Impact Assessment on the extension of EASA competences to ANS, ATM and Airports

Final report

Client: European Commission, DG TREN

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Table of contents

Preface

This study was conducted by ECORYS in co-operation with Trademco, National Aerospace Laboratory NLR and Cloos Consulting on behalf of DG TREN, Unit F2 (air traffic management & airport) and F3 (environment & air safety). The assignment was carried out under the Framework Contract for Impact Assessments and Ex-ante evaluations (lead contractor ECORYS). The study was carried out in the period April-August 2005.

The evaluation addresses the essential issue of how to retain the current high safety level in aviation given the continuing growth of air traffic in Europe. The creation of a single regulatory framework could prove to be a powerful measure in the realisation of this objective.

During the assessment we have spoken to a large number of people from many different organisations. In addition we have received an extensive reaction from people on the subject in writing. We would like to express our gratitude to all people who have shared their valuable insight with us on the matter.

The evaluation has been carried out by an independent evaluation team. It should be noted that this report represents the views of the consultant, which do not necessarily coincide with those of the Commission.

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Executive summary

Introduction

The EASA (European Aviation Safety Agency) was established by the European Parliament and Council Regulation (EC)1592/2002 of 15 July 2002. The aim of EASA is to create a single regulatory framework to promote the highest common standards of safety and environmental protection in civil aviation, to oversee their uniform application across Europe, and to promote them at world level.

As a first step, the basic Regulation established the basis of Community action in the domains of certification of aeronautical products, parts and appliances and the approval of organisations and personnel engaged in the construction and maintenance of these products. At present the European Commission is proposing to enlarge the competences of the agency with air operations, the licensing of air crew and safety of foreign aircraft (first extension).

The current intention is to further extend the competences of EASA in the field of regulation (including safety & interoperability) of **airports, air traffic management and air navigation services** in 2010. This second extension is part of the current impact assessment.

The assessment

The impact assessment was carried out by a team of independent consultant in the period April-August 2005. As part of this assessment an extensive stakeholder consultation has been carried out. Stakeholders have been identified through their membership of the Board of EASA, representative stakeholder of the ICB (Industry Consultation Body) and relevant international organisations.

Stakeholder consultation has been carried out through the distribution of a questionnaire on the subject. In total 71 questionnaires have been sent out and 56 questionnaires have been received back. In addition 25 face-to face and telephone interviews have been carried out with a selection of main stakeholders to get more in-depth feedback on the matter (see Annex A).

Problem analysis

Safety levels in aviation are very high …

Aviation safety in Europe stands at a very high level. Despite the fact that the airspace within the EU is very complex and intensely busy and the number of flights has doubled in the past 15 years, ATM service providers and aerodromes in Europe have managed to realise these high levels of safety. The current safety performance is achieved by the collective efforts of a professional, highly skilled and safety conscious workforce.

… but pressure is increasing

However, with ongoing growth of air traffic, the question is not only how the current safety performance is to be maintained, but how it can be improved further in the near future. It can be envisioned that further safety improvements depend strongly on the ability to introduce safety management systems at all stakeholders (ATM service providers, aerodromes and operators) in an effective and harmonised way throughout Europe.

An important action in this respect has already been the Commission initiative to create a Single European Sky. Part of the single sky initiative is to ensure common standards in the design, organisation and use of air space, the provision of navigation services and the interoperability of air traffic management systems across Europe, with the eventual purpose to organise air space in Europe in a more efficient manner while maintaining current safety levels.

Another initiative to improve efficiency and to create common standards within Europe was the establishment of EASA in 2002. The initial task of EASA has been to create common safety standards and their uniform application across Europe in the fields of airworthiness, flight crew licensing, and air operations.

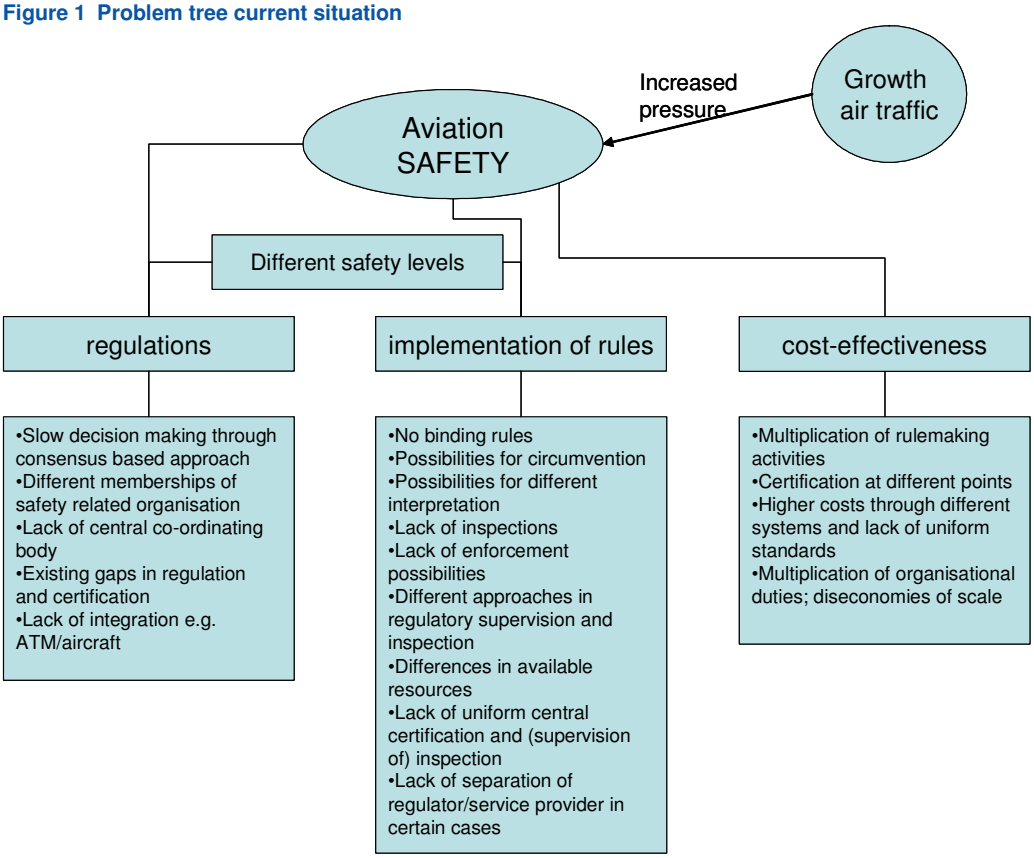
Extension of EASA competences clearly addresses a need

The further extension of EASA competences on safety regulation and application in the fields of ATM/ANS and Airports is an action aimed at a further improvement of safety. As such, it clearly addresses a need in the air transport system.

Internationally ICAO rules function as a regulatory umbrella. However, these rules are subject to differences in application and interpretation. Additionally, ICAO issues many recommendations as well, which are not mandatory for national authorities to implement. A number of initiatives have been undertaken to address this situation and create an enhanced level of harmonisation. In the field of ATM/ANS EUROCONTROL, through its ESARRs (EUROCONTROL Safety Regulatory Requirements), should be mentioned and equally the role of GASR in the Airport domain. However these initiatives do not always lead to binding new rules, and also a coherent certification and inspection approach on the implementation of the rules is lacking. Another drawback of the current situation is that it does not follow an integrated system approach throughout the aviation safety chain.

The main issues of the current situation are summarised in the following problem tree (see figure 1).

Figure 1 Problem tree current situation



These issues are also recognised by the stakeholders, which have been consulted for the present impact analysis. The large majority fully or partially agrees with the need for further harmonisation within the safety regulatory process in Europe in the field of ANS/ATM and Airports.

Objectives

The main objective of the Community intervention would be to address the problems identified with the current situation and to reach a safety regulatory process in ANS/ATM and airports, which harmonises rulemaking and application of rules across Europe on a uniform high level of safety.

Policy options

Three basic policy options are distinguished to modify the current situation

A number of different policy options have been discerned in this impact assessment. These serve as a first guidance framework. As a result of the analysis other options or modifications of the proposed options can be recommended. The main policy options are:

1. 'Do nothing': continue with present organisation of responsibilities. This option serves as the reference situation;
2. Extend EASA competences in rulemaking, certification and licensing and standardisation in the domains of airports, air navigation services and air traffic management;
3. Extend EUROCONTROL mandates issued by the Commission to the domains airports, air navigation services, and air traffic management (including certification and inspection responsibilities);

4. Establish a new Agency responsible for airports, air navigation services and air traffic management;

In addition, the impact assessment includes an assessment of a further extension of EASA competences with other functions where the long term public interest is paramount, or where neutrality is a must or where significant efficiency can be achieved. Examples of these could be charge collection, flow management, etc.

Analysis of impacts

The impacts of the extension of EASA competences (and the other policy options) are determined towards the do-nothing alternative that forms the base-line/reference option. Impacts are grouped into safety, economic, environmental and social impacts. To a certain extent it quantifies the reasons for EC involvement and gives a reflection on the extent that the objectives are reached.

Safety

The introduction of a common regulatory framework might lead to improvement in the overall safety level. Analysis of past accidents reveals that ATM/ANS or Airport related causes contributed to approximately 30% of them. Not all accidents will be affected by improved regulatory framework. It should be seen as part of a wider package of measures that have been initiated by the Commission. It has been roughly assessed that maximally one third of all ATM/ANS and airport related accident might potentially be avoided through the introduction of an effective common regulatory and control framework.

All policy options are expected to lead to improvements in comparison to the current situation. The "Extended EASA" option has the clear advantage above the other options, that it offers a fully integrated safety approach across all elements in the aviation safety chain. Another advantage, which is shared with the "New Agency" option, is that its link with the regulator (European Union) is relatively short since they both form part of the same overall organisation. This can shorten the time to implementation of new regulation.

A clear point of attention is that EASA needs to create good access to knowledge and expertise in the fields that will be included as part of the extension of competences. The available know-how in EUROCONTROL in the field of ATM/ANS is a specific advantage of the "EUROCONTROL option".

Economic

The integration of different competences in the field of aviation safety into a single organisation (the "Extended EASA" option) is expected to lead to the most effective organisation that requires the lowest number of interfaces. Tentative estimations of the additional cost implications for EASA indicate a range of € 4.4-6.5 million per annum. Cost implications of the "EUROCONTROL" option are expected to be slightly higher as a result of additional co-ordination efforts, while the "New Agency" option is by far the most cost-ineffective as a fully new organisation would have to be established. The process of building up sufficient expertise in the new areas towards 2010 would be a clear point of attention for the EASA option.

On the user side (manufacturers and airlines) it is expected that further harmonisation would lead to potential costs savings through further streamlining of systems and operations within Europe. All options are expected to perform equally good in this area.

Social

All options are expected to have a positive social impact through an increased labour mobility that might result from common licensing standards for staff working in the aviation domain.

Environment

The overall impact on the environment is expected to be non-negative or positive through the establishment of uniform environmental standards. This is valid for all options.

Comparison and conclusions on the policy options

The assessment reveals that there is a clear reason to intervene in the current situation. All policy options are expected to lead to positive impacts on safety, through the introduction of a common approach towards safety across the EU. This positive safety impact is expected to be highest in the case of the extension of EASA competences since this would enable a truly holistic system approach within one organisation. It would also establish a closer link between (support to) new rulemaking and regulation and the implementation of rules through a certification, audit, licensing and standardisation system.

The extension of the EASA competences clearly has European added value. Only on a European level it is possible to reduce interpretation differences and implementation differences. Furthermore, the extension of EASA offers the opportunity to establish common rules for the entire aviation system for the whole of the European Union. Finally, this option offers the possibility to reduce the multiplication of regulatory activities at different level.

The extension of EUROCONTROL mandates to the same extent as proposed for EASA is expected to be difficult as the introduction of EUROCONTROL responsibilities in the field of certification and inspection would require additional modifications of the EUROCONTROL convention. Also the Airport safety regulation domain appears to be less suitable to be covered through an extension of the EUROCONTROL mandates. In fact this option would still necessitate additional efforts in building up central harmonisation and co-ordination in the field of certification and licensing, and standardisation. A main advantage of the EUROCONTROL option would be that it would make use of the available technical know-how in the field of ATM/ANS. The early experiences with EASA have shown that building up experience in the start-up phases of an organisation is a clear challenge to be mitigated.

The establishment of a new agency has mainly disadvantages towards the extended EASA option, since it would burden the EU administration with setting up a new organisation. In addition it would create additional interfaces between the ATM/ANS and Airport and the other domains.

Finally, there is the possibility of extending EASA competences with other functions such as route charge collection, flow management, air space design and R&D. At this stage there appears to be no clear value added of transferring these functions to EASA unless there is a direct link to the regulatory process. It might even diffuse the visibility of EASA since it impacts on the focus of the agency on safety regulation. It is advised to keep EASA a lean and mean organisation and not burden the agency with additional tasks that have limited synergetic value.

Recommendations

The impact assessment reveals the extension of EASA competences in 2010 as the first ranked option. However, the analysis has also brought a series of issues which need to be addressed. These are:

Transition path

It is important that a careful transition path for the period 2005-2010 is developed. The current experience after the establishment of EASA shows that there are clear growing pains that affect the attitude of e.g. Member States towards EASA negatively. Therefore it is important to learn from the transfer of competences from JAA to EASA that has been accomplished. Furthermore, it is recommended not to transfer all tasks and responsibilities at once, but to apply a step-by-step approach. Furthermore, it is recommended to build in conditional checks in the legislation for the EASA extension whether the EASA organisation is capable to take in more responsibilities.

Distribution of responsibilities between NAAs and EASA

An important issue is the distribution of activities between EASA and NAAs, especially in the field of certification and supervision. It is advised that all activities with a clear European scope are executed by EASA. This concerns core responsibilities including the preparation and support of rules, standardisation of practices and certification and licensing of pan-European service providers (or other activities carried out at a pan-European level). All other activities in the regulation chain, being certification and licensing of national service providers, inspection on the application of rules by operators and enforcement can be carried out by the NAA (or accredited entities). It would then be EASA's responsibility again to supervise and audit the NAAs that these activities are carried out at an adequate level. Also highly labour intensive activities (cf. flight crew licensing related to the first extension) are suggested to be carried out at a local/regional level, as it would require a significant manpower capacity if they would be carried out by EASA.

Such a design of the policy option would mean it passes the 'boundary test' of subsidiarity. It would also counter-act the potential risk that the knowledge base at NAAs might be depleted.

Core functions and expertise are preferably carried out centrally at the EASA Headquarters. In this way, rulemaking for the entire aviation system can be optimised and consistency could be created. Tasks for which this interaction with the other aviation domains (airworthiness etc) is less required, (e.g. certain certification tasks) could be located elsewhere.

Related to this issue is the problem for (especially) the smaller Member States to build up sufficient expertise ("critical mass") and to employ full-time staff. One approach could be to create a central pool of inspectors at EASA which would be able to function as a resource base for these States. Another option would be to grant NAAs or other entities (cf. the classification societies in the shipping industry or the certification of recreational pilots by assessment bodies) a licence or accreditation to perform cross-national inspection services.

Towards regional centres?

The landscape in ATM and ANS has been changing rapidly since the adoption of the Single Sky package. This will continue in the coming years, a/o with the implementation of Functional Airspace Blocks (FABs). Although the development of these FABs is still in a starting phase, it is clear that the notion moves away from national boundaries and national influence. It is therefore important that when shaping the new regulatory structure for aviation safety, this new landscape is taken into account.

These (supranational) FABs might be operated by one ANSP or by co-operating ANSP from several countries. In any way it is clear that the direct relation between national airspace, national service provider and national authority is becoming more complex. This can result in the establishment of regional entities that perform the oversight function or the creation of accredited entities (be it accredited NAAs or other entities) that operate across borders.

Capitalizing on available European expertise

In order to fulfil the responsibility of rule making successfully, it is important that there is certain level of technical knowledge. Basic technical expertise in all fields is required in EASA itself to avoid that EASA is merely an administrative and judicial body. In this light it is advised to transfer the current SRC and SRU activities and expertise of EUROCONTROL in the field of ATM/ANS to EASA. More specialist and detailed technical expertise should be sourced from the vast amount of technical know how in the domain of ATM/ANS and Airports at the Member States and EUROCONTROL.

Military-civil interface

The co-ordination between the civil side and military side is important in ATM. This concerns not only the level of systems, harmonisation and flexible use of airspace, but also rulemaking and standardisation of practices. After all, in nearly all countries civil traffic is sometimes handled by the military ATM (with civil rules).

There are currently a number of co-ordination bodies for civil-military issues. It is recommended that these organisations remain existing to ensure co-ordination in the technical field, as long as necessary.

Association with third countries

An important issue that has been brought forward during the stakeholder consultation is that an extended EASA should have a pan-European view by establishing a relation with third countries. In the first instance these are countries that are not member of the European Union, but that are a member of EUROCONTROL and/or ECAC. This problem is already currently addressed within EASA by creating an observer status in the Management Board. However, it is important to involve non-EU member countries in the regulatory process on a broader scale. These may even be countries that are neighbouring Europe.

1 Introduction

1.1 Background

The EASA (European Aviation Safety Agency) was established by the European Parliament and Council Regulation (EC)1592/2002 of 15 July 2002. The aim of EASA is to create a central Community body to promote the highest common standards of safety and environmental protection in civil aviation, to oversee their uniform application across Europe, and to promote them at world level.

Before this date European countries had sought to harmonise their procedures and standards in the field of aviation safety through the Joint Aviation Authorities (JAA). The JAA acted as a co-ordinating body, relying on the good will of national aviation authorities across Europe. Despite significant achievements, there remained differences in the application of JAA rules in the Member States.

The mandate to EASA is to develop its know-how in all fields of aviation safety in order to assist Community legislators in the development and application of common rules for:

- The certification of aeronautical products, parts and appliances;
- The approval of organisations and personnel engaged in the construction and maintenance of these products;
- The approval of air operations;
- The licensing of air crew;
- The regulation of airports, air traffic management and air navigation services, including their interface with military aviation.

As a first step, the Regulation established only the basis of Community action in the first two domains listed above. At present the Commission is proposing to enlarge the competences of the agency to air operations and the licensing of air crew and safety of foreign aircraft (SAFA). The main tasks of EASA are related to support to rulemaking, certification and quality & standardisation of the implementation of Community law at the Member State level. The implementing rules developed through EASA's opinions, are then adopted by the Commission.

The current intention is to further extend the competences of EASA in the field of regulation (including safety & interoperability) of airports, air traffic management and air navigation services (second extension). This will lead to a Communication of the Commission around the end of 2005 and would lead to an intended proposed Regulation by end 2006. Implementation is then foreseen around 2010. This extension of EASA competences will be the subject of the underlying impact assessment.

1.2 Purpose of the project

Given this background, the present project aims at analysing the problem situation, exploring various policy options to deal with the situation and to carry out an impact assessment of the various options. The analysis of the problem needs to review the present situation. The impact assessment will subsequently explore the various policy options available of which the extension of EASA competences in only one option. The impact assessment is aimed at assessing the various effects (economic, social, environment, competitiveness) of the reviewed policy options.

The purpose of the impact assessment can be defined as follows.

Purpose of the project

The impact assessment will analyse the problem, review and analyse the available policy options and assess the potential impacts of the extension of EASA competences to ATM, air navigation services and airports.

1.3 Procedural issues and Stakeholder consultation

1.3.1 Procedural issues

The European Commission intends to provide its Communication on the (second) extension of EASA around the end of 2005. This will be followed by a proposal for a Regulation in 2006. The timing of this impact assessment has been fitted to this schedule. The kick-off meeting was at 28th April 2005. This was followed by a meeting on the Inception report on 25th May 2005 and an Interim report meeting on 24th June 2005. The Draft Final report has been discussed in a meeting on 4 August 2005. The Final report was the subject of the Final meeting on 19th September 2005.

1.3.2 Stakeholder consultation

The stakeholder consultation has been carried out via two mechanisms:

- a questionnaire has been distributed among a series of stakeholders in the aviation community. In total 48 organisations were approached, of which 32 responded. Additionally, 7 questionnaires were received from organisations that send in a reaction based on their own initiative.
- in addition, a series of 25 interviews have been held with key stakeholders to discuss in more detail the topics addressed in the questionnaire. Another 17 questionnaires were collected during the interviews.

The results of both the interviews and the questionnaires are the foundation under the impact assessment. These results have been used to develop and substantiate the analysis done on the various topics such as problem analysis, assessment of impacts and comparison of options. In each of the main chapter we have dedicated in addition a separate section to the stakeholders' view. Furthermore, a detailed analysis of the results

of the questionnaire is provided in annex B. Annex A provides more details on the organisations which have been consulted. Stakeholders have been identified through their membership of the Board of EASA, representative stakeholder of the ICB (Industry Consultation Body), relevant international organisations and a sample of ANSPs and Airport operators.

Questionnaire

The questionnaire has been distributed to the stakeholders via e-mail on 30 May 2005. The questionnaire was send to 71 stakeholders, consisting of the following groups:

- Civil Aviation Authorities
- International Organisations
- Airport operators
- Air navigation service providers
- Industry
- Other service providers (e.g. Meteo)

In the two weeks after the initial e-mail, telephone contact was sought with the stakeholder to ask whether they would have received the questionnaire and the request to fill it in. A reminder e-mail was sent to those who did not reply initially, on 17 June 2005. People were offered to respond from 30 May to 20 June 2005. In practice, questionnaires that came in until mid July have been processed.

A total of 56 answers have been received to the questionnaires that have been processed. This includes the questionnaires filled in during an interview, or received from the interviewed before or after the interview.

Interviews

In addition to the questionnaires, a series of interviews have been conducted with key stakeholders. These interviews took place in the period between 3 June and 12 July. In total, 25 interviews have been undertaken.

2 Problem definition

2.1 Introduction

The main purpose of extension of EASA is to reorganise the rulemaking and their implementation process including safety oversight with respect to safety related issues in air navigation services (ANS), air traffic management (ATM) and airport in order to ensure a uniform high level of safety across Europe. This chapter first deals with the current aviation safety level in Europe. This is followed by an analysis of the current situation with respect to rulemaking and implementation of the common rules within Europe. Finally the implications of the Single Sky package with respect to this topic are described.

2.2 Aviation safety level in Europe

Safety levels in Europe are high

Aviation safety in Europe stands at a very high level. Together with North-America and Australia, in terms of the achieved fatal accident rate in the former EU15 belongs to the safest regions in the world. The accident rate is around 0.4 per million flights, while in the former Eastern Europe a rate of 3.7 is achieved and in Africa a rate of 6.4 (period 1989 – 2003)[1]. Also the ATM related accident rate within the former EU15 does not deviate significantly from the rate in other regions of the world[2]. So, despite the fact that the airspace within the former EU15 is very complex and intensely busy, the ATM service providers and aerodromes in the former EU15 and EUROCONTROL managed to achieve a safety level that is similar to the most advanced countries in the world, despite the doubling of flights[3]. The current safety performance is achieved by the collective efforts of a professional, highly skilled and safety conscious workforce.

Differences between countries do exist

However, differences do exist between regions and might exist within the EU. Even though all the world regions follow the same global ground-rules that are established through the regulatory framework of ICAO it is not ensured that all States achieve similar levels of safety. An important reason for this is that a number of regulatory tasks (certification and supervision) are national tasks, and as such prone to local interpretations and to the local ability to provide sufficient oversight.

ICAO has accepted that the "target level of safety" (i.e. the level of safety that is aimed to be achieved by the regulatory framework) varies between the various regions in the world

1 Source: IVW, Aviation Safety Statistics
2 Source: NLR [NLR-TP-2003-376]. The situation is comparable to a.o. North-America.
3 From about 4 million IFR flights in the early 1990s, to 8 million in 2004.

in order to reflect the various levels of development (in terms of economy and safety) between the regions. ICAO requires that the target level is established by the States, but leaves to the national authorities the actual level of safety to aim for. It must also be noticed that ICAO encourages States to pool their resources and work together in this respect.

This still leaves room for differences between States. On a global scale this may be a pragmatic solution, but in the Western countries with a mature aviation system this does not promote the establishment of a "level playing field".

Growth of air traffic requires new harmonised approaches to retain safety levels

Not only possible differences between Members States form a reason for change, but also the need for further improvements in future. The current air transport system is a very safe system. Nevertheless, if the volume of air transport in Europe continues to grow at a predicted rate of 2-5% per year, it is expected that the associated number of aviation accidents will increase in future, if the accident rate per flight remains constant.

In the 10 years time frame of 1994-2004 within Europe there were an average of 3.9 fatal commercial air accidents per year (see also Annex C). According to EUROCONTROL's most recent long term forecast of flights (2004-2025), the overall number of flights in 2025 is expected to be between 1.6 and 2.1 times the 2003 traffic. If nothing is done to further improve safety, i.e. if the accident rate remains at the current level, this will result in a number of 6 to 8 fatal commercial air accidents per year in 2025. This means an expectation of a fatal accident every two months.

Civil Aviation has been seen for some years as being a High Reliability Organization (HRO). This means that it is very safe, compared to other means of transport. However, limitations to the current modus operandi in enabling the better standards for safety, capacity and efficiency require changes to today's Air Transport landscape. The growth of air traffic volume requires further improvement at a global scale. In the light of this development, Member States will increasingly experience safety problems that require additional measures in order to maintain an adequate level of safety. Equally, the increasing complexity, integration, and automation in ATM as well as changes in the roles of ATM staff and airspace structure all advocate for a more formal and integrated approach to safety. New ways to manage safety have therefore to be explored in order to analyze the safety of flight operations and air traffic management in a total system approach. It will be extremely difficult to maintain an adequate level of safety in particular at airports and in airspace with a high traffic density but also and increasingly in certain developing regions that experience fast growing air traffic. The need to enlarge the ATM capacity will result in more dependency of flight safety on newly introduced technology, procedures and automated functions with their individual risk of failure and new vulnerable interfaces.

Based on this notion it has become clear that in order to make an already very safe system even safer, new methods have to be introduced. These methods concern the transition from a reactive, compliance driven, methodology to a pro-active risk management and safety assessment methodology. Such modern techniques are usually referred to as safety

management[4]. The availability of safety management systems has become a mandatory ICAO requirement for Air Navigation Service providers (Annex 11, par. 2.26.1), and Aerodromes (Annex 14, par. 1.3.6). Despite this good initiative, the actual introduction and implementation of safety management systems suffer still from the "loose regulatory framework" as provided by ICAO. Much is left to the responsibility of local authorities where discrepancies exist in the level of expertise between Member States to guide ANS providers and Aerodromes with the implementation and the actual approval of these new systems.

