developed a 'Roadmap for the Development of the Safety Key Performance Indicators in ATM'. This Roadmap was subsequently approved by the PC in November 2007. The roadmap confirmed the ATM safety framework maturity study to be a good example of a 'leading' indicator, i.e. indicators that are identified principally through the comprehensive analysis of organisations (providers, regulators, States). They are designed to help identify whether ANSPs and Regulators are taking actions or have processes that are effective in lowering risk [Ref: 1, 2 and 3].

Between 2007 – 2009 the SAFREP Task Force developed an entirely new methodology to separately measure the maturity of ANSPs and Regulators (NAAs and NSAs). The ANSP methodology is aligned with the ICAO Global Roadmap for Aviation Safety; the Regulators methodology is aligned with the ICAO 8 elements for ATM Oversight. Both CANSO and a representative group of ATM Regulators assisted the SAFREP TF in defining the methodologies, which were approved by the Provisional Council of EUROCONTROL and published in 2009 [Reference 4].

CANSO has also been instrumental in defining metrics for measuring ATM Safety Maturity, together with EUROCONTROL, FAA, NAV CANADA and Airservices Australia, and have developed a standard to assist ANSPs in the development and implementation of their Safety Management Systems (SMS) [Ref: 5]. The CANSO model is almost identical to that developed by EUROCONTROL except that it removes text specific to the Single European Sky (SES). At their Safety

Standing Committee in November 2010, CANSO adopted the current safety maturity methodology to be their global performance metric.

In 2009 a representative sample of ATM Safety regulators and ANSPs participated in a pilot study to validate the revised methodology and documentation. This report presents the first measurements over the whole ICAO EUR Region.

1.2 Survey Objectives

The Safety Framework Maturity Study establishes the extent of progress made by ANSPs with respect to the introduction of ATM safety management systems and how the SMS framework relates to safety in operations and engineering. For Regulators it assesses how well they are meeting the ICAO 8 Critical Elements for Safety Oversight.

For ANSPs, the study seeks to:

- Determine the level of SMS improvement within the industry;
- Determine the extent to which learning is transferred across the industry;
- Establish a path along which ANSPs can focus their activities for continuous improvement.

The Standard of Excellence model against which ANSPs are measured supports the clear message promoted by the ICAO Safety Management Manual [Ref 6], that achievement of the highest level of SMS maturity is a long term process that must proceed in a very deliberate step-wise manner.

The Standard of Excellence consists of a system enabler (Safety Culture) and a framework of four components and 10 elements. The structure is presented in Figure 0 1, below:

Figure 0-1: SMS Excellence Model

The methodology for Regulators is aligned with the ESIMS Strategic Steps and also ICAO's 8 Critical Elements (see Figure 0 2). Specifically the aims are to:

- Determine the level of ATM Safety Regulatory Oversight within the industry;
- Determine the extent to which learning is transferred across the industry;
- Establish a path along which ATM Regulatory Authorities can focus their activities for continuous improvement.

As this is the first comprehensive use of the current methodology, the specific objective for this year is to establish a baseline from which progress can be monitored.

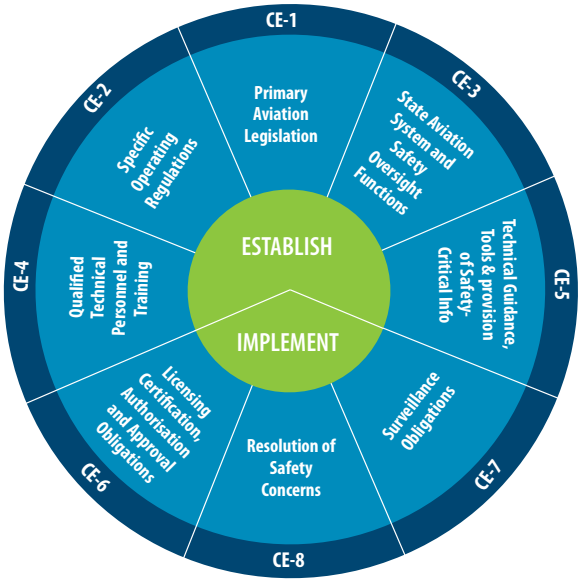

Figure 0-2: ICAO 8 Critical Elements

1.3 Study Areas

ANSPs were asked to assess themselves against 26 Study Objectives grouped into 11 Study Areas; Regulators were asked to assess themselves against 30 grouped into 9 Study Areas, see Table 0 1.

ANSP Study Areas	Regulator Study Areas
SA1 – Safety Culture	S1 - State Safety Framework
SA2 – Organisational and Individual Safety Responsibilities	S2 - Safety Resources
SA3 – Timely Compliance with International Obligations	S3 - Safety Interfaces
SA4 - Safety Achievement	S4 - Safety Reporting, Investigation and Improvement
SA5 - Competency	S5 - Safety Performance Monitoring
SA6 – Risk Management	S6 - Implementation of Safety Oversight
SA7 – Safety Interfaces	S7 - Adoption and Sharing of Best Practices
SA8 – Safety Assurance	S8 - Safety Culture
SA9 – Safety Performance Monitoring	S9 - Resolution of Safety Deficiencies and Concerns
SA10 – Organisational Safety Surveys and SMS Audits	
SA11 – Adoption and Sharing of Best Practices	

Table 0-1: Study Areas

1.4 Maturity Category, Maturity Level and Maturity Score

The questionnaire provided to ANSPs and Regulators asks them to assess their maturity against each Study Objective. They do so by selecting one of five possible responses (A – E) where:

fined as 'Initiating' – equivalent of a Level 1;

- B is defined as 'Planning/ Initial Implementation' - equivalent of a Level 2;
- C is defined as 'Implementing' - equivalent of a Level 3;
- D is defined as 'Managing & Measuring' - equivalent of a Level 4; and
- E is defined as 'Continuous Improvement' - equivalent of a Level 5.

Throughout this report we refer to the options A-E as a 'Maturity Category' or Level.

By combining the Maturity Categories/Levels assigned by organisations against each Study Objective with the mappings detailed in Appendix 4, an overall Maturity Score is derived. An overall Maturity Score (the average for score over all Study Objectives) is also calculated.

Note that a Maturity Level is also be assigned to each Study Area and is defined to be the lowest response (A – E, equivalent to Levels 1 - 5) to each Study Objective in a Study Area. An overall Maturity Level for the organisation is similarly defined to be the lowest response to any Study Objective.

CHAPTER 2 - SES STATES

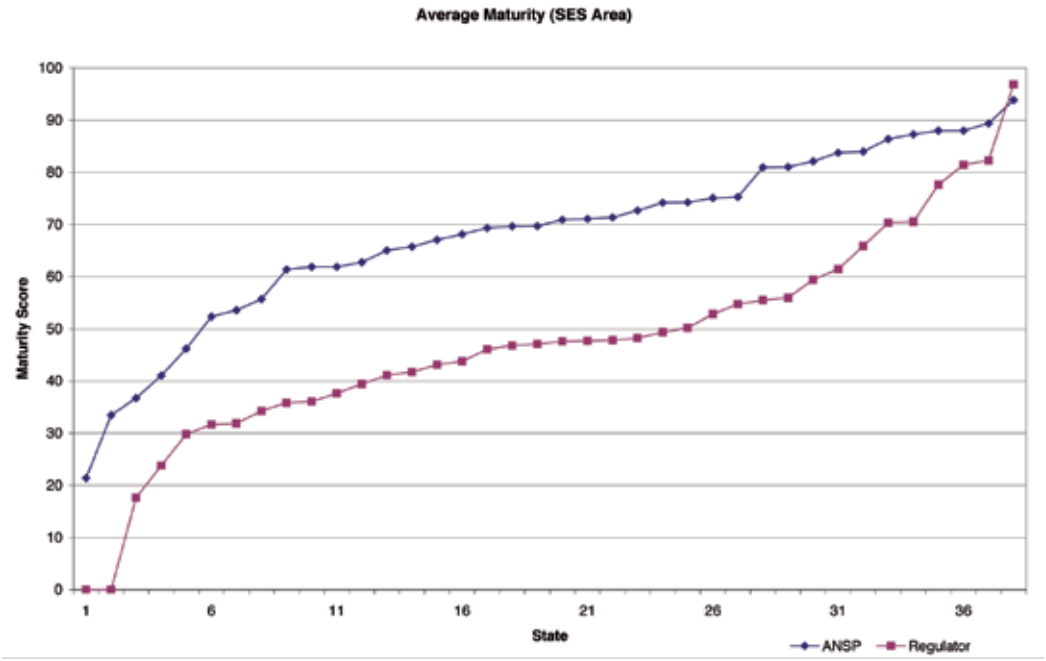

Figure 0-3: Average Maturity for ANSPs and Regulators

2.1 Regional Overview for SES States Only

All of the ANSPs, and 36/38 Regulators from the SES States[1] participated in the survey providing a comprehensive overview of the ATM Safety Framework Maturity across the region.

As with previous years, there is a clear distinction in maturity between ANSPs and Regulators, with the gap being 20% for all but the most mature organisations. Figure 0 3 shows the average maturity for ANSPs and Regulators in increasing order. (Note that the graph shows two Regulators who did not participate in the survey; however their null returns have been excluded from all other analysis.)

This is reflected in the overall maturity profile shown in Figure 0 4 which clearly shows that over 70% of Regulators believe they are at Maturity Level 1, whilst 87% of ANSPs rate themselves at Level 2 or 3. This discrepancy results from 26 Regulators responding with Category A to at least one question, compared with only four ANSPs.

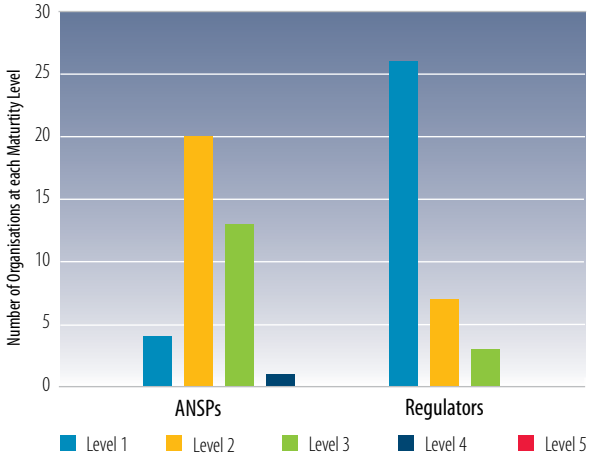

Figure 0-4: Profile of Maturity Levels

If we compare ANSPs and Regulators within the same State (Figure 0 5), unsurprisingly we find that the vast majority of ANSPs assess their safety maturity to be higher than their corresponding Regulator.

[1] Appendix 4 - Participation identifies if States are SES States or not

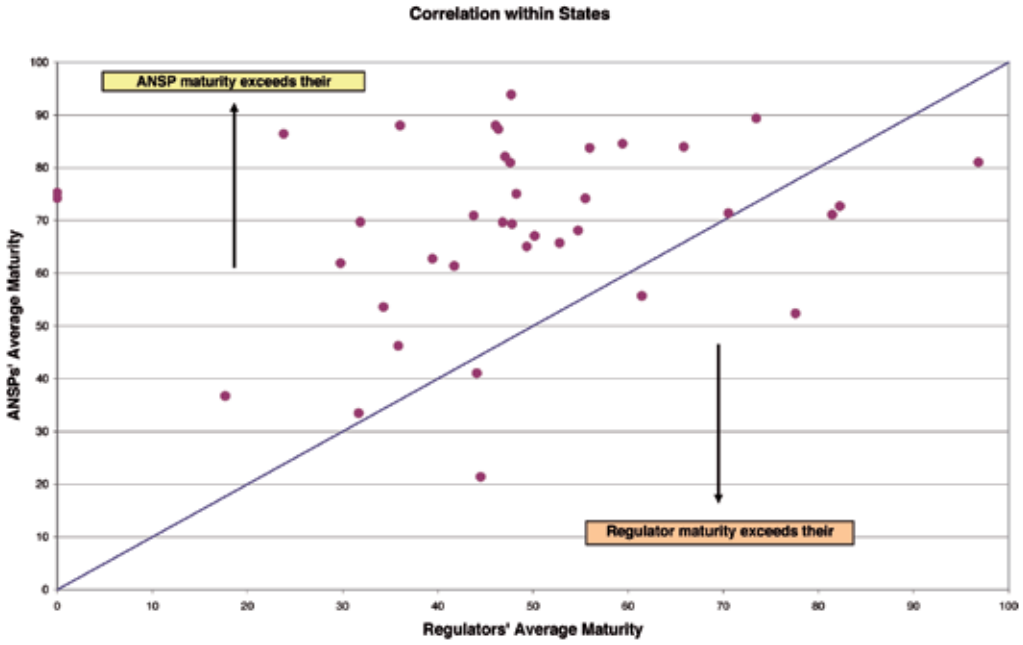

Figure 0-5: Correlation between Regulators and ANSPs within a State

In broad terms then, Regulators are either more conservative than their counterparts or in need of greater assistance to bring them up to the same level of maturity.

Generally both ANSPs and Regulators feel that the introduction of Functional Airspace Blocks is a positive step, and one that promotes the sharing of ideas and information between members. Some less mature organisations report that they have been given access to the information (e.g. systems, processes and procedures) by more mature (typically larger) FAB members. This is helping them to improve faster than they might otherwise have been able to. Additionally some organisations have been singled out during the interviews as providing wider support (e.g. by hosting exchange visits with States not in their FAB) which was very much appreciated by the visitors.

2.2 ANSP Survey Findings - SES States Only

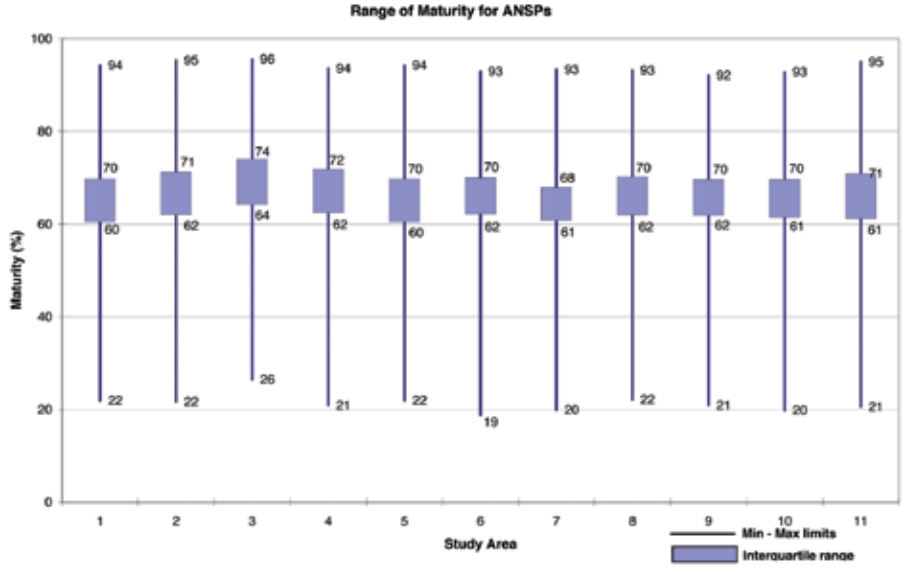

Figure 0-6: Range of Maturity for ANSPs

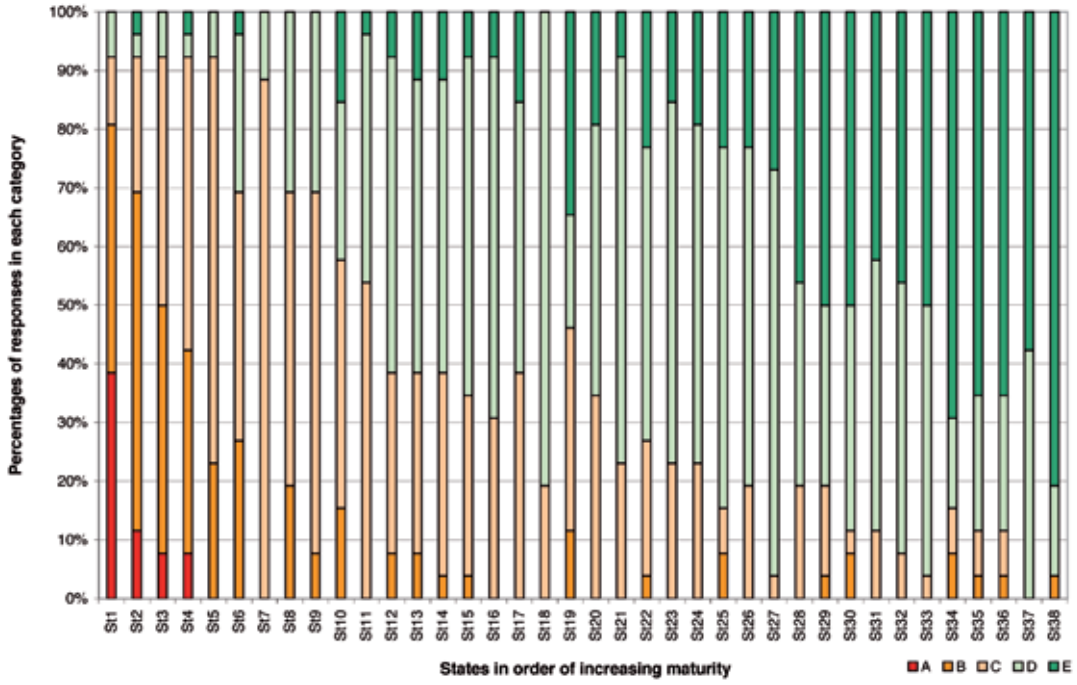

Figure 0-7: Percentage of Answers in each Maturity Category

2.2.1 Key Findings

ANSPs see international cooperation, whether through the mechanisms of the Functional Airspace Blocks or regional groupings such as EMAC, or participating in initiatives led by EUROCONTROL, CANSO and/or ICAO as a positive development for them. The opportunity to freely exchange ideas, and learn from others helps them to formulate specific plans of their own.

ANSPs report that the improvements they have made in Just Culture and Safety Culture are now having a tangible benefit. As yet the scale of the benefit may be difficult for them to quantify but the increased frequency in mandatory and voluntary reporting has been cited as one possible indicator.

ANSPs are subjected to quite a large number of audits or requests for information from various organisations, particularly their NSA, EUROCONTROL and ICAO. Even so, Safety Managers are using this survey to help them develop action plans and to discuss issues with their management.

The overwhelming majority of ANSPs have assessed their Safety Framework Maturity to be higher than their corresponding Regulator. However, since the ANSP and Regulator surveys are different, a direct comparison between Study Areas is not possible nor was in the intent of this survey.

2.2.2 Study Area 1 – Development of a Positive and Proactive Safety Culture

Objectives:

1.1 A positive and pro-active just, flexible, and informed safety culture (the shared beliefs, assumptions, and values regarding safety) that supports reporting and learning led by management.
1.2 Regular measurement of safety culture and an improvement programme.
1.3 An open climate for reporting and investigation of occurrences.

The maturity profile ranges from a minimum of 22.0% to a maximum of 94.2%, with the average being 67.1%. Figure 0 8 shows the number of times ANSPs achieved each Maturity Level in response to the objectives of Study Area 1.

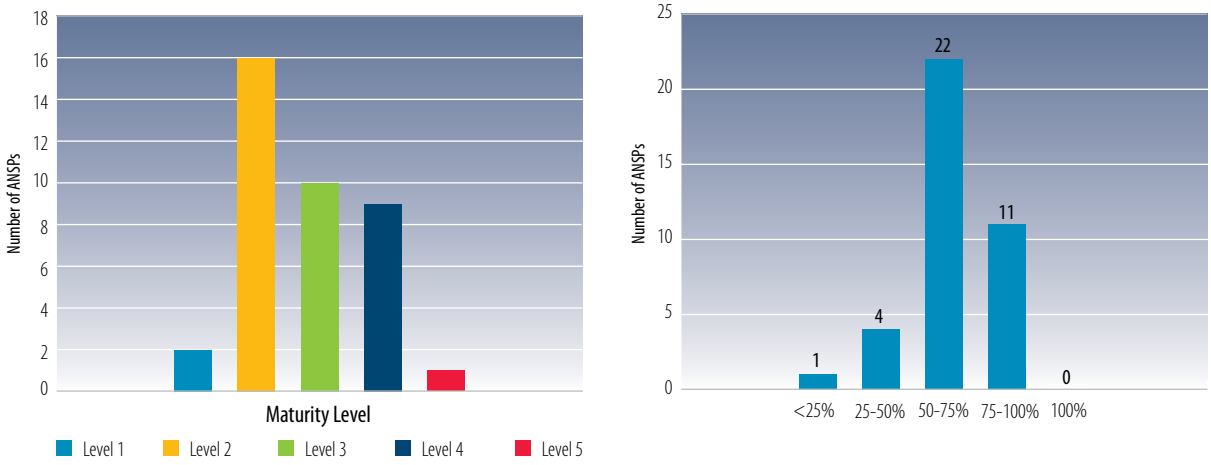

Figure 0-8: Number of ANSPs at each Maturity Level and distribution by score Study Area 1

ANSPs believe that they have a good Safety Culture, although this may not be common across all parts of the organisation.

State legislation is still a barrier to progress in some cases as it requires prosecution for acts of negligence or omission. Interestingly, the corresponding Regulators will generally indicate that they do not want to enforce this aspect of the law, and will do everything within their power to keep prosecutions to a minimum. Both organisations can be hindered if the law enforcement and/or judicial authorities become involved, and this is a legal requirement for certain classes of occurrence in some States.

Safety culture is being promoted through a number of mechanisms, including team briefings, staff awareness programmes, the distribution of safety reports etc. People are becoming more aware of safety and how they can contribute to maintaining or improving current performance.