2.3 Current regulatory framework

2.3.1 The global regulatory framework: ICAO

The global regulatory framework with respect to aviation safety has been established by the International Civil Aviation Organisation (ICAO). In the convention of Chicago in 1944 the ground-rules have been established that ensure the safe and orderly growth of civil aviation throughout the world. All European countries have ratified this treaty[5].
It should be mentioned that the convention of Chicago not only was aimed at aviation safety but also intended to provide the ground-rules for the provision of regular, efficient and economic air transport.

Box 2.1 Rules, standards and recommendations

Over the decades of civil aviation experience, several procedures, systems and tools have been developed. The following distinction is made by ICAO:

- **Rules** are a set of procedures all airspace users must apply for maximum safety.
- **Standards** are a set of procedures and systems that shall be applied when adopted and implemented by the different States. Differences in adoption and implementation need to be filed to ICAO. A standard may be adopted but not implemented in regions or States. For example, the Airborne Collision Avoidance System (ACAS) is standardised on global level, however not permitted to be used in, respectively over, Russia and the New Independent States
- **Recommendations** are a set of practices and tools that should be applied when adopted and implemented by the different States. However, differences in adoption and implementation need not to be declared. For example the recommendation on global level on surveillance system performance might or might not be applied in the different States and or regions.

The main issue is that rules and even the adoption of international standards is subject to the national sovereignty of each state, which at times prove to be resistant to changes. In addition the huge number of ICAO recommendations does not contribute to have a really "level playing field" throughout Europe.

The set of rules, standards and recommended practices (ICAO SARPs) form the so called *Annexes* (to the Chicago convention) signed and adopted, in part and sometimes with

[4] and their rules are "Objective Based Safety Regulations" (OBSR) as opposed to "prescriptive" regulations, being the latter more focused on the technical details, while the former on organisation, people and procedures.

[5] Whereas Member States are members of UN and ICAO, organisations such as EUROCONTROL, IATA and others have only observer status and do not vote for decisions by the ICAO Air Navigation Commission.

reservations, by the different ICAO Member States. Article 44 of the Chicago Convention states, that aviation rules and systems shall not be implemented if not standardised by ICAO. Even this rule was broken several times by certain States when financial interests prevailed, or when they deemed to have urgent safety issues to resolve[6]. Nevertheless it is the basic foundation for creating a global "level playing field".

However, despite these good intentions, ICAO can not be regarded as the global regulator of the aviation system. In the classic definition a regulator has three main tasks, i.e.:

1. Rulemaking
2. Certification
3. Supervision & enforcement

The main task of ICAO concerns rulemaking. The two other mentioned tasks remain the responsibility of the national authorities. Implementation of those ICAO Rules and SARPs is basically left to the States which might or might not have reported on the compliances and or deviations[7]. Even in the field of rulemaking it can be argued that this is still for a large part a national affair. The countries that have signed the convention of Chicago have in principle adopted the standards laid down in the Annexes to the Convention. However, any state can fairly easy circumvent compliance with the standards by filing a formal notice of difference to ICAO. All further regulatory material provided by ICAO, other than the Standards, has to be considered as recommendations and guidance, and thus is neither binding to the States, nor uniformly interpreted or applied.

Box 2.2 Example ICAO recommendation with respect to runway incursions

Runway incursion accidents remain a persistent problem, which are related to what is considered the most hazardous phase of flight. In 58% of cases pilots simply taxied onto runways or taxiways without clearance. Fatal accidents at Taipei and Milan in 2000 and 2001 claimed nearly 200 lives. Although ICAO has a standard definition for runway incursion hazards in place since November 2004, member nations are allowed to adopt it at their own pace. And like other ICAO recommendations, using the classification scheme for runway incursion, is not mandatory.

Despite this relatively "loose" regulatory framework ICAO has been, and still is, instrumental in achieving an adequate level of safety of the aviation system. Clearly, this level of safety has been achieved not only by ICAO but also by the activities of local aviation authorities that have adopted the regulatory framework as a basis for their own legislation, and effectively enforce this framework on a national scale. As noticed earlier this has led to differences in aviation safety levels across the world.

6 Such a case, with very high cost implications to airlines was the mandate of implementation of a United States developed Traffic Alert and Collision Avoidance System (TCAS) while the ICAO Airborne Collision Avoidance System (ACAS) was in the standardisation process. Now only after almost 10 years, TCAS Version 7 complies with the ICAO ACAS standard. Unfortunately this is not implemented in all aircraft that had been forced by US laws to implement earlier version.

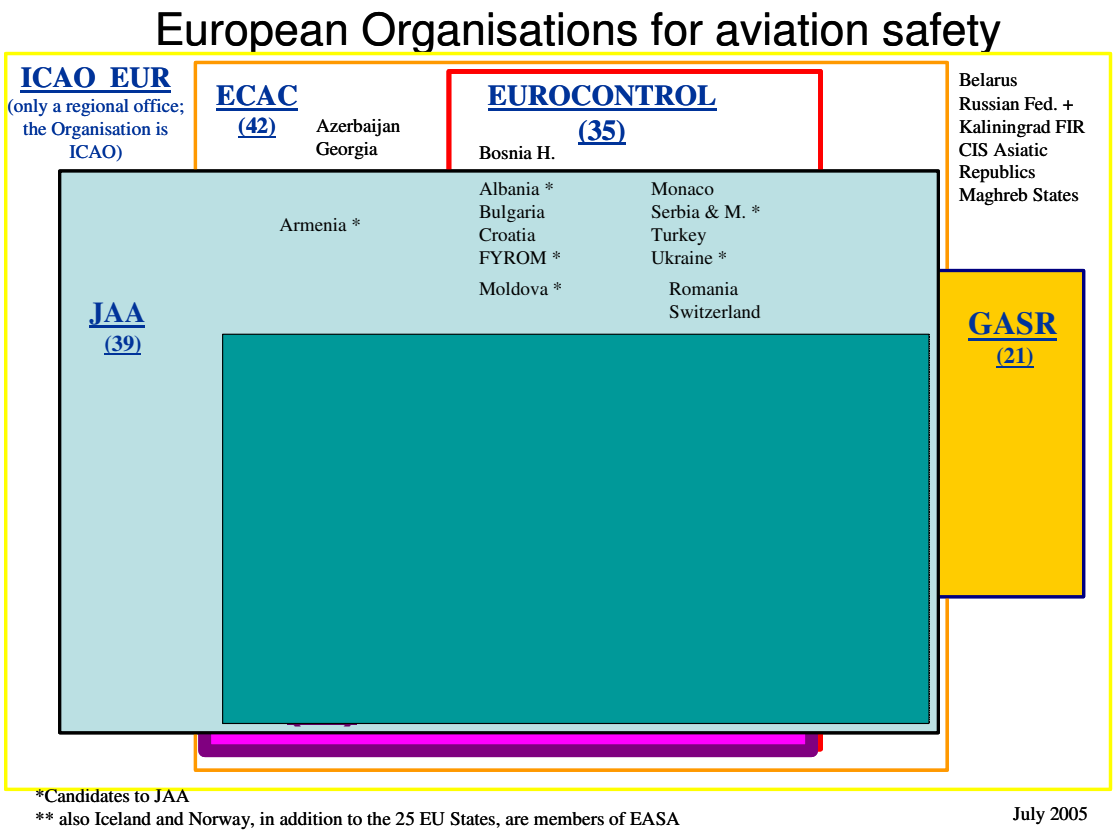
7 Only recently ICAO started with a "Universal Safety Oversight Audit Programme (USOAP) with the scope to perform safety audits in the Member States at least in every six years period.

2.3.2 Rulemaking and standardisation in Europe

Not every Member State is represented everywhere

There is not one Europe if the membership of different organisations involved in aviation safety in Europe is compared (see figure 2.1). For example ICAO Europe, with its regional office located in Paris, comprises all States of the ECAC (European Civil Aviation Conference)[8] plus Belarus, Russia, up to the Newly Independent States, which from a geographical perspective would be better associated to Asia.

Figure 2.1 Membership of European organisations involved in aviation safety



States are individually members of the organisations ICAO, ECAC and EUROCONTROL. These organisation themselves (e.g. EUROCONTROL) have only memoranda of co-operation between them, but are not directly represented in the decision making bodies of each other. With respect to the European Commission it should be noted that the EC is one of the EUROCONTROL members[9] and aims to get membership in ICAO.

Until 2002 the role of individual States has been exclusive. Each state assumed responsibility on national level for all domains, from airworthiness to ANS, ATM and Airport legislation, standardisation, respective standard adoption, certification, licensing, inspection up to operation.

[8] Which, since April 2005 is composed of 42 States, now including Georgia.

[9] Formally this is only the case as soon as this will have been ratified by all other members.

ECAC

The European Civil Aviation Conference currently consists of 42 Member States comprising almost all European States. Its objective is to promote the continued development of a safe, efficient and sustainable European air transport system. ECAC issues *resolutions, recommendations and policy statements* which should be brought into effect by its Member States. Safety and accident investigation are subjects that are addressed by ECAC. In their work programme 2004-2006, the following activities in these fields are envisaged:

- To strengthen Member States' safety oversight capability by:
  - under the SAFA programme, identifying major problem areas and corrective actions, through the development of analytic tools;
  - collectively considering and taking appropriate action on recurring findings from the ICAO Universal Safety Audit and Oversight Programme affecting the majority of ECAC States;
  - monitoring and actively following the transition from JAA to EASA, particularly from the point of view of the pan-European aspects of this transition.
- To harmonise Member States' approach to accident/incident investigation issues.

JAA (Joint Aviation Authorities)

For some competences in civil aviation (e.g. aircraft certification, flight crew licensing and air operations) States voluntary agreed to co-ordinate in the JAA some common effort with respect to safety rule making. The domains ATM/ANS and airports are not covered by JAA. The JAA is an associated body of the European Civil Aviation Conference (ECAC) representing the civil aviation regulatory authorities of 39 European States.

One of the JAA functions is to develop and adopt Joint Aviation Requirements (JARs) in the fields of aircraft design and manufacture, aircraft operations and maintenance, and licensing; and since 1987 JAA work has been extended to certification/design standards for all classes of aircraft. However, for the reasons exposed in the introduction, the simple publication of common rules, will not be sufficient to improve safety even more, in face of the continued growth of traffic, so part of these competences (i.e. airworthiness) have been transferred by the European Parliament (EP) already to the European Aviation Safety Agency (EASA), while others (e.g. flight crew licensing and air operations) are on the way to be transferred to the same agency.

EUROCONTROL

Based on mandates from the ECAC and the European Commission, for the domains of ANS and ATM (ground part and some airborne elements) EUROCONTROL (comprising today 35 States) assumed responsibility with respect to safety related rule making and publications of standards on European Level. In addition EUROCONTROL is involved in research and development activities, and pan-European service operation such as Central Flow Management Unit, Central Route Charging and ATS Operation in part of the Upper Airspace.

In 1998 EUROCONTROL established a Safety Regulation Commission (SRC), whose main objective is to harmonise safety regulation and safety initiatives within the

EUROCONTROL Member States. In addition a Regulatory Committee (RC) is established. The RC is a high level committee of senior aviation experts that give advice on ATM technical regulations with respect to airspace regulations, interoperability regulations, etc.

The formal regulatory function, i.e. the taking of decisions that should bind EUROCONTROL's Member States is the preserve of EUROCONTROL's Permanent Commission. No enforcement mechanisms do however exist, due to the intergovernmental nature of such Organisation.

EUROCONTROL started the development of a harmonised framework for ATM safety regulation**.** This includes development, assessment, promotion and maintenance of EUROCONTROL Safety Regulatory Requirements (ESARR). According to the "Single European Sky" regulations, these ESARRs are progressively being translated into the Community legislation.

In December 2003 the European Commission and EUROCONTROL signed a memorandum of cooperation in a number of areas. The implementation of the Single European Sky is one of these areas. In this respect, EUROCONTROL is given mandates for the development of a number of implementing rules for the Single European Sky Regulations. EUROCONTROL, in this framework, is assisting the European Commission with the development of implementing rules for the Single European Sky regulations. The rules are then adopted by the Commission.

The concern with EUROCONTROL's regulatory function is that it suffers to a certain extent from a similar drawback as ICAO. EUROCONTROL is not a rulemaker which is able to adopt rules into binding legislation. It needs the adoption of rules into national or Community legislation to make them binding. As a result differences exist in the implementation of ESARRs among the Member States of EUROCONTROL[10]. Also it does not have the authority within Europe to certify or approve systems (and safety management systems in particular) and to supervise and -if required- enforce the implementation of the regulations. It is still the national authority that has this competence.

GASR

Airport related subjects are left to the responsibility of individual States on the basis of ICAO provisions. A number of European States however established the Group of Aerodrome Safety Regulators (GASR), a voluntary organisation with no formal institutional identity, which, through mutual co-operation, aims for harmonisation of the safety regulation of aerodromes encompassing both the airport infrastructure and the airport operations.

The objectives of GASR are to:

1. Develop a harmonised approach to the safety regulation of aerodrome and ground aids operations.

[10] EUROCONTROL, SRC document 35; Annual Safety Report 2004, Brussels.

2. Co-operate with a view to achieving cost effective safety regulation in these areas.
3. Produce aerodrome safety requirements in a format that will facilitate their integration into European regulations at a future date.
4. Promote the GASR philosophy and the importance of aerodrome safety regulation as part of the total systems concept, particularly on the European scene, in co-operation with ICAO, the JAA, EUROCONTROL, EU/EC and EASA.

The European Union

Within the European Union four institutions/organisations are involved in the legislative process for aviation safety:

- The Council and the European Parliament
- The European Commission
- EASA

New legislative proposals are proposed by the Commission to the European Parliament and the Council who make the final decision on the adoption of new legislation. The subsequent implementing rules can be adopted directly by the Commission. The Commission can be supported in the preparation of new legislation and subsequent implementing rules by EASA (for the domains in which it has assumed responsibility) or by other external co-operation mechanisms (cf. role EUROCONTROL with respect to the SES implementing rules).

The Single European Sky

The single sky initiative was launched by the European Commission in 1999. Formal legislative proposals were tabled in late 2001, and the European Parliament and Member States reached agreement on them in December 2003. A package of four regulations (Regulation (EC) No 549/2004 to Regulation (EC) No 552/2004) entered into force on 20 April 2004, each making a specific contribution to the initiative.

- The framework regulation: this sets out the overall objectives for the single European sky initiative.
- The airspace regulation: this addresses the organisation and use of airspace in the area covered by the single European sky, aiming at the development of common procedures for design, planning and management of ATM.
- The service provision regulation: here the aim is to ensure that common standards for the provision of air navigation services are applied throughout the European Union.
- The interoperability regulation: this concerns the interoperability of systems, constituents and associated procedures of the European air traffic management network.

In order to separate regulatory and supervisory functions from actual service provision, the framework regulation requires each Member State to create (where it did not already exist) an independent national supervisory authority (NSA) or authorities. Such authorities must be independent, at least at the functional level, from all providers of air navigation services. In particular, these national authorities will play a leading role in

ensuring all service providers meet the safety standards and requirements set out for all operators across the EU. They will be responsible for organising regular inspections and surveys to ensure that all service providers comply with safety and other requirements set out for the single European sky.

EASA

EASA (European Aviation Safety Agency) was established by the European Parliament and Council Regulation (EC)1592/2002 of 15 July 2002.

As a first step, the Regulation established only the basis of Community action in the first two domains listed above. At present the Commission is proposing to enlarge the competences of the agency to air operations, the licensing of air crew and safety of foreign aircraft. Currently, EASA has three main tasks which are reflected in their organisational structure: (i) Rulemaking, (ii) Certification and (iii) quality and standardisation.

Rulemaking

EASA contributes to the production of all EU legislation related to the regulation of civil aviation safety and environmental compatibility. It submits opinions to the European Commission and must be consulted by the Commission on all legislative proposals in this field.

Aircraft certification and maintenance

In 2003, EASA took over responsibility for the airworthiness and environmental certification of all aeronautical products, parts, and appliances designed, manufactured, maintained or used by persons under the regulatory oversight of EU Member States. All type-certificates are now issued by EASA, and are valid throughout the European Union, while individual airworthiness certificates are issue by National Authorities.

Additionally EASA became the competent authority to approve and oversee the organisations involved in the design of aeronautical products, parts and appliances. It also carries out the same role for foreign organisations involved in the manufacture or maintenance of such products. Furthermore, EASA has developed the guidelines for issuing aircraft maintenance *licences* to engineers (which currently carried out by national authorities). To execute its tasks within the present period of building up its resources, EASA relies on national aviation authorities who have historically filled this role and concludes contractual arrangements to this effect.

Quality and standardisation

Where Community law is implemented at Member State level, EASA assists the Commission in overseeing its effective application and its uniform understanding. The necessary procedures for standardisation inspections are therefore being developed and maintained properly, uniformly and consistently across the European Union. Accordingly, EASA conducts *investigations* of undertakings as well as *standardisation inspections* of national authorities (the latter labelled s*upervision* in the terms of this impact assessment) throughout the EU, both to monitor the application of EU rules on aviation safety, and to assess the effectiveness of these rules. In case of non-compliance EASA reports to the inspected Member State and the Commission. Both can take corrective actions. EASA also provides *technical training* to achieve overall consistency and high level standards.

Rulemaking and standardisation at the Member State level

The adoption of rules and international standards adoption is subject to the national sovereignty of each state. Therefore almost each state in Europe has established a form of:

- Directorate General of Civil Aviation (DGAC) reporting directly to the respective Ministry of Transport as regulatory national authority;
- Civil Aviation Administration (CAA) as executive body, responsible also inter alias with Aircraft Certification and Registration, Aircraft Address administration etc;
- National Air Traffic Services that might be administrations, with a privatised organisation form and even fully private entities.

As a result of the Single Sky regulations Member States are obliged to separate the national supervisory authorities from air navigation service providers.

All international rules and standards developed by ICAO, ECAC or EUROCONTROL need to be accepted (or not) at the level of each sovereign state (insofar not adopted in Community legislation). Although regulation is generally separated from service provision to some degree in most Member States, a wide variation exists with respect to the approaches taken to the definition of the regulatory interfaces, supporting processes, inspection and audits, which offers much scope for harmonisation[11].

Overview

In summary, the European actors involved aviation regulation can be graphically depicted as follows.

Table 2.1a and b Aviation safety regulation actors in Europe

Institutions/organisations involved in safety legislation/regulatory tasks									
Geographical scope:	**Global**	**European**							**National**
Task:	**ICAO**	**EP**	**Council**	**EC**	**EASA**	**EURO-CONTROL**	**JAA**	**GASR**	**Aviation Authority**
Legislation									
Adoption of rules									
Develop. of rules									
Certification									
Standardisation inspections (of certificators)									
Investigations of undertakings									
Enforcement									

[11] Booz Allen Hamilton (2003) Study on benchmarking for best practices in Air traffic Management (European Community).

Organisations involved in safety regulatory tasks							
Geographical scope:	Global	European					National
Domain:	ICAO	EC	EASA	EUROCONTROL	JAA	GASR	Av. Aut.
Airworthiness							
Air OPS			Proposed (1st extension)				
Flight Crew Licensing.							
Safety of Foreign Aircraft (SAFA)					*		
ANS			Under this impact assessment				
ATM							
Airports							

* SAFA database run by JAA on behalf of ECAC

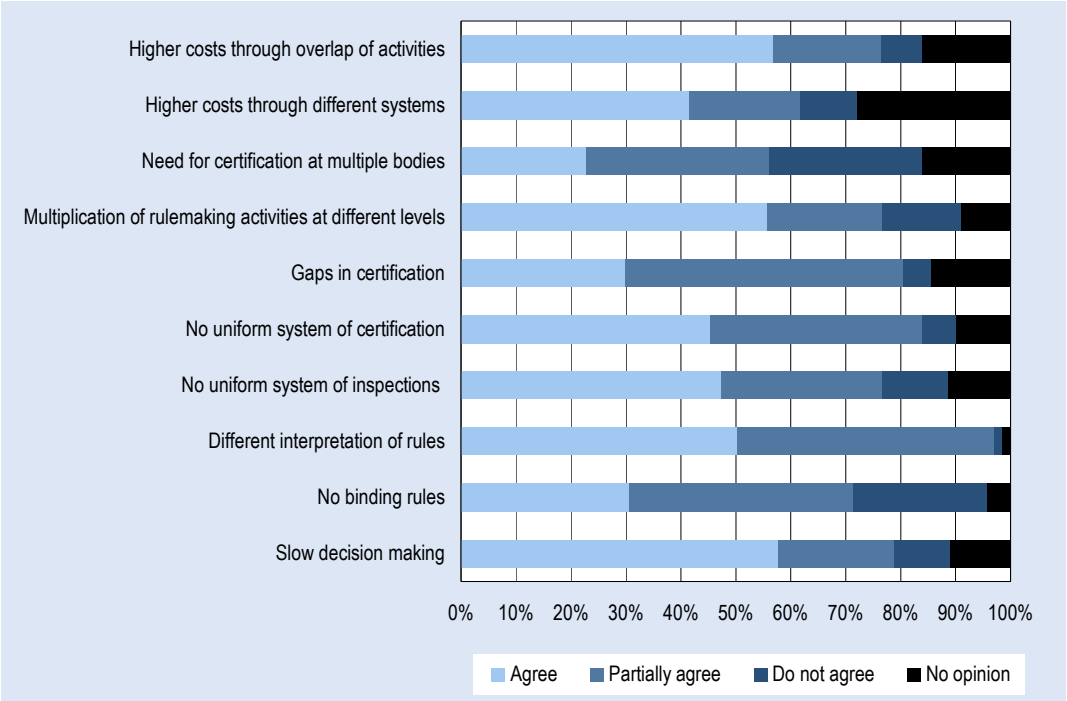
2.4 Stakeholders' opinion

2.4.1 Stakeholders' view on current regulatory framework

The general view is that the majority of stakeholders consulted in this impact assessment agrees or partially agrees with the problems identified. Although not all parties agree that (ICAO) rules would not be binding in all cases they do agree that there is significant room for differences in interpretation and slow implementation in national law. A related issue is that some ICAO regulation (especially in the airport domain) is judged to be rather outdated. The focus is mainly on hardware (lightings, stripes on runway), but these rules fail to address the softer issues like operations and procedures, which are becoming increasingly important. The airport operators themselves adopt a more cautious approach. They fear an additional regulatory layer in addition to the existing ICAO regulations and stress that EASA should base its regulations on ICAO.

Also the problems around the lack of a uniform system for inspection and certification, is recognised. Aspects concerning the higher costs through overlap and through different systems are mainly recognised, but seem to be a 'second order' problem.

Figure 2.2 Stakeholders' view on current regulatory framework



2.4.2 Stakeholders' view on the need to change

The stakeholders were consulted whether they found if there was a reason to change the current situation. The responses for each type of stakeholder are summarised in the table below.

Table2.2 Stakeholders' view on the need to change

	Yes	To some extent	No	No opinion
CAA	62%	29%	5%	5%
Industry	75%	25%	0%	0%
Other service providers	60%	40%	0%	0%
Airport operators	50%	50%	0%	0%
ANSP	67%	33%	0%	0%
Intern. organisations	55%	45%	0%	0%

Hardly anyone considers the current situation to be ideal. A majority of about 60 percent of all stakeholders think there are arguments to change current situation. Another 37 percent agrees 'to some extent' that some things should be different. Many stakeholders claim that national variations in rules and standards should be eliminated or at least lessened. Or, as one stakeholder states:

"As traffic volumes are estimated to double by 2023, there is a need to ensure a consistent and coherent approach to safety regulation of ATM, including airports, where prioritisation can be given towards mitigation of the most significant risks and proactively addressing associated hazards. Safety risks are directly related to traffic

volume, so as traffic increases, the risks increase by a factor on the increase. More effective safety oversight and regulation will require a data driven approach as opposed to simple reliance on a process of compliance. For this to be effective, a single institution should be allocated at the responsible body."

2.5 Conclusions and justification of EU intervention

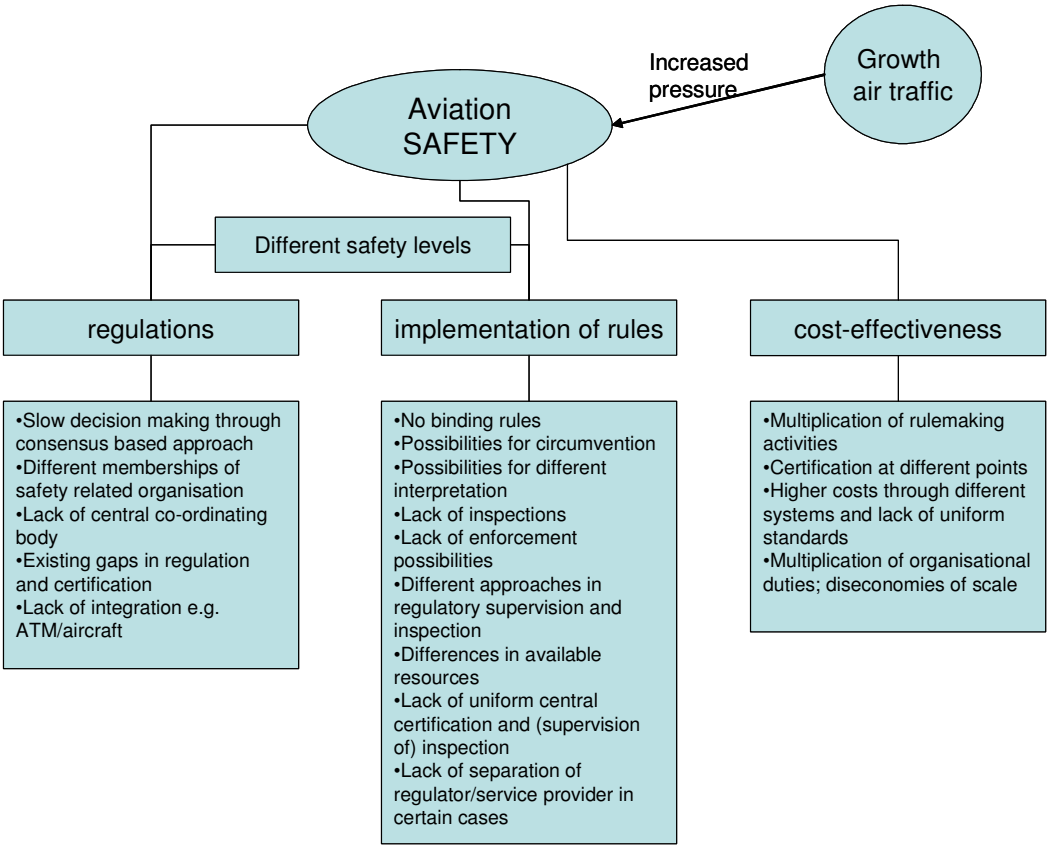
2.5.1 Conclusions on current situation

It is clear that the current safety performance is achieved by the collective efforts of a professional, highly skilled and safety conscious workforce. The question is not only how the current safety performance is to be maintained, but how it can be improved further in the near future while optimising the use of resources at European level. It can be envisioned that further safety improvements depend strongly on the ability to introduce safety management systems at all stakeholders (ATM service providers, aerodromes and operators) in an effective and harmonised way throughout Europe (see figure 2.3).

Although ICAO rules function as a regulatory umbrella, these rules are subject to differences in application. In addition, ICAO issues many recommendations as well, which are not mandatory for national authorities to implement. Thus, in the current situation, clear differences exists between Member States in the field of ATM/ANS and Airports, since much of the implementation activities are carried out at the Member States level, without central oversight or certification. Even where central co-ordinating activities have been undertaken (e.g. in the field of ATM) large diversity occurs. Consequently the applied methodology for certification and for safety oversight, if any, varies strongly between States. Also the allocated resources between Member States clearly differ.

Another drawback of the present situation is that there is a lack of an overall system approach to air transport safety. The different domains are handled through different organisations, while it is increasingly recognized that air transport safety would benefit from a holistic consistent gate-to-gate approach that integrates ATM, flight operations and airports. Furthermore, in a number of accidents (a lack of) regulatory aspects have played an important role. See annex C for more details.

Figure 2.3 Problem tree rulemaking & implementation in aviation safety (ANS/ATM/Airport)



2.5.2 Justification of European wide intervention

"Necessity test"

On the basis of the problem analysis it is apparent that there is a clear need for an enhanced role of the EU as the continuing growth of air traffic requires a clear impetus to change to current organisation of the regulatory process in Europe to further improve the current high levels of aviation safety. This is also illustrated in the basic regulation on the establishment of EASA[12], which already mentions the possibility to extend the competences of the agency in other areas in the field of civil aviation safety, under the supervision of the Commission and in line with the Treaty.

Taking an overall system approach to safety it is considered important to develop a requirement for safety management programs which are not confined to a single domain but is holistically integrated across the various aviation disciplines, organizations etc, while remaining grounded on the "real" world and at the service of the aviation sector/ industry. Therefore, to make the introduction of safety management systems in Europe the success that is required to achieve the desired safety improvements, it appears appropriate that an enhanced role of the European Aviation Safety Agency in the regulatory process (i.e. in the field of rulemaking, certification and supervision) is warranted. This would ensure that there is a "level playing field" for all stakeholders involved and would safeguard that safety improvements would materialise uniformly

[12] Regulation (EC) No 1592/2002

within the European Union. The National Authorities will also continue to exist, issuing certificates and licenses, where more appropriate for proximity reasons, but on the basis of common rules and under the supervision of the European Agency.

A need for EU intervention is affirmed by the stakeholders

Also the stakeholders consulted confirm that there is a real need to change the current situation (98% conclude that there is a need for change).

3 Objectives & indicators

3.1 Objectives

The intended extension of EASA competences is addressing the problems that are associated with the current organisation of the rulemaking and implementation process with respect to safety in ANS, ATM and airports and a lack of standardization in safety oversight by the appropriate national authorities.

The EU intervention addresses different levels of objectives:

- *General objectives*: objectives which correspond with the overall wider policy goals of the intervention. These objectives are also influenced by other factors, but the intervention is expected to have a positive contribution towards them.
- *Specific objectives:* more immediate objectives of the intervention that contribute to achieve the overall objectives. Also these objectives are influenced by factors outside the direct control of the policy intervention;
- *Operational objectives*: these objectives are related to the expected outputs of the measure.

Obviously the expected objectives of the extension of EASA competences are closely linked to the problems described in the previous chapter. In fact the policy chosen is meant to remedy or mitigate the existing problems and to lead to improvements. As such there is also a strong link to the impacts that describe the expected effects of the intervention (these impacts are most strongly linked to the specific and general objectives). These effects can than be monitored and evaluated ex-post (did the intervention result in realising the objectives as defined at the beginning).

For the EASA extension the following objectives are distinguished:

General objectives:

General objectives of the European Commission as described in the Commission's work programme for 2005 and the Annual Policy Strategy for 2006[13]. In these policy documents the following 5 years strategic objectives have been discerned:

- Putting Europe back on the track of *prosperity*
- Reinforce Europe's commitment towards *solidarity*
- Strengthen the citizen's *security*
- Project and promote these objectives outside EU borders through *a stronger voice in the world*

[13] see http://europa.eu.int/comm/atwork/programmes/index_en.htm

Specific objectives:

The specific objectives are related to specific air transport objectives, which are also supported by other initiatives such as the creation of a single European Sky. In fact the extension of EASA competences is closely related to this initiative: These specific objectives can be summarized as:

- The creation of an air transport system which is characterized by:
    - a high uniform level of safety
    - adequate capacity with acceptable delays
    - cost-effective and efficient
    - a "level playing field" for commercial operators, and
    - minimum environmental impacts

Operational objectives:

The operational objectives are related to the concrete actions with respect to the proposed EU intervention. First of all these are:

- the actual adoption of the new regulation and the actual transfer of responsibilities;
- an optimum and safe use of airspace for all users by introducing common rules and standards for airspace planning and management;
- the establishment of a working organisation (own staffing EASA or delegated responsibilities through specific contracts or other appropriate arrangements)

At the next level the activities within EASA that are triggered by the new Regulation would become operational objectives. These include:

- the development of a uniform set of rules complementary to the SES regulations
- the establishment and implementation of certification, standardisation, inspection and supervision activities
- the enforcement of rules
- the implementation of additional functions such as technical training, activities with respect to safety regulation
- the provision of specific services if these will be included within the scope of the EASA extension

3.2 Indicators

Indicators are meant to concretize the objectives. This step is important since it will allow the measurement and assessment of the various policy options and enable adequate monitoring and evaluation of the policy intervention. The indicators on the level of specific and general objectives are closely related to the problems and the expected impacts, while the operational objectives result in more practical indicators related to the fulfilment of actions. The indicators can be considered a common initial drafting by the consultants.

Table 3.1 Objectives and indicators (initial, non-exhaustive list)

Objective	Indicators
Overall policy objectives[14]	
Prosperity	Economic growth Job creation Improved functioning of internal market through removal of obstacles and improved connectivity of European networks Labour mobility Modernisation of ATC
Solidarity	Cohesion Sustainable economic growth
Citizen's security	Increased transport safety
External projection	Improved visibility of EU institutions Improved transatlantic dialogue and external relations with key partners through regulatory convergence
Specific policy objectives	
Uniform high level of safety	Uniform set and application of (binding) rules & enforcement No more certification gaps Uniform quality & certification of ANS/ATM/Airport Less dispersed organisational model (clearer responsibility levels) Central technical training Improved organisational efficiency (leading to faster changes if required) Harmonised systems & interoperability Integrated system approach (A/C, ATM,/ANS, Airport) Clear separation of responsibilities (regulator/supervisor/service provider) Central fallback for understaffed NAAs Improved visibility and position EU in safety regulation
Adequate capacity with acceptable delays	Uniform rules for airspace design (SES related) ATM capacity meet air traffic demand Average delay less than 15 minutes of 95% of the aircraft departures/arrivals Elaboration of civil-military interface
Cost-effective and efficient air transport system	Less multiplication of rulemaking activities Lower cost for certification & licensing for users (one-window) (competitiveness) Harmonised system & interoperability in EU (cost savings manufacturers; competitiveness) Improved position of EU internationally (e.g. certification equipment, a/c) Economies of scale through centralisation (a.o. central fallback for small NAAs) Improved organisational efficiency (faster decision-making, less separate organisation required) Employment effects Faster time to implementation of new techniques & regulation
Minimum environmental impact	Uniform rules for minimising the impact of air transport on the environment Uniform monitoring system
Operational objectives	
Establish regulatory framework	Adoption new regulation on extension EASA competences
An optimum and safe use of	Progress reports on the implementation of the SES regulations by the Member States and

[14] Indicators based on Annual Policy Strategy for 2006 (COM(2005)73. Most relevant indicators have been selected.

airspace for all users by introducing common rules and standards for airspace planning and management	provision of support to States as required.
Establishment of working organisation EASA	Adequate staffing in all functions & responsibilities of EASA Institutional arrangements with 3rd parties (NAAs, qualified entities for certification and e.g. EUROCONTROL for technical expertise on ANS/ATM))
EASA output: - new regulation - implementation of certification, inspection & licensing & enforcement - implementation of additional functions (e.g. training, R&D)	- develop new regulation in ATM/ANS/Airport - activity report on certification/inspection/licensing activities + eventual decisions on corrective actions (through Commission) - training, R&D etc. activities

Source: Consultants' team

4 Policy options

4.1 Introduction

This section describes the policy options that are available to develop an organisation that is responsible for the development of common rules, uniform application of such rules and standardisation oversight in the field of air traffic management, air navigation services and airports. These alternative policy options will be assessed in this impact assessment.

The policy options that have been discerned are:

1. 'Do nothing': continue with present organisation of responsibilities. This options serves as the reference situation;
2. Extend EASA competences in rulemaking, certification and licensing and standardisation in the domains of airports, air navigation services and air traffic management;
3. Extend EUROCONTROL mandates issued by the Commission to the domains airports, air navigation services, and air traffic management (including certification and inspection responsibilities);
4. Establish a new Agency responsible for airports, air navigation services and air traffic management.

In addition, an analysis is made of a further extension of EASA competences with other functions where the long term public interest is paramount, or where neutrality is a must or where significant efficiency can be achieved. Examples of these could be charge collection, flow management, etc.

These policy options are outlined from section 4.3 onwards. First, section 4.2 describes the responsibilities concerned and applicable areas of the policy options.

4.2 Relevant competences

Possible responsibilities and allocation to policy options

In the previous section the policy options have briefly been introduced. This section will address the possible responsibilities that would apply to the policy options. In addition it will be highlighted to which areas these responsibilities will apply. Responsibilities and areas together form the competences of the policy option.

There are a number of key responsibilities that have to be covered by a new entity in the field of regulation and oversight in air navigation services, air traffic management and

airports. These responsibilities together form a kind of "regulation and implementation chain" and are:

1. **Rulemaking** (preparation and adoption)
2. **Certification** and **Licenses**
3. **Standardisation** of practices, **Inspection** of the application of rules and **Enforcement**
4. **Supervision** of delegated responsibilities

In policy options 2 (extend EASA competences), 3 (extend EUROCONTROL mandates) and 4 (create a new agency) the core responsibilities are subject to analysis. This means that the main difference between those three policy options is the organisation structure of those responsibilities. These policy options will be compared to the first policy option 'Do nothing', which serves as the reference model.

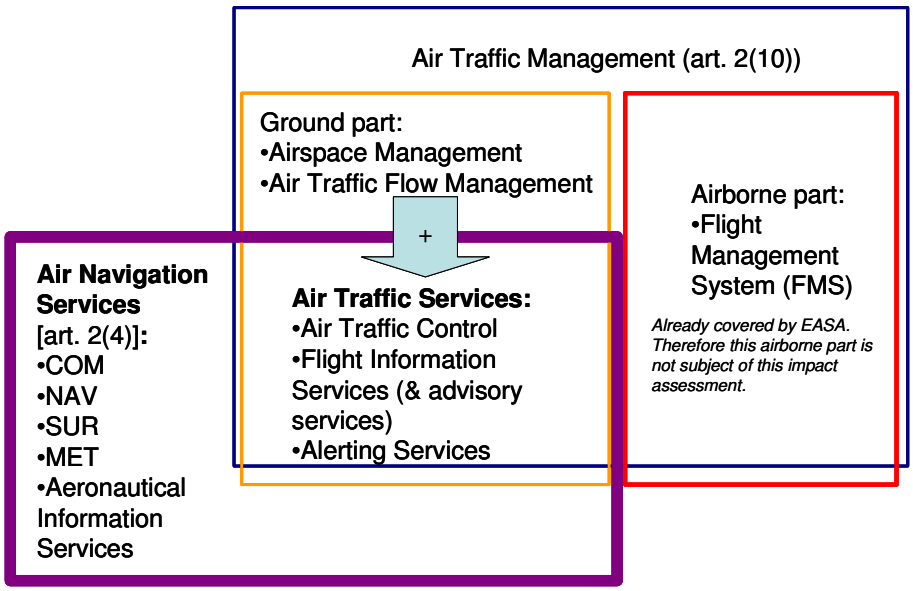
The last policy option under study takes into account other possible functions. This policy option is equal to policy option 2 (extend EASA competences), but in addition certain key functions, even operational, will be executed as well. This will be addressed in more detail in section 4.7.

Areas concerned

In the section above, the various responsibilities that an extended EASA or another organisation model will contain have been described. The objective of the impact analysis indicates that these responsibilities concern the domains of air navigation services, air traffic management and airports. In this section these domains are further detailed.

In this impact assessment the definition of air navigation services and air traffic management as laid down in Regulation 549/2004 on the SES framework will be followed. This definition is visualised as follows:

Figure 4.1 Definition of air navigation services and air traffic management



It should be noticed that the airborne part of air traffic management (i.e. mainly the Flight Management System/FMS). is already part of the EASA competences, while the ANS providers will be subject to certification on the basis of common requirements, starting from 2006.

This means that the area of air navigation services that will be under study, and to which the responsibilities of the policy options reach, concern the technical, safety and operational aspects of:

- Air Traffic Services
- Communication systems and services
- Navigation systems and services
- Surveillance systems and services
- Meteo systems and surveillance
- Aeronautical information systems and services

The domain of air traffic services on which the responsibilities will be executed comprises of:

- The operational, technical, safety and capacity aspects of
  - Area control service
  - Approach control service
  - Aerodrome control service (incl. runway incursions oversight)
  - Flight information services
  - Alerting service
- ATM equipment (ground and partly air)[15]
- Environment (flight efficiency, departure and arrival management)

In addition, the functions of flow management and airspace design and management, will also be considered.

All these areas thus concern both the infrastructure and services aspects.

The area airport on which the responsibilities will be executed comprises of:

- The operational, technical, safety and capacity aspects regarding:
  - Aerodrome infrastructure and equipment (e.g. lights, navaids, etc.), and its layout
  - Ground operations (platform procedures, fuelling, de-icing, etc.)
- Environment
  - Obstacle control (wind hindrance, etc.)
  - Wildlife (bird control, field maintenance)
  - Noise & emissions
- Contaminated runways

To be complete, it is underlined that the list of aspects covered under the areas of air navigation services, air traffic management and airports above, does not imply that in one of the policy options EASA (or a new agency) will carry out air traffic services or provide ANS itself. The responsibilities of such an extended EASA will include preparation of

[15] Only those equipment items that currently not yet fall under EASA competences.

rules, certification, standardisation, inspection etcetera and these responsibilities will be executed on the area of the total aviation system.

4.3 The 'Do-nothing' option

This option concerns a continuation of the present situation. This situation has been described in chapter 2, where it was concluded that this was not a viable option. The 'Do-nothing' option serves as reference option for the other policy options.

4.4 Extend EASA competences

This policy option involves the concept of extending the current EASA responsibilities to the areas of air navigation services, air traffic management and airports. Again, this extension would comprise all identified responsibilities in section 4.2 (except service provision).

The adoption of Regulation (EC) No 1592/2002 opened the way for a new Community system of air safety and environmental regulation. It has laid the basis for the extension of the EASA competences to the additional areas of air navigation services, air traffic management and airports.

The policy option 'Extended EASA competences' concerns an extension of EASA to the application of the current responsibilities to more areas. In this policy option, the current responsibilities for certification, licences, rulemaking, quality and standardisation, inspection and supervision will be extended to areas of air navigation services, air traffic management and airports. This concerns both the infrastructure ('products') and services aspects of these areas, which have been described in more detail in section 4.2.

4.5 Extend EUROCONTROL mandates issued by the European Commission

The policy option that will be part of this impact assessment is to extend the current fields of mandates to EUROCONTROL regarding the drafting of SES rules (e.g. to the airport domain). These mandates will concern all responsibilities identified in section 5.2 (from rulemaking preparation to contingency planning, except provision of operational functions, which is already carried out by EUROCONTROL today), in all areas under study: air navigation services, air traffic management and airports.

Note that some of the responsibilities that would be part of the new mandates to EUROCONTROL are already carried out by EUROCONTROL. These are for example the drafting of implementation rules for SES and the development of regulations in the RC. However, many other responsibilities would be an extension of their current activities and domain (e.g. safety regulation airports, including the infrastructure).

It is assumed that the administrative procedure within EUROCONTROL to prepare and support rules in this option would be the same as for the current mandate to develop the implementing rules. This is different than the procedure to adopt the ESARRs, which need to be approved by Provisional Council.

4.6 Establish a new Agency

Rather than to extend the mandates to EUROCONTROL or extend the EASA competences beyond the aircraft, its crew and its operations, another policy option could be to create a totally new Agency for the specific regulatory responsibilities in the areas of air navigation services, air traffic management and airports.

A Community agency is a body governed by European public law; it is distinct from the Community Institutions (Council, Parliament, Commission, etc.) and has its own legal personality. It is set up by an act of secondary legislation in order to accomplish a very specific technical, scientific or managerial task, which is specified in the relevant Community act[16].

4.7 Extend EASA competences and include some other functions

The last policy option under study is actually the same as the option 'Extended EASA competences', but including the provision of other additional functions by EASA. These functions can be for example:

- Performing R&D
- Technical training
- Rulemaking for accident and incident data collection and investigation
- Development of contingency plans
- ATM/CNS development planning and coordination
- R&D coordination;
- Airspace design;
- Flow management
- Charge collection

During the analysis it will be assessed whether it is desirable to have EASA execute functions like these as well.

[16] There are currently sixteen bodies answering the definition of Community agency, even though differing terms are used to designate them (Centre, Foundation, Agency, Office, Observatory). EASA is one of the current sixteen agencies. The new Agency to be established in the area of regulation of air navigation services, air traffic management and airports would be of the same type as EASA and the other existing 15 agencies.

5 Analysis of impacts

5.1 Introduction

The impacts of the extension of EASA competences and the other policy options are determined towards the do-nothing alternative that forms the base-line/reference option.

Impacts are grouped into safety, economic, environmental and social impacts. To a certain extent it quantifies the reasons for EC involvement and gives a reflection on the extent that the objectives are reached.

It contains a general analysis of the potential impact per group, combined with specific separate analyses on a number of key areas. Major specific impacts distinguished that are subjected to a separate additional analysis are:

- Safety impacts; potential impacts on the air transport safety situation
- Economic impact for users
- Cost effectiveness of a central approach towards a decentralised approach

5.1.1 Key areas for safety impact assessment

The policy options that are available to organise the uniform regulation, application of rules and oversight of standards in the field air traffic management, air navigation services and airports, will have different impact on aviation safety. In order to perform an objective assessment on this impact four key areas which, to certain extent, are of influence on the increase or decrease of aviation safety are distinguished. These key areas are:

- Interfaces
- Available knowledge
- Changes
- Conflict of interest

Interfaces

In general air transport may be regarded as a large system which is composed of several elements and processes. Safety in this system depends on the way that the elements and processes are able to communicate with each other. In this respect, the system is to be considered as a chain whereas the safety is determined by the weakest link in the chain. Any interface in the system is a risk that requires additional coordination. Accidents or incidents may occur when interfaces are not properly managed.

This view is also reflected in the FAA Commercial Airplane Certification Process Study (CPS) report that found that the breakdown of the communication paths between the

members of the aviation industry is often causal or contributory to flight safety occurrences. Also the Space Shuttle Columbia accident investigation report concluded that among the organizational causes of the Columbia accident were "organizational barriers that prevented effective communication of critical safety information".

Interface deficiencies may occur within a single organisation, as well as between multiple organisations. However they are more likely to occur between multiple organisations. Particularly when separate organisations represent different disciplines, interface deficiencies may emerge.

For the assessment with respect to impact on safety, for each of the policy options it is judged whether the option will result in an increase or a decrease of the number of interfaces which are applied to communicate safety information between multiple disciplines.

Available knowledge

It is well known that aviation always has been on the forefront of development of safety measures and practices. Therefore the required level of knowledge within the organisations that are active in the aviation community also is necessarily high. This high knowledge level is required within all kinds of disciplines and organisations within the community. It concerns not only technical knowledge, but also knowledge in the areas of operation, organisation, safety management and regulation, which all together allow the aviation community to move on and succeed.

This level of knowledge requires continuous attention, as any degradation in any part of the system may lead to safety hazards.

For the assessment with respect to impact on safety, for each of the policy options it is judged whether the option will result in a change in the level of available knowledge within the relevant organisations.

Changes

The aviation community is changing constantly, not only because of technological advances, but also because the community is embedded in a dynamic society. Maintaining or improving safety is only possible if the system of aviation continuously is adapted and improved. It is necessary that these changes are made timely. However, also history shows that safety can be compromised when different parts of the aviation system change with different rates[17]. This is most likely to occur when one part of the system changes disproportionally over a relatively short period of time.

For the assessment with respect to impact on safety, for each of the policy options it is judged whether the option would introduce changes that are considered necessary to further improve the level of safety of aviation in Europe. Also it is judged whether the

[17] For instance, see the study on aviation safety management in Switzerland: P.J. van der Geest, M.A. Piers, H.H. de Jong, M. Finger, D.H. Slater, G.W..H. van Es, G.J. van der Nat, Aviation safety management in Switzerland, recovering from the myth of perfection, NLR-CR-2003-316, NLR Amsterdam, 2003.

pace at which these changes are introduced is sufficiently balanced and whether the policy option allows management of change.

Conflicts of interest

Originating from the days of Baron de Montesquieu, it is recognized that sufficient separation should exist between a regulatory body and an executive body in order to prevent any conflict of interest. Such conflict of interests may prevent either the regulatory body or the executive body to decisively fulfill their task. For example conflict might exist between new standards and the cost implications of implementing them, or between capacity of airspace or airports and safety standards for operation and separation.

For the assessment with respect to impact on safety, for each of the policy options it is judged whether the option could contain or introduce mixed interests between regulatory and executive entities.

5.1.2 Contribution of ANS, ATM and Airports to accident risk

A full comprehensive quantitative assessment of the impact on aviation safety of the policy options is not possible since the available data on accidents and causal relation do not fully enable such an analysis. However, in general, a rough estimation of the contribution of Air Traffic Management, Air Navigation Services and Airport operations to accidents can be made by analysing accidents that occurred in the past.

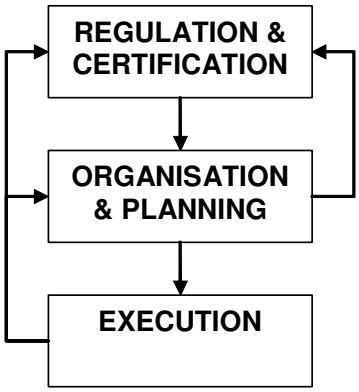
An analysis has been made of all fatal accidents that occurred in Europe in the period 1994-2004 (see Annex C for an overview of the accidents). Analysis shows that ANS/ATM was a factor in 12 of the total of the 43 accidents (28%), whilst the Airport was a factor in 6 of the 43 accidents (14 %). Attention should be made however that these factors are not necessarily mutually exclusive. The combined contribution of ANS/ATM and Airport related factors to the mentioned accident sample is in the order of 30%.

Safety regulation and certification in the areas of ANS/ATM and Airports is relatively young compared to the area of aircraft and aircraft systems (i.e. CS.25.1309). In this respect it is expected that substantial opportunities for safety improvement do exist in the areas of ANS/ATM and Airports, resulting from more effective safety regulation and certification. Of course improvements in the areas of ANS/ATM and Airport regulation alone will not be able to prevent all failures that have contributed to mentioned accidents. It will depend on how these improvements are being organised and implemented.

In the most negative scenario it can be envisioned that intended improvements may not materialize and therefore they will not affect safety at all as compared to the present situation. However, in a more positive way of reasoning the process of improving safety can be described as a control process which takes place at three interlocking levels of functioning (see figure 5.1):

- Regulation & Certification
- Operation & Planning
- Execution

Figure 5.1 Levels in the safety control process



The **regulation and certification** level provides the ground rules for the organisation & planning level. It sets targets of safety performance, and subjects the organisation and planning to a periodic review and improvement process.

The **organisation and planning** level guides and coordinates the execution level. Organisation and planning has to provide the resources and criteria for the execution level to operate.

At the **execution** level, control of hazards takes place through the actions of those directly in contact with them; the flight crew, air traffic controllers, maintenance personnel etc.

Improvements at all three levels will be required to achieve the full safety improvement.

It is clearly not straightforward to apportion a potential share of the possible safety improvements to each of the functional levels, without any specific additional in-depth research. In absence of this specific research it has been assumed that all three levels have an equal potential to improve safety. This means that maximally about one third of the accidents with ATM/ANS and/or airport as a causal factor might be prevented by improved regulation. Since from the accident dataset (Annex C) only in 30% of the total aviation accident cases these causal factors were present, the maximum overall safety improvement would be one third of 30%, thus 10%.

Based on these considerations, it is expected that a reorganisation of the aviation rulemaking and implementation process in Europe with respect to ANS, ATM and Airports could have a total potential safety improvement (in terms of a reduction of the number of fatal accidents) between 0 and 10% compared to the current situation, depending on the effectiveness of such reorganisation.

Although no detailed analysis of non-fatal accidents and incidents was conducted, it appears reasonable to assume that the effect would be in the same order of magnitude as for fatal accidents.

5.2 EASA extension

5.2.1 Safety impacts

General safety impact

An integrated system approach to safety

Extending the EASA mandate from the areas of Airworthiness and Environmental Compatibility to the areas of Air Navigation Services, Air Traffic Management and Airports will be a significant improvement from a safety perspective. This will lead to an integrated, total aviation safety approach that ensures interoperability, harmonised rules and most efficient transition of safety regulation into community rules.

An integrated approach towards aviation safety is critical since the future aviation system will head for a gate-to-gate concept, with future characteristics such as:

- There will be a shared use of all available information between air (Aircraft/Pilots) and ground (ATM and Airport) in the sense of "Total Information Sharing" or "System-Wide Information Management (SWIM)"
- A co-operative ATM system uses air ground communication for a stronger interoperability / integration of Aircraft on board systems (ATM and FMS) and ground systems as used for ANS and ATM. Co-operative ATM systems have to be developed in a synchronized mode.
- The air side of airports will in future be stronger integrated in the ATM system also for ground movements on the apron (and taxiways). High traffic densities require integration of procedures for surface movement and arrival/departure management, as well as integration of flow and capacity management.

Binding rules and enforcement mechanisms

The process of converting regulation into community law is well served by the extension of EASA competences, since EASA is fully integrated in the regulatory process of the European Union. Also enforcement mechanisms are in place in this system.