Many ANSPs have either conducted a Safety Culture survey, or are planning to do so in the near future. Those that have been conducted are leading to action plans to improve performance. ANSPs that have not yet conducted a Survey still believe that their Safety Culture is good, but often cite a lack of resources as a limiting factor. Those who have already completed a survey are considering when best to repeat it to see whether measurable progress has been made (a frequency of 2-3 years seems to be emerging as an optimal choice).

The use of external organisations, such as EUROCONTROL, to conduct a Safety Culture survey was seen to provide a positive benefit and it brings independence and credibility. Coordination and cooperation between departments, and different levels within the organisation are seen as key enablers.

ANSPs have stated that the frequency and scope of occurrence reports seems (in their opinion) to be increasing and is taken to be a sign of an improving Safety Culture and Just Culture. Where internal systems allow, ANSPs are monitoring the frequency of reporting within specific departments (e.g. engineering and operations) or at separate locations, and not the organisations as a whole. Anomalies are investigated so that good practice can be shared or problems corrected as soon as possible with the aim of ensuring that improvements are organisation-wide and not localised. Some ANSPs believe that they have open reporting systems and reported that staff believe they will be dealt with fairly.

2.2.3 Study Area 2 - Organisational and Individual Safety Responsibilities

Objectives:

2.1 An approved, clearly documented, and recognised system for the management of safety. Management structure, responsibilities, accountabilities and authorities are clearly defined and documented.
2.2 A clearly defined safety management function that is independent of line management.
2.3 An integrated safety planning process is adopted by the organisation with published and measurable safety goals and objectives which are accountable to the executive.
2.4 Clear understanding and acceptance of safety management responsibilities by all staff and contractors.

The maturity profile ranges from a minimum of 21.7% to a maximum of 95.3%, with the average being 68.7%. Figure 0 9 shows the number of times ANSPs achieved each Maturity Level in response to the objectives of Study Area 2.

ANSPs typically have a formal Safety Management System (SMS) that is approved by the Safety Director or a responsible Board Member. Whilst the Safety Director or Board Member retains overall accountability for the SMS, they may delegate the responsibility to implement it to a Safety Function (which may be a team, department or part-time role), Managers or staff elsewhere in the organisation. The SMS will contain a high-level description of the roles, responsibilities and accountabilities for safety within the organisation. Staff that have specific safety responsibility will also have a letter of appointment or a job description that details their role.

A number of organisations have not yet implemented a comprehensive Safety Management System. They believe that they have the critical elements in place, but other aspects are under development.

In larger organisations, the Safety Management System will be controlled and operated by a Safety Department or Unit. Small organisations cannot afford to have full-time safety specialists, so the duties are shared as part-time roles.

Direct and independent reporting routes to the Chief Executive or the Board are established in all but four ANSPs. In these cases:

- One has a safety team who report to a joint Safety and Quality Board, chaired by the Chief Executive;
- One ANSP is reorganising the management structure and will appoint a Safety Manager;
- One has only part-time roles for safety so normal line-management routes are employed; and
- One reports that there is little coordination on safety internally which is restricting the safety management function effectiveness.

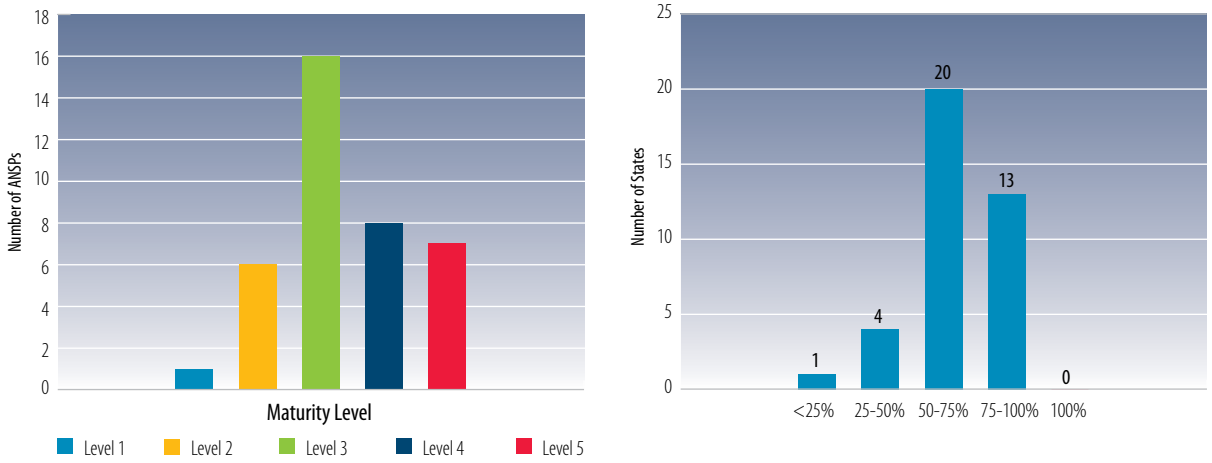

Figure 0-9: Number of ANSPs at each Maturity Level and distribution by score Study Area 1

Whilst ANSPs routinely develop safety plans, either as part of a formal or ad hoc process, these plans are not always widely published. They are made available to managers who have specific responsibility for delivery, but they are not always made available to other members of staff. This can be the case even when the communications mechanisms are available.

Because Safety Function plays a key role in the internal oversight/audit functions they are able to identify examples of best practice within operating units, and to transfer that to other units.

Providing evidence of continuous improvement at Board-level is difficult, possibly because those responding to the survey are not, themselves, Board members and do not have access to the Board papers.

Typically ANSPs would indicate that all personnel are aware of the importance of safety and that regular meetings are used to enforce the message. Staff therefore understand how their actions can affect some aspects of safety, without fully appreciating how the whole safety management system operates. Staff with specific safety responsibilities are made aware of them through formal job descriptions but also through various meetings and reviews.

With regard to contractors the picture is more varied. Some ANSPs only allow contract staff to perform roles with little or no direct safety function; others do allow contractors to have safety responsibilities. The latter group specify the safety requirements and duties to be performed in the contract. Whilst some ANSPs are confident that their contractors are performing their safety functions well, others indicated that they were less confident, for example *"Despite safety assurance documents and service level agreements, contractors' understanding and acceptance cannot be vouched for."*

2.2.4 Study Area 3 – Timely Compliance with International Obligations

Objectives:

3.1 A formal SMS that meets all applicable safety regulatory requirements

3.2 An organisation that strives to go beyond compliance, takes into account the need to ensure, in a timely manner, that there are no inconsistencies with regional/international safety standards.

The maturity profile ranges from a minimum of 26.5% to a maximum of 95.6%, with the average being 71.8%. Figure 0 10 shows the number of times ANSPs achieved each Maturity Level in response to the objectives of Study Area 3.

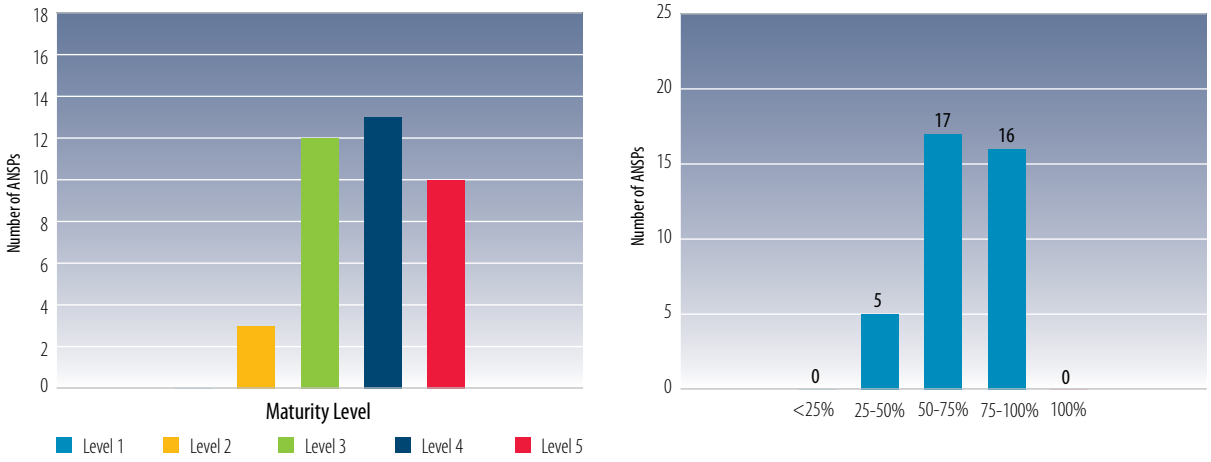

Figure 0-10: Number of ANSPs at each Maturity Level and distribution by score Study Area 3

ANSPs report this as one of their strongest areas, most feeling that they have a mature and effective Safety Management System in place. Some ANSPs report that Safety Management is integrated into the overall Business Management System, or combined with a Quality Management System.

Safety Management Systems are typically reviewed every 6-12 months, or when there is a significant organisational change, and plans drawn up to rectify any deficiencies found.

The less mature ANSPs recognise that their Safety Management Systems are incomplete. They have focussed on getting the fundamental parts of the system in place and are developing other areas.

Typically a States' primary aviation legislation will require all secondary legislation and regulation to be compliant with international standards. Timely compliance is then achieved by:

- The Regulator informing the ANSP of any changes or new regulatory requirements;
- Information is disseminated around the ANSP and reviewed;
- The ANSP makes provisions (finance, staff, operational planning etc.) to implement the changes. Timescales would be discussed with the Regulator at this stage;
- New requirements come into force;
- ANSP implements changes. (Note 4 and 5 are interchangeable. Changes may be implemented before the requirements come into force if it is feasible to do so.)

This system seems to work well, but can occasionally be upset if the Regulator does not keep the ANSP informed at the start.

ANSPs would find it difficult to systematically demonstrate compliance with every standard or requirement, especially given the constantly evolving regulations, and regulatory and supervisory frameworks. Whilst there are some ANSPs still striving to achieve compliance with national and international requirements, most believe that they already do so. A few ANSPs report that they strive to go beyond mere compliance; others would like to go beyond but are limited by the resources they have available.

Rather than seeking to go beyond compliance, some ANSPs are working with, or lobbying EUROCONTROL, CANSO and ICAO. They hope to influence the future direction so that their interests are best met and therefore they do not need to go beyond compliance.

Note that although a number of key ESARR provisions have been transposed into Community Law, through the Common Requirements, many interviewees still referred to ESARRs.

2.2.5 Study Area 4 – Safety Standards and Procedures

Objectives:

4.1 Clearly defined and documented safety standards and procedures.
4.2 Staff know about the safety and safety management standards, which are regularly reviewed, assessed, and maintained.
4.3 Emergency response procedures and an emergency response plan that documents the orderly and efficient transition from normal to emergency operations and return to normal operations.

The maturity profile ranges from a minimum of 20.9% to a maximum of 93.6%, with the average being 69.0%. Figure 0 11 shows the number of times ANSPs achieved each Maturity Level in response to the objectives of Study Area 4.

Safety standards and procedures are typically documented in a Safety Management Manual, which is made available to staff in either paper form, or electronically on an intranet site. Where intranet sites are available they will also provide additional guidance, supporting material and examples (e.g. safety case or risk assessment). Safety Management Manuals are controlled under the Quality Management Systems, which ensures that they are regularly reviewed and that appropriate document controls are applied. Typically a Safety Manual would be reviewed annually, or at times of change (e.g. organisational, operational or regulatory change).

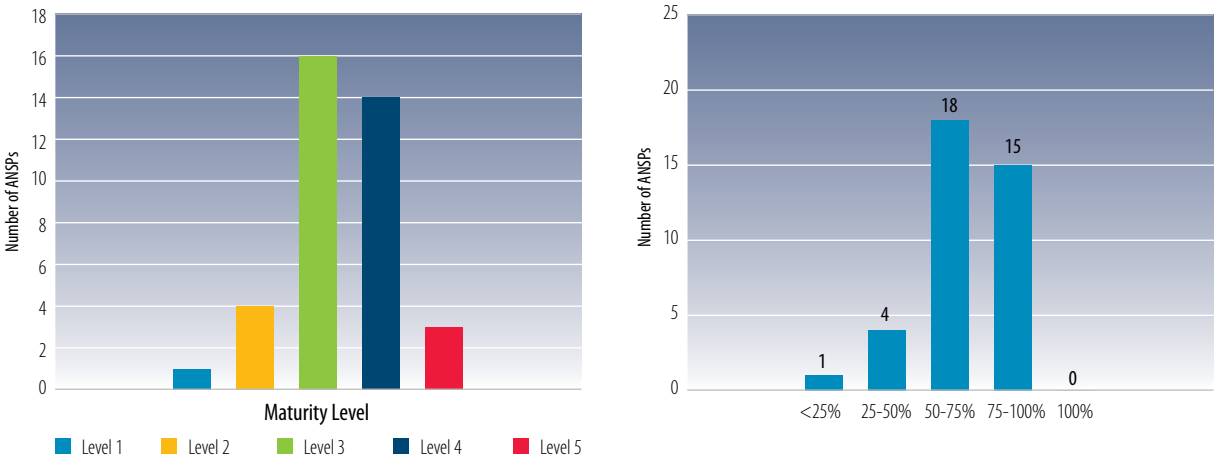

Figure 0-11: Number of ANSPs at each Maturity Level and distribution by score Study Area 4

There is evidence of ownership at the highest levels within ANSPs, since Chief Executive Officers or Board members will often approve the Safety Manual, or at least some aspect of it (e.g. policy statements).

Staff will either receive a copy of the Safety Manual, or be told how to access it; its use forms part of their training. The ways in which staff are informed of changes and trained in new procedures is varied; some ANSPs introduce training programmes, others hold briefing meetings, whilst a number simply e-mail staff and ask them to read and comply with the update.

Internal and external audits ensure that operational units have the necessary documentation and procedures they need, and also verify that those procedures are effectively implemented. Non-compliances and corrective actions are used to maintain standards.

The more mature ANSPs are looking beyond the aviation industry for ways to benchmark their Safety Management Systems, and to gain ideas which would help them improve. Typically this focuses on other high-hazard industries with similar regulatory frameworks. Incident reports from a variety of sources are reviewed to ensure that any lessons that could be learned are captured.

A more varied picture emerges when considering emergency response procedures. ANSPs will typically mention that they have backup equipment, facilities and emergency procedures, and that staff are trained to use them, but plans are not always exercised to ensure that they are effective. We see a full spectrum of responses including:

- All the necessary infrastructure is identified and regularly exercised;
- It is tested, but the dangers of exercises involving the live system are recognised, as they would introduce unnecessary risk and disruption;
- Emergency response plans are a Certification requirement;
- We provide training and simulations;
- Procedures cover system degradation but restoration is a risk area;
- We do not undertake regular table-top exercises;
- Rehearsing the emergency response procedures has not been discussed.

The scope of the emergency procedures seems a little unclear; typically they are based around basic scenarios, such as equipment failure or how to clear the airspace. Loss of a key service, such as Met, may not always be covered.

Many ANSPs reported that lessons learnt following the recent eruption of the Eyjafjallajokull volcano on Iceland, and subsequent ash cloud, have been used to modify contingency arrangements.

2.2.6 Study Area 5 - Competency

Objectives:

5.1 Staff, and contractors (where appropriate) are trained, competent in safety and safety management, and where required, licensed.

The maturity profile ranges from a minimum of 22.0% to a maximum of 94.2%, with the average being 67.1%. Figure 0 12 shows the number of times ANSPs achieved each Maturity Level in response to the objectives of Study Area 5.

ANSP staff within the Safety Function (which may be a team, department or part-time role) are not licensed, nor is there a requirement for them to be licensed. However, many have attended specific training courses provided at IANS and elsewhere. ATCOs and Engineering staff are licensed in accordance with national requirements.

Whilst some ANSPs operate a formal competency management system based around the requirements of the role, others are still trying to introduce formal schemes. The scope of competence management systems varies, but typically ANSPs are seeking to have a single system that covers the whole range of their activities. Where schemes are being introduced Trade Unions are occasionally hindering progress, either by using it to air other issues or Licensed proposing different solutions.

Staff are either trained at their own State facility or by external providers, including EUROCONTROL. The training schemes are approved by the Regulator, who will also issue the licenses once the necessary examinations have been passed, experience gained etc.

Whether or not a formal competency management scheme is being operated, licensed personnel undergo refresher training. This will either be an annual requirement or bi-annual depending upon the role and requirements of the licence.

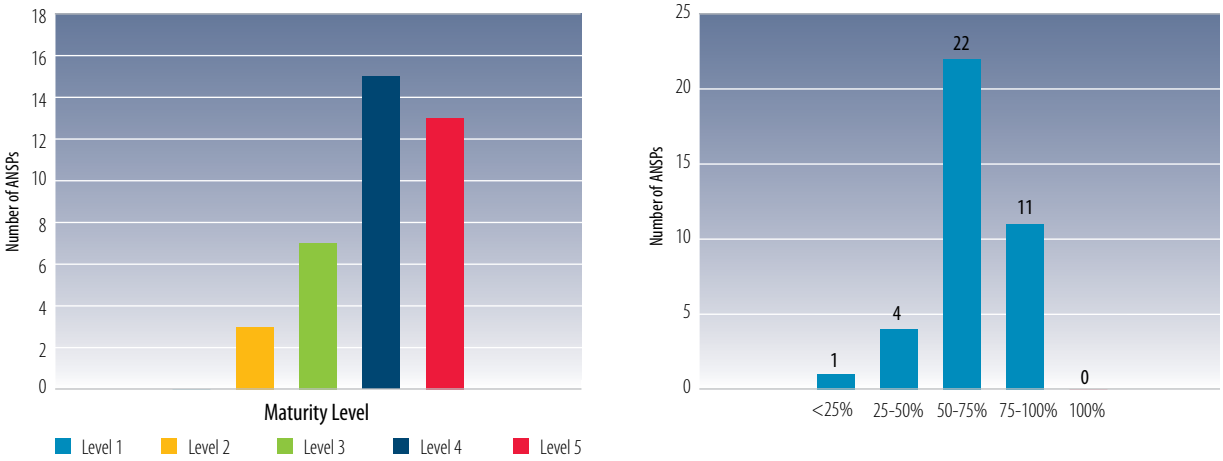

Figure 0-12: Number of ANSPs at each Maturity Level and distribution by score Study Area 5

Training plans are prepared, and regularly reviewed, for all licensed staff. These are then used to formulate a training programme, which is sent for review and approval by the Regulator. Note that the lack (or perceived lack) of technical expertise in some Regulators seems to be causing delays in the approval of training plans.

Changes in the legal framework are causing training requirements and training programmes to be reviewed.

Contractors seem to be used infrequently in a safety-critical role. Where they are, they will be subjected to the same training and licensing arrangements as permanent staff. Contractors may also be given a nominated contact point within the Safety Function.

2.2.7 Study Area 6 – Risk Management

Objective:

6.1 A continuing risk management process that identifies, assesses, classifies, and controls all identified safety risks within the organisation, including potential future risks.

The maturity profile ranges from a minimum of 18.8% to a maximum of 92.9%, with the average being 67.9%. Figure 0 13 shows the number of times ANSPs achieved each Maturity Level in response to the objectives of Study Area 6.

ANSPs report that their Safety Management Systems generally include specific processes to identify and manage risk. These include:

- A requirement for safety cases to be developed under certain circumstances;
- A risk assessment to be conducted whenever existing systems, processes and procedures are changed;
- A risk classification system that allows risk comparison across the organisation.

Although not universally the case, ANSPs try to involve their Regulator as soon as possible during any change or project that requires a major risk assessment or safety case. By working with the Regulator they seek to reduce the likelihood of non-compliance and minimise the possibility of their safety arguments being rejected.

These systems are considered to be embedded (i.e. common practice and a fundamental way of working) within their organisations and supported by the Safety Function (which may be a team, department or part-time role). Project Managers are, typically, given the responsibility for ensuring that the risks posed by their project are assessed and mitigated.

The more progressive ANSPs want to move from reactive to more proactive risk management processes, and to anticipate new issues before they arise.

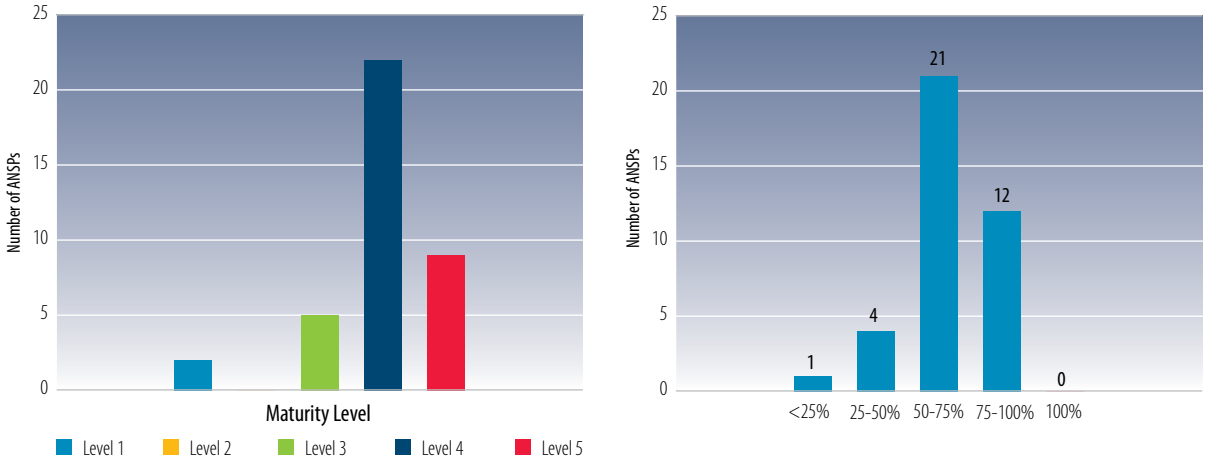

Figure 0-13: Number of ANSPs at each Maturity Level and distribution by score Study Area 6

Training is being provided on a number of levels; from basic internal courses on subjects such as Functional Hazard Analysis and risk prioritisation, to more advanced courses run by external suppliers such as EUROCONTROL IANS.