With this policy option also the competence area of Airports will be well accommodated. From a safety aspect this is important because (airport) ground incidents are a major portion of ATM-related incidents and accidents[18]. Certification of airports at present is required by ICAO, but implementation is performed on national level, leading to dissimilarity in implementation standards.

The process of extending the EASA competences should be sufficiently phased in order to allow the organisation to build-up the required expertise. Also sufficient attention should be given to the distribution of activities and responsibilities between EASA and national authorities.

Impact on ATM and ANS domain

EASA could provide uniform sets of rules for the whole aviation domain (Aircraft, ANS/ATM, Airport) which would be beneficial as there would be less critical interfaces and could grant their enforcement. It also allows an integrated approach towards the whole safety chain. EASA could contribute by a centralized rulemaking and enforcement

[18] Van Es. Review of Air Traffic Management related accidents worldwide: 1980-2001. NLR-TP-2003-378, Amsterdam

framework to more harmonised systems with an improved interoperability and hence a positive impact on safety. This is especially true for future co-operative ATM systems where the airborne and the ground systems are interlinked by air/ground data links and interoperability is essential.

Shorten time to implement new rules

The experience with ESARR regulatory process teaches that rule transposition in European and national regulatory frameworks and their implementation is far from being adequate and lagging behind by at least two years[19], in comparison to the originally planned application date. Uniform binding rules to be established by EASA and their implementation would be beneficial for safety as currently this situation is not a given. However, in principle this would also be possible for the other policy options, when rules are uniformly transposed first in EC legislation and subsequently in national regulatory frameworks.

Elimination of certification gaps

Certification gaps, as existing today would be eliminated by EASA rule making and certification. For example ground ANS/ATM systems are presently not or only in part certificated. When the responsibilities of the regulation chain for all parts of the aviation domain are in EASA hands, uniform quality in ANS/ ATM and Airport can be achieved across the domains and across the Member States countries.

High or average safety standards?

A common regulatory framework is expected to lead to relatively high safety standards. In addition, Member States, might introduce additional safety requirement on certain aspects where they feel a need in their respective state.

Impact on Airport domain

Harmonized interpretation of rules and standards

While ICAO's global regulatory framework provides for the ground rules of aviation safety (Annex 14 for Aerodromes), Certification, Supervision and Enforcement still remains the task of national authorities. In practice States signatories to the Chicago Convention commonly deviate from ICAO rules, standards and recommended practices (ICAO SARPs) as laid down in the Annexes, in order to regulate their national air transportation system. This at times creates a clear tension to the establishment of a level playing field in Europe. Extension of EASA to the Airport domain will enable the uniform transposition of ICAO rules into Community law. If EASA would further detail the ICAO SARPS, and decrease the room for differences in interpretation, this would create a set of uniform binding rules, which could be uniformly applied and enforced across the Member States. In addition, it will enable to fill current gaps with respect to safety related processes and operations at airports, as the ICAO regulatory framework for aerodromes mainly deals with hardware specifications.

Improved airport certification

The majority of States have only recently started with certification of airports according to ICAO Annex 14. Some States had already such a certification in place from the time that it was still a recommendation. However, the ICAO Annex 14 deals predominantly with the requirements and certification of infrastructure (e.g. dimensions of runways). There is a need to broaden the scope also to the softer side of aerodromes, i.e. totality of systems, operating procedures (including accountability for outsourced service) and manuals. Extension of EASA competences regarding certification would therefore reduce

[19] EUROCONTROL, SRC document 35; Annual Safety Report 2004, Brussels.

these existing certification gaps and would lead to a uniform quality of the certification process and outcome.

5.2.2 The safety impact in detail

The impact on safety of this policy option is assessed by means of the key areas which are introduced in section 5.1.1.

Interfaces

In this policy option, the current responsibilities certification, rulemaking, quality and standardisation, will be further extended from the areas of Airworthiness and Environmental Compatibility, Air Operations, Flight Crew Licensing and Safety of Foreign Aircraft to the areas of Air Navigation Services, Air Traffic Management and Airports. With this extension of the mandate all these areas are accommodated in one single organisation, resulting in a single entity for aviation safety regulation in Europe. This will lead to an integrated, total aviation safety approach that ensures interoperability between ground and airborne segments and which is considered very important. Assumed that none of the responsibilities of EASA will (partly) remain by other agencies, it is quite clear that this will certainly lead to a considerable reduction of the number of interfaces.

Available knowledge

If EASA would become the single entity for aviation rulemaking in Europe, it will need to build up a competent staff in relatively short time in order to gain the required knowledge. The current experience is that EASA already has suffered some difficulties with attracting sufficient qualified staff. However, this is considered to be a temporary problem, because once the decisions in favor of EASA are made in due time required expertise is expected to be attracted from the market. It is also possible to transfer certain existing knowledge centers fully to EASA (specific reference is made to the SRU within EUROCONTROL). Another risk for EASA is that specialists (such as ATM specialists and Airport specialists) might get isolated from operational practice. Therefore they will not be able to build up more expertise on the relevant areas from within EASA.

Changes

As a single European authority, EASA would have full regulatory competences: preparation of rules to be adopted by the Commission, certification and supervision, including enforcement. Such an approach would ensure timely implementation of a regulatory framework in whole Europe.

This framework could comprise all areas of the aviation safety chain: Airworthiness, Environmental Compatibility, Flight Crew licensing, Air Operations, Safety of Foreign Aircraft, ANS/ATM and Airports. Therefore in this policy option it should be possible to sufficiently manage the required changes within the required timeframe over the required areas of competence.

Conflict of interest

Since in this policy option EASA would become only a safety regulating entity (and no service provider), no conflict of interest between regulatory function and the service provision is foreseen.

Conclusion on safety impact:
The introduction of a common regulatory framework is expected to lead to improvement in the overall safety level. A strong point of the extension of EASA competences is that it allows the introduction of an integrated approach across the whole safety chain. EASA's direct link with the regulator (European Union) allows a faster introduction of (binding) rules and certification and enables the use of existing enforcement mechanisms.

A clear point of attention is that EASA needs to create good access to knowledge and expertise in the fields that will be included as part of the extension of competences.

5.2.3 Economic impacts

General

Reduced multiplication of tasks

The extension of EASA will lead to a decrease of multiplication of rulemaking activities. Through a clear distribution of responsibilities, roles in the regulation chain can be defined and multiplication can be decreased subsequently.

Improved system efficiency

Furthermore, EASA would be responsible for the entire aviation system. Hence possible overlaps between specific domains (e.g. the Aircraft and ATM domain) will be eliminated. In addition it will lead to improved harmonisation and interoperability between the domains. As EASA will be able to develop rules on harmonisation and interoperability without having to take account of specific national (industrial) interests this might lead to further efficiency gains through improved operability. On the other hand, it has been noticed that there are currently certain gaps in rulemaking. These gaps are expected to be filled, which leads to additional activity in rulemaking, albeit not multiplication.

The extension of EASA competences might lead to further system efficiencies as it enables the co-ordination and integration of different organisational bodies through a central aviation safety agency which encompasses the different domains in the safety chain. For example GASR indicated that they see themselves as an interim solution until EASA takes over. The decreased number of interfaces that would be necessary through an increased integration will result in further cost-efficiencies.

Faster introduction of new rules and resulting systems

The extension of EASA could lead to a decreased duration of the transition and implementation time and process of equipment. However, this impact is difficult to substantiate. A central regulatory entity would certainly have an advantage over several national rulemakers that have to decide about the implementation of systems on a European scale. On the other hand, EASA will still need to consult Member States and has to transfer the draft rules to the European Commission at the end to implement the rule in law.

Cost-efficiencies for (European) airlines

It is expected that the costs for the airlines will decrease. Harmonized systems and operational procedures will lead to direct costs savings. Also indirectly users might profit from the intervention as it will impact on the overall safety level, which in turn will lead to costs savings for airlines that are related to accidents and incidents. Both European and non-European airlines will benefit from such a decrease. However, it is anticipated that European airlines will benefit relatively more. After all, improved interoperability of systems for example, will affect higher costs savings for European airlines (all of their aircraft would be affected) than for non-European airlines (only part of their aircraft affected). Hence their cost base improves relatively more than their non-European competitors. This has a positive impact on the competitiveness of the European airline industry.

Cost-efficiencies for NAAs

Finally, an extended EASA could provide a central fallback function for small or understaffed and less experienced national authorities, e.g. for inspection and auditing activities. It has been mentioned that a pool of safety auditors[20] could be established which assist the understaffed or less experienced national authorities in their responsibilities.

5.2.4 Cost implications

An assessment has been made of the possible cost implication of extending EASA competences (see Annex D). The costs of the option to extend EASA competences will consist largely of personnel costs and overheads. Main assumption in the cost calculation is that EASA will only adopt those tasks that need to be centralised on a central European level with respect to rulemaking, standardisation and supervision of delegated responsibilities. The remainder of the responsibilities can be carried out on a national level.

Table 5.1 Estimated additional (annual) costs of the EASA extension option

Costs category	M€
Staff costs	3.4 - 5.1
Other administrative expenditures	1.0 - 1.4
Total costs	4.4 – 6.5

Conclusion on economic impact:
The extension of EASA competences will have distinct impact on cost-efficiency since it will reduce duplication of activities in rulemaking in Europe and will enable a further integration and co-ordination of different organisational bodies in one central European body. This will reduce the number of interfaces and is expected to accelerate the pace of decision-making. The existence of a central agency might also lead to economies of scale and the creation of a central pool of expertise for smaller, less experienced Member

[20] **"Safety regulator audits"** are defined by EUROCONTROL Safety Regulatory Requirement 1 (ESARR 1) as meaning a systematic and independent examination conducted by, or on behalf of, a National Supervisory Authority to determine whether complete safety-related arrangements or elements thereof, to processes and their results, products or services, comply with required safety-related arrangements and whether they are implemented effectively and are suitable to achieve expected results.

States.

Harmonisation and increased operability will also have a positive impact on the costs for (European) airlines, since efficiency gains will be reached through harmonized systems and operations.

The costs implications of the "extended EASA" option are estimated at € 4.4-6.5 million per annum.

5.2.5 Social

Uniform potential for human mobility

The European Commission proposed in its last year Communication COM(2004)473 the introduction of a Community Air Traffic Controller License to harmonise competence requirements, including linguistic knowledge. The European Parliament, in its first reading of the proposed Directive on the Community air traffic controller license, requested a Commission initiative with the aim to regulating the licensing schemes and qualifications for all professions involved in the safety chain in the context of air navigation services (i.e. air traffic safety electronic engineers, airspace designers and managers, aeronautical information managers etc.).

If an extended EASA would set the conditions for such licenses, and inspect whether the issuing of the licenses e.g. by the national authorities would be according to the rules, it would create a common basis for controllers and other ATM and airport personnel with critical safety functions to work on. This would impact human mobility positively, especially taking into account the development of functional airspace blocks in future.

5.2.6 Environment

It is anticipated that the extension of EASA will have a positive impact on the environment. EASA is foreseen to have a competence in the environmental issues of ATM/ANS and airports as well. This can for example concern preparation of rules on the concentration of noise or spreading of noise in the design of approach or departure procedures, further application of continuous descent approach or noise emissions at airports.

The policy option will therefore lead to uniform rules on the environmental impact of aviation in the ANS/ATM and airport domain. Furthermore, in order to enforce these rules, a uniform monitoring system will have to be developed. This is considered to be positive for the environment.

5.2.7 Other impacts

Civil-military interface

The co-ordination of the civil and the military side is important in airspace management. There is a clear need to create a stable civil-military interface when extending EASA's competences. It is expected that this will further built upon the starting interface as

developed in the SES Committee which will also tap into other existing civil-military interfaces at national and European level[21].

Increased international visibility

The establishment of one single Agency, that is responsible for regulation for the entire aviation system, will increase the international visibility of Europe. It will be "the entity to call" for foreign counterparts, rather than that those counterparts would have to deal with multiple organisations. Additionally, an extended EASA can as that single entity take in a stronger position in discussions on a global level regarding the development of rules in aviation.

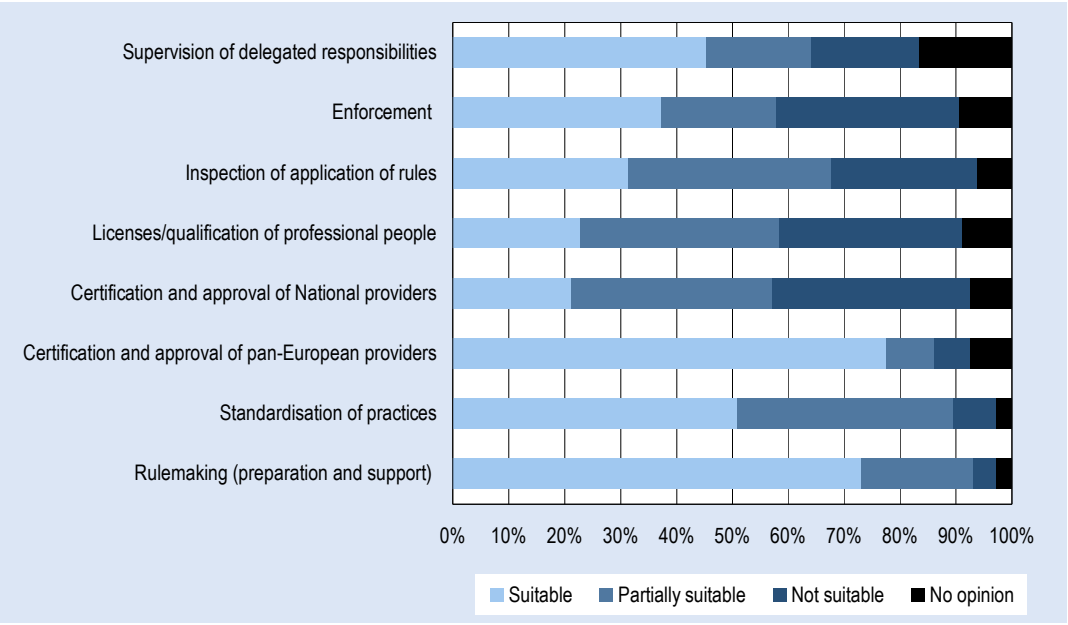
5.2.8 Stakeholders' view on the option

We have asked the stakeholders which responsibilities should be carried out by EASA in an "extended EASA" option. The majority agrees fully that EASA should be dealing with the preparation and support of rulemaking, to the standardisation of practices and with the certification of pan-European service providers. Figure 5.2 provides more insight in the opinion of the stakeholders about the potential responsibilities of an extended EASA.

21 Civil-military interfaces currently exist on national, but also on European level, the latter in various structures. Existing arrangements comprise:

- within EUROCONTROL: EUROCONTROL Military Unit (MIL), Military Harmonisation Group (MILHAG), Civil-Military Interface standing Committee (CMIC), The Military team (MILT).
- Single European Sky civil Military Committee (SESMiC).
- The European ATM Military Directors Conference (EURAMID).
- The NATO ATM Committee (NATMC).

Figure 5.2 Stakeholders' view on extended competences of EASA



The figure also indicates that there is much more 'resistance' to the possibility that EASA would certify, inspect the application of rules and enforce those rules concerning national service providers. Many stakeholders argue that the principle of subsidiarity is to be applied, especially given the required local knowledge one needs to undertake these responsibilities.

Opinion of National CAAs

Preference for EASA extension

The majority of the CAAs that have been interviewed prefer an EASA extension over an extension of EUROCONTROL mandates or establishing a new Agency. This is illustrated by a CAA as follows. The Single European Sky **(SES)** in conjunction with a **"gate to gate"** concept of ATM operation implies as a logical, "condition sine qua non", consequence that a total view to the aeronautical system is necessary and safety is in fact always a **"safety chain"** whereas the safety is determined by the weakest link in the chain. Therefore all safety aspects in the aeronautical domain need to be:

- Concentrated in one hand with a single point of contact
- Have to be unified in nature and uniform with respect to regulation, implementation and supervision;
- Considering that any interface in this safety chain is a risk that requires additional co-ordination.

It has been mentioned that the current image EASA performance is not appealing to give them more tasks. Although this might very well be related to the fact that EASA was only established in 2003, it nevertheless requires that safeguards are built in the decision process and following adoption legislation about the extension of EASA. Before the moment of extension is there, a test is carried out whether EASA is capable to take up the new responsibilities of the extension. If this would be not the case, postponement of the extension would be necessary or even a separate New Agency might be established instead.

Opinion of International organisations

Most of the International organisations that have responded share the view of the national CAAs. Bottom line: "It is no longer tenable for the individual countries in Europe to regulate the national components of an aviation industry that is operating at a European level." However, another drawback was brought forward: "EASA risks being over-extended (particularly in the transition phase) unless it acquires adequate public funding and staffing levels to properly address the new mandate. It is believed that EASA ATM activities must be publicly funded and not financed through the Certification Fees and Charges Regulation."

Other risks of the EASA extension option have been brought forward. Today's image is that EASA has many start-up difficulties. Many stakeholders do not accept that EASA is a young organisation in a build-up phase. They want professional response from EASA from the start, being professionals themselves. Sometimes EASA can not yet live up to expectations, and this harms their image. This image is not going to improve on the short term, particularly when the industry will get charged for activities of EASA. Some stakeholders are complaining dearly, and are very impatient. A bad image may cause credibility problems. Extending EASA with ATM/ANS could overload EASA, leading to further damage of the EASA image.

Another risk is the lack of involvement of stakeholders in the regulation process. This may create opposition to the regulatory activities of EASA. Within JAA there was always very early involvement and discussion in rulemaking of all JAA Member States. This was much appreciated. It appears within EASA that there is less involvement. EASA proposes a rule and then the consultation process starts. For many stakeholders this kind of (late) involvement is insufficient. It may result in rulemaking from an ivory tower.

Opinion of Airport operators

The Airport operators express that their concern that EASA might want to develop its own new set of rules, rather than basing it on existing ones. It is argued that the extension of responsibilities of EASA towards the airport domain is more difficult than to the ATM domain, due to its pan-European nature and the work of EUROCONTROL. Neither EASA nor EUROCONTROL have the expertise or competence in all the aspects of airport airside safety and operations, or the certification of aerodromes. Another risk that is mentioned is that EASA might not devote equal importance to airport issues in relation to other spheres of competences.

Opinion of Airline industry

Reactions from airlines and airline organisations indicate that they favour the EASA option significantly over a new Agency or an extended EUROCONTROL. Quote from one of the respondents: "the only viable option to ensure that the objectives of the Single European Sky are met. ATM systems need to be certified from and end-to-end point of view and therefore all regulatory issues related to ATM should be dealt with by one Authority which can only be EASA".

Opinion of ANSPs

Many of the ANSPs subscribe that there is a need to change the current situation. Many of the current problems were in total or partially agreed. From the options available, the

option to extend the EASA competences was considered most attractive. However, it was warned that there would still remain a risk that also in future roles and responsibilities would not be clear and that duplication of work not avoided. In addition there is a fear for insufficient knowledge and an increase of costs for users.

Stakeholder opinion on impacts

As described in the previous sections, we have identified different impacts of extending EASA competences towards ATM, ANS and airports. We asked the stakeholders if they agree with these impacts. The table presented below, gives the percentage of the stakeholders that agree or partially agree with the effects, as opposed to the ones that do not agree (the ones with no opinion are disregarded) (see for more details Annex B).

Table 5.2 Stakeholders' opinion on impacts

Potential effects	CAA	IND	OSP	APT	ANSP	ORG
Clear responsibilities rulemaking, supervision, inspection	91%	100%	100%	83%	100%	100%
Uniform binding rules	91%	100%	80%	100%	100%	100%
Uniform quality & certification of ANS/ATM/Airport	95%	100%	75%	100%	100%	100%
Improved integration between ANS/ATM & Airport domains	95%	100%	100%	67%	50%	91%
Harmonised systems & inter-operability	91%	100%	80%	100%	67%	91%
Further improvement of safety in aviation	95%	100%	100%	50%	50%	73%
Reduced time to implement new regulation and systems	86%	100%	75%	60%	100%	67%
Cost savings for users	60%	100%	75%	17%	20%	70%
Improved interface military-civil	65%	67%	67%	33%	25%	71%
Improved possibilities for human mobility	83%	100%	80%	80%	0%	63%
Staffing problems for new organisation	85%	75%	33%	100%	80%	89%
Increased international visibility/credibility	95%	100%	100%	80%	100%	100%

CAA – Civil Aviation Authority; IND = Industry; OSP = Other Service Providers; APT = Airports; ANSP = Air Navigation Service Providers; ORG = Internat. Organisations; TOT = Total.

The most likely effects of extending EASA competences according to the stakeholders are more clarity in responsibilities for rulemaking, supervision and inspection, uniform and binding rules, and uniform quality and certification of ANS/ATM/Airport. Through subsidiarity principles and an effective peer review process, national standards could be made uniform. It is regarded less likely that extending EASA competences would lead to an improved interface military-civil or cost savings for users.

5.3 Extension of EUROCONTROL mandates

In this section the differences in impacts of the option to extend the mandates of EUROCONTROL is compared with the EASA extension option. For the various categories of impacts it will be analysed to which extent this option scores better or worse compared to the EASA option.

5.3.1 Safety impacts

General safety impact

Safety improvements will occur

Extending the EUROCONTROL mandate within the competence areas of Air Navigation Services, Air Traffic Management and Airports will lead to improvements in comparison to the present situation. However with respect to the policy option of extending the EASA mandate there are important drawbacks. A less optimal integration of air-ground interoperability and less harmonised rules will be achieved. Also, EUROCONTROL currently lacks the authority within Europe to effectively achieve adoption of safety regulation into community law. This would require a strong commitment of the European Commission towards adopting EUROCONTROL prepared rules (similar to the mandates for the SES implementing rules).

No fully integrated system approach

Certification & licensing would require changes in the convention

Another drawback is that the extension of EUROCONTROL mandates with responsibilities for certification and licensing would require a modification of the current (not yet fully ratified) convention. The feasibility of such an adjustment is a complex, long lasting process involving many Member States of EUROCONTROL.

Use can be made of existing ATM/ANS knowledge

This policy option however offers the advantage that ATM expertise already is available within the EUROCONTROL organisation. In the field of airport regulation less experience is available, especially taking into account that the current ICAO Annex 14 deals almost exclusively with physical infrastructure. The perceived conflict of interests caused by EUROCONTROL, acting both as a regulator and as a service provider, is not assessed to actually occur due to the functional separation of these competences within the EUROCONTROL organisation. The mere perception, however, might affect the credibility of EUROCONTROL in this respect.

Impact on ATM and ANS domain

The EUROCONTROL extension option suffers from the fact that the Airport and the airborne side, the latter an EASA domain, would have to be integrated to cover all functional aspects in aviation considering co-operative “gate to gate” aviation system envisaged for the future.

Also the mentioned perception of potential conflicts of interest might affect optimal performance of this option. Finally EUROCONTROL is a multinational organisation with no executive power. The new convention is not yet fully ratified and it would have to be modified once more to take up the competences proposed in this policy option.

Assuming these issues could be solved, and EUROCONTROL would take up the competences as addressed in this policy option, EUROCONTROL could as much as EASA provide and enforce uniform (binding) sets of rules for ATM/ANS. However, EUROCONTROL could not provide uniform and integrated sets of rules for the whole aviation domain (Aircraft + ANS / ATM / Airport) which would be beneficial as there would be less interfaces and could not grant their enforcement, as Aircraft is an EASA domain.

Certification Gaps, as existing today in ATM/ANS could also as much as by EASA be filled by EUROCONTROL. However, again, if it concerns certification on the interface

between ATM/ANS and the Aircraft domain, there would be a disadvantage for EUROCONTROL, as they do not cover the Aircraft domain.

Uniform quality in ANS/ ATM and Airport could be achieved by EUROCONTROL, provided that EUROCONTROL would have the Airport specialists on board. Additionally, EUROCONTROL could contribute that it is not strived for an average safety level but for the highest safety level, as much as EASA.

When only part of the competence (ANS/ATM and Airport) would be assigned to EUROCONTROL the situation with presently distributed responsibilities would not be fully solved. EUROCONTROL could contribute only in part, for the ground systems to more harmonised systems with an improved interoperability as there still would be a critical interface to the airborne systems.

Impact on Airport domain

For the Airport domain, the majority of the arguments as described for the ATM/ANS domain above, are valid as well. Many of the impacts that would be realised under the EASA option could to some extent be realised via the EUROCONTROL option as well, apart from the added value of a total system approach that could be provided by EASA. However, major disadvantages of the EUROCONTROL option are that another change of the convention is required and that EUROCONTROL has only limited experience in Airport regulation and certification.

5.3.2 The safety impact in detail

The impact on safety of this policy option is assessed by means of the key areas which are introduced in section 5.1.1.

Interfaces

In this policy option, the mandate of EUROCONTROL is extended with the competence areas of Air Navigation Services, Air Traffic Management and Airports. With this extension of the EUROCONTROL mandate not all competence areas are accommodated in one single organisation, because the competence areas Airworthiness, Environmental Compatibility, Air Operations, Flight Crew Licensing and Safety of Foreign Aircraft will remain covered by EASA. It is clear that this will lead to an increase of the number of interfaces.

Available knowledge

Within the organization of EUROCONTROL already existing knowledge would be available to employ on the new gained tasks. This knowledge also comprises technical expertise. However in the field of Airport certification EUROCONTROL suffers a lack of knowledge. This knowledge would have to be acquired by building up a competent staff in relatively short time. If the required expertise can be attracted from the market in due time depends on the way there will be dealt with the local authorities.

Providers of ANS tend to take own initiatives, sometimes bypassing EUROCONTROL for reasons of efficiency. This development, when it continues, might lead to a risk that technical expertise at EUROCONTROL will be lost.

Changes

EUROCONTROL is not a regulatory body in the sense that it has the authority within Europe to enforce implementation of regulations, which implicates that timely implementation of a regulatory framework in whole Europe is not ensured. Full commitment of the Commission would be required to transpose rules developed by EUROCONTROL into Community law.

Conflict of interest

EUROCONTROL today accommodates both competences service provision and rule making. These competences are functionally separated within the EUROCONTROL organisation to avoid any mix of interests and responsibilities. In practise this appears to work as a sufficient separation. However since no natural separation exists such as is obtained when both competences are accommodated in separate organizations, a *perceived* conflict of interest might arise. This could possibly weaken EUROCONTROL's position.

5.3.3 Economic impacts

General

The extension of the EUROCONTROL mandates will decrease multiplication of rulemaking activities to some extent. Also in this option, much clearer responsibilities will rule out overlap. However, EUROCONTROL would not be responsible for the entire aviation system. Hence, on those themes which concern both for example ATM and the aircraft, multiplication of rulemaking could still exist. Hence, it is expected that there will be a smaller decrease in multiplication of rulemaking activities than in the EASA option.