More mature ANSPs are developing Corporate Risk Management systems that incorporate information from a wide range of sources, including audit, mandatory and voluntary reporting systems, risk assessments and safety cases. Many ANSPs started to integrate that through Aerospace Performance Factor developed by SAFREP and FAA. These provide a high-level overview as well as the underlying detail. They can also link hazards to underlying causes and monitor trends, thereby helping to identify the most appropriate mitigation.

2.2.8 Study Area 7 – Safety Interfaces

Objectives:

7.1 Effectively managed safety-related internal interfaces (e.g. quality management system, security, and environment).

7.2 The effective management of external interfaces with a safety impact (e.g., MIL, airspace users, airports). Formalised processes and procedures dealing with external agreements, services, and supplies (e.g., cross-border Letters of Agreement).

The maturity profile ranges from a minimum of 19.9% to a maximum of 93.4%, with the average being 65.5%. Figure 0 14 shows the number of times ANSPs achieved each Maturity Level in response to the objectives of Study Area 7.

Eleven ANSPs gave themselves their lowest Maturity Score in Study Area 7, Safety Interfaces, than in any other Study Area.

Typically the main internal interfaces were reported to be the quality, environment and security management systems. Where an organisation has implemented a combined management system (usually quality, safety and environment, but occasionally security as well) there are no clearly defined boundaries, although the way the whole system works is well understood and managed.

ANSPs with separate management systems believe that they have good levels of cooperation and coordination; frequently quality, safety and environment teams will be managed jointly or share common office space enabling good communication routes. Again they feel that this negates the need for formally defined service level agreements.

Whether part of a combined or separate management system, the procedures used by ANSPs will define roles and responsibilities for managing safety interfaces.

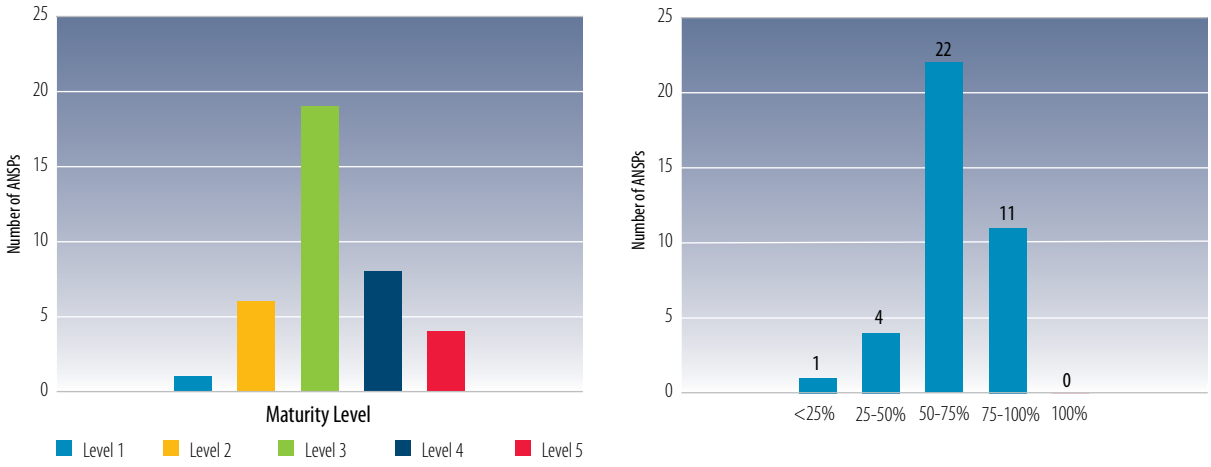

Figure 0-14: Number of ANSPs at each Maturity Level and distribution by score Study Area 7

Many ANSPs cited the Military as being one of their main external interfaces, although airspace users and airports are also mentioned. Typically there will be a Letter of Agreement (or similar) defining how the interface is to be managed, who does what, when, how etc. The sharing of data will also be covered where it is appropriate.

Whenever contractors, or external organisations, are used to provide equipment and services, the contract will be used to define safety requirements. Some ANSPs believe that they don't have the resources necessary to audit external organisations as they would like however on-site contractors are audited in the same way as permanent staff.

Letters of Agreement are commonly used as instruments to manage the interfaces with neighbouring States. Where this is the case, interviewees do not say whether these are covered by a higher-level State Agreements.

Whilst the performance of external organisations is monitored, there does not tend to be a formal system in place to review, and if necessary revise, Letters of Agreement or contract specifications. Such reviews are, at best, ad-hoc. Some ANSPs indicated that they would like to have more freedom to audit across an external interface but this is not always possible. Occasionally it requires the cooperation of the Regulator or another State body.

2.2.9 Study Area 8 - Safety Reporting, Investigation and Improvement

Objectives:

8.1 A continuing organisation-wide process to report and investigate safety occurrences and risks.
8.2 An organisation-wide means to record and disseminate lessons learned.
8.3 Appropriate safety information and knowledge is shared with Industry stakeholders. Information disclosure is compliant with agreed publication and confidentiality policies/agreements.

The maturity profile ranges from a minimum of 22.2% to a maximum of 93.2%, with the average being 68.6%. Figure 0 15 shows the number of times ANSPs achieved each Maturity Level in response to the objectives of Study Area 8.

There are well established systems for reporting safety occurrences, based around mandatory and voluntary reports. Some ANSPs also have mechanisms to provide for anonymous reporting. All of these systems are reactive i.e. they are primarily designed to provide information about events that have occurred.

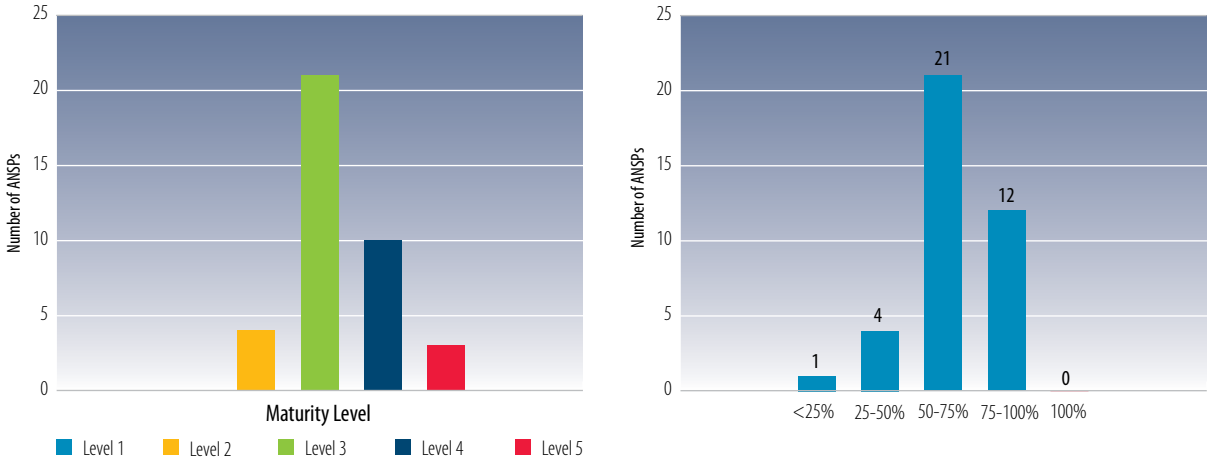

Figure 0-15: Number of ANSPs at each Maturity Level and distribution by score Study Area 8

Whilst the systems are in place, and ANSPs are actively promoting a Just Culture to encourage voluntary reporting, the level of reporting is still mixed:

- Some ANSPs have indicated that staff probably over-report;
- Some have indicated the level of reporting is about right for an organisation of their size and complexity;
- Others believe that there are still things which should be reported that are not, but obviously the level of under-reporting is difficult to quantify.

Whilst systems for safety occurrence reporting are well developed, this is not the case for reporting potential risks. ANSPs rely on the voluntary reporting system to capture information about events that could potentially occur but which have not yet happened. Where such risks are identified, staff may inform the Safety Function or suggest improvements using normal occurrence reports or alternative routes (e.g. an e-mail to the Safety Function).

Many Regulators have been given direct access to the ANSPs reporting system, so that they can monitor the situation in real-time. Others are given regular reports, or notified when a serious event occurs.

Minor incidents may be investigated solely by the ANSP, occasionally with a degree of oversight by the Regulator (i.e. to ensure that the outcome is appropriate and in line with Regulatory requirements). More serious incidents will be investigated by the Regulator; some interviewees also mentioned their Accident Investigation Board at this point, others did not (but the survey is not designed to explore this relationship). Even for serious incidents ANSPs will still undertake an internal investigation.

As databases used to capture incident reports are developing, some ANSPs are beginning to notice inconsistencies (e.g. in the type and frequency of reports or between Units and sites), which they are seeking to understand and eliminate.

After an incident investigation, various mechanisms are used to ensure that the lessons are learned and appropriate mitigation implemented. These include:

- Management meetings;
- Workshops and seminars are organised;
- Safety bulletins are circulated; and
- Intranet sites updated.

The difficulty many ANSPs have is in ensuring that the message gets across. Some have implied that staff receive the information, but that it is not read or is swamped by the other paperwork that they are expected to deal with. The timeliness of feedback is also critical to ensuring that lessons are learned: if the investigative process is too long, those reporting the incident feel that nothing has happened.

Maintaining confidentiality may be difficult if feedback is to be pitched at the right level of detail to all those involved. For example if an ATCO reports, then it may involve his manager, colleagues, staff in adjacent sector etc. Investigating, providing feedback and making improvements in such cases can be difficult to achieve if confidentiality is also to be maintained.

ANSPs have a broad range of policies and attitudes when it comes to the sharing of safety information with other industry stakeholders, including:

- The ANSP does not have a clear policy;
- Information will be shared with the Regulator but not industry;
- Information may be made available on request;
- Data are actively shared with stakeholders, even when regulation does not require it; and
- We are fostering the cooperation with external stakeholders at different levels.

When asked a similar question about the sharing of information, Regulators frequently mentioned Functional Airspace Blocks and their involvement in them. ANSPs were less likely to mention FABs in this context, although as the FABs develop some ANSPs would like to see the sharing information become routine.

2.2.10 Study Area 9 – Safety Performance Monitoring

Objectives:

9.1 An established and active monitoring system that uses and tracks suitable safety indicators and associated targets (e.g., lagging and leading indicators).

9.2 Methods to measure safety performance, which is compared within and between ANSPs.

9.3 A general public knowledgeable of the ANSP's performance through routine publication of achieved safety levels and trends. (Information disclosure is compliant with the requirements of ICAO Annex 13, Attachment E).

The maturity profile ranges from a minimum of 20.9% to a maximum of 92.1%, with the average being 67.9%. Figure 0 16 shows the number of times ANSPs achieved each Maturity Level in response to the objectives of Study Area 9.

Defining and then monitoring performance indicators is an area where some ANSPs are still struggling, although this is not necessarily reflected in the ANSPs Maturity Scores![2] Even when they have defined indicators, smaller ANSPs do not really have enough information to make the analysis statistically significant.

In some States, Regulators are driving the process of defining the State Target Levels of Safety. In other States the process is being driven by the ANSP, who will propose a set of performance indicators to the Regulator. In these cases, Safety Targets are less likely to have been established. However, ANSP managers will use Key Performance Indicators to monitor performance and drive progress. A final group of ANSPs have yet to establish their safety indicators.

Although they are working towards defining their own performance indicators, some ANSPs do not feel that there is any urgency to do so. They are waiting for a standardised set of indicators at a European level, which they will adopt.

The data used to measure and monitor performance comes from a number of sources, including:

- Automatic safety monitoring tools;
- Quantitative reliability indicators for technical systems;
- Use of safety occurrences and investigations reports;
- Risk Analysis Tool (RAT);
- Aerospace Performance Factor (APF); and
- EUROCONTROL's Safety Framework Maturity Survey.

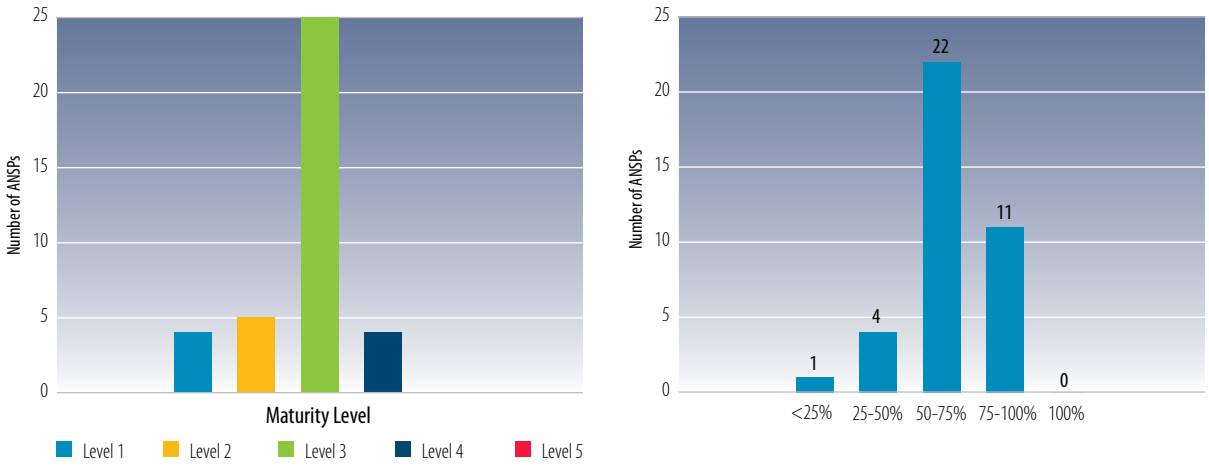

Figure 0-16: Number of ANSPs at each Maturity Level and distribution by score Study Area 9

[2] EUROCONTROL has noticed a discrepancy in the information presented here and in other data sources such as LSSIP Reports and ESIMS Audit.

The data are analysed using a combination of qualitative and quantitative techniques, but the trend seems to be towards the use of quantitative methods if there are sufficient data. APF methodology started to be quoted by several ANSPs as a way forward to aggregate various types of indicators and monitor trends over time. Frequently the monitoring of performance will not be the responsibility of the Safety Function; the task may be undertaken by Quality or a broader performance team. Where this is the case, safety will be just one of many indicators that managers use to run the business, e.g. finance, quality, safety, environment etc. Larger ANSPs will compare the performance of internal Units and all ANSPs will compare themselves with external bodies, if they can get the data in sufficient detail to make the comparison meaningful. Additional guidance in this area would be appreciated.

As with defining safety indicators, ANSPs are also having difficulties in establishing safety targets.

There is a common concern expressed by a number of ANSPs about how well the information they do, or could, publish is understood. This limits what they are willing to publish and how they make it available. Typically, high-level safety performance is presented in an annual report, which is made available on the website. Other information is only made available on request, and then only after careful consideration.

Some ANSPs have indicated that they would not wish to go beyond Maturity Category C (Implementing) in this area.

Frequently the information available to the public comes via the Regulator or Accident Investigation Board rather than directly from the ANSP itself. Safety targets, achieved performance and trends are not readily available in anything other than broad terms. Even when they are available, it is not always clear on what basis it is being presented (e.g. whether an expected trend is normalised by anticipated movements).

2.2.11 Study Area 10 – Operational Safety Surveys and SMS Audits

Objective:

10.1 Internal and independent (external) operational safety surveys and SMS audits.

The maturity profile ranges from a minimum of 19.8% to a maximum of 92.8%, with the average being 67.3%. Figure 0 17 shows the number of times ANSPs achieved each Maturity Level in response to the objectives of Study Area 10.

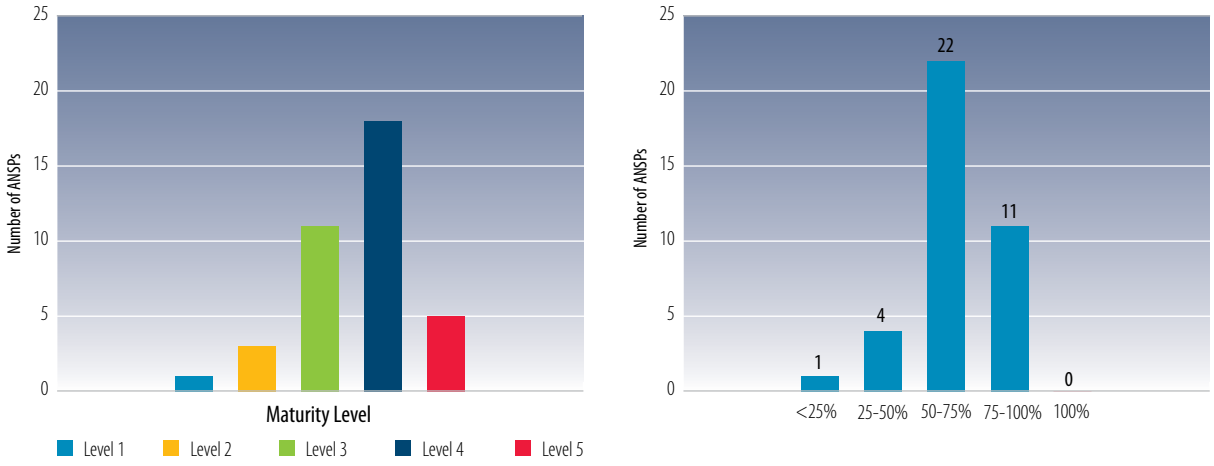

Figure 0-17: Number of ANSPs at each Maturity Level and distribution by score Study Area 10

Internal audits are generally conducted by, or in conjunction with, the Quality Department. Operational safety surveys are a different technique and those are run with the OPS and/or Engineering departments. These typically target each Unit at least once per year, with follow-up or ad hoc audits as necessary. A similar external audit pattern, from the Regulator, is also apparent. Each Unit may have a specific annual Safety Survey and Audit Plan.

When audits are conducted by the Quality Department, and safety procedures are treated as a quality item, it is not apparent that the effectiveness of those procedures can always be tested by someone without a safety background.

Audit findings are reviewed and responsible individuals identified for implementing corrective actions within defined timescales. The nature of appropriate corrective action may be obvious, or may require detailed analysis and risk assessment before implementation. Progress in implementing corrective actions will be monitored by the audit team or Quality Department.

Some ANSPs are involved with independent reviews[3] by peer organisations, e.g. will invite fellow ANSPs to review their operations.

2.2.12 Study Area 11 – Adoption and Sharing of Best Practices

Objectives:

11.1 A structured approach exists to promote safety, its standing within the organisation and lessons learned through application of the SMS.
11.2 A structured approach to gather information on operational safety and SMS best practises from the industry.
11.3 Sharing of safety and SMS-related best practises with industry stakeholders.

The maturity profile ranges from a minimum of 20.6% to a maximum of 95.0%, with the average being 68.0%. Figure 0 18 shows the number of times ANSPs achieved each Maturity Level in response to the objectives of Study Area 11.

Some ANSPs have a clear strategy to actively promote safety, for example through the use of a safety website, safety bulletins and briefings. They will use these and other tools to disseminate lessons learnt, re-enforce key messages and publicise changes to the Safety Management System. Where ANSPs do not have separate promotional activities, they rely on staff to be aware of, and adhere to, the requirements

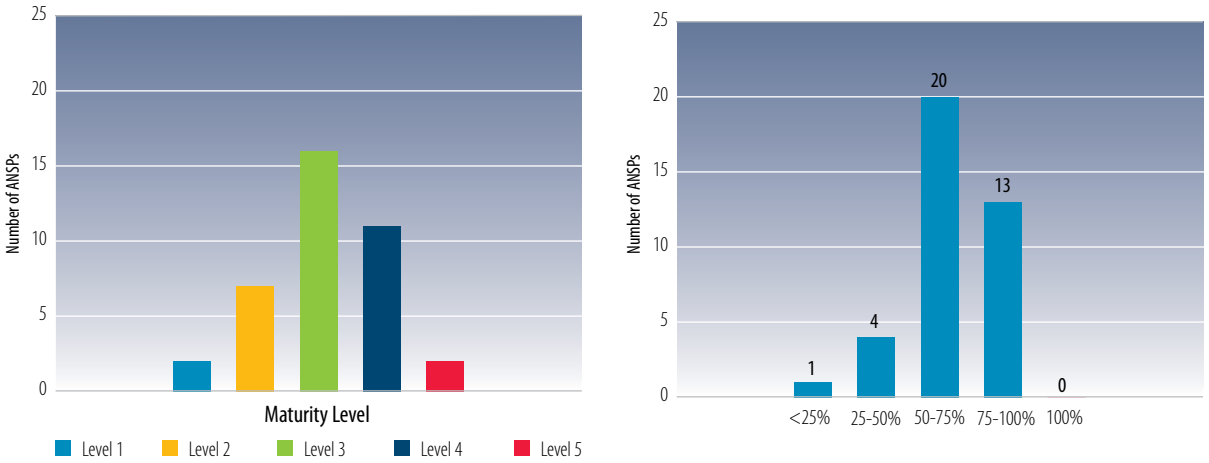

Figure 0-18: Number of ANSPs at each Maturity Level and distribution by score Study Area 11

[3] These independent peer reviews are not to be confused with the Peer Reviews of National Supervisory Authorities (NSA) as prescribed in Article 9.1 of Regulation (EC) N°. 2096/2005.

stated in the Safety Management System. This group may use e-mail to inform staff when changes are made to the Safety Management System.

All ANSPs recognise the importance of learning from lessons and have adopted various means to achieve this (see also 2.2.9 above). Whilst the majority of schemes are top-down (i.e. the Safety Function (which may be a team, department or part-time role) reviews the information and disseminates the lessons to the staff), one ANSP is also actively encouraging staff to identify and share lessons with their peers. The latter approach was reported to be so successful that now the drive is explicitly 'from the ground up'.

Internal and external meetings are being arranged where related groups gather to discuss safety concerns, for example on Human Factors. ATCOs from different control centres are meeting to discuss common issues and how they have been solved locally.

Another common method used to disseminate information within an ANSP is for it to be provided to managers or Unit heads who then cascade to their staff.

Lessons learned are also being disseminated at a number of levels, including participation in EUROCONTROL, ICAO and CANSO meetings. Generally fora that are used to gather information will also be used to share it.

More mature ANSPs, and those with the resources to do so, are gathering information from other parts of the aviation industry as well as other high-hazard industries (such as rail). They review the information available before incorporating any lessons into their own systems.

2.3 Regulator Survey Findings – SES States Only

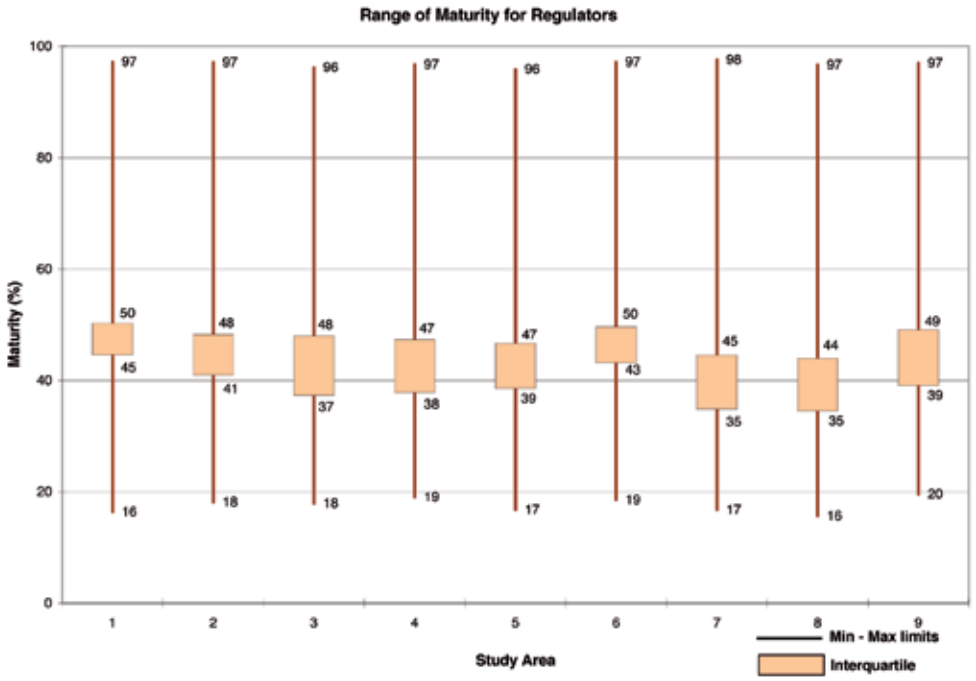

Figure 0-19: Range of Maturity for Regulators

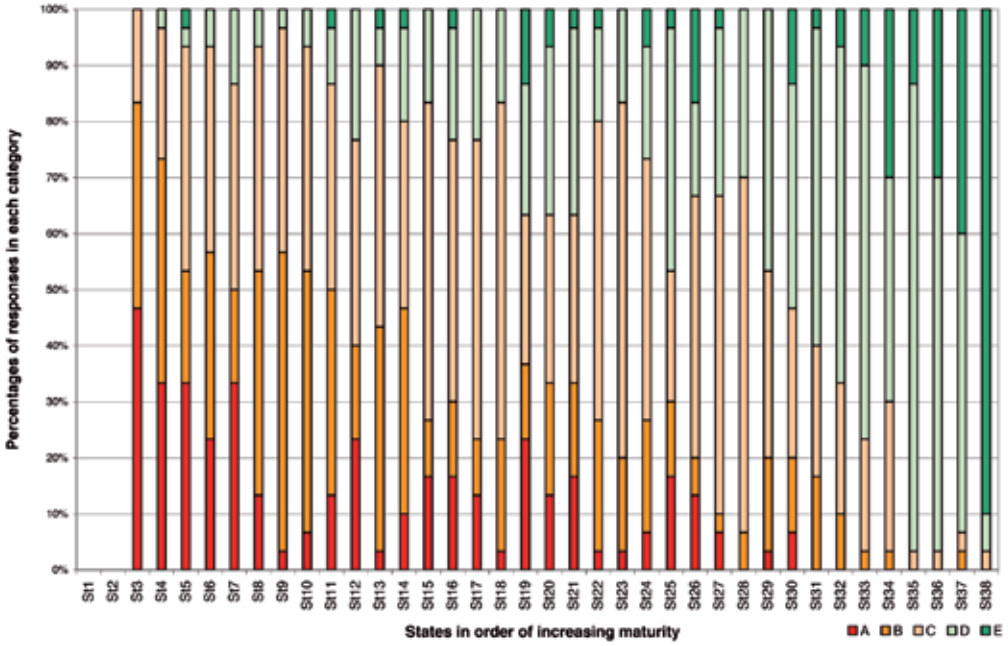

Figure 0-20: Percentage of Answers in each Maturity Category

2.3.1 Key Findings

In keeping with the comments made by ANSPs, Regulators have commented that they see the introduction of Functional Airspace Blocks is seen as a very positive step, and one which will promote sharing of information. Regulators have commented that they see the potential benefit in moving towards common procedures and methods within FAB groups, but this is still a long way off. In the short term, smaller and less mature Regulators see it as a great opportunity to learn from larger or more mature neighbours.

As reported in previous years, Regulators see the lack of competent technical staff as their biggest obstacle to making progress. The staff shortages seem to be particularly acute in NSAs rather than NAAs.

Further guidance material on how to define Target Levels of Safety, and then how to measure performance would be welcomed.

2.3.2 Study Area 1 – State Safety Framework

Objectives:

1.1 There is a well established primary aviation legislation that contains provisions enabling the government and its administration to proactively supervise and regulate civil aviation activities in relation to Air Traffic Management. Regular measurement of safety culture and an improvement programme.

1.2 There are adequate regulations that address, at least at minimum level, national requirements stemming from primary legislation and international obligations providing for standardized procedures, equipment and infrastructure in ATM.

1.3 Regulations addressing the minimum level of national requirements are known to staff, and are regularly reviewed, assessed and maintained up to date by the appropriate authority within the Regulatory function.

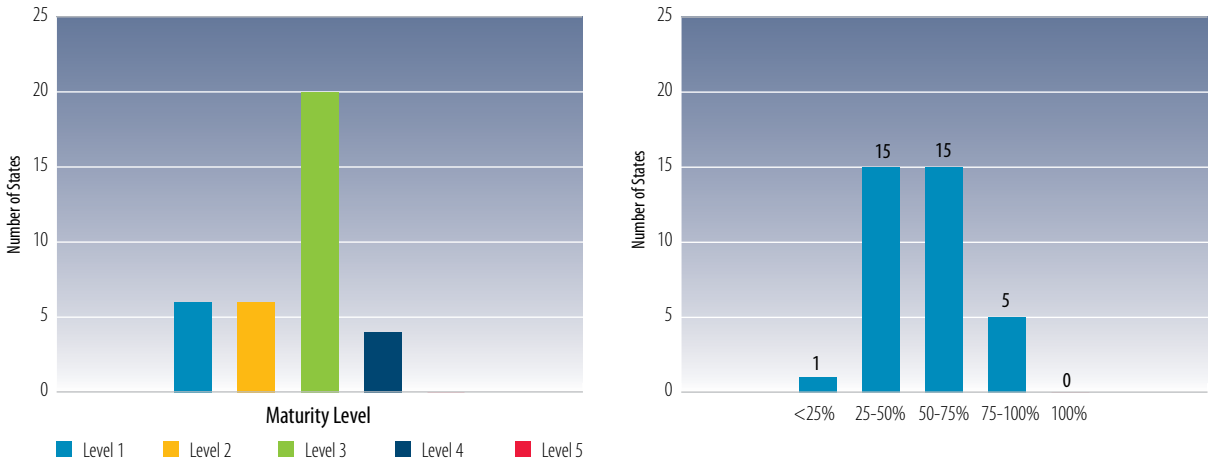

Figure 0-21: Number of Regulators by Maturity Level and distribution by score Study Area 1

1.4 There is a Regulatory organisation established and other relevant authorities, supported by appropriate and adequate technical and non-technical staff with safety policies, regulatory functions and objectives in place.

1.5 The regulatory and service provision functions and organisations are clearly separated at all levels in the State.

1.6 Legislation is in place to ensure the oversight of safety requirements in accordance with national and international obligations.

1.7 The State's regulatory process takes into account the need to implement and comply with national requirements and international obligations in a timely and consistent manner.

The maturity profile ranges from a minimum of 16.4% to a maximum of 97.2%, with the average being 53.3%. Figure 0 21 shows the number of times Regulators achieved each Maturity Level in response to the objectives of Study Area 1.

The majority of Regulators reported that primary aviation legislation, covering all aviation operations including ATM, was well established. Where this is not the case, Regulators report that they are working towards implementing the necessary legislation. A number of Regulators reported that deficiencies have been identified, either as a result of external audits or a gap analysis that they have conducted, and these are being addressed.

The ability to change primary legislation is often difficult as it can rely on finding time within the States' legislative programme (e.g. time for Parliament to review and debate). As a result there can be delays in implementing Commission Regulations that affect primary aviation legislation.

Wherever possible, States endeavour to keep legislation and guidance simple and "straightforward", allowing the ANSP to identify the most appropriate methods of operation.

All Regulators believe that their secondary legislation is adequate for their immediate needs, although many recognise that gaps still exist and improvements could be made, for example as the practical implementation of SES Framework evolves, weaknesses are being identified. Secondary legislation is typically more flexible; revisions are quicker and easier to make than is the case for primary legislation. The exact process for revising secondary legislation varies but often Regulators, supported by legal departments (either their own or part of a Government Ministry) draft the requirements they need; these are then enacted with Ministerial approval. However, when considering the requirements of European Commission Regulations, Governments may decide to consult with the aviation industry before secondary regulations are implemented. This can be a lengthy process.

Regulators are, typically, relatively small organisations and therefore they believe that keeping staff aware of changes is easily achieved in practice. Frequently many people within the department will be involved in drafting or reviewing primary and secondary legislation and associated regulations. Formal systems, to make staff aware of changes, are not always in place as they are not seen to be necessary. Some Regulators do have a formal process to make staff aware of changes to regulations and standards, typically involving regular meetings. Staff have access to the documents and guidance they need through a variety of means depending upon the infrastructure available to them. The majority of Regulators reported using an electronic means (e.g. intranet or document management system) but handbooks and manuals are still common.

In all but one case Regulators report that there is clear separation between themselves and their ANSP. Frequently the two organizations will be physically separated as well as functionally and operationally, although this is not always the case. There are instances of the two organisations being part of a single State-owned company. In such cases the Regulator and service provider will have separate Directors reporting to the Chief Operating Officer or the company Board. Financial independence is achieved through various means, including Government funding, certification and licensing charges.

Even though ANSPs and Regulators are separated on all levels, there appears to be good co operation between the two.

Regulators have provided a range of responses concerning oversight from:

- *"There is a clear oversight function (documented in an Inspectors' Manual) which is continually reviewed for improvements".*

to

- *"A new safety oversight system has been put in place; the safety oversight requirements are included in the State's legislation and have been published and implemented. "*

Funding for regulatory oversight activities is taken from a number of sources including aviation fees. Linking fees to oversight is seen by some to promote effectiveness and efficiency.

Generally the timely implementation of national requirements and international obligations is not considered a problem. Where difficulties can arise, they are generally around the speed of the consultation process when formulating or revising regulations based on EU requirements. Frequently States commented that the Regulator and ANSP will both be aware of forthcoming changes and will plan for change.

2.3.3 Study Area 2 – Safety Resources

Objectives:

2.1 There are adequate financial and competent resources in place to carry out all phases of safety regulatory processes.
2.2 Staff are qualified and trained. Technical and administrative staff are competent for the tasks required of them and are certified/licensed where required.
2.3 There is sufficient guidance material and safety information provided for staff to enable them to perform their functions effectively and in a standardised manner.

The maturity profile ranges from a minimum of 18.2% to a maximum of 97.1%, with the average being 51.9%. Figure 0 22 shows the number of times Regulators achieved each Maturity Level in response to the objectives of Study Area 2.

Generally financial resources are not a limiting factor but, as has been found during previous Safety Maturity Surveys, the availability of competent technical resources continues to be an issue. Typically the funds generated from certification and licensing are being used to finance the Regulator (as noted the previous section, linking the revenue stream to the activity is seen to be beneficial). In some instances the income generated this way is wholly sufficient to fund the Regulator; in others the Ministry of Transport (or similar) fund any shortfall.

Whist the majority of Regulators have mechanisms in place to predict and monitor resource requirements, this is not universally the case. Some Regulators, including those who have previously been seen as quite mature, do not have formal resource plans; indeed they are not certain that all regulatory functions are covered. Note that Article 11 of Regulation (EC)

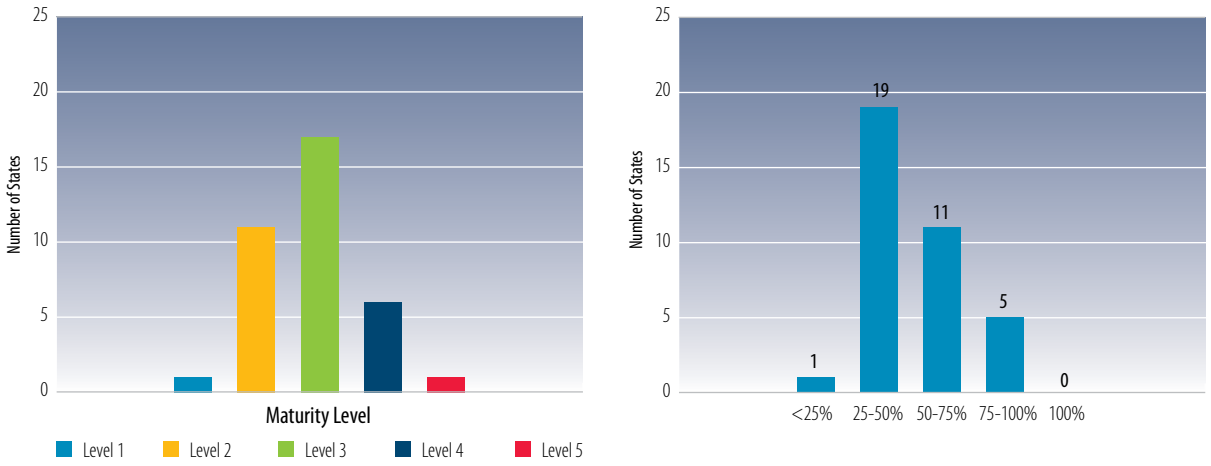

Figure 0-22: Number of Regulators by Maturity Level and distribution by score Study Area 2

1315/2007 requires National Supervisory Authorities to produce a resource plan every two years. The statements made by some Regulators here go against their previous assertions in Section 2.3.2 that they comply with international obligations.

The more mature Regulators have systems which continually monitor and review resource, generating an annual report on resources and training requirements. These are presented to the Director or Board so that they can be incorporated into the planning process.

Many Regulators report a shortage of experienced staff and recruitment limits placed by central Government hinder progress. Wherever possible, graduates are being recruited and training programmes implemented to overcome their lack of experience. Pay differentials between ANSPs and Regulators continues to be an issue.

Where staff shortages do exist Regulators are prioritising their activities, ensuring that they focus on the main issues. Staff from the ANSP are sometimes being used to cover a lack of technical expertise, but the range of duties that can be allocated to them is limited.

Overall, Regulators believe that they have knowledgeable and experienced staff. More mature Regulators have a clear commitment to training and development and are very proactive. They have a formal competency management system and new recruits spend their first few months on training and development activities. Even those who do not have formal training plans do provide training where it is required.

EUROCONTROL's Institute of Air Navigation Services (IANS) is frequently cited as the main training provider, however a number of difficulties have been indicated, including the fact that the courses are frequently over-subscribed so providing the required training can be difficult;

Typically Regulators report that all of the policies, procedures, forms, checklists etc. required are incorporated into an electronic handbook and made available to technical staff. The teams are quite small, and staff are used to working together, so it is believed that this also provides a degree of standardisation.

There are various means of ensuring that roles, responsibilities and accountabilities are documented and assigned. In most cases staff will have a written letter of appointment which defines them; some Regulators have a roles and responsibilities matrix that is written around the various posts, with current post-holders formally named.

The provision of guidance material is improving. Most Regulators make it available via an intranet or staff handbook. Material published by EUROCONTROL and other Regulators is sometimes included in the guidance provided to enable the Regulator to learn from best practices elsewhere.

2.3.4 Study Area 3 – Safety Interfaces

Objectives:

3.1 All safety related internal interfaces are effectively and proactively managed.
3.2 Related internal regulatory management systems (e.g. Safety Programme and QMS) have been coordinated.
3.3 All external interfaces with a safety impact (other Regulators, ANSPs, MIL, Airspace Users, Airports, etc.) are coherent, effective and proactively managed.
3.4 Working relationships with ANSPs are based on formalised processes and procedures in accordance with their safety significance.

Internal interfaces are typically managed through weekly, monthly, quarterly and ad-hoc meetings between department heads and managers. Whilst the most important problems are discussed at these meetings, their effectiveness is not formally assessed.

Where Regulators have a quality management system certified to ISO 9001, the interface between the quality and safety management systems are functioning and understood although not always formalised and documented. The maturity of the quality management system itself can also influence the response to these objectives. Regulators that do not currently have ISO 9001 certification believe that they would probably combine the Safety Manager's role into a joint Safety/Quality function rather than have two separate systems.

Regulators believe that they have good external relationships with key partners - particularly the ANSP and military (both users and regulator). Some NSA staff are former employees of the ANSP and hence they have very good day-to-day working relationships. The relationship with airports is not universally as good, with some Regulators finding it difficult to engage them in joint improvement activities.

Regulators prefer to adopt a cooperative style with external bodies. The ANSP, military, airspace users and airports are actively encouraged to co-operate with Regulators and each other to improve aviation safety.

Regulators generally seek comments on draft legislation and regulation from other stakeholders, and in some Regulators this requirement is enshrined in State legislation.

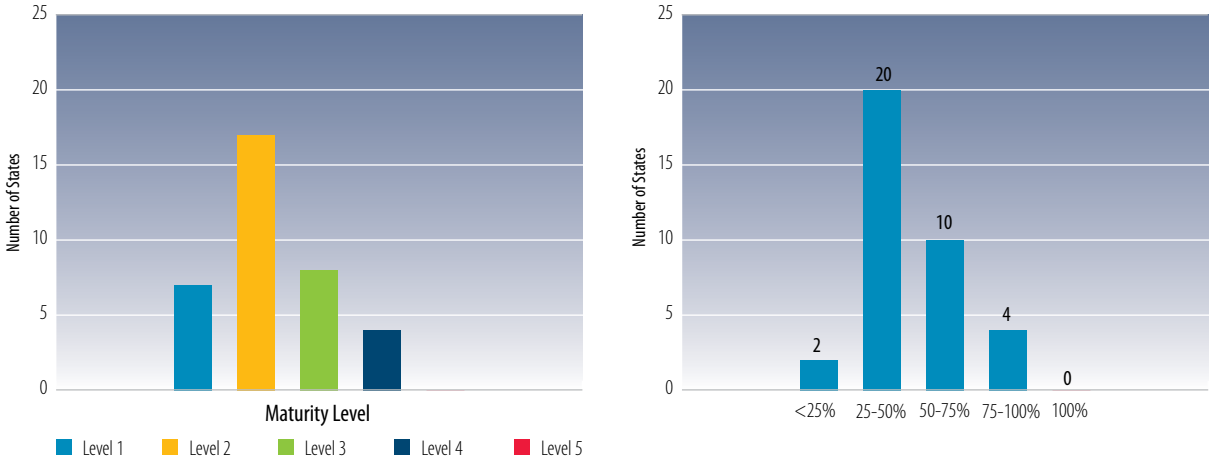

Figure 0-23: Number of Regulators by Maturity Level and distribution by score Study Area 3

2.3.5 Study Area 4 – Safety Reporting, Investigation and Reporting

Objectives:

4.1 Institutional arrangements are in place for the supervisory and regulatory tasks as regards collection, investigation, evaluation and dissemination of occurrence data.

4.2 The State is implementing a just culture climate.

The maturity profile ranges from a minimum of 19.0% to a maximum of 96.7%, with the average being 49.8%. Figure 0 24 shows the number of times Regulators achieved each Maturity Level in response to the objectives of Study Area 4.

Occurrence reporting systems seem to be well established and provide a number of ways in which data can be collected e.g. mandatory and voluntary reporting. In some Regulators the lack of voluntary reports, or rather the small number of them, is a cause for concern. Other Regulators have indicated that the voluntary reporting system is being heavily used, frequently for things that might be considered Union matters and only tenuously safety-related.

Some Regulators have direct access to the ANSP's occurrence reporting system but also run a parallel system of their own. Mandatory reports are investigated and trends monitored to identify common themes and weaknesses.

State criminal law frequently dictates how the concept of Just Culture is implemented in practice. If prosecutors and/or law enforcement become involved, the concept of Just Culture may be of little significance. Regulators try not to involve the legal process if at all possible to avoid such problems. Other States have a very enlightened justice system where prosecutions will only take place for acts of gross negligence or criminal intent.

Where the principles of Just Culture have been implemented, there can still be difficulties. Even though the regulatory intent has changed, it is taking time for old cultures to be changed and for ATM staff to have confidence in the new arrangements.