The same argument is valid for avoiding duplication in certification. In case of an extension of the EUROCONTROL mandates there might exist a case that certain equipment needs to be certified by both EASA (aircraft side) and EUROCONTROL (ATM side). Hence also in this respect the magnitude of the impact would be smaller in the EUROCONTROL case than in the extended EASA case.

Harmonisation and interoperability will also be one of the key aims of the extension of EUROCONTROL mandates. However, in such a situation EUROCONTROL would not be responsible for the entire aviation system, which would have ensured an improved harmonisation between the various domains. On the other hand, EUROCONTROL would be able to develop rules with harmonisation and interoperability as key condition, without needing to take into account national (industrial) interest. This will enable a further interoperability within one domain.

As for the extension of EASA, also the EUROCONTROL policy option could lead to a decreased duration of the transition and implementation time and process of equipment. Again, this impact is difficult to substantiate. EUROCONTROL as a central regulatory entity would certainly have an advantage over several national rulemakers that have to decide about the implementation of systems. On the other hand, also EUROCONTROL will still need to consult Member States and has to transfer the draft rules to the European Commission at the end to implement the rule in law. It is anticipated that there is no difference between both policy options for this impact.

It is expected that the costs for the airlines will decrease. Although hard to assess with certainty the potential costs savings are expected to be lower than in the policy option to extend EASA. After all, there is no optimum level of harmonisation and interoperability ensured in the EUROCONTROL option (no total system approach). The interoperability of systems that touch upon these subsystems (e.g. data link etc) will be less optimal, and therefore lead to a smaller costs decrease in this option compared to the EASA option.

Organisational effectiveness

The extended EUROCONTROL mandates option scores lower in terms of impacts regarding the organisational effectiveness compared to the EASA option. The EUROCONTROL option would make the decision making process more difficult, as it is not a Community Agency, but a multinational organisation, with 35 members (instead of the 25 Member States). Furthermore, EUROCONTROL stands by definition further away from the rulemaker (the European Commission) than a Community Agency as EASA, although the current mandates for developing the SES implementing rules indicate that this does not have to be a major obstacle. In terms of number of organisations, it would mean that the situation stays as in the EASA option, both EUROCONTROL and EASA continue to exist, only that the competences are distributed differently.

EUROCONTROL will not be the integrating body for rulemaking in a gate to gate context and a total systems approach to safety. Although it currently undertakes research in this domain, a result of the existence of EUROCONTROL with competences in rulemaking in the ATM/ANS and Airport domain next to EASA with its competence in the Aircraft domain, is that there are two organisations, not one integrating body.

With the EUROCONTROL extension option there would be the notion of no clear separation of responsibilities between regulator / supervisor tasks and service provision. It has been noted that although EUROCONTROL has taken and will take various actions to overcome this issue, the perception at the aviation stakeholders is still that of a mix of responsibilities.

New technologies and regulations, especially for co-operative systems still need additional co-ordination as all airborne systems being in EASA hands would generate additional interfaces. Within ATM/ANS and Airport the time to implement new technologies and regulations would probably be the same as in the EASA option, although the substantial technical knowledge in the field of ATM/ANS currently existing at EUROCONTROL might have a positive impact.

5.3.4 Cost implications

The costs for the option to extend the EUROCONTROL mandates are considered to be more or less comparable with the costs as calculated for the extension of EASA option. After all, the distribution of responsibilities between the central agency and the national level would be the same in both options. Furthermore, the salary levels at EUROCONTROL and EASA are comparable.

Table 5.3 Estimated additional (annual) costs of the EASA extension option

Costs category	M€
Staff costs	3.6 - 5.4
Other administrative expenditures	1.0 - 1.5
Total costs	4.6 – 6.9

The major difference though is the way the expenditures are financed. It is expected that the costs of an extension of the mandates of EUROCONTROL would be (partly) recovered from the user charges, as currently is the practice for all EUROCONTROL costs. The EASA budget would be under EC budgetary control, with possibly a stricter monitoring and budget control mechanism.

5.3.5 Social

EUROCONTROL has adopted its ESARR5, which a/o addresses the licensing of air traffic controllers. If the EUROCONTROL mandates would be extended, as foreseen in this policy option, EUROCONROL could continue and fine tune its work on means of compliance and application of ESARR5, including conditions for licensing, and subsequently inspect and enforce the uniform application by national authorities. This would have a positive impact on human mobility, to the same extent as it would have as it was carried out in the EASA option.

5.3.6 Environment

If the mandates of EUROCONTROL would be extended, as is the subject of this policy option, it is expected that this has a positive environmental impact. This will be equal as in the option to extend EASA competences, as also in this option, uniform rules on the environmental impact of aviation will be developed.

5.3.7 Other impacts

Civil-military interface

Currently there are several organisational structures within EUROCONTROL that contribute to the civil-military interface in ATM. An extension of the EUROCONTROL mandates would not impact this interface negatively. On the contrary, there is a clear experience in co-ordination with the military within EUROCONTROL. However, among stakeholders there is currently a view that the civil-military interface must be brought to a higher level within the EUROCONTROL organisation.

Increased international visibility

This impact will be significantly lower in this EUROCONTROL option compared to the extended EASA option. After all, no single entity will be created for aviation safety regulation. As a result there still will be a diffusion of responsibilities in the domains, hence a decreased clarity for non-European institutions and organisations. They still would have to deal with two organisations (EASA and EUROCONTROL).

5.3.8 Stakeholders' view on the option

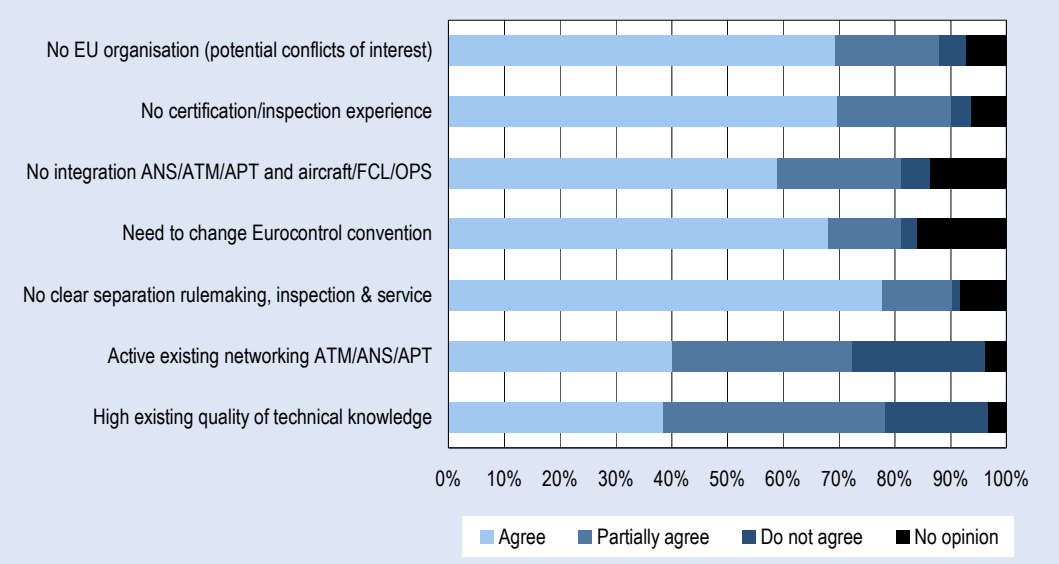
General

The stakeholder have been asked to which extend they would agree or disagree with a number of advantages and disadvantages of the option. The following advantages and disadvantages have been brought forward:

- Advantages:
  - High existing quality of technical ANS/ATM/Airport knowledge
  - Active existing networking ATM/ANS/Airport
- Disadvantages:
  - No clear separation rulemaking, inspection & service provision
  - Need to change EUROCONTROL convention
  - No integration between ANS/ATM/Airport and aircraft/Flight crew licensing/Operations
  - No certification/inspection experience
  - No EU organisation (potential conflicts of interest)

Figure 5.3 indicates to which extent the stakeholders agree with these (dis)advantages.

Figure 5.3 Stakeholders' view on (dis)advantages "Extended EUROCONTROL" option



From the figure it can be derived that the majority of the stakeholders fully agrees with the disadvantages of the option identified. There is also a majority that fully or partly agrees with the advantages of the option that EUROCONTROL has a high existing quality of technical knowledge and that they are active in exiting networking in the relevant domains. Furthermore, EUROCONTROL is considered to have a good interface with the military.

Opinion of national CAAs

The CAAs have also expressed their concerns about the EUROCONTROL extension option. These are:

- The required need to change the Convention is a tremendously slow process
- The lack of separation between service provision and regulation
- The total system approach would not be realised.
- Lack of experience in airport safety regulation.
- The organization is used to working on a consensus basis and would find it difficult to switch to a rulemaking and especially enforcement role

However, there are also positive responses to the EUROCONTROL option, such as: “To extend EUROCONTROL mandates is an efficient means to be successful for the implementation of the SES during the transition period, without destabilising the actual work in progress”. And: “with EUROCONTROL one immediately covers 35 States instead of 25”.

It is stated that Extended EUROCONTROL mandate could be considered only when EUROCONTROL would be turned into a community agency without any conflict of interest. This would imply a separation from all services and operations (Maastricht / CEATS etc.).

Note that it has not been asked which option of the three (EASA, New Agency, EUROCONTROL) they prefer. Various remarks concerning the risks of the extended EASA option:
- The risk that National authorities start to rely fully on EASA to do the job.
- EASA lacks sufficient competences in the ATM/Airport fields
- Clear definition of responsibilities with EUROCONTROL required
- There should be clear agreement between ICAO and EASA about issues concerning EASA competences and Member State competences
- It might lead to difficulties in the civil-military interface.

Opinion of Airport operators

Most airport operators share the position on the EUROCONTROL option. EUROCONTROL is suitably qualified in ATM/ ANS issues but not in airport related issues. The entire EUROCONTROL organisation is ATC driven, minded and focused. EUROCONTROL cannot cover the full range of airport issues and the organisation was not designed to meet airport requirements. If EUROCONTROL mandate will be extended to airports, airport interests and needs might be underrepresented in the organisation.

Opinion of ANSPs

ANSPs considered this option less effective due to an insufficient track record in the domain of regulation and a lack of transparency.

5.4 Establishment of a new Agency

In this section, the impacts of the option to establish a new Agency are compared with the EASA extension option. Similar to the previous section it is analysed to which extent the alternative option, in this case the establishment of a New Agency, scores compared with the EASA extension option.

5.4.1 Safety impacts

General safety impact

The establishment of a new Agency as a regulatory body on the areas of Air Navigation Services, Air Traffic Management and Airports is expected to lead to improvements in the overall safety level. However, it is expected that this will lead to less improvement than the policy option of extending the EASA mandate. This new agency will exist beside EASA and EUROCONTROL, which will create a triangle of distributed regulatory entities. Although all safety competence areas will be accommodated within one of the regulatory authorities the aviation system will suffer from a clear lack of efficiency which will arise as the result of having several regulatory bodies.

Impact on ATM and ANS domain

Many of the safety impacts for the Airport, ANS and ATM domain, as identified under the "extended EASA" option, could be realised by this New Agency option as well. After all, it is mainly a matter of organisation that makes the difference. In principle, either EASA or a new Agency should take up the same competences, and provide central rulemaking. However, a major disadvantage of this New Agency option is the fact that by definition, it would not cover the Aircraft domain, which is currently covered by EASA. Hence, the added value of an EASA option, the total system view, cannot be realised in the New Agency option. This disadvantage addresses many of the impacts identified.

The New Agency could indeed provide and enforce uniform (binding) sets of rules for the Airport, ATM and ANS domain. However, it could not provide these for the whole aviation domain (Aircraft/Flight Operations/Flight Crew/Foreign Aircraft + ANS/ATM/ Airport) which would be beneficial as there would be fewer interfaces. Certification gaps, as existing today, would be eliminated at the Airport, ATM and ANS level. Where these gaps exist for the interface between the Airport, ATM/ANS and Aircraft domain, these gaps could not be solved. A uniform quality in ANS/ ATM and Airport could be achieved by the New Agency, provided that New Agency would have the ANS/ ATM and Airport specialists. The New Agency could as much as EASA aim to apply the highest safety level instead of the average. However, when only part of the competence (ANS/ATM and Airport) would be assigned to New Agency the situation with presently distributed responsibilities would not be solved fully. After all, we would have two central entities for rulemaking in aviation on a European level. Finally, the New Agency could contribute only in part, for the ground systems to more harmonised systems with an improved interoperability as there still would be a critical interface to the airborne systems.

Finally it should be noted that a New Agency would most likely experience start-up difficulties as almost every new organisation. By 2010, EASA is expected to have built up sufficient experience for all responsibilities in the regulation chain, while the New Agency would need to develop this experience from scratch.

Impact on Airport domain

For the Airport domain, the same remarks are valid as for the ATM/ANS domain. In the New Agency option, many of the impacts could be realised as in the EASA option. The New Agency option however, lacks the possibility to develop and enforce rules from a holistic aviation viewpoint and lacks experience in rulemaking, inspection and

enforcement, as it has to start to develop these capabilities, rather than to build on experiences.

5.4.2 The safety impact in detail

The impact on safety of this policy option is assessed by means of the key areas which are introduced in section 5.1.1.

Interfaces
The establishment of a new Agency as a rulemaking body which accommodates only part of all competence areas besides already existing authorities that accommodate the remains of the competences is a policy option that creates much extra interfacing.

Available knowledge
The new agency will need to build up a totally new staff in relatively short time in order to gain the required knowledge. With also EASA soaking up the available knowledge from the market this may become rather difficult. Since the agency does not yet exist no available in-house knowledge is brought in.

Changes
The extent to which the new agency will be able to implement regulation in Europe depends highly on the legal status that the new agency will have. It will need to be a regulatory body that has the authority to enforce implementation in order to manage the required changes over the required areas of competence. However, since in this policy option not all areas of competence are accommodated within one regulatory entity it will be rather difficult to implement a consistent and uniform regulatory framework in whole Europe.

Conflict of interest
No conflict of interest between regulatory and executive entities is foreseen in this policy option.

5.4.3 Economic impacts

General
The establishment of a New Agency will decrease multiplication of rulemaking activities to some extent. Also in this option, clearer responsibilities will decrease existing overlaps. However, the New Agency would not be responsible for the entire aviation system. Hence, on those themes which concern both for example ATM and the aircraft, multiplication of rulemaking could still exist. Hence, it is expected that there will be a smaller decrease in multiplication of rulemaking activities than in the EASA option.

The same argument is valid for avoiding duplication in certification. In case of an established New Agency there might exist a case that certain equipment needs to be certified by both EASA (aircraft side) and the New Agency (ATM side). Hence also in

this respect the magnitude of the impact would be smaller in the New Agency option than in the extended EASA option.

Harmonisation and interoperability will (should) also be one of the key aims of the New Agency. However, in such a situation the New Agency would not be responsible for the entire aviation system, which would have ensured an improved harmonisation between the various domains. On the other hand, the New Agency would be able to develop rules with harmonisation and interoperability as key condition, without needing to take into account national (industrial) interest. This will enable a further interoperability within one domain.

As for the extension of EASA, also the New Agency policy option could lead to a decreased duration of the transition and implementation time and process of equipment. Again, this impact is difficult to substantiate. The New Agency as a central regulatory entity would certainly have an advantage over several national rulemakers that have to decide about the implementation of systems. On the other hand, also the New Agency will still need to consult Member States and has to transfer the draft rules to the European Commission at the end to implement the rule in law. It is anticipated that there is no major difference between both policy options for this impact.

It is expected that the costs for the airlines will decrease, but not as much as in the policy option to extend EASA. After all, there is no optimum level of harmonisation and interoperability ensured in the New Agency option (no total system approach). The interoperability of systems that touch upon these subsystems (e.g. data link etc) will be less optimal, and therefore lead to a smaller costs decrease in this option compared to the EASA option. As a result the positive impact on competitiveness will be smaller than for the EASA option.

Organisational effectiveness

The policy option New Agency scores less in terms of organisational effectiveness as the option to extend EASA. This is obvious to a large extent: an additional agency is created. Compared with the EASA option, there would be need to relate the activities at EASA and the new Agency, hence the decision making process becomes more complex. In addition, there would not be a central integrating body for rulemaking in aviation, but two. However, as in the EASA option, other organisations such as GASR could cease to exist.

Furthermore, the new Agency could function as a central fallback for understaffed national authorities, just like EASA. An overall quality management within the airport and ANS/ATM domains is possible, however such overall quality management system would not be possible for the entire aviation domain, as the Aircraft domain responsibilities would still be at EASA.

Within this policy option the time to implement new technologies and regulation is likely to decrease compared to the current situation on ATM/ANS and airports. However, compared with the EASA policy option, there is still a need for an interface with the Aircraft domain, hence this would require additional time. Finally, as a New Agency would not be a service provider, there would be a clear separation of responsibilities.

5.4.4 Cost implications

The costs for the New Agency option have been assessed at m€ 7.5 to 8.6. This is higher (approx. 30%) than the EASA option, which can be explained by the additional overhead that a New Agency will have to bear, compared to EASA (Management team, IT system etc).

Table 5.4 Total additional (annual) costs in the New Agency option

Costs category	M€
Staff costs	5.7 – 6.5
Other administrative expenditures	1.8 – 2.1
Total costs	7.5 – 8.6

5.4.5 Social

It is expected that the impact on human mobility will be the same as in the extension of EASA option. After all, it is important that the rules for licensing etc are developed and enforced. If this done within this option and the EASA option in the same way, the impact will be the same. It should be noted though that EASA could benefit in terms of efficiency from its experience in its existing licensing programs.

5.4.6 Environment

If a New Agency would be established, as is the subject of this policy option, it is expected that this has a positive environmental impact. This will be equal as in the option to extend EASA competences, as also in this option, uniform rules on the environmental impact of aviation will be developed.

5.4.7 Other impacts

Civil-military interface

The impact on the civil-military interface would be the same as in the EASA option. Either way, a safeguard should be developed that when drafting new rules there is sufficient co-ordination with the military.

Increased international visibility

Compared to the EASA extension option, the impact on international visibility will be less in this New Agency option. After all, there would be two organisations responsible for safety regulation in Europe, which does not provide the maximum clarity for non-European organisations and institutions. It might even raise confusion, if the two entities do not speak with one voice on certain themes.

5.4.8 Stakeholders' view on the option

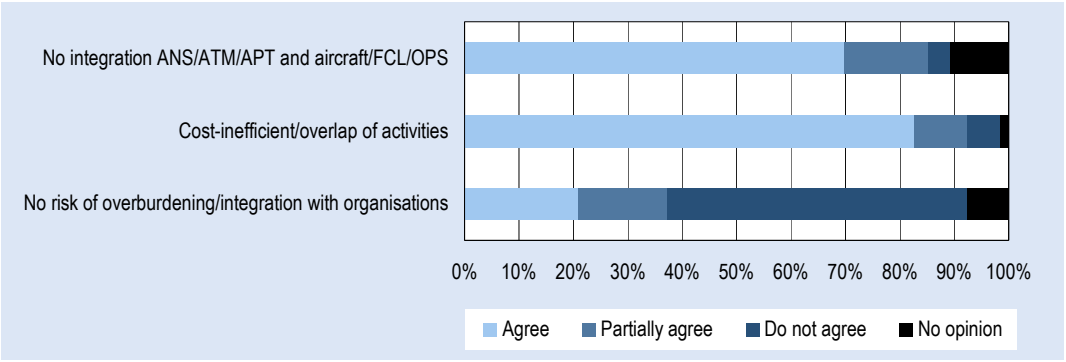
General

In the stakeholder consultation it has been asked to which extent the stakeholders would agree with certain perceived advantages and disadvantages of this option. The following (dis)advantages were perceived:

- Advantage:
  - No risk of overburdening or integration with existing organisations (e.g. EASA)
- Disadvantages:
  - Cost-inefficient/overlap of activities
  - No integration between ANS/ATM/Airport and aircraft/Flight crew licensing/Operations

The following figure presents the view of the stakeholders on these perceived (dis)advantages.

Figure 5.4 Stakeholders' view on (dis) advantages "New Agency" option



A large majority agrees that establishing a new agency would not lead to the desired integration of rulemaking for the entire aviation system. Furthermore, it is agreed that this option would lead to inefficiencies and / or overlap of activities. Stakeholders disagree with the potential advantage that the New Agency reduces the risk of potential overburdening of existing organisations.

Opinion of national CAAs

Many of the CAAs have identified risk associated with the New Agency option. These risks are

- Inefficient to create another organisation with more overheads
- Unclear separation of responsibilities between this Agency and EASA. This might lead either to gaps or to overlaps.
- Total system approach is desired, and would not be realised in this way
- Very difficult to recruit adequate people.

It is also noted that certification and audits of the implementation of rules are a local issue, due to the local circumstances that play a role.

Opinion of Airport operators

Airport operators have brought forward a consideration like this: “A New agency has the advantage that the structures and competences can be customised to the needs of the airport industry. In all other arrangements airports run the risk of being treated as least appendix in the loop. On the other hand a new agency might become less powerful than EASA or other agencies. The geographic scale of Europe and the numbers of Airports would justify a dedicated European Airport Agency “.

Opinion of ANSPs

Many of the ANSPs subscribe that there is a need to change the current situation. Many of the current problems were in total or partially agreed. It was warned that also in the New Agency option there would still remain a risk that in the future roles and responsibilities would not be clear and that duplication of work could not be avoided. In addition there is a fear for insufficient knowledge and an increase of costs for users.

5.5 Additional EASA functions

5.5.1 Analysis

Apart from the core responsibilities concerning the regulation chain (rulemaking assistance, certification etc) other functions/tasks could possibly be transferred to EASA. These include:

- R&D (regarding ATM/ANS and airports), either undertaken directly or supporting co-ordination;
- Technical training;
- Rulemaking for accident and incident data collection and investigation;
- Development of contingency plans (e.g. emergency planning in special situations that need a co-ordinated action in ATM, ANS or airports).
- Other possible functions

R&D

EASA’ extension of competences in this domain is expected to add to the quality of safety regulations and oversight; hence it would have a positive impact on safety in the end. However, it is not really the R&D which is needed; what actually matters is the development of technical expertise. This is not something that has to be developed internally in EASA, but it could be found in the market with external experts, at the Member States or at EUROCONTROL. EASA should identify safety areas where R&D is required and encourage appropriate parties to perform studies

Note that it would impact the organisational effectiveness negatively if EASA would take up a strong position in R&D. It would be yet another party performing R&D, next to what is done on the national level, at EUROCONTROL and in the market. Hence, there is a risk on duplication, which has a negative economic impact.

Technical training

The provision of training by EASA is expected to have a positive impact on safety. After all, as a regulatory entity, EASA would be able to match the training curriculum as close

as possible to the need from the regulations. The better adapted the training to the regulations, the better the effect for safety is. Furthermore, the training would be uniform.

However, it is the question whether EASA should be the only training centre. If it would be the only centre, this would create a monopoly, and hence inefficient prices for the training. If it would be just one of the training centres, next to commercial ones, they might tend to show adverse behaviour, by arguing that as the rulemaker, they would be the best institution to obtain the training from.

It could be argued that offering training is a commercial service, and would not be a suitable activity for a rule maker. An alternative strategy would be that EASA would be confined to only providing accreditation to training establishments, and leave training itself to specialised centres. EASA could develop common standards for training. The establishment of common training standards would facilitate social mobility for qualified personnel (e.g. safety auditors) across Europe.

Based on results of past safety audits being performed at European or ICAO level this standardised training and mobility could provide valuable help to those countries whose present safety practices are lagging in quality and implementation compared to the average European level.

Rulemaking for accident and incident data collection and investigation

Council Directive 94/56/EC mandated Member States to ensure that the technical investigations (following aviation accidents & incidents) be carried out by a permanent civil aviation body or entity, functionally independent in particular of the NAA (part of the "safety chain") and in general of any other party (e.g. ANSPs, airports, etc...) whose interests could conflict with the investigations themselves. Subsequent Directive 2003/42/EC, whose scope is wider than the previous one (all "occurrences", including those voluntarily reported), mandates the States to collect, evaluate, process and store the related information, as well as to make this information available to other MS and to the Commission. Additionally, on the basis of the second Directive mentioned, the Commission is developing the necessary SW tools (programme for the "European Co-ordination Centre for Aviation Incidents Reporting Systems = ECCAIRS).

Currently, despite these two directives, there are no harmonised rules for accident and incident data collection and investigation, including follow-up actions. Member States have their own approaches, in which quality differences may exist. Therefore, a harmonisation of rulemaking can have a positive impact on safety.

However, one could argue that if EASA would take up this rulemaking, a conflict of interest would rise. After all, investigation after an accident might result in a conclusion that the rules were not sufficient, or not properly applied. This would directly concern EASA. Hence, if EASA would carry out rulemaking for accident and incident data collection and investigation, it could be developing rules for evaluation of their own performance. The role of EASA would primarily be to initiate actions based on the recommendations made by Transport Safety Boards after the investigation and monitor recommendations to be carried out by other parties.

Development of contingency plans

Safety is positively impacted if contingency plans are in place in the ATM, ANS and airport domain. The development of such contingency plans is a competence that requires a significant amount of technical knowledge, and additionally local knowledge (e.g. for airports) as well. One could argue that the development of contingency plans is an activity that is closely linked to service provision. The service providers seem to be more suited to develop these contingency plans. It is recommendable that EASA develops the rules for those contingency plans, i.e. that every service provider has these plans developed according to common standards.

Other possible functions

Other possible functions that could be envisaged to fall under EASA are for example flow management, charge collection, airspace design, R&D co-ordination and ATM/CNS development planning and co-ordination. It is generally felt that transferring these functions to an extended EASA is not a good option. These functions are relatively labour intensive (e.g. flow management is currently carried out by approximately 300 persons), and would lead to a massive organisation. It is doubtful whether this would enhance organisational effectiveness and would lead to a step forward compared to the current situation. This consideration is valid for the majority of other functions as indicated in the beginning of this section.

5.5.2 Stakeholders' view on the additional functions

Additionally we asked the stakeholders their view on the previous issues. The table presented below, gives the percentage of the stakeholders that consider EASA suitable or partially suitable for the functions, as opposed to the ones that do not find EASA suitable (the ones with no opinion are disregarded).

Table 5.5 Stakeholders' view on additional functions

Potential functions to fall under EASA	CAA	IND	OSP	APT	ANSP	ORG
R&D	60%	50%	33%	80%	0%	50%
Technical training	75%	100%	40%	100%	0%	67%
Rulemaking for incident data collection and investigation	83%	100%	100%	80%	50%	91%
Development of contingency plans	59%	25%	75%	75%	17%	82%

AA – Civil Aviation Authority; IND = Industry; OSP = Other Service Providers; APT = Airports; ANSP = Air Navigation Service Providers; ORG = Internat. Organisations; TOT = Total.