From the nature of the responses provided during telephone interviews it would seem that there is a limited number of organisations where the fundamental differences between the concepts of Just Culture and Safety Culture are not always fully understood. Such issues need further analysis and addressing at the level of each organisation, as they are not necessarily symptomatic for the whole population.

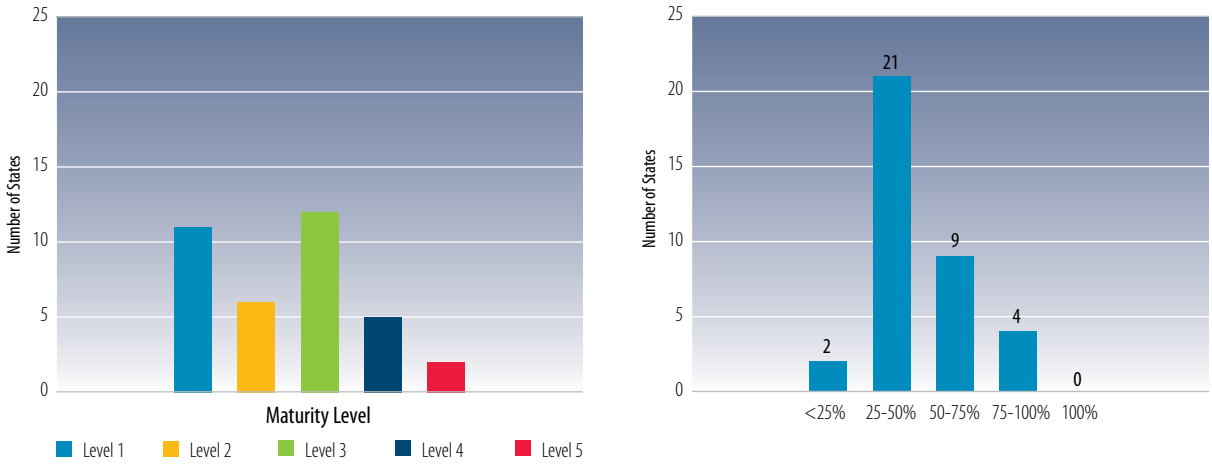

Figure 0-24: Number of Regulators by Maturity Level and distribution by score Study Area 4

2.3.6 Study Area 5 – Safety Performance Monitoring

Objectives:

5.1 Safety levels, both for the State and operators/ service providers, are commonly established through the ATM safety regulatory framework.
5.2 The levels of safety achieved are regularly monitored and assessed in order to determine their compliance with safety regulatory requirements.
5.3 The public have knowledge of the overall ATM safety related

The maturity profile ranges from a minimum of 16.8% to a maximum of 95.9%, with the average being 49.5%. Figure 0-25 shows the number of times Regulators achieved each Maturity Level in response to the objectives of Study Area 5.

Several Regulators would appreciate EUROCONTROL's help and advice, or examples of "best practice", in establishing acceptable safety levels, safety targets and thresholds, as it is an area where they feel particularly weak.

A range of maturity is observed, including:

- We are ready to establish acceptable safety levels as soon European wide levels are decided and adequate guidance material is published;
- The State Safety Programme contains a programme of work to identify appropriate safety levels;
- There is an active programme of developing safety targets;
- Safety levels are established by the ANSP and these go forward to the Regulator for review
- Safety levels are regularly monitored and reviewed by the Regulator and there is also external benchmarking.
- Quantitative levels are defined and measured.
- Target Safety Levels have been in place for two years but there is concern over the targets that have been set.

Where Safety Targets have been defined, Regulators are actively monitoring ANSPs' performance at, for example, monthly safety review meetings.

Regulators believe that it is difficult to compare Safety Levels between countries due to differences in, for example, the way incidents are classified.

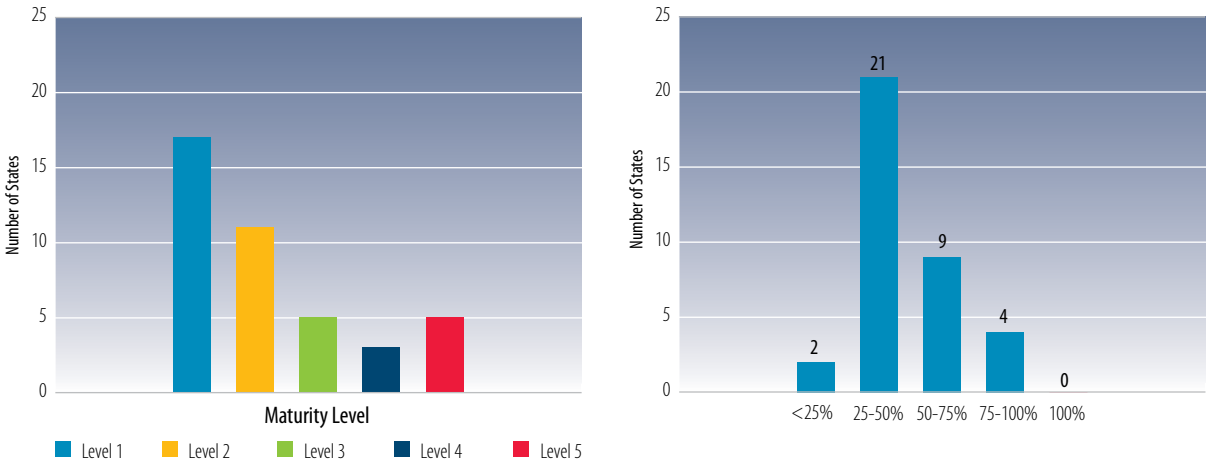

Figure 0-25: Number of Regulators by Maturity Level and distribution by score Study Area 5

Regulators have not radically changed their policy on information being made available to the public since the last survey in 2009. Four common themes emerge:

- The public are given no safety information;
- Some (high level) data are provided to the public;
- Information is provided on request;
- Information is provided in an annual report[4], either as a chapter within the main annual report or as a separate document.

Where numerical Safety Levels are defined, they are in terms of the ratio of incidents. Typically the aim would be to have no ATM involvement in fatal or severe incidents. Additionally, targets to improve the number of reported incidents will be established.

There are still concerns that the release of information to the public can be problematical. Safety professionals understand that a target of "No Incidents" is not realistic, but would the public accept anything less?

ICAO USOAP audit reports are considered to be confidential unless the audited State wishes otherwise. Although only one Regulator reported that they have asked ICAO to publish the results of their recent USOAP audit, which they see forms part of a policy to provide information to the public, twelve of the SES States have actually made their reports available to the public.

2.3.7 Study Area 6 – Implementation of Safety Oversight

Objectives:

6.1 The State's safety oversight system is implemented in accordance with national regulatory requirements and international obligations (i.e. processes and procedures for the oversight of the safety regulatory requirements (e.g. granting, revocation, limitation or suspension of license/certificate; authority to conduct inspections/audits, make recommendations, monitoring activity to ensure that objectives and requirements are met; planning, conducting oversight activities)) are effectively implemented.

6.2 Audits are conducted by qualified auditors to ensure that all applicable ATM safety regulatory requirements and implementing arrangements by ANSPs are being met.

6.3 Processes and methods are in place to ensure that the safety regulatory requirements in respect to changes to the ATM system are being met.

The maturity profile ranges from a minimum of 18.6% to a maximum of 97.2%, with the average being 52.4%. Figure 0-26 shows the number of times Regulators achieved each Maturity Level in response to the objectives of Study Area 6.

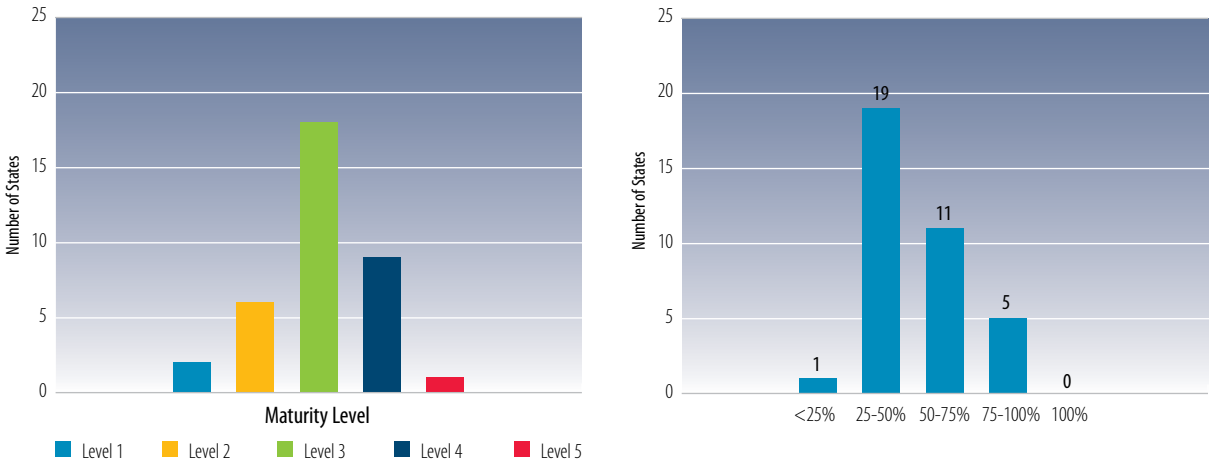

Figure 0-26: Number of Regulators by Maturity Level and distribution by score Study Area 6

[4] Not to be confused with the annual report required by Article 14 of Regulation (EC) 1315/2007.

Regulators have established their oversight arrangements in accordance with, amongst others, Regulation (EC) 549/2004 and Regulation (EC) 1315/2007. Some Regulators report having systems that have been in place for a number of years and hence they consider them to be mature; other Regulators are still developing their systems or addressing identified weaknesses. Less mature Regulators still have safety oversight systems that are ad-hoc or partially formalised. Efforts are being made to fully formalise the systems but a lack of personnel is causing difficulties.

The maturity level of the safety oversight system is reflected in a Regulator's approach to audit. More mature Regulators will have a systematic approach to auditing based on a one or two-year forward programme, during which all Units are audited at least once. An analysis of risk, and a review of emerging trends, also provides input to the development of the future programme. Regulators also have the power to audit at any time i.e. ad hoc, spot check and post implementation audits are common.

All the information available to the Regulator is reviewed to identify areas to target. Once the need for audit has been identified, the process is supported by high-level and low-level check lists to ensure consistency and appropriate coverage.

Less mature Regulators report that they have plans for the implementation of oversight audits but that the process is not yet formalised. Procedures for conducting audits exist and are documented in operational manuals, handbooks etc.

All Regulators report having qualified auditors, some of whom have attended EUROCONTROL's three stage audit course at IANS. Auditors are given the power to revoke licences and operating certificates if the need were to arise. Regular refresher training (IANS/ISO) is also provided. Audits are conducted in accordance with national requirements using the techniques learnt at IANS and elsewhere.

Regulators report that they are always seeking ways to improve and discussions at international fora, such as IANS and FAB groups, help with this.

The safety regulatory requirements with respect to changes are met in accordance with State legislation e.g. ANSP certification rules, ANSP certification manual, checklists, and annual audit programme. Changes to the ATM system are typically assessed in accordance with Commission Regulation 2096/2005. For major changes, a safety case and technical file will be developed by the ANSP and reviewed by the Regulator. Regulators prefer to work closely with ANSPs during periods of change so that they are aware of the issues and can provide appropriate guidance. (Note that guidance will be directed towards legal and regulatory requirements, not how these should be addressed.)

Interestingly, when discussing the oversight of change, many Regulators still refer to the requirements of ESARR 4 (Risk Assessment and Mitigation in ATM) and how their systems comply with it.

2.3.8 Study Area 7 – Adoption and Sharing of Best Practices

Objectives:

7.1 The State has an established system that gathers information on regulatory best practices and lessons learned from the industry (such as regional/local operational safety improvement action plans, TOOLKITs).

7.2 There is a process in place to share regulatory best practices and safety lessons learned. All information is shared internally, nationally, regionally and with international bodies.

The maturity profile ranges from a minimum of 16.8% to a maximum of 97.6%, with the average being 47.6%. Figure 0-27 shows the number of times Regulators achieved each Maturity Level in response to the objectives of Study Area 7.

Regulators believe that the recently established NSA Coordination Platform will gather "best practices" and make it available to others. By tapping into the work done here they can effectively and efficiently learn about practices being used elsewhere. An EU sub-group under the Single European Skies was also cited as a mechanism to exchange "best practice".

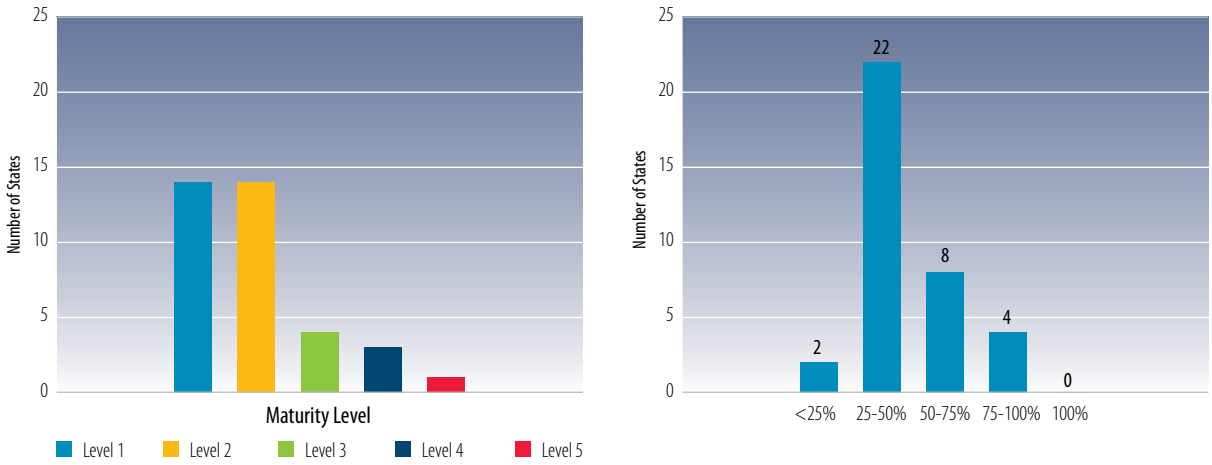

Figure 0-27: Number of Regulators by Maturity Level and distribution by score Study Area 7

Attending various EUROCONTROL committees and working groups encourages discussion and provides fora where ideas can be exchanged. However, Regulators with limited personnel do not always find it possible to participate. (Note that this issue could lead to a widening in the gap between the larger Regulators who have the resources, and the smaller ones who do not.)

Functional Airspace Blocks provide an information exchange mechanism, which may lead to harmonised FAB procedures. Less mature Regulators within the FAB groups are learning from more mature members.

One Regulator cited exchange visits as being a very cost effective and informative approach to learning from others. They had sent a group of staff to a State they believed to be in some ways comparable but more mature and had come back with many ideas.

Although SES States are bound by the Common Requirement some Regulators stated that compliance with ESARRs and the use of tools and guidance provided by EUROCONTROL (e.g. the TOKAI system for the investigation of occurrences) is evidence of adopting '*best practice*'. Other Regulators see ESARR compliance as a minimum requirement, and this is reflected in the lower Maturity Categories they selected. The latter group believe that they would have to go beyond ESARR compliance before they could claim to be adopting 'best practice'.

Whenever examples of '*best practice*' are identified they are always reviewed to ensure that they are compatible with the State's particular requirements and their legislative and regulatory frameworks before being implemented (i.e. 'best practice' in one State may not be directly applicable in another).

Generally Regulators believe that the fora they use to gather '*best practice*' are the same as those they would use to share it. Being active on committees and in workshops is cited as a demonstration of maturity. The EU Peer Review process[5] and independent Peer Reviews between States (e.g. organised by FAB members) will also promote the sharing of ideas.

[5] Peer Reviews are a combined effort between NSAs, formalised by the EC and facilitated by EUROCONTROL to promote best practices used by NSAs for supervisory tasks and to support the harmonisation of NSAs' arrangements.

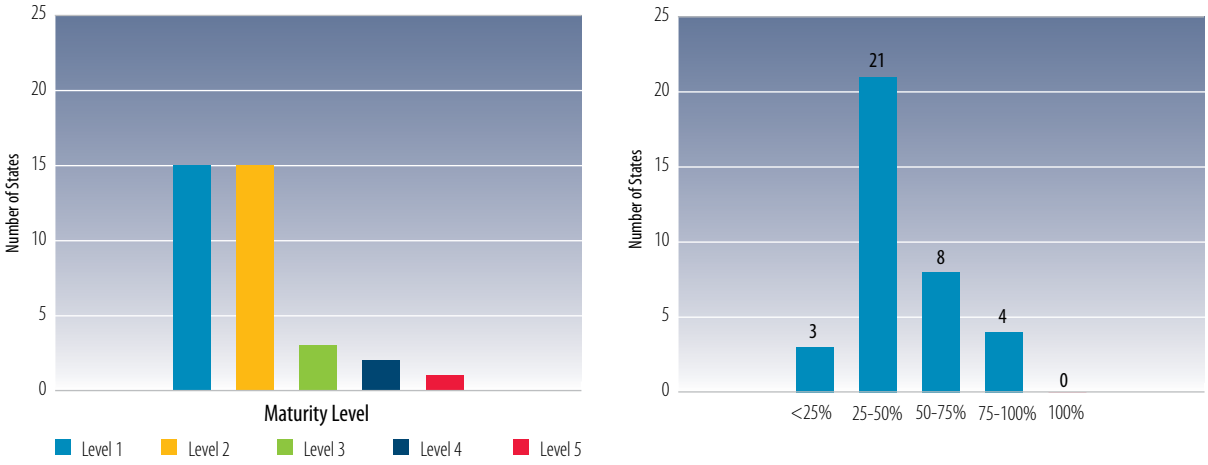

Figure 0-28: Number of Regulators by Maturity Level and distribution by score Study Area 8

2.3.9 Study Area 8 –Safety Culture

Objectives:

8.1 There is a proactive regulatory safety culture that is led by the management in ensuring that relevant staff are aware of and support the regulatory organisation's shared beliefs, assumptions and values.

8.2 Safety culture is measured on a regular basis and there is an improvement programme in place.

8.3 Staff are motivated to ensure that the safety regulatory functions provide a quality service to its stakeholders.

The maturity profile ranges from a minimum of 15.7% to a maximum of 96.7%, with the average being 47.0%. Figure 0-28 shows the number of times Regulators achieved each Maturity Level in response to the objectives of Study Area 8.

Whilst some of Regulators believe that they have a good safety culture and highly motivated staff, it is clear that formal measurement schemes are rarely used. They believe that it is easy to achieve a common safety culture within a small organisation.

Where Regulators believe that they have a positive, well developed or developing safety culture, staff across the whole organisation are (passively) involved in safety activities. Having a good awareness amongst staff is seen as the biggest enabler. However, they recognise that establishing a fully pro active system takes time. Safety culture is assessed qualitatively during interviews and discussions, and is the responsibility of managers.

Measuring safety culture, and hence being able to introduce improvement plans, is seen as a difficult task. In the absence of more formal schemes, EUROCONTROL's Safety Framework Maturity Survey was given as an example of a tool used to monitor safety culture.

At the other end of the maturity scale we find Regulators who know safety is important but the need to measure safety culture is not yet recognised. Staff may not have a harmonized understanding of what safety means for their activities. Where this is the case, presentations are being organised to discuss topics such as:

- What is safety?
- Why is it important?
- How do individuals relate to safety?

In answering the question "There is a proactive regulatory safety culture…." a number of Regulators cited the number and quality of reports received from the ANSP as evidence. It would appear that some Regulators are interpreting the Study Objective to mean that overall the State has a good safety culture and not just their own organisation.

Whilst there is not a common approach, and performance monitoring is not always a formalised activity, Regulators are keen to ensure that they provide a quality service to the aviation industry. Where performance is monitored, a range of techniques will be employed including:

- The ad-hoc collection of stakeholder feedback;
- An annual survey of stakeholders;
- Formal meetings with certificate holders; and
- A survey of public opinion.

2.3.10 Study Area 9 – Resolution of Safety Deficiencies

Objectives:

9.1 The results of occurrence reporting system and investigation activities are used in the identification of deficiencies and safety concerns and their resolution.

9.2 The results of the safety oversight activities (e.g. audits, inspections, certification, oversight of changes, oversight of ATM staff etc) are used in the identification of deficiencies and safety concerns and their resolution.

The maturity profile ranges from a minimum of 19.6% to a maximum of 97.0%, with the average being 51.2%. Figure 0 29 shows the number of times Regulators achieved each Maturity Level in response to the objectives of Study Area 9.

Whilst all Regulators reported having a system in place to resolve safety deficiencies, not all of them have been used. Some of the smaller Regulators reported having no incidents yet that would trigger the mechanism; their response to this survey is therefore based on an understanding of how the system is designed to operate.

Incident reports and the results of oversight activities are analysed and key risk areas are identified; this information is then used to plan future oversight activities. ANSPs and Regulators may have a formal procedure for the classification of incidents, but not necessarily for conducting investigations. When investigating incidents, all Regulators will seek to identify the root cause and ensure that appropriate recommendations are made to eliminate the deficiencies they find. Some have adopted proprietary software tools to help in this area. The results of the analysis typically inform the safety oversight programme for the coming year or trigger an immediate follow-up audit or inspection.

Regulators will monitor the implementation of any recommendations they make to ensure that all corrective and preventative action is taken. This may be undertaken in conjunction with their Quality Management System, which will have the necessary processes for generating corrective action requests; monitoring progress and close-out. Care is taken when writing recommendations to ensure that the Regulator is not assuming responsibility for

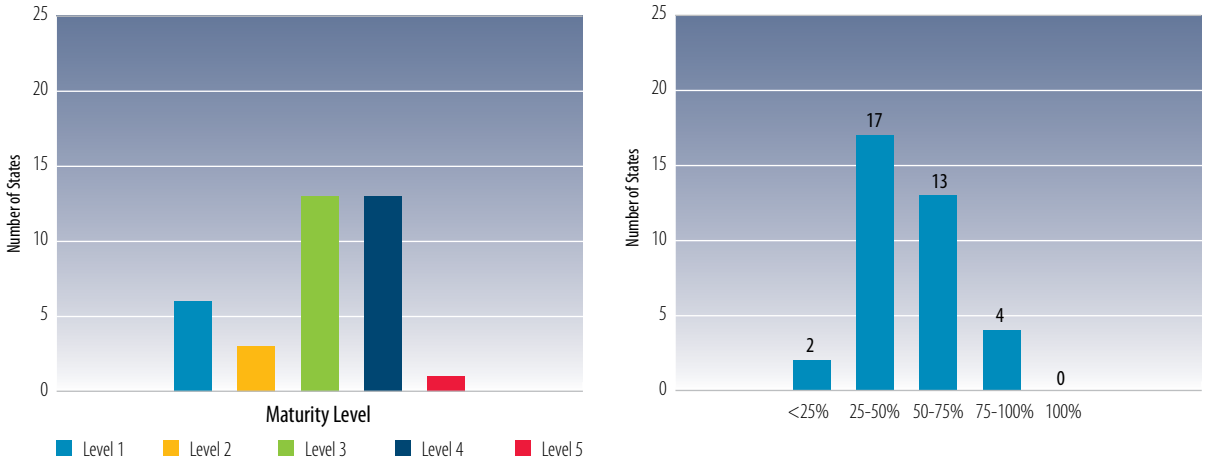

Figure 0-29: Number of Regulators by Maturity Level and distribution by score Study Area 9

the implementation details, and hence any future incidents.

Regulators will typically require the ANSP to correct a deficiency, and the ANSP must devise appropriate methods to comply.

Whenever a corrective action request is generated, the recipient will be given a timescale within which to comply. Failure to comply with an appropriate standard, or within the specified timescale, can result in the revocation of licences or certificates. If Regulators identify major deficiencies, then they have the power to immediately revoke licences or operating certificates, and operations cease.

Re-audit or re-inspection is commonly used to ensure that the corrective actions are effective and remain so.

CHAPTER 3 - ICAO EUR REGION SURVEY RESULTS

3.1 Regional Overview - All Participating States

A total of 46 of the 54 ANSPs in the ICAO EUR region participated in the survey; this includes the 38 SES States discussed previously. 42 Regulators, including 36 from the SES States, also participated. See Appendix 5 for a list of participating States.

There is no significant difference in the maturity profile for ANSPs or Regulators outside of the SES region (Table 0 2: Maturity Levels for ICAO EUR and SES States).

Maturity Level	ICAO EUR Region		SES States	
	ANSPs	Regulators	ANSPs	Regulators
Level 1	5	30	4	26
Level 2	23	9	20	7
Level 3	17	3	13	3
Level 4	1	0	1	0
Level 5	0	0	0	0

Table 0-2: Maturity Levels for ICAO EUR and SES States

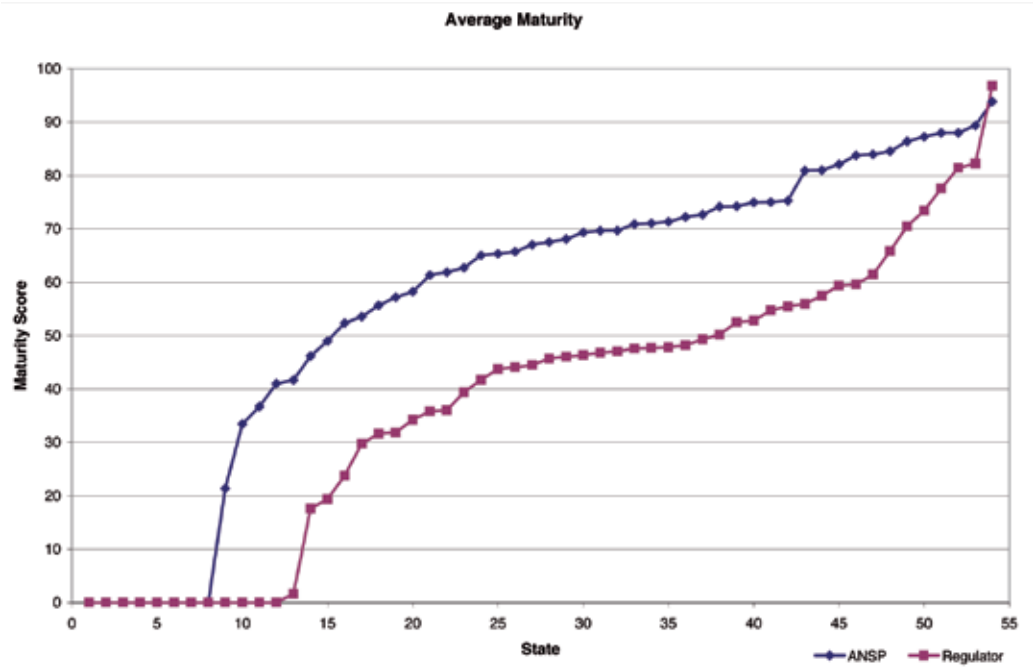

Figure 0-30: Average Maturity for ANSPs and Regulators in the ICAO EUR Region

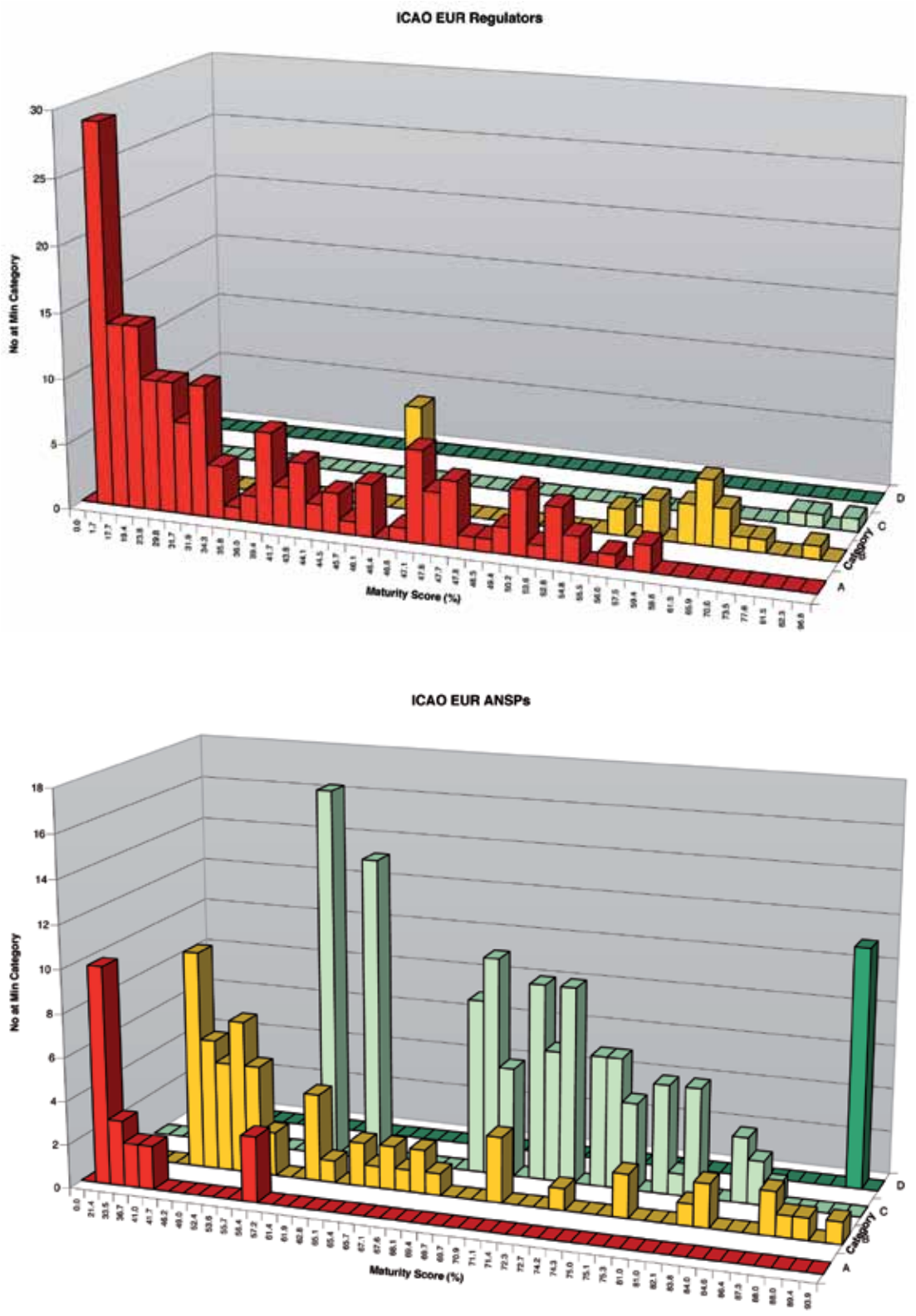

Figure 0-31: Minimum Responses and the Effect on Maturity

The feedback received from those organisations outside of the SES region was broadly in line with that discussed previously. The ranges of Maturity Scores (mean and standard deviation) they achieve are comparable with those of SES members so it is not possible to categorise them as a distinct group. The frequent reference to support from EUROCONTROL, or that they have systems in compliance with ESARRs, may account for the observed results.

For each Study Objective, ANSPs and Regulators were asked to select one of five Maturity Categories (A - E). Figure 0 31 shows, for each organisation, the lowest category chosen and the number of times that category occurs overall. In some sense this provides an indication of the amount of work the organisation has to do before it moves up to the next level.

As one might expect, organisations with a lower maturity score will have selected Category A more frequently than those with a higher overall maturity. What is interesting though is the distinct contrast between ANSPs and Regulators. It is clear that the overwhelming majority of Regulators selected Category A in response to at least one Study Area, whilst only five ANSPs did likewise. The majority of ANSPs believe that their weakest areas are at Category B or above. Furthermore none of the Regulators had Category D as their lowest response, whilst one of the ANSPs did. Ultimately this explains the maturity gap seen in Figure 0-30.

3.2 ICAO EUR Region ANSPs – All Participating States

By combining the response provided to each Study Objective (Category A-E) and the Study Area weightings described in Appendix A4.1, it is possible to derive a numerical score for each Study Area. Figure 0 32 shows the maturity score for each ANSP in their weakest Study Area. Interestingly none of the ANSPs thought that they were weakest in Study Areas 2, 3 or 5, whilst areas 7 (Safety Interfaces) and 1 (Development of a Positive and Proactive Safety Culture) proved to be the main areas of concern.

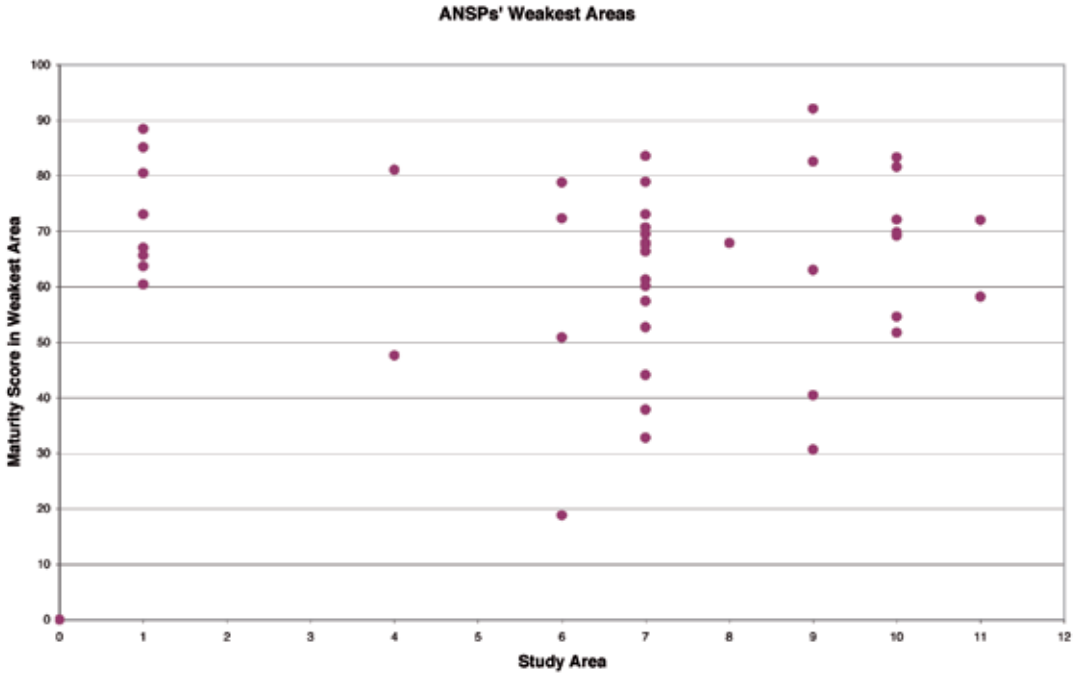

Figure 0 32: ANSP Maturity Score in their Weakest Area

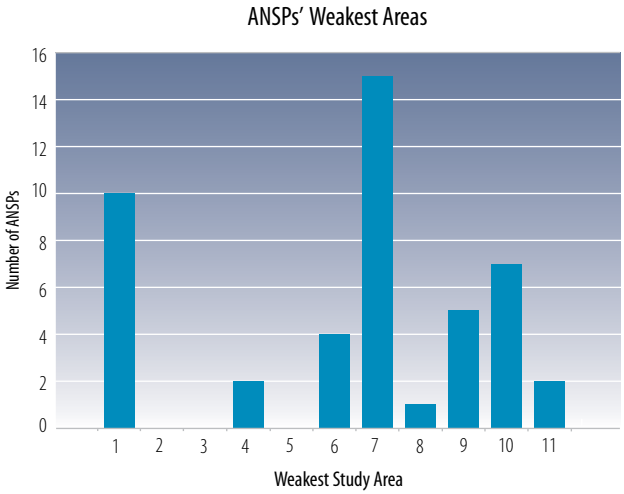

Figure 0-33: Number of ANSP who are weakest in each Study Area

Figure 0-34 summarises the responses provided to each Study Objective and clearly shows that ANSPs marked themselves down on:

- Objective 9.3 A general public knowledgeable of the ANSP's performance through routine publication of achieved safety levels and trends;
- Objective 1.2 Regular measurement of safety culture and an improvement programme; and
- Objective 8.3 Appropriate safety information and knowledge is shared with industry stakeholders.

Over 60% of responses were Maturity Category of A to C in these three areas.

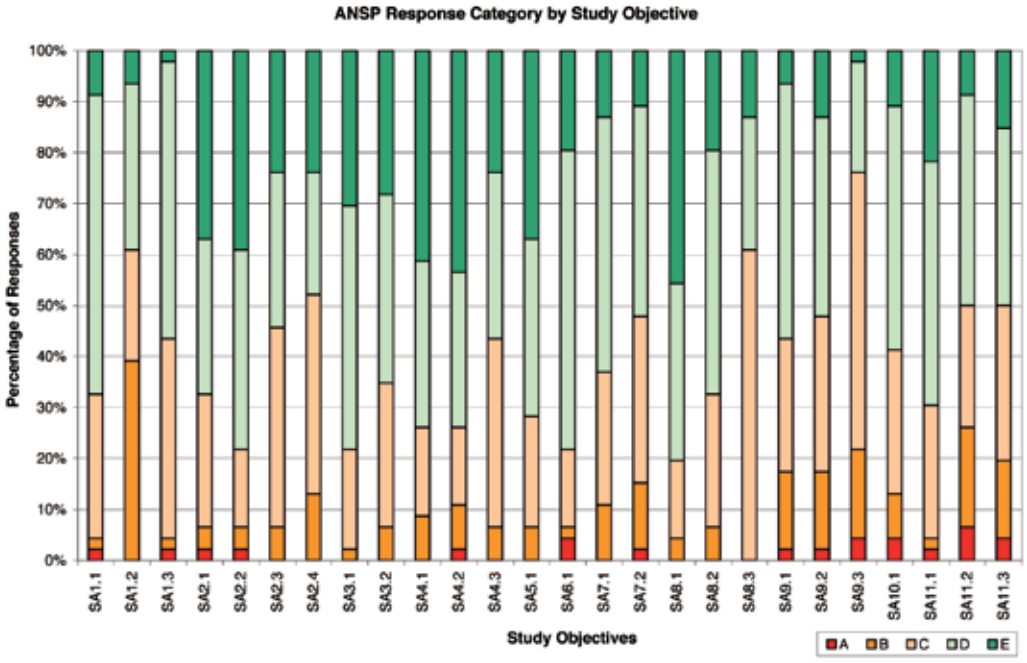

Figure 0-34: ANSP Response Category by Study Objective

ANSPs also agree on their strongest area (see Figure 0 35) with over 70% of them having their highest Maturity Score in Study Area 3 - Timely Compliance with International Obligations.

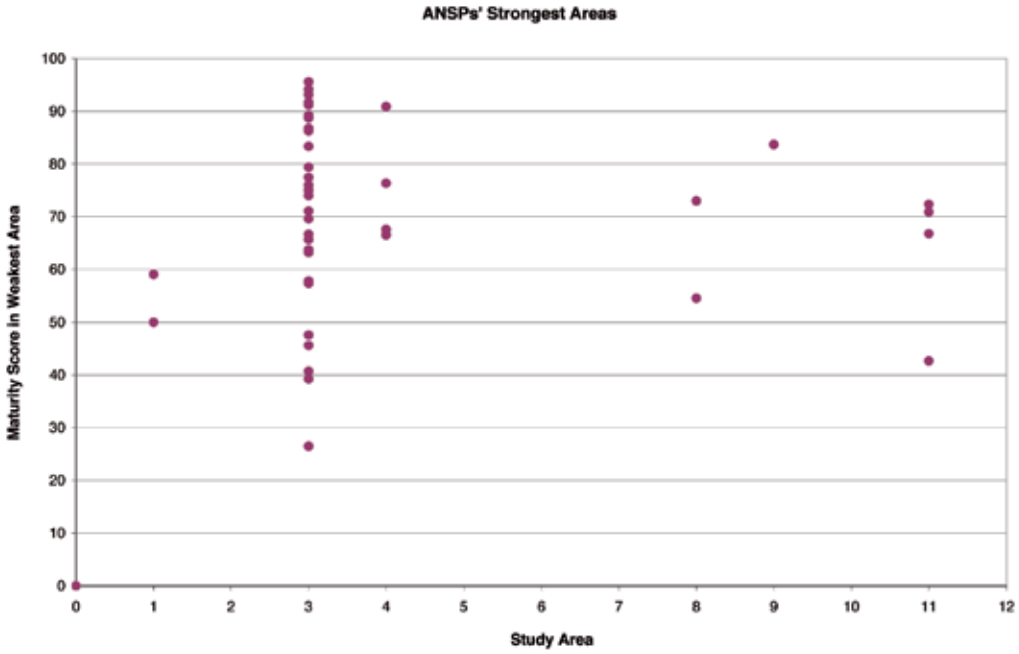

Figure 0-35: ANSP Maturity Score in their Strongest Area

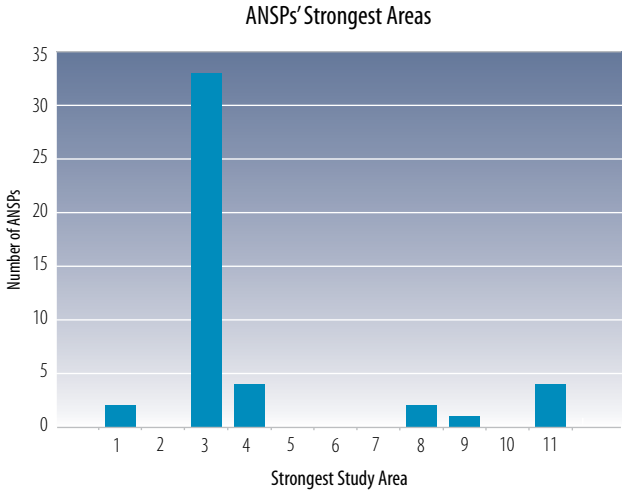

Figure 0-36: Number of ANSP who are strongest in each Study Area

3.2.1 Statistical Comparisons

Figure 0 37 shows the frequency with which ANSPs achieve a certain level of maturity; Table 0 3 summarises the statistical mean and variance for the two data sets. Although the mean values are very similar, the variance (spread of values) differs by a factor of two. It is therefore worth considering whether in fact the two samples could be significantly different (i.e. is there something fundamentally different in the way SES States and those outside the region have responded?).