Rulemaking for incident data collection and investigation is considered a function suitable to transfer to EASA according to a majority of the stakeholders. R&D is not considered to be a suitable function of EASA. However, some stakeholders claim that none of these functions would be suitable initially. The organisation would need to have a very clearly defined function and burdening it with additional extraneous functions would be detrimental. In time other functions could be added if considered necessary.

6 Comparing the options, conclusions, recommendations

6.1 Comparing the options and conclusions

In this chapter the impacts of the extension of EASA competences, the option to extend EUROCONTROL mandates and the option to establish a New Agency are compared towards the "do-nothing" alternative (the base-line/reference option). Impacts are grouped into safety, economic, environmental and social impacts. An overview of the main conclusions per impact category is presented in the following impact table. These are the impacts for 2010 at the conclusion of a transition phase.

Table 6.1 Main impacts per policy option

Impact	Extended EASA	Extended EUROCONTROL mandates	New Agency
Safety			
Overall safety level	Optimum improvement through integrated approach	Clear improvement, but to a lesser extent than the EASA option (see issue below)	Clear improvement, but to a lesser extent than the EASA option (see issue below)
Integrated safety approach	High level of integration, limited number of organisational interfaces. Certification gaps are eliminated	Additional interfaces between ANS/ATM domain and other domains. Additional interfaces between certification and inspection and rulemaking (not suitable EUROCONTROL). Also Airport less suitable for EUROCONTROL.	Additional interfaces between Airport & ANS/ATM and other air transport components (aircraft, crew, operations). Certification gaps are eliminated.
Flexibility to adopt changes	Relative short time to implementation of new regulation. Direct link with rulemaker (part of same organisation).	Ratification of new convention allows decision making by majority vote. Membership EUROCONTROL larger than EU. Could lead to double decision making.	Relative short time to implementation of new regulation. Direct link with rulemaker (part of same organisation). Additional need for co-ordination with EASA.

Impact	Extended EASA	Extended EUROCONTROL mandates	New Agency
Conflicts of interest	No major conflicts of interests	Possible perceived conflicts of interest between rulemaking activities and ATM service provision	No major conflicts of interests
Economic			
User costs	Decreased user costs through harmonisation through a) increased harmonisation of systems, b) streamlined operations at airports, c) streamlining of costs incurred by service providers, d) decrease of operational costs	Idem	Idem
Organisational effectiveness	Strongest reduction of number of interfaces	Reduction of interfaces but still interfaces necessary between system components + rulemaking and certification	Reduction of interfaces, but still interfaces necessary between Airport, ANS/ATM and other air transport system components
Employment	Although cost-efficiency might be reached through centralisation, overall employment impacts are expected to be positive, since EASA would fill gaps in current situation.	Some additional overhead staffing through split in organisational responsibilities.	Additional overhead staffing
Staffing	Need to build up sufficient expertise (or create adequate outsourcing/co-operation arrangements).	Extensive available technical knowledge in ATM/ANS domain. Need to build up additional expertise in Airport domain	Need to build up sufficient expertise (or create adequate outsourcing/co-operation arrangements)
Costs of the option (annual)	Estimated at 4.4 – 6.5 million euro	Estimated at 4.6 – 6.9 million euro. Approximately similar to EASA. However less stringent budgeting mechanism might exist since Member States contribution can be largely transferred to	Estimated at 7.5 – 8.6 million euro. Additional overhead costs compared to EASA.

Impact	Extended EASA	Extended EUROCONTROL mandates	New Agency
		user charges	
Social			
Increased human mobility	Common licensing for staff would lead to improved cross EU labour mobility	Idem	idem
Environment			
Overall impact	Non-negative or positive through uniform environmental standards at e.g. airports	Idem	Idem
Other			
International visibility	One central EU organisation would gain highest visibility	Responsibilities divided over different organisations decreases overall international visibility	Responsibilities divided over different organisations decreases overall international visibility

Comparison and conclusions on the policy options

The assessment reveals that there is a clear reason to intervene in the current situation. All policy options are expected to lead to positive impacts on safety, through the introduction of a common approach towards safety across the EU. This positive safety impact is expected to be highest in the case of the extension of the EASA competences since this would enable a truly holistic systems approach within one organisation. It would also establish a closer link between (support to) new rulemaking and regulation and the implementation of rules through a certification, audit and licensing system.

The extension of the EASA competences clearly has European added value. Only on a European level it is possible to reduce interpretation differences and implementation differences. Furthermore, the extension of EASA offers the opportunity to establish common rules for the entire aviation system for the whole of the European Union. Finally, this option offers the possibility to reduce the multiplication of rulemaking at different levels.

The extension of EUROCONTROL mandates to the same level of competences as EASA is expected to be difficult as the introduction of EUROCONTROL responsibilities in the field of certification and standardisation inspections would require additional modifications of the (revised) EUROCONTROL convention. Also the airport domain appears to be less suitable to be covered through an extension of the EUROCONTROL mandates. In fact this option would still necessitate additional efforts in building up central harmonisation and co-ordination in the field of certification and licensing, and standardisation. A main advantage of the EUROCONTROL option would be that it would make use of the available technical know-how in the field of ATM/ANS. The early

experiences with EASA have shown that building up experience in the start-up phases of an organisation is a clear challenge to be mitigated.

The establishment of a new agency has mainly disadvantages towards the extended EASA option, since it would burden the EU administration with setting up a new organisation. In addition it would create additional interfaces between the ATM/ANS and Airport and the other domains.

Finally, there is the possibility of extending EASA with other functions such as route charge collection, flow management, air space design and R&D. At this stage there appears to be no clear value added of transferring these functions to EASA unless there is a direct link to the regulatory process. It might even diffuse the visibility of EASA since it impacts on the focus of the agency on safety regulatory activities. It is advised to keep EASA a lean and mean organisation and not burden the agency with additional tasks that have limited synergetic value.

6.2 Recommendations

The impact assessment reveals the extension of EASA competences in 2010 as the first ranked option. However, the analysis has also brought a series of issues which need to be addressed. These are:

Transition path

It is important that a careful transition path for the period 2005-2010 is developed. The current experience after the establishment of EASA shows that there are clear growing pains that affect the attitude of e.g. Member States towards EASA negatively. Therefore it is important to learn from the transfer of competences from JAA to EASA that has been accomplished (and that will be implemented for the first extension of EASA competences in the fields of Flight crew licensing, Air operations and Safety of foreign aircraft). Furthermore, it is recommended not to transfer all tasks and responsibilities at once, but to apply a step-by-step approach. Finally, it is recommended to build in conditional checks in the legislation for the EASA extension, in order to assess whether the EASA organisation is capable to take in more responsibilities.

Distribution of responsibilities between NAAs and EASA

An important issue is the distribution of activities between EASA and NAAs, especially in the field of certification and supervision of certified organisations. It is advised that all activities with a clear European scope are executed by EASA. This concerns core responsibilities including the preparation and support of rules, standardisation of practices across NAAs themselves, and certification and licensing of pan-European service providers (or other activities carried out at a pan-European level). All other activities in the regulation chain, being certification and licensing of national service providers, inspection on the application of rules by operators/providers, and enforcement can be carried out by the NAA (or accredited entities). It would therefore be EASA's responsibility to supervise and audit the NAAs, in order to ensure that these activities are carried out at an adequate level. Also highly labour intensive activities (cf. flight crew

licensing) are suggested to (remain to) be carried out at a local/regional level, as it would require a significant manpower capacity if they would be carried out by EASA.

Such a design of the policy option would mean it passes the 'boundary test' of subsidiarity. It would also counter-act the potential risk that the knowledge base at NAAs might be depleted.

Core functions and expertise are preferably carried out centrally at the EASA Headquarters. In this way, rulemaking for the entire aviation system can be optimised and consistency could be created. Tasks for which this interaction with the other aviation domains (airworthiness etc) is less required, (e.g. certain certification tasks) could be located elsewhere.

Related to this issue is the problem for (especially) the smaller Member States to build up sufficient expertise and to employ full-time staff. One approach could be to create a central pool of safety auditors at EASA which would be able to function as a resource base for these States. Another option would be to grant NAAs or other entities (cf. the classification societies in the shipping industry or the certification of recreational pilots by assessment bodies) a licence or accreditation to perform cross-national inspection services. Also other forms of distributed or delegated responsibilities can be thought of.

Towards regional centres?

The landscape in ATM and ANS has been changing rapidly since the adoption of the Single Sky package. This will continue in the coming years, a/o with the implementation of Functional Airspace Blocks (FABs). Although the development of these FABs is still in a starting phase, it is clear that the notion moves away from national boundaries and national influence. It is therefore important that when shaping the new regulatory structure for aviation safety, this new landscape is taken into account.

These (supranational) FABs might be operated by one ANSP or by co-operating ANSP from several countries. In any way it is clear that the direct relation between national airspace, national service provider and national authority is becoming more complex. This can result in the establishment of regional entities that perform the oversight function or the creation of accredited entities (be it accredited NAAs or other entities) that operate across borders.

Capitalizing on available European expertise

In order to fulfil the responsibility of rule making successfully, it is important that there is a certain level of technical knowledge. Basic technical expertise in all fields is required in EASA itself to avoid that EASA will merely become an administrative and judicial body. In this light it is advised to transfer the current SRC and SRU activities and expertise of EUROCONTROL in the field of ATM/ANS to EASA. More specialist and detailed technical expertise should be sourced from the vast amount of technical know how in the domain of ATM/ANS and Airports at the Member States and EUROCONTROL.

Military-civil interface

The co-ordination between the civil side and military side is important in ATM. This concerns not only the level of systems, harmonisation and flexible use of airspace, but

also rulemaking and standardisation of practices. After all, in nearly all countries civil traffic is sometimes handled by the military ATM (with civil rules).

There are currently a number of co-ordination bodies for civil-military issues. It is recommended that these organisations remain existing, to ensure co-ordination in the technical field.

Association with third countries

An important issue that has been brought forward during the stakeholder consultation is that an extended EASA should have a pan-European view by establishing a relation with third countries. In the first instance these are countries that are not a member of the European Union, but that are a member of EUROCNTROL and ECAC. This problem is already currently addressed within EASA by creating an observer status in the Management Board. However, it is important to involve non-EU member countries in the regulatory process on a broader scale. These may also include countries that are neighbouring Europe.

7 Planning future Monitoring & Evaluation

7.1 Introduction

Policymakers need systems in order to verify whether implementation is 'on track' and to what extent the policy is achieving its set objectives. When a policy is not achieving its objectives, they need to know the cause in order to make adjustments. Therefore it is important to develop a monitoring and evaluation arrangement which can provide valuable information in this regard.

In the context of the reform process launched in 2000, the Commission acknowledged the need for more results-focused management and decided, inter alia, to further develop evaluation the Commission with the emphasis on its use as a management tool and with evaluation centred on activities. This process has led to a set of requirements on evaluation that applies to all policy areas. These requirements are set out in a number of documents:

- The Financial Regulation[22]
- The implementing rules of the Financial regulation[23]
- The Communication on Evaluation[24], and
- The Communication on Evaluation Standards and Good Practices[25]

Evaluation and monitoring are not the same. Monitoring is a continuous and systematic process carried out during the duration of an intervention. The intention is to correct any deviation from the operational objectives and thus improve the performance of the programme. Monitoring usually does not provide answers on the results and impacts of interventions, since this is part of evaluations. Evaluations can take the form of both ex-ante, interim or ex-post evaluations. A typical evaluation addresses the results and impacts of interventions and deals with evaluation criteria such as sustainability and relevance.

The aim of monitoring is to provide information concerning the performance (e.g. effectiveness and efficiency) of the delivery mechanism. Monitoring information can be divided into three categories:

[22] Council Regulation 1605/2002, articles 27, 28 and 33.
[23] Commission Regulation 2342/2002, art 21.
[24] SEC(2000)1051.
[25] SEC(2002)5267.

- **Operational information** e.g. time to contract (in case of subcontracting), payment times;
- **Financial information** e.g. resources used versus planned resources, resources used as percentage of available budget;
- **Compliance related information** e.g. deliverables received, project status against objective and previously defined milestones.

Information should also be presented on time and managers must have confidence in its accuracy. The monitoring has to cover the complete lifecycle of a project and of the programme. Responsibilities for reporting have to be clear. There should be procedures and practices to ensure that management-level information is prepared and communicated on time.

The *monitoring* will be used for the day-to-day management of the research projects and agenda, and consequently for taking corrective measures if necessary. The project and programme *evaluation* will be mainly used for judging the projects and agenda on their overall performance at specific points in time, e.g. annual evaluations, periodic evaluations and ex-post evaluations. External experts normally carry out the evaluation, in order to give an independent and unbiased evaluation report.

Four basic types of evaluations exist:

- **Ex ante evaluation** study carried out before an intervention takes place;
- **Annual evaluation** study carried out every year aimed at providing information about performance on short term indicators, e.g. budgets, delays, flexibility, and personnel;
- **Periodic (interim) assessments** carried out every period (e.g. every five years) aimed at providing information about performance on medium/long term indicators, e.g. environmental impact, safety, competitiveness, sustainability, and robustness;
- **Ex-post evaluation** study carried out after the intervention, aimed at providing detailed information on the actual performance of the organisation in relation to the estimated performance and lessons learnt. Since EASA is not established with a specific end-date this type of evaluation appears to be less relevant.

The role of annual evaluation and the periodic assessments is to recommend corrective actions on the level of projects and research agenda, e.g. changing the priorities or the focus of a specific theme. The ex-ante and ex-post evaluations have the function to aim at giving a judgement on the desirability and feasibility of the delivery mechanism itself and to draw conclusions on best practices and lessons learnt for future projects and delivery mechanisms.

Current evaluation practice for EASA

The current evaluation requirements for EASA are set out in the basic regulation on the establishment of EASA (Reg 1592/2002, art. 51). According to the regulation:

1. Within three years from the date of the Agency having taken up its responsibilities, and every five years thereafter, the Management Board shall commission an independent external evaluation on the implementation of this Regulation.
2. The evaluation shall examine how effectively the Agency fulfils its mission. It shall also assess the impact of this Regulation, the Agency and its working practices in establishing a high level of civil aviation safety. The evaluation shall take into account the views of stakeholders, at both European and national level.
3. The Management Board shall receive the findings of the evaluation and issue recommendations regarding changes to this Regulation, the Agency and its working practices to the Commission, which may forward them, together with its own opinion as well as appropriate proposals, to the European Parliament and to the Council. An action plan with a timetable shall be included, if appropriate. Both the findings and the recommendations of the evaluation shall be made

Since the capability of EASA to absorb new competences is an essential element it is suggested to implement the first (interim) evaluation three years after the extension of the competences and every five years thereafter. This should be aligned with the already planned (interim) evaluations on the other competences.

7.2 Specific evaluation requirements

In 2006 the Commission will present its Regulation on the extension of EASA competences. Implementation is then foreseen around 2010. It is recommended to divide the evaluation process in these two stages. In each stage the evaluation has a different character:

- between 2006 and 2010: evaluating whether the actions necessary to implement the EASA extension take place
- after 2010: evaluating whether the objectives of the EASA extension are set.

Evaluation between 2006 and 2010

In the Recommendations section in the previous chapter it has been described that it is recommendable to test before the actual extension of EASA competences whether the Agency is indeed ready for the extension. This can be done a/o by evaluating:

- the development plan for the extension that needs to be written
- the recruitment process
- the action plan for the transition phase.

In order to decide to continue with the extension in 2010, it is therefore necessary to define the criteria for this decision in the Regulation.

Evaluation after 2010

It is foreseen that the extension of EASA competences will be implemented by 2010. After implementation, it is necessary to evaluate whether the implementation matches with the objectives of the extension. The monitoring can be done on the 3-tier level of the objectives (see chapter 3):

1. General objectives
2. Specific objectives
3. Operational objectives.

Rather than repeating these objectives of the intervention to extend EASA competences, we refer to chapter 3 for an overview.

7.3 Objectives and evaluation indicators

As mentioned above, measurable indicators should be identified to evaluate the results of the proposed intervention. The definition of the indicators is of course very closely related to definition of the objectives. The indicators are the translation of the objectives into measurable outcomes, serving as a basis for measuring achievements. The indicators have some requirements and should be 'RACER', i.e.[26]:

- **R**elevant, i.e. closely linked to the objectives to be reached
- **A**ccepted (e.g. by staff and stakeholders)
- **C**redible for non-experts, unambiguous and easy to interpret
- **E**asy to monitor (e.g. data collection should be possible at low cost)
- **R**obust against manipulation

As stated in the new guidelines for Impact Assessment, at this stage one needs to focus on the indicators for the key policy objectives. These have already been developed in chapter 3 and seem valid for the future monitoring of the implementation of the EASA extension.

[26] European Commission, 2005, Impact Assessment Guidelines, Brussels.

Table 7.1 Objectives and indicators (initial non-exhaustive list)

Objective	Indicators
Overall policy objectives[27]	
Prosperity	Economic growth Job creation Improved functioning of internal market through removal of obstacles and improved connectivity of European networks Labour mobility Modernisation of ATC
Solidarity	Cohesion Sustainable economic growth
Citizen's security	Increased transport safety
External projection	Improved visibility of EU institutions Improved transatlantic dialogue and external relations with key partners through regulatory convergence
Specific policy objectives	
Uniform high level of safety	Uniform set and application of (binding) rules & enforcement No more certification gaps Uniform quality & certification of ANS/ATM/Airport Less dispersed organisational model (clearer responsibility levels) Central technical training Improved organisational efficiency (leading to faster changes if required) Harmonised systems & interoperability Integrated system approach (A/C, ATM,/ANS, Airport) Clear separation of responsibilities (regulator/supervisor/service provider) Central fallback for understaffed NAAs Improved visibility and position EU in safety regulation
Adequate capacity with acceptable delays	Uniform rules for airspace design (SES related) ATM capacity meet air traffic demand Average delay less than 15 minutes of 95% of the aircraft departures/arrivals Elaboration of civil-military interface
Cost-effective and efficient air transport system	Less multiplication of rulemaking activities Lower cost for certification & licensing for users (one-window) (competitiveness) Harmonised system & interoperability in EU (cost savings manufacturers; competitiveness) Improved position of EU internationally (e.g. certification equipment, a/c) Economies of scale through centralisation (a.o. central fallback for small NAAs) Improved organisational efficiency (faster decision-making, less separate organisation required) Employment effects Faster time to implementation of new techniques & regulation
Minimum environmental	Uniform rules for minimising the impact of air transport on the environment

[27] Indicators based on Annual Policy Strategy for 2006 (COM(2005)73. Most relevant indicators have been selected.

impact	Uniform monitoring system
Operational objectives	
Establish regulatory framework	Adoption new regulation on extension EASA competences
An optimum and safe use of airspace for all users by introducing common rules and standards for airspace planning and management	Progress reports on the implementation of the SES regulations by the Member States and provision of support to States as required.
Establishment of working organisation EASA	Adequate staffing in all functions & responsibilities of EASA Institutional arrangements with 3rd parties (NAAs, qualified entities for certification and e.g. EUROCONTROL for technical expertise on ANS/ATM))
EASA output: new regulation implementation of certification, inspection & licensing & enforcement implementation of additional functions (e.g. training, R&D)	develop new regulation in ATM/ANS/Airport activity report on certification/inspection/licensing activities + eventual decisions on corrective actions (through Commission) training, R&D etc. activities

Source: consultant's team

It is recommended that these indicators will be further developed in a later stage, when the amendments of the Council and /or Parliament are known.

Annex A: Stakeholder consultation

The stakeholder consultation has been carried out via two mechanisms:

- a questionnaire has been distributed among a series of stakeholders in the aviation community
- in addition, a series of interviews have been held with key stakeholders to discuss in more detail the topics addressed in the questionnaire.

The results of both the interviews and the questionnaire are the foundation under the impact assessment. These results have been used to develop and substantiate the analysis done on the various topics such as problem analysis, assessment of impacts and comparison of options. In each of the main chapter we have dedicated in addition a separate section to the stakeholders' view. Furthermore, a detailed analysis of the results of the questionnaire is provided in annex B.

It has been chosen to approach all members of the Management Board of EASA (CAAs), either for only a questionnaire or additionally for an interview. The CAAs that have been approached for an interview were a mix of larger and smaller CAAs, from EU15 and from recently acceded countries. Additionally, a number of international organisations have been approached for a questionnaire and a selection of those for an interview. These were organisations that are consulted by the Commission for the SES process as well (The Industry Consultation Body). Finally, a diverse sample of ANSPs and Airports has been approached for a questionnaire. Note that for airports and ANSPs also the branch organisations have been interviewed.

Questionnaire

The questionnaire has been distributed to the stakeholders via e-mail on 30 May 2005. In the two weeks after the initial e-mail, telephone contact was sought with the stakeholder to ask whether they would have received the questionnaire and the request to fill it in. A reminder e-mail was sent to those who did not reply initially, on 17 June 2005. People were offered to respond from 30 May to 20 June 2005. In practice, questionnaires that came in until mid July have been processed.

The stakeholders were consisting of the following groups:

- Civil Aviation Authorities
- (International) Organisations
- Airport operators
- Air navigation service providers
- Industry
- Other service providers (e.g. Meteo)

The following 48 organisations have been approached with the request to fill in the questionnaire:

Table A1 Organisations approached for questionnaire

AENA Spain	CAA Portugal
Aerospace and Defence Industries Association of Europe	CAA Romania
EANS (ANSP Estonia)	CAA Slovakia
Arinc	CAA Slovenia
Association of European Airlines	CAA Switzerland
ATCEUC	Copenhagen Airport
Athens International Airport	DFS Germany
Aviation Meteo Group	EUROGROUP
British Airports Authority	European Business Aviation Association
Brussels International Airport Corporation	European Cockpit Association
CAA Austria	European Low Fares Airline Association
CAA Belgium	European Regional Airline Association
CAA Bulgaria	European Transport Forum
CAA Cyprus	Fraport
CAA Czech Republic	HUNGARCONTROL
CAA Denmark	IFATCA
CAA Finland	International Air Carrier Association
CAA Ireland	International Council of Aircraft Owner and Pilot Association
CAA Latvia	LVNL Netherlands
CAA Lithuania	NATS United Kingdom
CAA Luxemburg	Schiphol Airport
CAA Malta	Sita
CAA Norway	Stockholm Arlanda Airport

We received 32 responses from these organisations on our request. In addition, we received 7 responses from organisations that have not been approached. An additional 23 questionnaires were distributed before an interview, of which 17 questionnaires were received during interviews that we conducted (see next section). This means that a total of 56 answers have been received to the questionnaires that have been processed. We received questionnaires from the following stakeholder organisations.

Table A2 Organisations that responded to questionnaire

CAAs	Organisations	Airports	ANSP	Other service providers	Industry
Belgium	EBAA	ACI	AENA	ARINC	AEA
Bulgaria	ECA	Avinor	EANS	Aviation Meteo Slovenia	Airbus
Cyprus	ECAC	BAA	CANSO	DMI	IATA
Czech	ETCEUC	Barajas	DFS	METEO Hungary	Lufthansa
Denmark	ETF	Munich	LVNL	SITA	
Estonia	EURAMID	Schiphol	NATS		
Finland	EUROCONTROL				
Germany	GASR				
Greece	IAOPA				
Hungary	IFATCA				
Ireland	IFATSEA				
Italy	JAA				
Latvia					
Lithuania					
Luxemburg					
Netherlands					
Norway					
Portugal					
Slovenia					
Spain					
Sweden					
Switzerland					

Interviews

In addition to the questionnaires, a series of interviews have been conducted with key stakeholders. These interviews took place in the period between 3 June and 12 July. In total, 25 interviews have been undertaken. All but two interview requests were responded positively. Interviews have been conducted with the following organisations:

Table A2 Interviewed organisations

ACI	Canso
CAA Estonia	EASA
CAA France	ECAC
CAA Germany	EUROCONTROL (3)
CAA Greece (2)	EUROMID
CAA Hungary	FAA
CAA Italy	GASR
CAA Netherlands	Hungarcontrol
CAA Spain	IATA
CAA Sweden	IFATSEA
CAA UK	JAA

Annex B: Questionnaire report

Summary of main findings questionnaire

Problems with the current situation

We asked the stakeholders if they agree with a number of issues being a problem. Almost all stakeholders agree that a different interpretation of rules is a problem. Also, the fact that there are no binding rules and the higher costs through overlap of activities are seen as important problems. To a lesser extent, the slow decision-making and a lack of a uniform system of inspection and certification are regarded as problematic. With regard to gaps in certification, multiplication of rulemaking activities and higher costs due to differing systems being a problem, stakeholders are more ambivalent, some agree, some do not or do not have an opinion. Finally, about 48 percent of the stakeholders claim that the current organisation of responsibilities in the domain of ATM/ANS and airports has a negative effect with regard to safety (as opposed to some 22 percent who thinks it is positively affected). An overwhelming majority of 98 percent of the stakeholders think there are reasons to change the current situation.

Extending EASA competences

Next, the respondents were requested to indicate which responsibilities they would consider suitable to pass to EASA. Almost all stakeholders agree that the responsibilities for rulemaking (preparation and support) and standardisation of practices could be transferred to EASA. To a lesser extent, they agree that certification and approval of pan-European providers and systems and supervision of delegated responsibilities are suitable for transferring to EASA. The stakeholders generally don't think that EASA is a suitable organisation for certification and approval of national providers and systems or licensing and qualification of professional people. The most likely effects of extending EASA competences include more clarity in responsibilities for rulemaking, supervision and inspection, uniform and binding rules, uniform quality and certification of ANS/ATM/Airport and increased international visibility/credibility. Apart from the core responsibilities concerning the regulation chain, stakeholders think EASA would also be a suitable organisation for rulemaking for incident data collection and investigation.

Other policy options

Apart from extending EASA competences, two other options have been identified:

a) To *extend EUROCONTROL mandates* for the responsibilities (rulemaking, certification, inspection etc.) for ANS, ATM and airports.
b) To *establish a new Agency* for the responsibilities of ANS, ATM and airports.

According to a majority of the stakeholders extending EUROCONTOL mandates (option a) has several disadvantages, including a lack of clear separation between rulemaking, inspection and service provision, the need to change the EUROCONTROL convention, the lack of certification and inspection experience and potential conflicts of interest. An advantage according to some stakeholders is the high existing quality of technical ANS/ATM/Airport knowledge.

Also, the establishment of a new agency (option b) is considered to have more disadvantages than advantages. A lack of integration between ANS/ATM/Airport and aircraft/Flight crew licensing/Operations and cost-inefficiencies due to overlap of activities are expected by a majority of the stakeholders.

0. Stakeholder information

Response

A total of 56 answers have been received to the questionnaires. The answers came from the following countries: Hungary, Slovenia, Finland, Belgium, Denmark, Switzerland, Czech Republic, Sweden, Latvia, Portugal, Lithuania, Norway, The Netherlands, Luxembourg, Bulgaria, Italy, Greece, Germany, Spain, Cyprus, Estonia, Ireland and United Kingdom. This means that almost the entire EU-25 (and Norway, Bulgaria and Switzerland) has participated in the stakeholder consultation.

The categories of stakeholders that responded to the questionnaire were: CAAs (23), Organisations (12), Airports (6), ANSPs (6), Other service providers (5), and Industry (4). This means that CAAs are relatively well represented. In order to get a balanced picture the answers to the questionnaire are separated for the six stakeholder types and overall averages are not weighted by number of responses per stakeholder type.

Involvement in different domains

The stakeholders have responsibilities in different areas. We have distinguished three domains of involvement. The table presented below summarises the results (note that most stakeholders are involved in more than one domain).

Table B1 Stakeholder domains

Domain	Involvement
Air traffic management	73%
Air navigation services	77%
Airports	64%

The table shows that the response is dispersed quite evenly between the three domains. In other words: all domains are well represented in the stakeholder consultation.

Of course there is a relationship between the types of stakeholders and the domains of involvement. For instance, CAAs are usually involved in all three domains, whereas ANSPs are less likely to be involved in airports.

1. Current situation

We have identified a number of existing problems with respect to the current division in responsibilities in the regulation chain in the domain of ATM/ANS and airports:

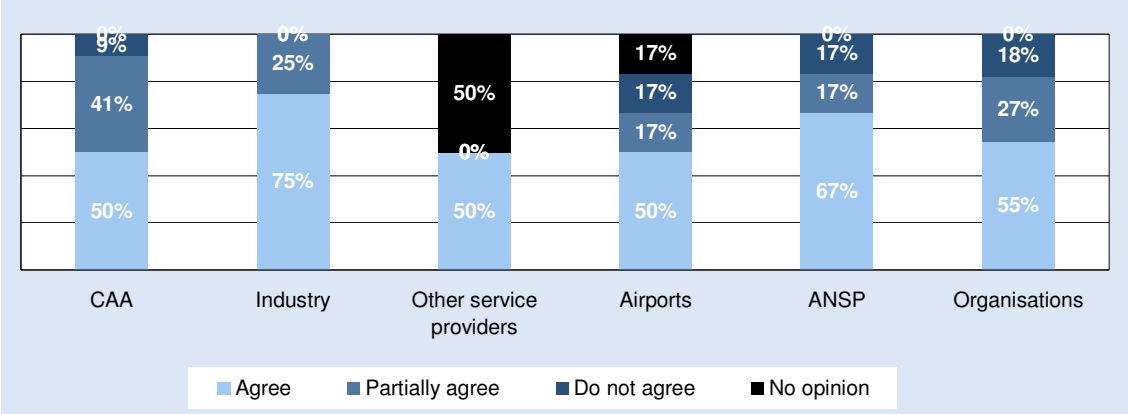
i. Rulemaking assistance
ii. Certification & Licenses
iii. Standardisation, Inspection and Enforcement
iv. Supervision

We asked the stakeholders if they agree with a number of issues being a problem. The results are given below.

Slow decision-making

The figure presented below shows the level of agreement within the six types of stakeholders.

Figure B1 Slow decision making

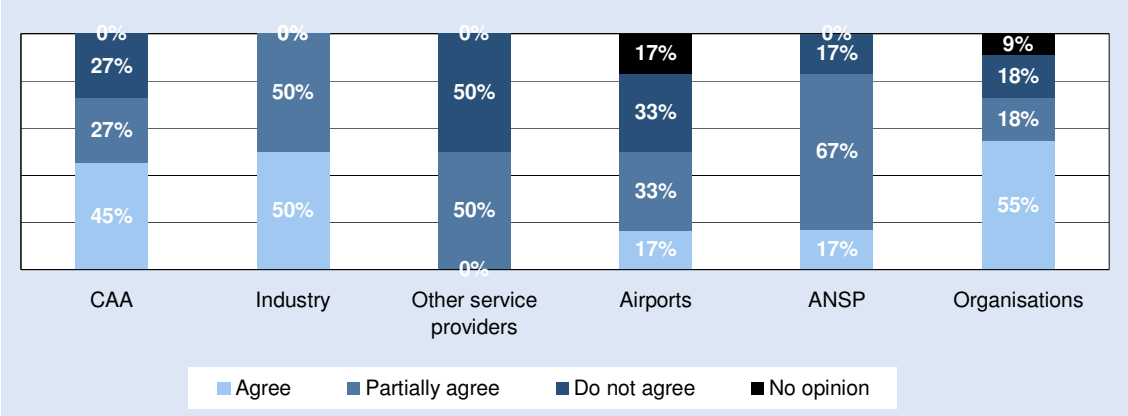


A large majority (partially) agrees with decision-making being a problem. Especially the industry regards decision-making as being too slow. However, according to a CAA, one should be careful to speed it up, because some time is needed for the harmonisation process.

No binding rules

The figure presented below shows the level of agreement within the six types of stakeholders.

Figure B2 No binding rules



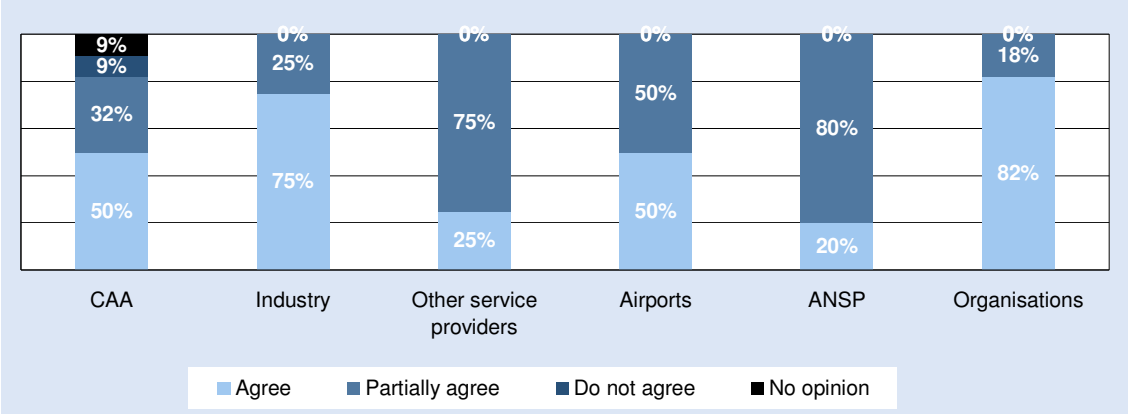
The stakeholders are not uniform in their opinion. A majority of the industry regard the issue of no binding rules as a problem (or partially agree with this), whereas for instance

other service providers do not see this as a problem or only partially agree. Where possible, States apply to ICAO rules and deviances are being filed.

Different interpretation of rules

The figure presented below shows the level of agreement within the six types of stakeholders.

Figure B3 Different interpretation of rules

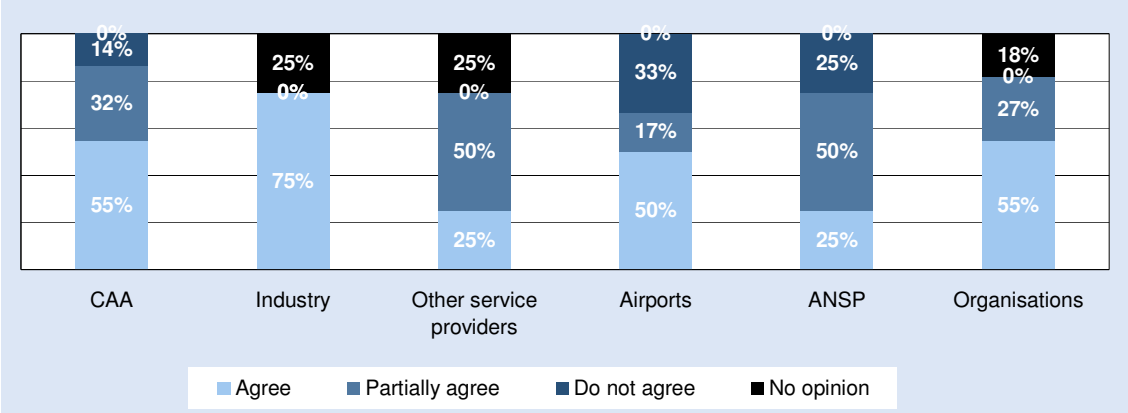


Almost all stakeholders agree that the different interpretation of rules is a problem. Especially the industry and organisations are convinced about this. Other service providers and ANSPs only partially agree. Also, there is a difference between the interpretation of 'rules' and 'guidelines' (e.g. EUROCONTROL documents).

No uniform system of inspections

The figure presented below shows the level of agreement within the six types of stakeholders.

Figure B4 No uniform system of inspections



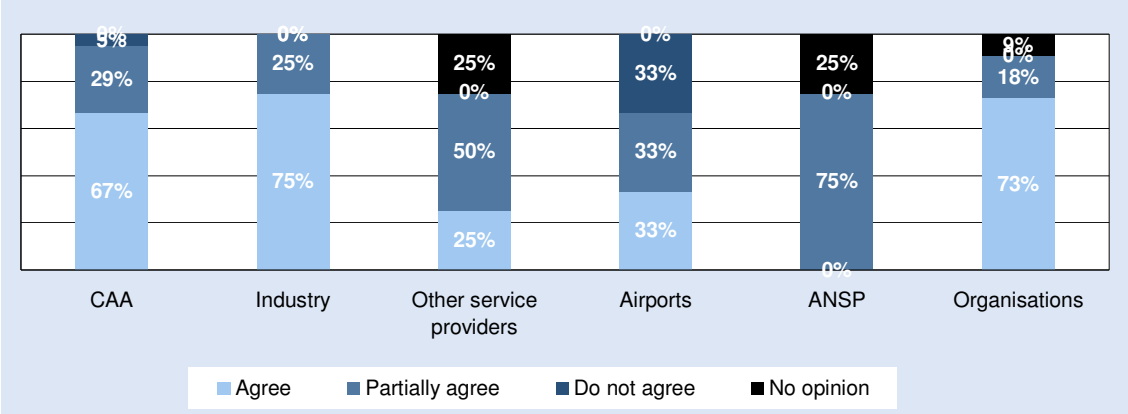
The stakeholders have mixed opinions on the system of inspections. A majority of organisations, airports and industry (partially) agrees that the lack of a uniform system is a problem, whereas for instance other service providers only partially agree or do not

have an opinion. According to one stakeholder, a uniform system of inspections will be in effect when the implementation procedures are written down.

No uniform system of certification

The figure presented below shows the level of agreement within the six types of stakeholders.

Figure B5 No uniform system of certification

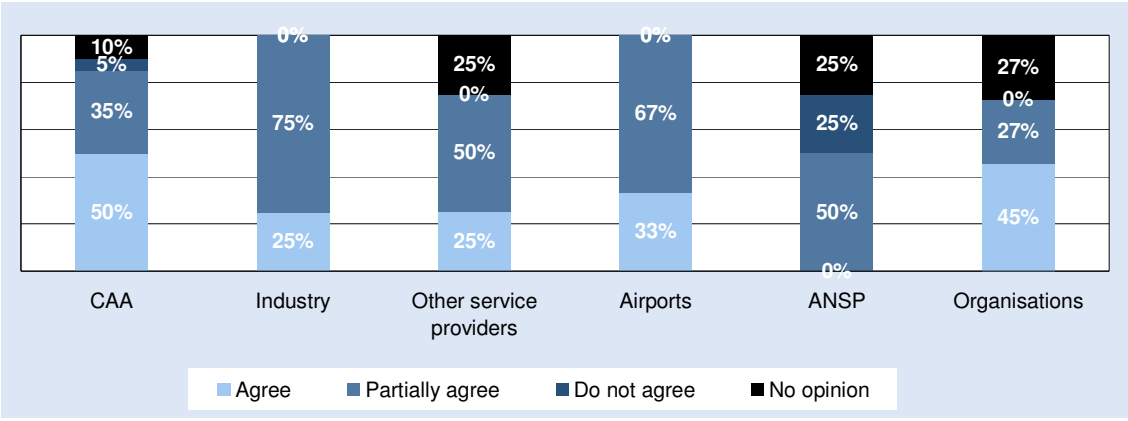


The opinions on the system of certification are more or less similar to those on inspections. However, some stakeholders tend to regard the lack of a uniform system of certification more of a problem than the absence of a uniform system of inspections.

Gaps in certification

The figure presented below shows the level of agreement within the six types of stakeholders.

Figure B6 Gaps in certification

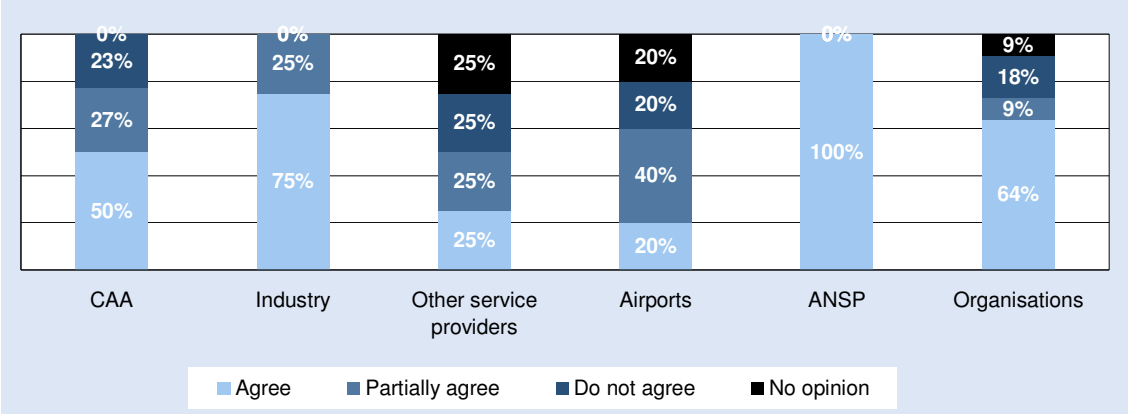


Relatively many stakeholders don't have an opinion on this matter. The rest of the response is heterogeneous about whether gaps in certification form a problem. The industry and airports tend to agree, ANSPs less so. Few respondents have elaborated on this issue.

Multiplication of rulemaking activities at different levels

The figure presented below shows the level of agreement within the six types of stakeholders.

Figure B7 Multiplication of rulemaking activities

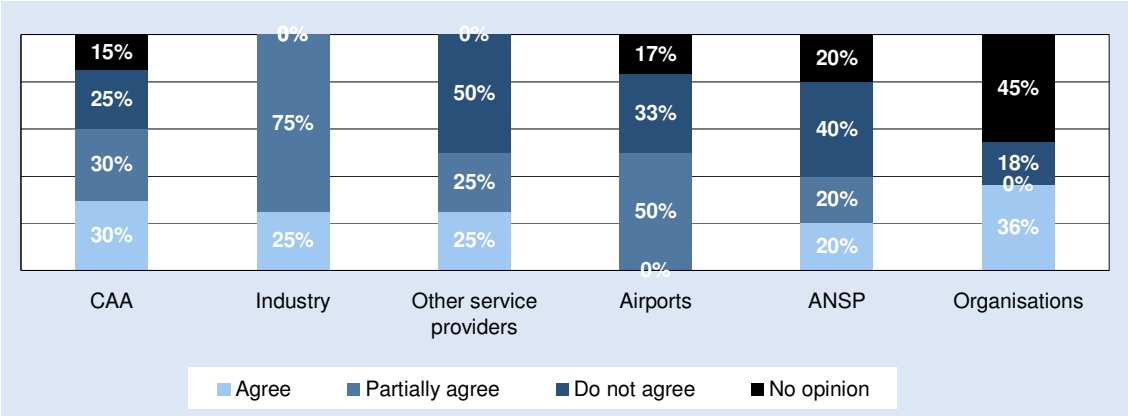


There is a noticeable difference of opinion between the stakeholders. ANSPs and, to a lesser extent, international organisations and industry agree that multiplication of rulemaking activities at different levels is a problem. Also the majority of CAAs (partially) agrees. On the other hand, airports and other service providers are more ambiguous: some agree, some disagree. All European States are signatories to ICAO provisions at the highest levels. Each State CAA then develops local regulations for aviation safety. These are often duplicated but can be different within each State, some being more mature than others. EUROCONTROL is attempting to standardise the ATM approach, GASR (Group Aerodrome Safety Regulators) is attempting to standardise Aerodrome Certification requirements across all European States.

Need for certification at multiple bodies

The figure presented below shows the level of agreement within the six types of stakeholders.

Figure B8 Need for certification at different bodies

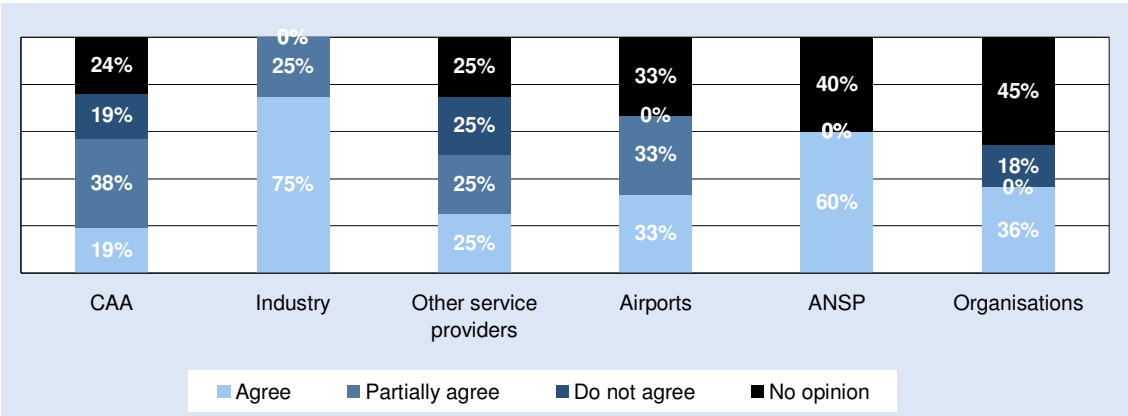


Again, opinions differ between stakeholders. However, relatively many do not think that the need for certification at multiple bodies is a major problem, especially airports and ANSPs. Aerodrome certification for instance is issued by the national authority (one body only).

Higher costs through different systems

The figure presented below shows the level of agreement within the six types of stakeholders.

Figure B9 Higher costs through different systems

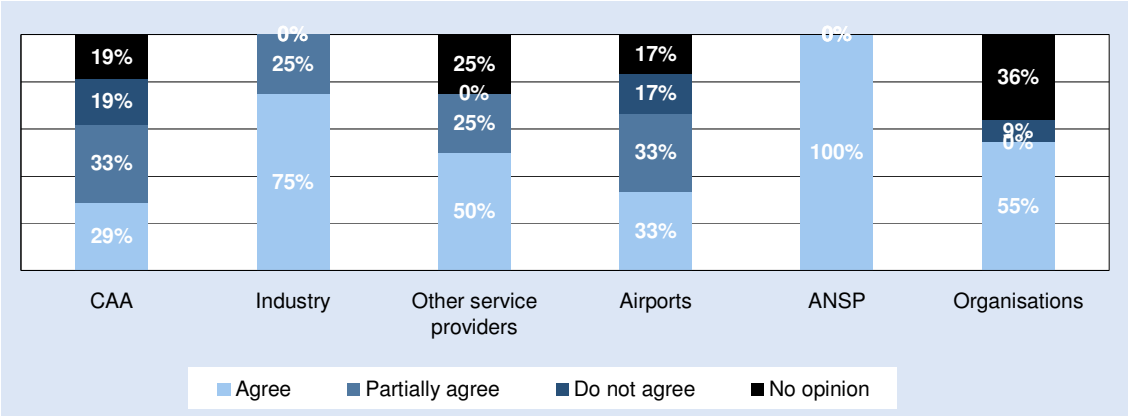


Many stakeholders do not know if different systems culminate in higher costs. For example, the relevance to airports is limited. The ones that do have an opinion predominantly agree that these higher costs are a problem.

Higher costs through overlap of activities

The figure presented below shows the level of agreement within the six types of stakeholders.

Figure B10 Higher costs through overlap of activities



Most stakeholders (partially) agree with overlap of activities leading to higher costs. Some CAAs, airports and organisations however do not think this is a problem.

Current traffic safety situation

Finally, we asked the stakeholders if in their opinion the current organisation of responsibilities in the domain of ATM/ANS and airports affects the overall air traffic safety situation negatively or positively. The table below shows the responses per stakeholder type.

Table B2 Effect of current situation on aviation safety

	Negatively	Positively	No influence
CAA	67%	14%	19%
Industry	20%	20%	60%
Other service providers	20%	20%	60%
Airports	50%	50%	0%
ANSP	67%	17%	17%
Organisations	50%	0%	50%

Almost half of the respondents considers the traffic safety situation adversely affected by the current organisation of responsibilities, especially the CAAs and ANSPs. On the contrary, a small majority of the airports say the current organisation is positively affecting safety. About one third of all stakeholders do not see a clear relationship between the current organisation and the safety situation.

2. Do-nothing option

Next, we asked the stakeholders if they found that there was a reason to change the current situation? The responses for each type of stakeholder are summarised in the table below.

Table B3 Need to change current situation?

	Yes	To some extent	No	No opinion
CAA	62%	29%	5%	5%
Industry	75%	25%	0%	0%
Other service providers	60%	40%	0%	0%
Airports	50%	50%	0%	0%
ANSP	67%	33%	0%	0%
Organisations	55%	45%	0%	0%

Hardly anyone considers the current situation to be ideal. A majority of about 60 percent of all stakeholders think there are arguments to change current situation. Another 37 percent agrees 'to some extent' that some things should be different. Many stakeholders claim that national variations in rules and standards should be eliminated or at least lessened. Or, as one stakeholder states:

> *"As traffic volumes are estimated to double by 2023, there is a need to ensure a consistent and coherent approach to safety regulation of ATM, including airports, where prioritisation can be given towards mitigation of the most significant risks and proactively addressing associated hazards. Safety risks are directly related to traffic volume, so as traffic increases, the risks increase by a factor on the increase. More effective safety oversight and regulation will require a data driven approach as opposed to simple reliance on a process of compliance. For this to be effective, a single institution should be allocated at the responsible body."*

3. Extending EASA competences

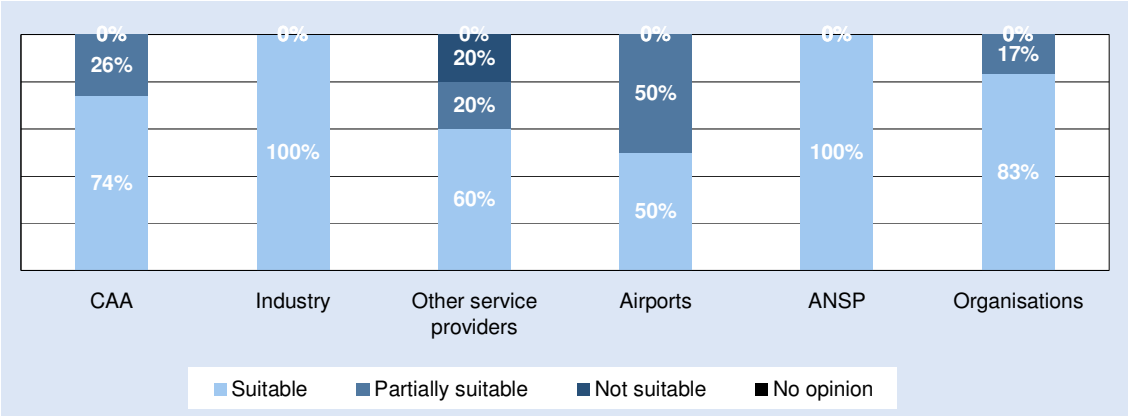
New responsibilities

An option is to extend EASA competences towards ATM, ANS and airports. The respondents were requested to indicate which of the responsibilities they would consider suitable to pass to EASA.

Rulemaking (preparation and support)

The figure presented below shows whether or not the six types of stakeholders find this responsibility suitable to pass to EASA.

Figure B11 Appropriateness to transfer competence on rulemaking

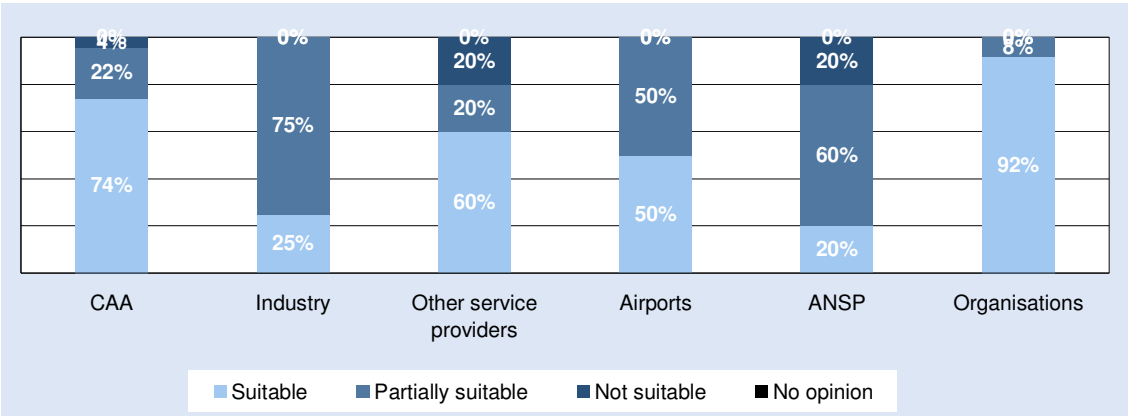


Almost all stakeholders agree that rulemaking could become part of EASA's future responsibilities. However, one airport warns that airport infrastructure must not be subject to regulations that do not allow for unique circumstances due to e.g. geographical or weather conditions.

Standardisation of practices

The figure presented below shows whether or not the six types of stakeholders find this responsibility suitable to pass to EASA.