Statistic	SES States	ICAO States
Mean	68.2	60.6
Standard Deviation	16.6	11.6
Variance	276.3	133.5
Participating States	38	8

Table 0 3: Simple ANSP Statistics

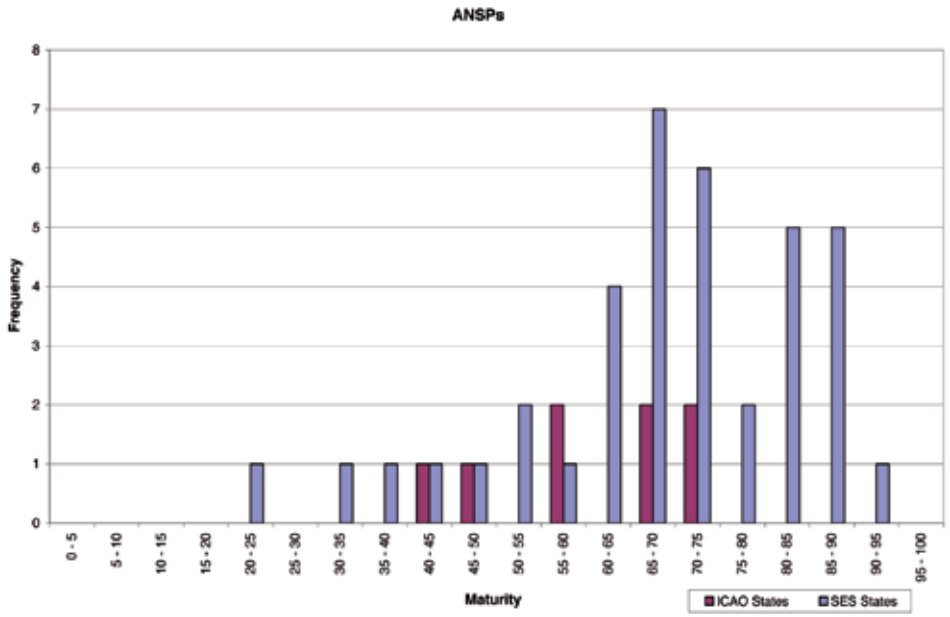

Figure 0-37: Frequency with which ANSPs achieve a level of maturity

Two statistical tests have been used to determine whether the observed mean and variance are consistent with a single population (i.e. whether it is possible to distinguish between ANSPs with SES States and those in the broader ICAO EUR Region), see Appendix 3. No statistically significance was found and therefore it is reasonable (to a 95% confidence level) to assume that ANSPs in the whole ICAO EUR Region can be treated as a single group.

3.3 ICAO EUR Region Regulators – All Participating States

By combining the response provided to each Study Objective (Category A-E) and the Study Area weightings described in Appendix A4.2 it is possible to derive a numerical score for each Study Area. Figure 0-38shows the maturity score for each Regulator in their weakest Study Area.

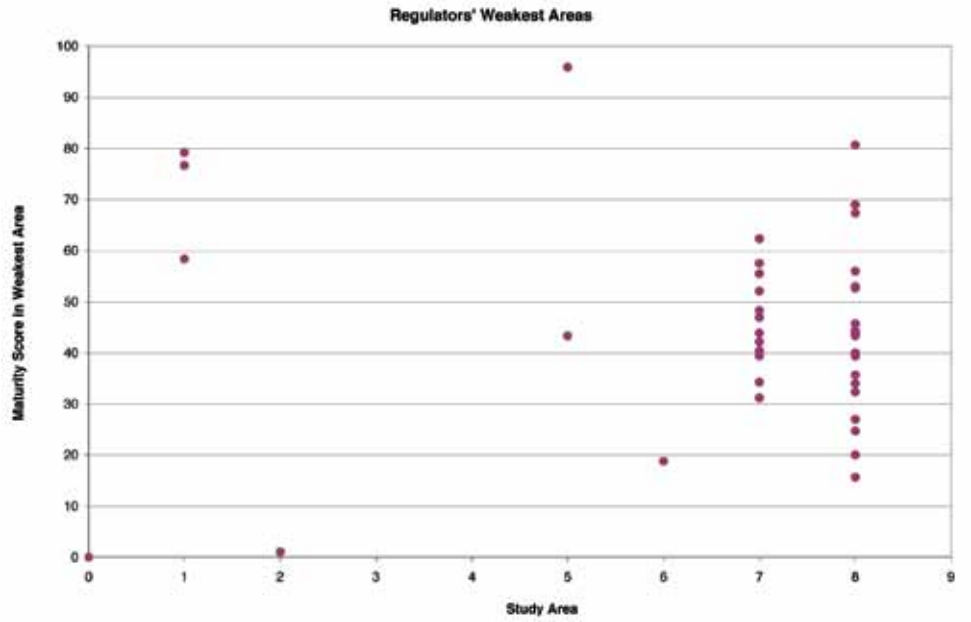

Figure 0-38: Regulator Maturity Score in their Weakest Area

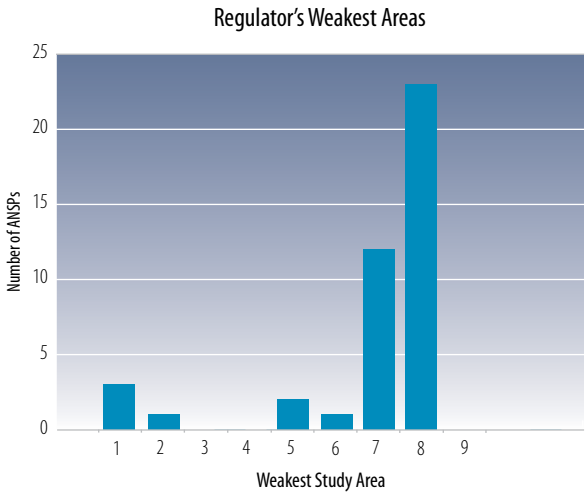

Figure 0 39: Number of Regulators who are weakest in each Study Area

The overwhelming majority of Regulators are weakest in Study Areas 8 (Safety Culture) or Study Area 7 (Adoption and sharing of best practice).

As mentioned previously, many Regulators found the term "best practice" difficult to understand and interpret. Systematic processes to share information, either internally or externally are not generally well developed.

Figure 0-40 summarises the responses provided to each Study Objective and clearly shows that the majority of Regulators marked each question at Categories A to C in contrast to ANSPs (see Figure 0-34).

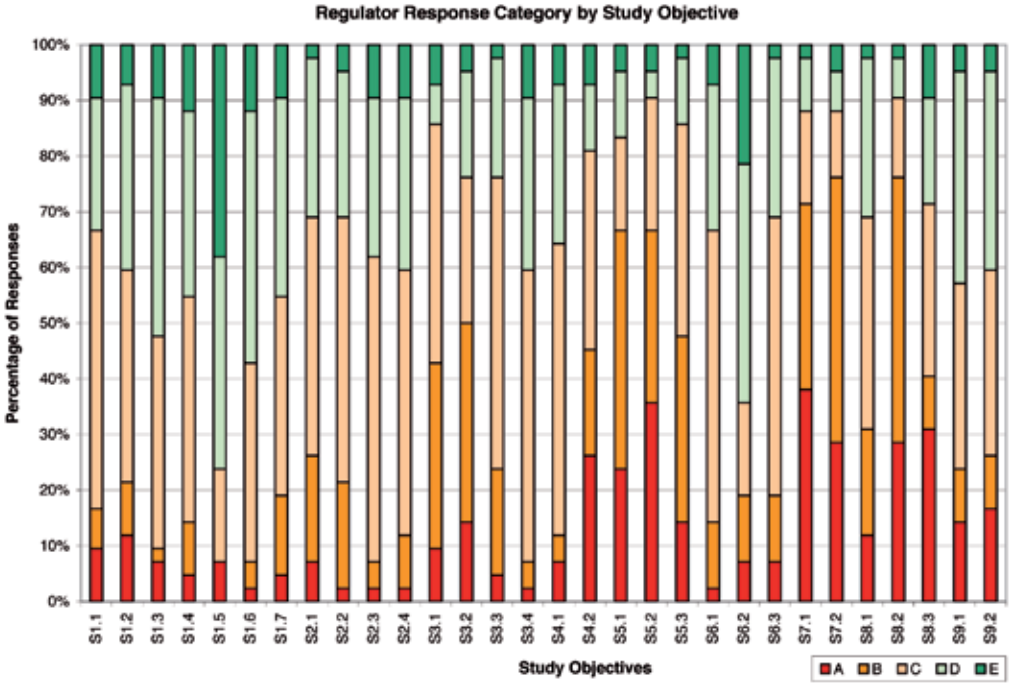

Figure 0-40: Regulator Response Category by Study Objective

Maturity Categories A to C were chosen for 90% of responses to two Study Objectives:

- Objective 5.2 The levels of safety achieved are regularly monitored and assessed in order to determine their compliance with safety regulatory requirements; and
- Objective 8.2 Safety culture is measured on a regular basis and there is an improvement programme in place.Whilst current levels of performance are monitored, Regulators do not typically have well defined targets and do not conduct benchmarking exercises.

As with the ANSPs, Regulators do not systematically assess their own Safety Culture so that improvement programmes can be initiated.

Whilst Regulators agree on which is their weakest Study Area, they are less inclined to agree on their strongest. Figure 0 41 shows that 52% of Regulators believe that they are strongest in Study Area 1 - State Safety Framework with Study Areas 2, 6 and 9 accounting for over 33% of the remainder.

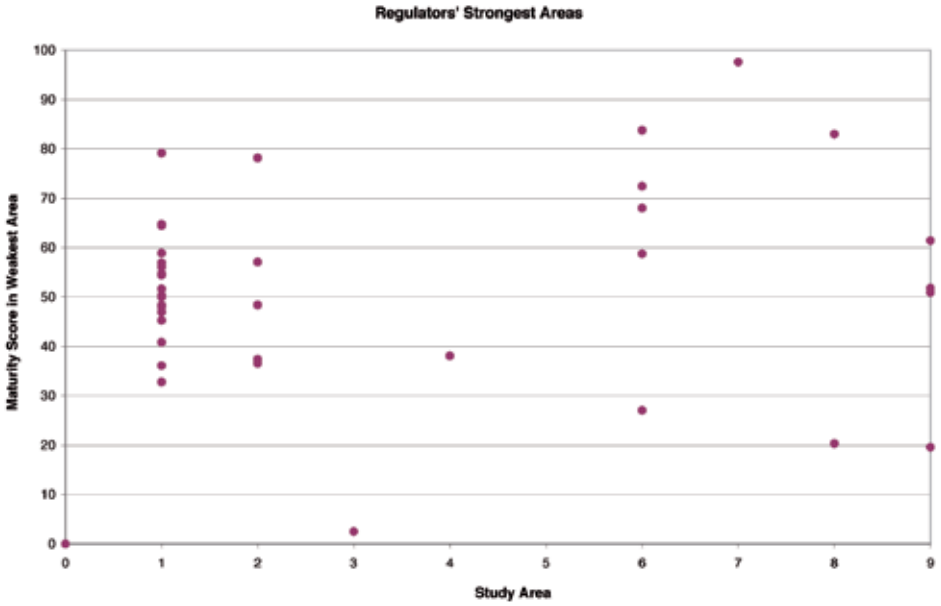

Figure 0-41: Regulator Maturity Score in their Strongest Area

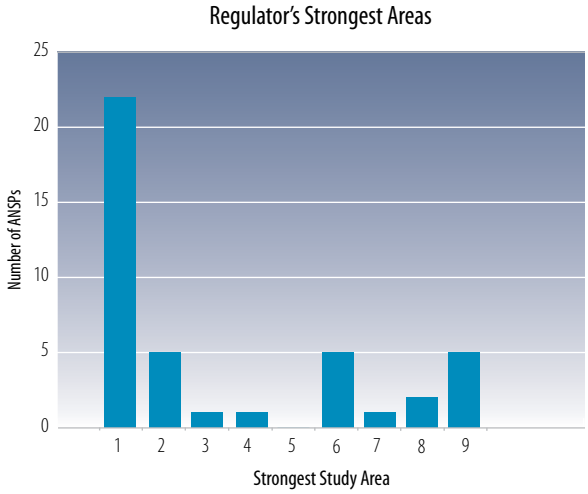

Figure 0-42: Number of Regulators who are strongest in each Study Area

3.3.1 Statistical Comparison

Figure 0-43 shows the frequency with which Regulators achieve a certain level of maturity; Table 0 4 summarises the statistical mean and variance for the two data sets. Again the graph appears to show a consistency between the data, but is there a fundamental difference?

Statistic	SES States	ICAO States
Mean	50.3	39.4
Standard Deviation	17.3	23.6
Variance	298.8	555.1
Participating States	36	6

Table 0-4: Simple Regulator Statistics

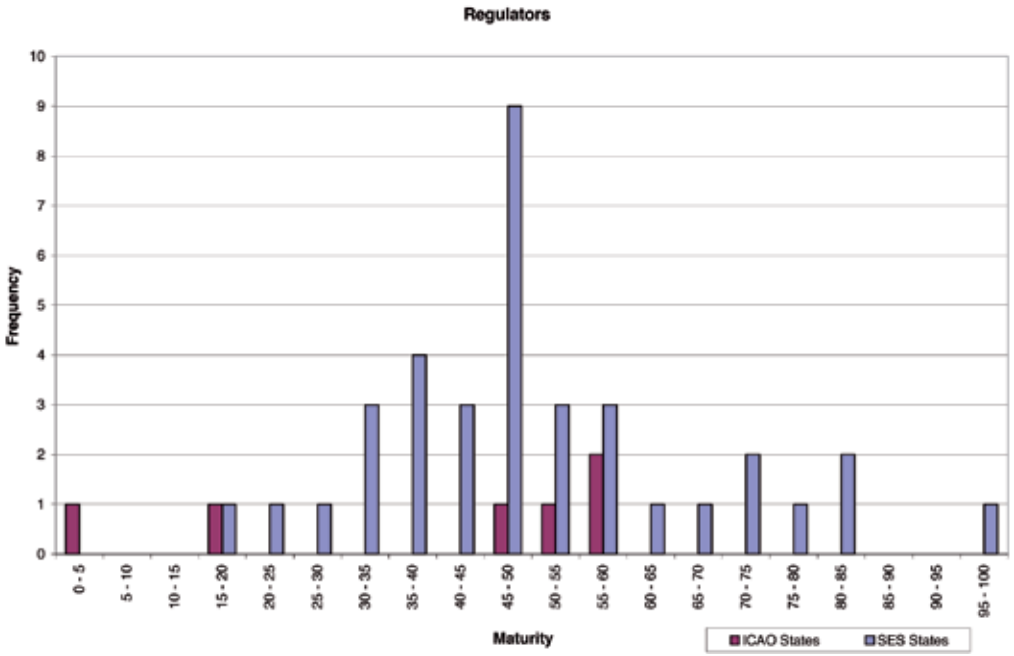

Figure 0-43: Frequency with which Regulators achieve a level of maturity

Two statistical tests have been used to determine whether the observed mean and variance are consistent with a single population (i.e. whether it is possible to distinguish between Regulators with SES States and those in the broader ICAO EUR Region), see Appendix 3. No statistically significance was found and therefore it is reasonable (to a 95% confidence level) to assume that Regulators in the whole ICAO EUR Region can be treated as a single group.

CHAPTER 4 - CONCLUSIONS

4.1 General

1. States are very supportive of the survey and frequently use it as an integral part of their own review and planning process. Often the questionnaire, and less frequently the interview, will involve a number of people from around the organisation, which is encouraging.

2. Interviewees are very enthusiastic and willing to openly discuss the strengths and weaknesses of their organisation.

3. 85% of ANSPs invited to participate in the survey returned a questionnaire; all of the SES States returned their questionnaire. Of those who returned a questionnaire, 93% were also interviewed. Participation by Regulators was slightly lower, with 77% returning a questionnaire, of which 90% were also interviewed. Not all of the Regulators from SES States participated. Overall, slightly fewer States participated than in 2009.

4. There appear to be a group of 'mature' States who are marking themselves based on a deep understanding of where they are and even where they would like to be. This generated quite a broad range of responses to survey questions reflecting a good understanding of their own strengths and weaknesses. A second group appear to mark themselves based on where they believe they should be, or would like to be, even if all requirements are not always met fully. This will be indicative of less mature organisations, regardless of their final scores, but such situations are practically always detected, at the latest at the interview stage.

5. Statistically there is no distinction between the Safety Maturity profile of SES States and those in the broader ICAO EUR Region.

6. The introduction of Functional Airspace Blocks was seen, by ANSPs and Regulators alike, as a very positive step. The cooperation already taking place is helping weaker States to improve faster than they would otherwise be able to. Equally it is helping to formulate common methods on previously perceived difficult areas, such as Safety Targets.

7. ANSPs and Regulators both welcome the guidance material, tools and methods provided by EUROCONTROL.

8. As seen in previous Safety Framework Maturity Surveys, States are making a limited amount of information available to the public and other stakeholders. Before they would be willing to make more information available they believe that the public needs to be better educated so that they fully appreciate the information.

4.2 ANSPs

1. The mean Safety Maturity Score for ANSPs within the SES States is 68.6%, compared with 60.8% for those outside of the region, giving an overall mean score of 67.4%. 28 ANSPs are at Maturity Level 2 or below.

2. On average Study Area 3 (Timely Compliance with International Obligations) is the ANSPs strongest area, whilst they are weakest in Study Area 7 (Safety Interfaces).

3. Whilst the mean Safety Maturity Score does vary across Study Areas, no one Study Area stands out as being of particular concern or exceptionally good.

4. Progress on Just Culture is being hindered in some ANSPs by processes beyond the control of the ANSPs, for example judicial systems not recognising the concept.

5. Some ANSPs identified a lack of resources (i.e. suitably qualified and experienced staff) in their safety departments as something that was hindering progress. However, the number of incident reports continues to increase which is taken as a positive sign that progress is being made.

6. The relationships between operational staff, the safety department and senior management can lead to tensions and a breakdown in working relations. Ultimately decisions may be made, for good reasons, but without the full safety implications being taken into account. (The Safety Manager is only one voice amongst many.)

7. Trust and a good Safety Culture, are seen as positive enablers.

4.3 Regulators

1. The mean Safety Maturity Score for Regulators within the SES States is 50.2%, compared with 39.4% for those outside of the region, giving an overall mean score of 49.0%. 39 Regulators are at Maturity Level 2 or below.

2. On average Study Area 1 (State Safety Framework) is the Regulators' strongest area, whilst they are weakest in Study Area 8 (Safety Culture), particularly the measurement of Safety Culture.

3. A shortage of suitably trained and qualified staff is hindering the Regulators' ability to perform some of their functions. Regulators are prioritising what they do, based on the staff available and the perceived level of risk.

4. Many Regulators would welcome further guidance and support concerning a coordinated and harmonised method of establishing and monitoring Target Levels of Safety. Fortunately the more serious forms of incident are very rare, but this makes it very difficult for an individual State to monitor.

5. Changing Primary Legislation is time-consuming and some States are still finding it very slow to incorporate International requirements into State Legislation, where those are not directly applicable (i.e. SES regulations). Similarly, the lack of a State Safety Plan is also a hindrance in some cases.

6. Regulators try to make as much use as possible of the courses offered by EUROCONTROL. Unfortunately time constraints and over-booking means that they cannot always attend.

7. Regulators are trying to promote a Just Safety Culture but, in many cases, State Legislation requires them to involve the law enforcement and/or judicial authorities when investigating the more serious incidents. This external involvement is seen as undermining work on Just Culture.

CHAPTER 5 - RECOMMENDATIONS

It is recommended that EUROCONTROL:

R1. Supports the Functional Airspace Blocks at every possible opportunity. Furthermore EUROCONTROL should also promote the exchange of information (including policies, procedures, data etc.) and ideas between Functional Airspace Blocks.

R2. Reviews the guidance material available to ANSPs and Regulators on the development of safety targets.

R3. Reviews the guidance material available to ANSPs and Regulators on the development of safety indicators and target levels of safety. Both leading and lagging indicators should be addressed and the review should take into consideration the SAFREP output. Where appropriate, additional material should be made available.

R4. Works with ANSPs and Regulators to ensure that Safety Culture surveys are introduced and that appropriate improvement programmes are subsequently implemented.

R5. Works with ICAO Regional Office to understand why participation by States outside of the SES and ECAC Regions is low (re to ENAPG decision).

APPENDIX 1- REFERENCE MATERIAL

A1.1 References

1. Improving European ATM Safety through SMART Safety Indicators, 3rd SAFREP TF Report to Provisional Council European ATM Safety Performance Indicators, 2009

2. ATM Safety Framework Maturity Survey Methodology for ANSPs, 3rd SAFREP TF Report to Provisional Council Appendix 1, 2009

3. ATM Safety Framework Maturity Survey Methodology for ATM Regulators, 3rd SAFREP TF Report to Provisional Council Appendix 2, 2009

4. Global Aviation Safety Roadmap, prepared by the Industry Safety Strategy Group for ICAO.

5. CANSO Standard of Excellence in Safety Management Systems, July 2009

6. Safety Management Manual, Document 9859, ICAO, 2009

7. ESARR Advisory Material/Guidance Material, Severity Classification Scheme for Safety Occurrences in ATM, EAM 2/GUI 1, Edition 1.0, 1999

8. ESARR Advisory Material/Guidance Material, Harmonisation of Safety Occurrence Severity and Risk Assessment, EAM 2/GUI 5, Edition 1.0, 2005

9. ESARR 2, Reporting and Assessment of Safety Occurrences in ATM, Edition 2.0, 2000

A1.2 Background Material

Although not directly referenced in this report, the following Level 2 Local Single Sky Implementation Reports and Audit Results Summary Sheets from the ESARR Implementation Monitoring and Support (ESIMS) Programme were used as background information whilst preparing for the telephone interviews:

State	LSSIP Years	ESSIM Audits
Albania	2010 - 2014	
Armenia	2010 - 2014	
Austria	2010 - 2014	10/14 September 2007
Azerbaijan	2009 - 2013	
Belgium	2010 - 2014	
Bosnia	2010 - 2014	
Bulgaria	2010 - 2014	29 September/3 October 2008
Croatia	2010 - 2014	24/28 November 2008
Cyprus	2010 - 2014	
Czech Republic	2010 - 2014	
Denmark	2010 - 2014	7/11 November 2005
Estonia	2010 - 2014	16/20 March 2009
Finland	2010 - 2014	12/16 March 2007
France	2010 - 2014	5/9 February 2007
FYROM	2010 - 2014	7/11 July 2008
Georgia	2010 - 2014	
Germany	2010 - 2014	
Greece	2010 - 2014	
Hungary	2010 - 2014	5/9 December 2005
Iceland		18/22 June 2007
Ireland	2010 - 2014	31 March/04 April 2008

APPENDIX 1 - REFERENCE MATERIAL

State	LSSIP Years	ESSIM Audits
Italy	2010 - 2014	
Latvia	2010 - 2014	7/11 April 2008
Lithuania	2010 - 2014	
Luxembourg	2010 - 2014	
Maastricht	2010 - 2014	
Malta	2010 - 2014	27/30 March 2008
Moldova	2010 - 2014	
Netherlands	2010 - 2014	24/28 April 2006
Norway	2010 - 2014	
Poland	2010 - 2014	
Portugal	2010 - 2014	19/23 June 2006
Romania	2010 - 2014	15/19 October 2007
Serbia	2010 - 2014	17/21 November 2008
Slovak Republic	2010 - 2014	23/27 October 2006
Slovenia	2010 - 2014	6/10 November 2006
Spain	2010 - 2014	3/7 April 2006
Sweden	2010 - 2014	19/23 November 2007
Switzerland	2010 - 2014	3/7 December 2007
Turkey	2010 - 2014	
Ukraine	2010 - 2014	
United Kingdom	2010 - 2014	2/6 July 2007

APPENDIX 2 - METHODOLOGY

A2.1 Overview

The methodology is described in detail in References 1, 2 and 3, and summarised in Figure A0 1.

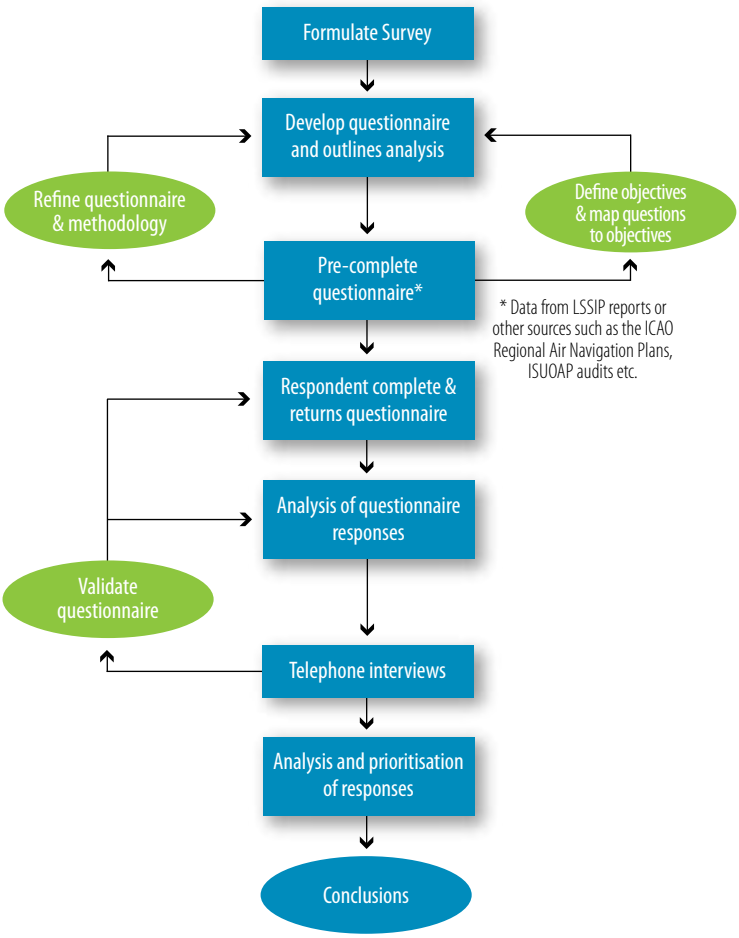

Figure A0-1: Survey Methodology

A2.2 Study Areas

EUROCONTROL formulated the study areas:

- For Regulators they are based on ICAO's 8 Critical Elements plus Safety Culture; and
- For ANSPs they were developed in consultation with the main stakeholder groups and industry bodies based on the SMS Excellence model adopted by CANSO and EUROCONTROL and aligned with ICAO Global Aviation Safety Roadmap.

From this they developed two questionnaires which were tested and refined during a pilot study in 2009. In the summer of 2010 EUROCONTROL distributed both questionnaires to all of the ANSPs and Regulators in the ICAO EUR Region (with ICAO support for some States outside the SES region). Each organisation was asked to complete and return the questionnaire specific to them; additionally Regulators were asked to fill in a questionnaire based on their knowledge of their main ANSP (and vice versa). Whilst not critical to the survey, it was hoped that completing the second questionnaire would allow organisations to open up a dialogue between ANSPs and Regulators, hence improving the flow of safety-related information.

ANSPs were asked a total of 26 questions grouped into 11 Study Areas; Regulators were asked 30 questions grouped into 9 Study Areas, see Table A0-1.

ANSP Study Areas	Regulator Study Areas
SA1 – Safety Culture	S1 - State Safety Framework
SA2 – Organisational and Individual Safety Responsibilities	S2 - Safety Resources
SA3 – Timely Compliance with International Obligations	S3 - Safety Interfaces
SA4 - Safety Achievement	S4 - Safety Reporting, Investigation and Improvement
SA5 - Competency	S5 - Safety Performance Monitoring
SA6 – Risk Management	S6 - Implementation of Safety Oversight
SA7 – Safety Interfaces	S7 - Adoption and Sharing of Best Practices
SA8 – Safety Assurance	S8 - Safety Culture
SA9 – Safety Performance Monitoring	S9 - Resolution of Safety Deficiencies and Concerns
SA10 – Organisational Safety Surveys and SMS Audits	
SA11 – Adoption and Sharing of Best Practices	

Table A0-1: Study Areas

APPENDIX 2 - METHODOLOGY

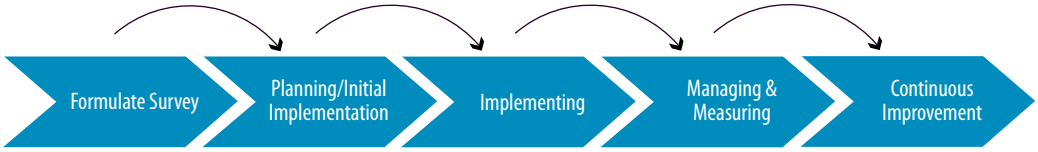

Figure A0-2: Maturity Categories

A2.3 Capability Maturity Model

For each question there are five possible answers, from Initiating to Continuous Improvement, based on a Capability Maturity Model, see Figure A0-2. An organisation should achieve/match all of the characteristics at one maturity category before they can consider moving up to the next. Even if many aspects of a higher category are applicable, a lower level of maturity should be selected if the higher category is not fully satisfied.

Unlike the studies conducted between 2002 and 2009, Regulators were asked questions specifically about their own organisation and not simply to provide their opinion of the ANSP.

Once the completed questionnaires are received, the organisation's nominated focal points are contacted to discuss the results and seek supporting evidence. In a number of cases the responses to specific questions were revised up or down based on the interview, and a revised questionnaire submitted for final analysis.

Since the methodology relies on a self-assessment, the SAFREP TF is seeking to increase the robustness of the maturity measurements by:

- Encouraging surveys from peer organisations under the umbrella of EUROCONTROL;
- Visiting 5-10 organisations to conduct a short face-to-face review of the questionnaire and evidence provided. States would be selected at random, although it is hoped that every State could be visited during the first reference period; and
- Taking into account the existing data (e.g. LSSIP) and audit reports (e.g. IUSOAP, ESIMS).

A2.4 Numerical Analysis

EUROCONTROL, in discussion with its stakeholders through SAFREP Task Force, has weighted each question (0 – 5) according to its relevance to each study area (during 2 years of development and validation including 22 review Workshops). The responses provided by ANSPs and Regulators on their questionnaires are assigned a numerical value (0 - 4 corresponding to categories A - E).

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

$$S_{i,j} = \frac{100 \sum_{k=1}^{n_{i,j}} r_{k,j,i} \cdot w_{k,j}}{4 \sum_{k=1}^{n_{i,j}} w_{k,j}}$$

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

$w_{k,j}$ 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.

A2.5 Mapping of Study Areas and ICAO Critical Elements

The mapping of the Study Areas, in the Regulator survey, onto the appropriate ICAO Critical Elements agreed in SAFREP is shown in Table A0-2.

	ESIMS Strategy Step	CE1	CE2	CE3	CE4	CE5	CE6	CE7	CE8
		Primary Aviation Legislation	Specific Operating Regulations	State civil Aviation system and safety oversight functions	Technical Personnel Qualification and Training	Technical Guidance, Tool and Provision of Safety-Critical Information	Licensing, Certification, Authorisation and Approval Obligations	Surveillance Obligations	Resolution of Safety Concerns
S1: State Safety Framework	Framework	√	√	√		√		√	
S2: Safety Resources	Framework		√	√	√		√		√
S3: Safety Interfaces	Framework		√						
S4: Safety Reporting, investigation and Improvement	Oversight	√	√	√				√	√
S5: Safety Performance Monitoring	Oversight	√		√		√	√	√	
S6: Implementation of Safety Oversight	Oversight		√		√		√		
S7: Adoption and Sharing of Best practices	Misc				√				
S8: Safety Culture	Misc	No mapping with ICAO Critical Elements							
S9: Resolution of safety Deficiencies and Concerns	Resolution of safety deficiencies		√		√				√

A2.6 Telephone Interview Procedure

Preparation

- Contact the interviewee by e-mail or telephone to agree a time and date for the interview;
- Confirm the appointment in UCT and local time;
- Read the available background material.

Interview

- At the appointed time, make the call;
- Confirm that the interviewee is free to talk and establish how long they have available;
- Introduce yourself and how the interview fits in with the overall aims of the project;
- Ask the interviewee to describe their organisation and their role within it;
- Work through each response in the questionnaire seeking evidence to support the maturity score chosen;
  - Ask the interviewee to explain why the particular category was chosen;
  - Use open questions;
  - Let the interviewee do most of the talking;
  - Use the prompts in the REG and ANSP Interview Questions to challenge reasoning;
  - Explore issues that aid or hinder progress;
  - If necessary seek additional confirmation by supplementary e-mail;
  - Clarify anything that you do not understand or which seems to conflict with earlier statements;
  - Try to understand whether you are being given an honest opinion or one from which they are unwilling to move;
  - Do not push too hard otherwise the interviewee will dry up and give you nothing;
  - If what you are being told agrees with the level of maturity selected, move on;
  - Record all relevant details and private notes in your project logbook;
- Confirm any actions that have been agreed (e.g. to provide information, change maturity levels etc.);
- Ask whether there is anything you can pass on to EUROCONTROL on their behalf;
- Confirm that the interviewee has your contact details just in case they decide they want to provide more information;
- Thank the interviewee for their time and end the call.

Post Interview

- Update the Status Report;
- Undertake any actions you have agreed to;
- Monitor actions the interviewee has agreed to undertake;
- Write up the interview into the Repository;
- Inform the Project Manager if a new Questionnaire has been created with revised scores.

APPENDIX 3 - STATISTICAL TESTS

A3.1 ANSPs

A Fisher variance-ratio test can be used to determine whether the variance of one data set is statistically significantly greater (or smaller) than another. As there is no reason to suspect that the variance of one group should be larger or smaller than that of the other, a "two-sided" F-Test is appropriate and yields the following results:

- Observed value: 2.07
- Critical value: 4.32

Since the observed value of the F-Test is less than the critical value we conclude that the two samples are consistent with a single population (to a 95% confidence level). For completeness we also perform a "Student" t-Test assuming equal variance to determine whether the sample means are consistent with a single overall population variance. The data yield the following results:

- Observed value: 1.15
- Critical value: 2.02

which is consistent with a single population mean (to a 95% confidence level).

Since the differences in mean and variance from the two data sets are not statistically significant we can conclude that there is no fundamental difference in maturity profile within the SES region and for the participating States outside.

(*Note that the "Student" t-Test assumes that the observations are taken from a sample with a normal distribution. A Mann-Whitney test makes no such assumption, and when conducted on the same data gives the same result; namely that there is no statistically significant difference between the two data sets.*)

A3.2 Regulators

A Fisher variance-ratio test yields the following results:

- Observed value: 1.86
- Critical value: 2.96

Since the observed value of the F-Test is less than the critical value we conclude that the two samples are consistent with a single population (to a 95% confidence level). For completeness we also perform a "Student" t-Test assuming equal variance to determine whether the sample means are consistent with a single overall population variance. The data yield the following results:

- Observed value: 1.36
- Critical value: 2.02

which is consistent with a single population mean (to a 95% confidence level).

Since the differences in mean and variance from the two data sets are not statistically significant we can conclude that there is no fundamental difference in maturity profile within the SES region and for the participating States outside.

APPENDIX 4 - QUESTION MAPPINGS

A4.1 Mapping of ANSP Questions to Study Areas

Questions	Study Areas										
	SA1	SA2	SA3	SA4	SA5	SA6	SA7	SA8	SA9	SA10	SA11
SA1-1	5	5	5	3	5	4	4	5	4	4	4
SA1-2	5	4	0	1	5	1	0	0	0	4	4
SA1-3	4	3	1	2	4	2	0	5	5	3	3
SA2-1	4	4	4	4	4	4	4	5	4	4	3
SA2-2	2	5	5	3	2	3	1	2	2	2	3
SA2-3	5	5	3	3	5	4	3	4	4	4	4
SA2-4	2	5	5	3	2	3	1	2	2	2	3
SA3-1	1	2	5	2	1	2	1	2	1	2	2
SA3-2	1	3	5	3	1	1	1	2	2	2	2
SA4-1	2	5	2	5	2	2	2	2	2	2	3
SA4-2	3	3	1	4	3	4	1	4	4	4	4
SA4-3	3	2	0	3	3	4	3	3	4	4	5
SA5-1	4	5	3	2	5	4	2	4	4	4	3
SA6-1	4	5	3	4	4	5	4	4	4	4	3
SA7-1	5	5	0	4	5	5	5	4	4	5	3
SA7-2	3	3	2	3	3	4	5	3	3	2	2
SA8-1	5	3	1	2	5	0	0	5	5	2	3
SA8-2	5	2	0	3	5	4	2	5	4	4	5
SA8-3	3	3	2	3	3	4	4	4	3	2	2
SA9-1	2	3	2	2	2	2	2	4	5	5	2
SA9-2	4	2	0	2	4	4	2	3	5	3	2
SA9-3	4	2	0	3	4	4	2	4	5	4	2
SA10-1	4	4	2	4	4	4	4	4	4	5	5
SA11-1	4	3	0	3	4	3	3	2	4	4	5
SA11-2	4	3	0	3	4	3	3	2	4	4	5
SA11-3	3	2	0	1	3	2	4	5	4	2	4

A4.2 Mapping of Regulator Questions to Study Areas

Questions	Study Areas								
	SA1	SA2	SA3	SA4	SA5	SA6	SA7	SA8	SA9
S1-1	5	2	3	3	2	3	1	1	3
S1-2	5	3	3	3	3	3	1	1	3
S1-3	4	4	3	2	2	3	2	2	3
S1-4	5	5	3	2	2	3	2	2	2
S1-5	5	3	4	2	2	4	1	1	2
S1-6	5	2	2	2	2	5	2	1	2
S1-7	5	3	3	2	2	2	2	1	2
S2-1	3	5	2	3	3	4	2	1	2
S2-2	2	5	2	3	3	3	2	2	2
S2-3	2	4	3	3	3	3	3	2	2
S2-4	2	4	3	2	2	4	2	4	3
S3-1	1	2	5	2	2	3	2	2	2
S3-2	1	2	4	2	2	2	2	3	3
S3-3	2	3	5	4	2	3	3	2	4
S3-4	3	2	5	3	3	3	2	2	3
S4-1	4	3	4	5	3	3	2	2	4
S4-2	2	2	4	4	3	2	4	5	4
S5-1	4	3	3	3	4	3	2	3	2
S5-2	3	3	3	3	5	4	2	2	3
S5-3	2	3	4	3	4	3	2	3	2
S6-1	3	4	3	2	3	5	2	2	4
S6-2	2	5	3	2	2	5	2	2	2
S6-3	3	4	3	2	3	4	2	2	3
S7-1	3	3	3	3	2	3	5	4	2
S7-2	2	3	4	3	2	2	5	3	2
S8-1	2	3	3	3	2	2	4	5	3
S8-2	2	2	3	3	3	2	3	5	2
S8-3	2	4	3	2	2	3	3	4	2
S9-1	3	2	3	5	3	3	3	3	5
S9-2	3	2	3	3	3	5	3	3	5

APPENDIX 5 - PARTICIPATION

The following table provides a summary of the participation as at 20th January 2011.

State	SES State	Air Navigation Service Providers		Regulators	
		Questionnaires	Interviewed	Questionnaires	Interviewed
Albania	Yes	Yes	Yes	Yes	Yes
Algeria	No	No	No	No	No
Armenia	No	Yes	Yes	Yes	Yes
Austria	Yes	Yes	Yes	Yes	Yes
Azerbaijan	No	Yes	Yes	Yes	Yes
Belarus	No	No	No	No	No
Belgium	Yes	Yes	Yes	Yes	Yes
Bosnia & Herzegovina	Yes	Yes	Yes	Yes	Yes
Bulgaria	Yes	Yes	Yes	Yes	Yes
Croatia	Yes	Yes	Yes	Yes	No
Cyprus	Yes	Yes	Yes	Yes	Yes
Czech Republic	Yes	Yes	Yes	Yes	Yes
Denmark	Yes	Yes	Yes	Yes	Yes
Estonia	Yes	Yes	Yes	Yes	Yes
Finland	Yes	Yes	Yes	Yes	Yes
France	Yes	Yes	Yes	Yes	Yes
Macedonia (FYROM)	Yes	Yes	Yes	No	No
Georgia	No	No	No	No	No
Germany	Yes	Yes	Yes	Yes	No
Greece	Yes	Yes	Yes	Yes	Yes
Hungary	Yes	Yes	Yes	Yes	Yes
Iceland	Yes	Yes	Yes	Yes	Yes
Ireland	Yes	Yes	Yes	Yes	Yes
Italy	Yes	Yes	Yes	Yes	Yes
Kazakhstan	No	No	No	No	No
Kyrgyzstan	No	No	No	No	No
Latvia	Yes	Yes	Yes	Yes	Yes
Lithuania	Yes	Yes	Yes	Yes	Yes
Luxembourg	Yes	Yes	Yes	Yes	Yes

State	SES State	Air Navigation Service Providers		Regulators	
		Questionnaires	Interviewed	Questionnaires	Interviewed
Maastricht UAC	Yes	Yes	Yes	No	No
Malta	Yes	Yes	Yes	Yes	No
Moldova	No	Yes	Yes	Yes	Yes
Monaco	No	Yes	No	Yes	No
Montenegro	Yes	Yes	Yes	Yes	Yes
Morocco	Yes	Yes	Yes	Yes	Yes
Netherlands	Yes	Yes	Yes	Yes	Yes
Norway	Yes	Yes	Yes	Yes	Yes
Poland	Yes	Yes	Yes	Yes	Yes
Portugal	Yes	Yes	Yes	Yes	Yes
Romania	Yes	Yes	Yes	Yes	Yes
Russian Federation	No	No	No	No	No
Serbia	Yes	Yes	Yes	Yes	Yes
Slovak Republic	Yes	Yes	Yes	Yes	Yes
Slovenia	Yes	Yes	Yes	Yes	Yes
Spain	Yes	Yes	Yes	Yes	No
Sweden	Yes	Yes	Yes	Yes	Yes
Switzerland	Yes	Yes	Yes	Yes	Yes
Tajikistan	No	No	No	No	No
Tunisia	No	Yes	Yes	No	No
Turkey	No	Yes	No	Yes	Yes
Turkmenistan	No	No	No	No	No
Ukraine	No	Yes	Yes	Yes	No
United Kingdom	Yes	Yes	Yes	Yes	Yes
Uzbekistan	No	Yes	No	No	No

APPENDIX 6 - GLOSSARY

Acronym or Term	Meaning
ACC	Area Control Centre
AirProx	Report to authorities by pilot or ATCO when separation standards have been compromised
AIS	Aeronautical Information Service
ANSP (or ASP)	Air Navigation Services Provider
APP	Approach
AST	Annual Summary Template
ATCO	Air Traffic Control Officer
ATM	Air Traffic Management
ATS	Air Traffic Service
ATSEP	Air Traffic Safety Electronic Personnel
CAA	Civil Aviation Authority
CAAct	Civil Aviation Act
CAD	Civil Aviation Department
CANSO	Civil Air Navigation Services Organisation
CRs	Single European Sky Regulations of the European Community
DG	Director General
EAD	European Aeronautical Information Service Database
EASA	European Aviation Safety Agency
EC	European Commission
EMAC	European Civil Aviation Conference
ECCAIRS	European Co-ordination Centre for Aviation Incident Reporting Systems
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
FAA	Federal Aviation Authority
FIR	Flight Information Region
FoI	Freedom of Information Act
IANS	Institute of Air Navigation Services
ICAO	International Civil Aviation Organisation
IFR	Instrument Flight Rules
ISIS	Implementation of the Single European Sky In South East Europe
IUSOAP	ICAO Universal Safety Oversight Audit Programme
LSSIP	Local Single Sky ImPlementation

Acronym or Term	Meaning
'Just Culture'	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.'
KPI	Key Performance Indicator
MoT	Ministry of Transport
NSA	National Aviation Safety Authority
OAT	Operational Air Traffic
OII	Office for Incident Investigation
OJT	On the Job Trainer/Training
PC	Provisional Council
Regulator	Regulator, often the National Civil Aviation Authority.
SAFREP TF	Safety Data Reporting and Data Flow Task Force
SASI	Support to ANSP Safety Management System Implementation
SES	Single European Sky
SISG	Safety Improvement Sub Group
SLA	Supplementary Letter of Agreement
SMM	Safety Management Manual
SMS	Safety Management System
SMU	Safety Management Unit
SRC	Safety Regulation Commission
TCA	Terminal Control Areas
TLS	Target Level of Safety
TOKAI	Tool Kit for ATM Occurrence Investigation
VFR	Visual Flight Rules

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