Figure B12 Appropriateness to transfer competence on standardisation of practices

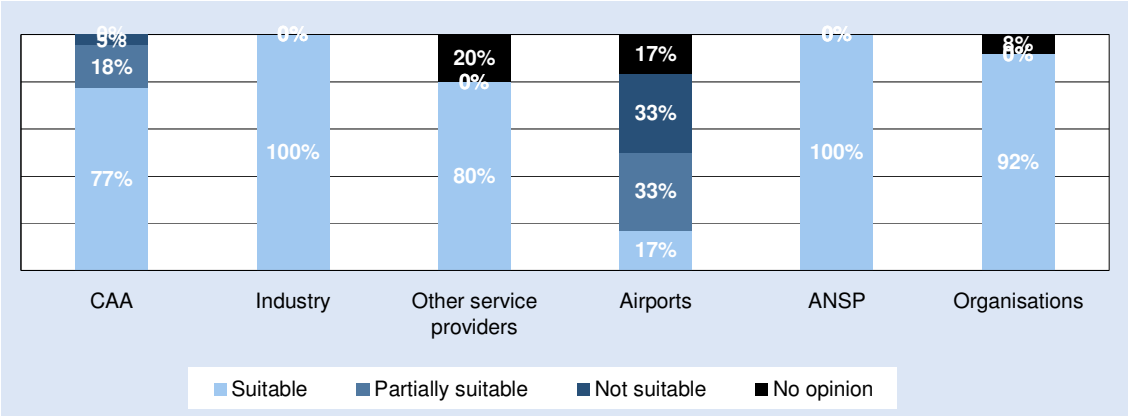


The stakeholders predominantly agree that EASA is a suitable delivery mechanism for standardising different individual practices. However, again, standardisation should allow for adjustments to local circumstances.

Certification and approval of pan-European providers/systems (e.g. GNSS)

The figure presented below shows whether or not the six types of stakeholders find this responsibility suitable to pass to EASA.

Figure B13 Appropriateness to transfer competence on certification of pan-European providers/systems

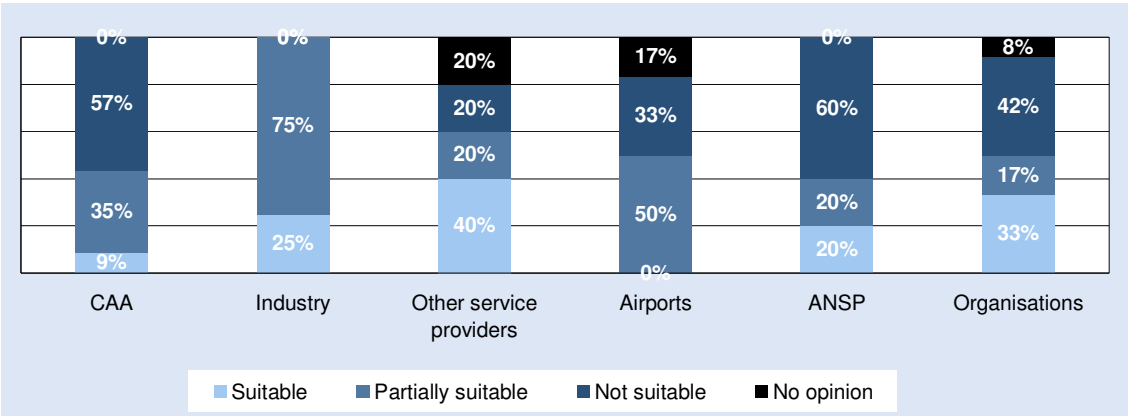


A majority of the respondents of the questionnaire find the EASA suitable for the task of certification and approval of pan-European, providers and systems. However, airports are an exception; most of them do not think EASA should be responsible for it. Some airports think it should be carried out by EUROCONTROL.

Certification and approval of National providers and systems

The figure presented below shows whether or not the six types of stakeholders find this responsibility suitable to pass to EASA.

Figure B14 Appropriateness to transfer competence on certification of national providers/systems

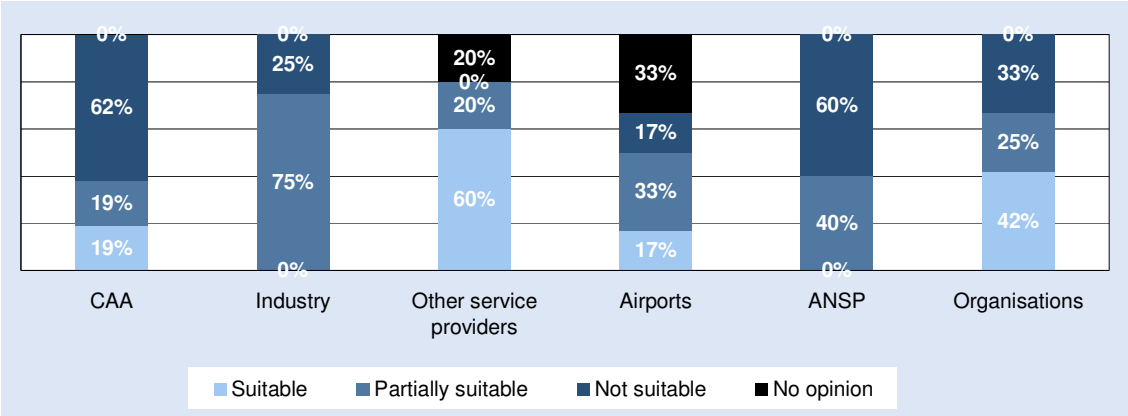


Most stakeholders say that EASA is not suitable for the certification and approval of national providers and systems. Some state that it is important for the airport operator to have close relations with the authority in order to solve day-to-day issues and this will best be done by the national authority. However, the industry finds EASA partly or entirely suitable for certification and approval.

Licenses/qualification of professional people

The figure presented below shows whether or not the six types of stakeholders find this responsibility suitable to pass to EASA.

Figure B15 Appropriateness to transfer competence on licensing/qualification of professionals

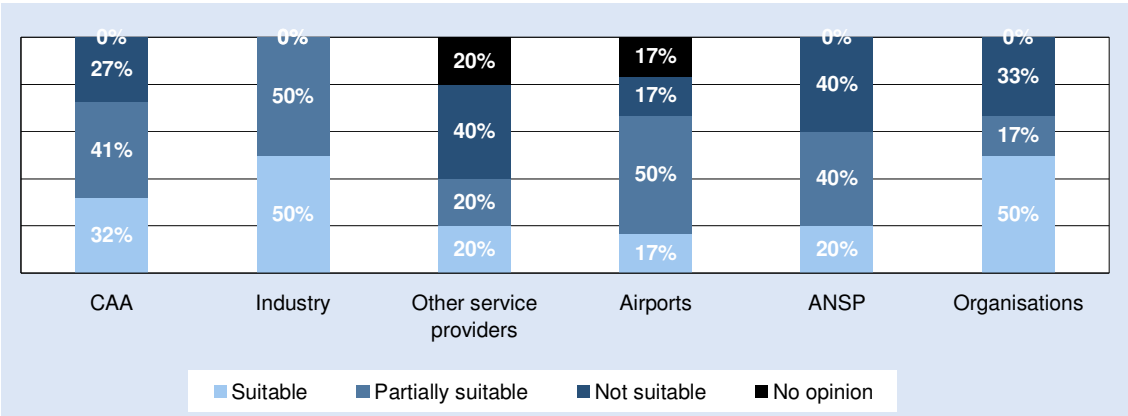


Licensing of professional people is generally not considered to be the responsibility of EASA. Only a few stakeholders say that licensing could be passed to EASA. Licenses are often based on tests and interviews; the national authority is the most logical body to do this. However, licenses could still be issued locally under a central framework.

Inspection of application of rules

The figure presented below shows whether or not the six types of stakeholders find this responsibility suitable to pass to EASA.

Figure B16 Appropriateness to transfer competence on inspection of application of rules

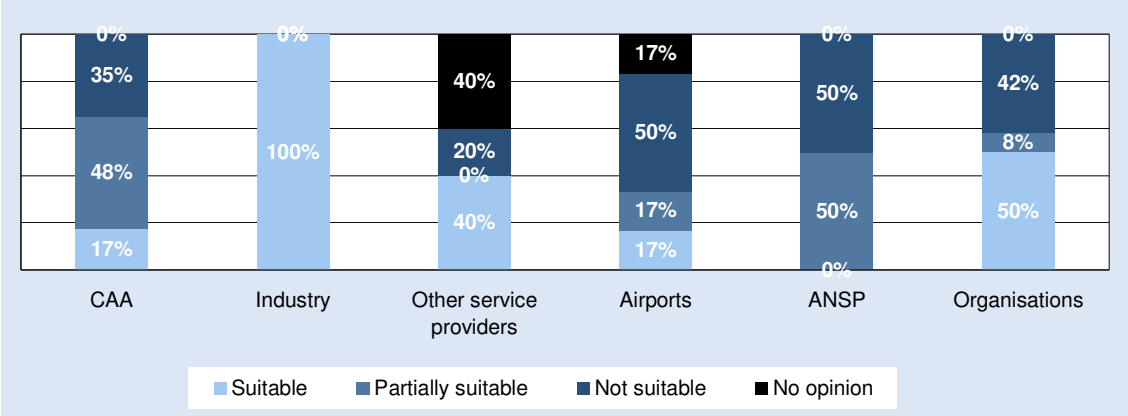


The opinions of the stakeholders regarding whether EASA is suitable for the inspection of application of rules are very much dispersed. None of the six categories of stakeholders seem to have a dominant opinion on this matter. Only the industry is slightly in favour of passing inspection responsibilities to EASA. As long as inspection is primarily based on document control, it could be executed by EASA, but for visual or face-to-face inspections a national authority seems to be more suitable.

Enforcement

The figure presented below shows whether or not the six types of stakeholders find this responsibility suitable to pass to EASA.

Figure B17 Appropriateness to transfer competence on enforcement

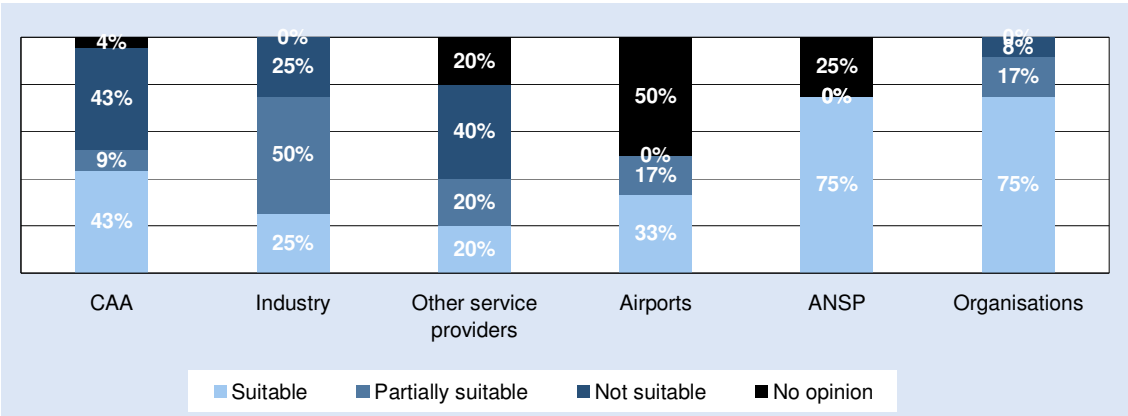


More or less similar to the previous topic, opinions of the stakeholders on enforcement are dispersed. This time, the industry is very much in favour of passing enforcement responsibilities to EASA, but especially ANSPs are more or less against it.

Supervision of delegated responsibilities

The figure presented below shows whether or not the six types of stakeholders find this responsibility suitable to pass to EASA.

Figure B18 Appropriateness to transfer competence on supervision of delegated responsibilities



A small majority of the stakeholders considers EASA suitable for the supervision of delegated responsibilities. CAAs, industry and other service providers however do not have a dominant opinion in this issue.

Effects of extending EASA competences

We have identified different effects of extending EASA competences towards ATM, ANS and airports. We asked the stakeholders if they agree with these effects. The table presented below, gives the percentage of the stakeholders that agree or partially agree with the effects, as opposed to the ones that do not agree (the ones with no opinion are disregarded).

Table B4 Effects of extending EASA competences

Potential effects	CAA	IND	OSP	APT	ANSP	ORG
Clear responsibilities rulemaking, supervision, inspection	91%	100%	100%	83%	100%	100%
Uniform binding rules	91%	100%	80%	100%	100%	100%
Uniform quality & certification of ANS/ATM/Airport	95%	100%	75%	100%	100%	100%
Improved integration between ANS/ATM & Airport domains	95%	100%	100%	67%	50%	91%
Harmonised systems & inter-operability	91%	100%	80%	100%	67%	91%
Further improvement of safety in aviation	95%	100%	100%	50%	50%	73%
Reduced time to implement new regulation and systems	86%	100%	75%	60%	100%	67%
Cost savings for users	60%	100%	75%	17%	20%	70%
Improved interface military-civil	65%	67%	67%	33%	25%	71%
Improved possibilities for human mobility	83%	100%	80%	80%	0%	63%
Staffing problems for new organisation	85%	75%	33%	100%	80%	89%
Increased international visibility/credibility	95%	100%	100%	80%	100%	100%

The most likely effects of extending EASA competences according to the stakeholders are more clarity in responsibilities for rulemaking, supervision and inspection, uniform and binding rules, uniform quality and certification of ANS/ATM/Airport and increased international visibility/credibility. Through subsidiarity principles and an effective Peer Review Process, national standards could be made uniform. It is regarded less likely that extending EASA competences would lead to an improved interface military-civil or cost savings for users. Some stakeholders even think that costs will increase.

4. Other policy options

Apart from extending EASA competences, other options are:

a) To extend EUROCONTROL mandates for the responsibilities (rulemaking, certification, inspection etc) for ANS, ATM and airports.
b) To establish a new Agency for the responsibilities for the domains ANS, ATM and airports.

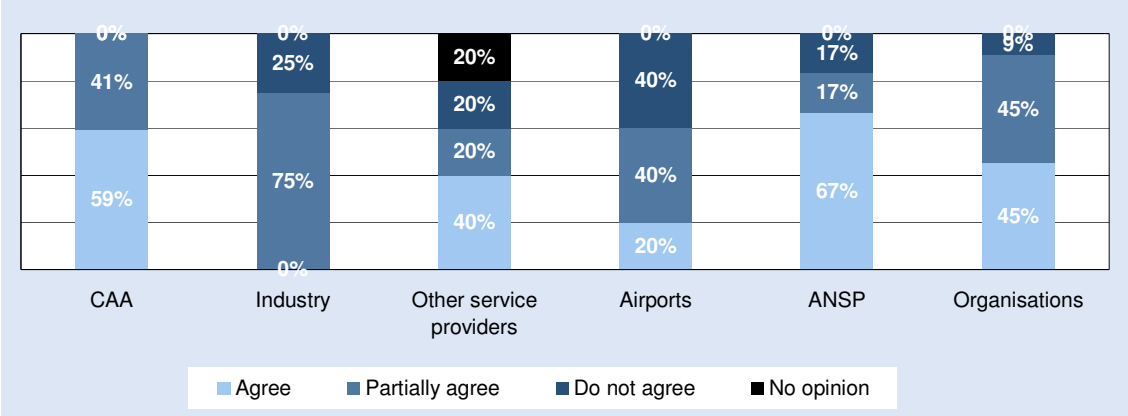
We have identified a number of advantages and disadvantages of these alternative options in relation to the extension of EASA competences.

a) To extend EUROCONTROL mandates

Again, we asked the stakeholders to indicate whether they agree or disagree with the advantages and disadvantages.

Advantage: High existing quality of technical ANS/ATM/Airport knowledge
The figure presented below shows the level of agreement within the six types of stakeholders.

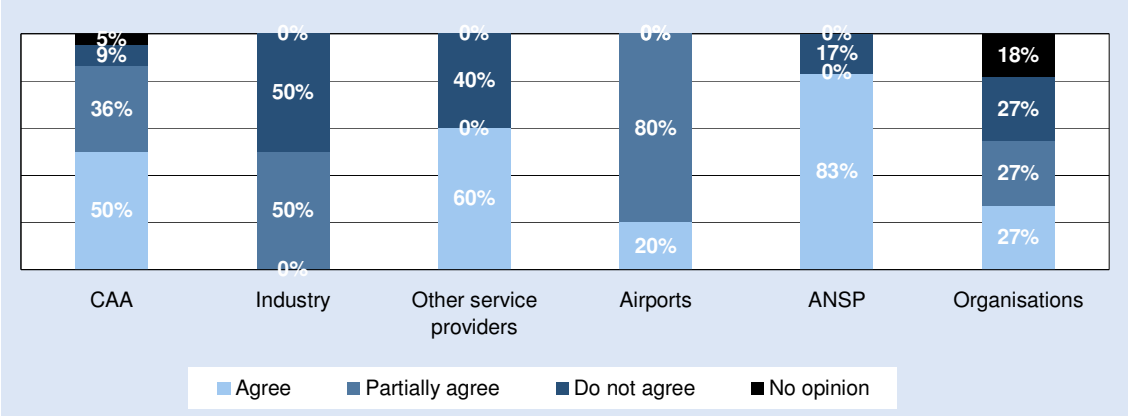
Figure B19 High existing knowledge of ANS/ATM domain



Not all stakeholders regard high quality of technical ANS/ATM/Airport knowledge as an advantage of extending EUROCONROL mandates. Especially airports disagree. Some stakeholders state that EUROCONTOL has some technical experience but it does not cover the whole domain and in many areas they lack practical experience of regulation or service provision.

Advantage: Active existing networks ATM/ANS/Airport
The figure presented below shows the level of agreement within the six types of stakeholders.

Figure B20 Active ANS/ATM/Airport network

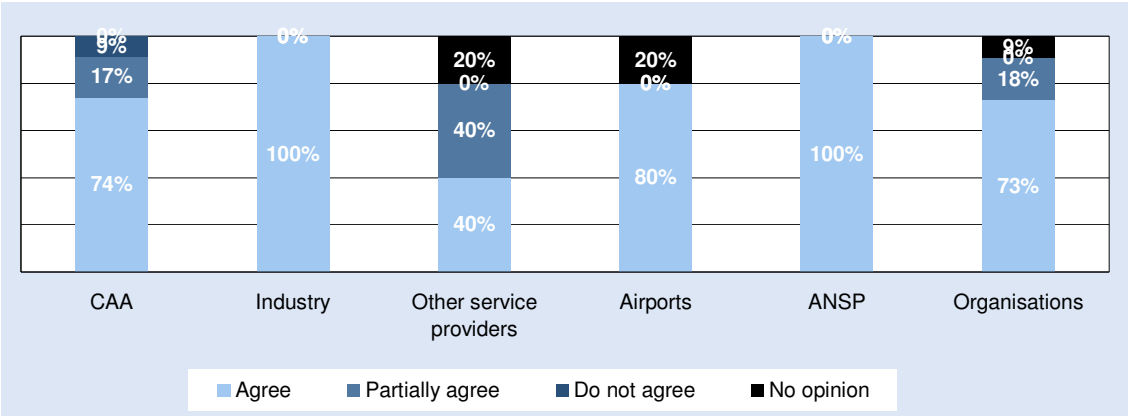


Stakeholders' opinions on whether active existing networks should be considered an advantage of extending EUROCONTROL mandates are much dispersed. Industry and other organisations tend to disagree, whereas CAAs and ANSPs predominantly agree. Airports and other service providers are more ambivalent: some agree, some disagree or have no opinion. Few respondents have elaborated on this issue.

Disadvantage: No clear separation rulemaking, inspection & service provision

The figure presented below shows the level of agreement within the six types of stakeholders.

Figure B21 Lack of clear separation of responsibilities

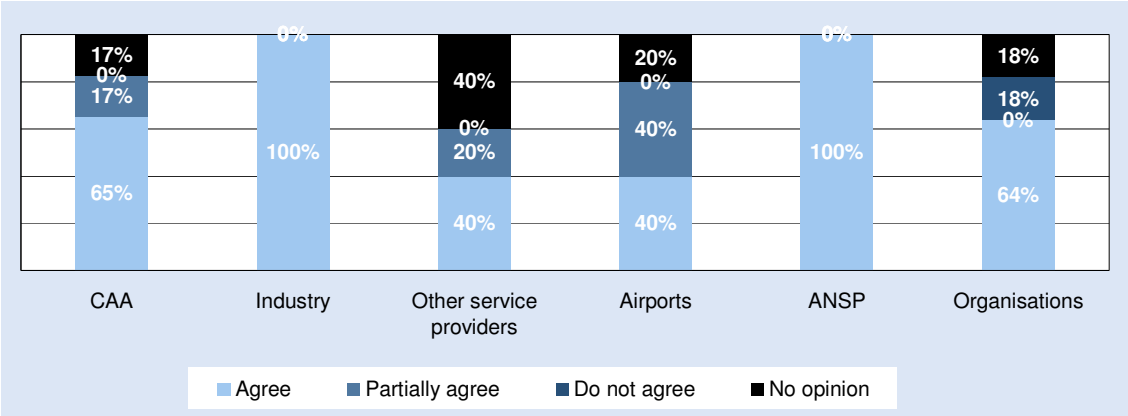


Almost all stakeholders agree that the lack of a clear separation between rulemaking, inspection and service provision is a disadvantage of extending EUROCONTROL mandates. Only a few respondents have no opinion or only partially agree with this. EUROCONTOL is not expected to be able to maintain a service provision role and a complete and transparent segregation of these roles would be required.

Disadvantage: Need to change EUROCONTROL convention

The figure presented below shows the level of agreement within the six types of stakeholders.

Figure B22 Need to change EUROCONTROL convention

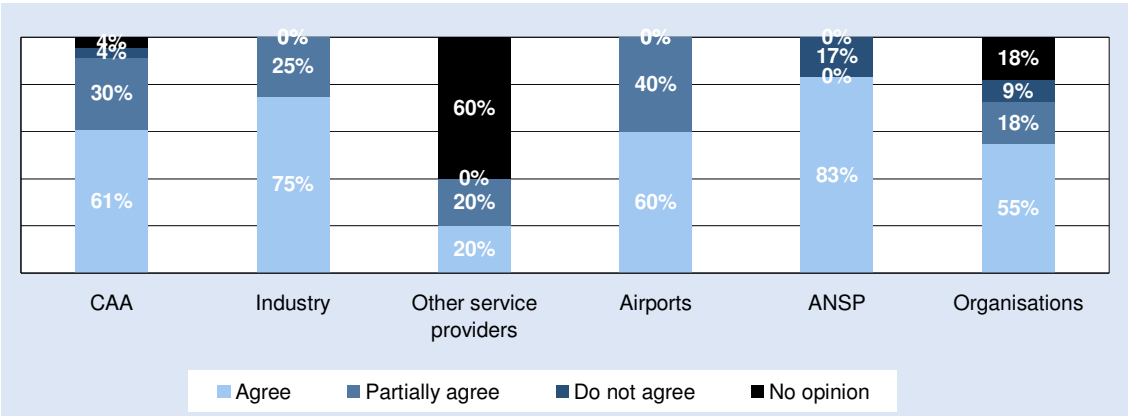


Again, a large majority of the stakeholders agree that the need to change the EUROCONTROL convention is a disadvantage of extending EUROCONTROL mandates. A limited number of respondents have no opinion or only partially agree with this.

Disadvantage: No integration between ANS/ATM/Airport and aircraft/FCL/OPS

The figure presented below shows the level of agreement within the six types of stakeholders.

Figure B23 No full system integration

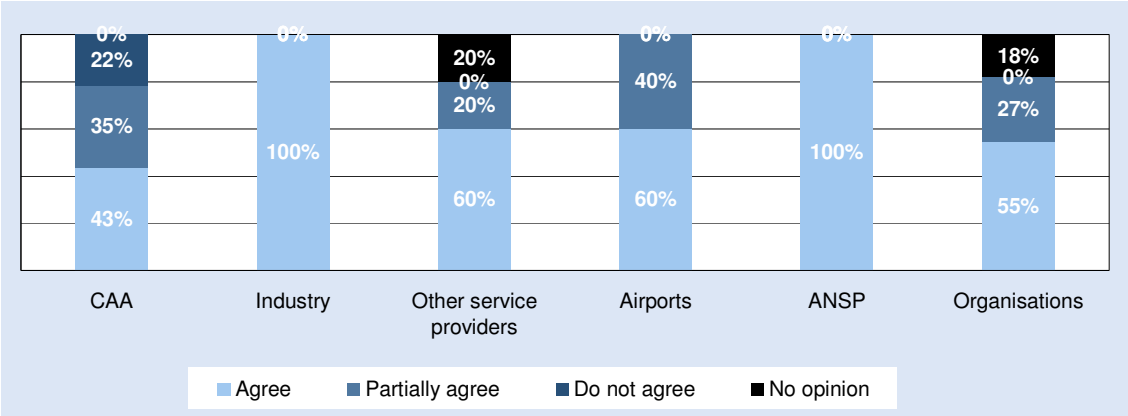


The lack of integration between ANS/ATM/Airport and aircraft/FCL/OPS is considered a disadvantage of extending EUROCONTROL mandates, at least to a certain degree. Only a few CAAs and ANSPs disagree with this.

Disadvantage: No certification/inspection experience

The figure presented below shows the level of agreement within the six types of stakeholders.

Figure B24 No certification/inspection experience

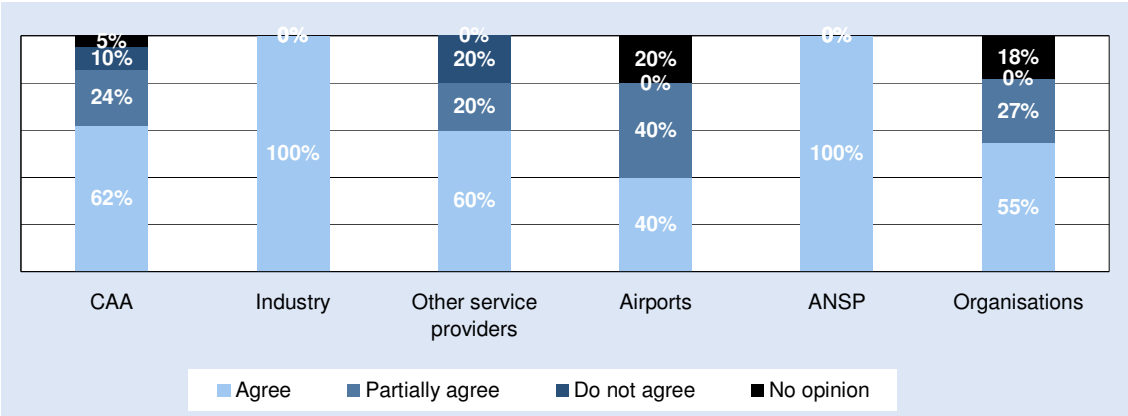


Again, a large majority of the stakeholders (partially) agrees that the lack of experience in certification and inspection is a disadvantage of extending EUROCONTROL mandates. Only a few (about 22%) CAAs disagree with this.

Disadvantage: No EU organisation (potential conflicts of interest)

The figure presented below shows the level of agreement within the six types of stakeholders.

Figure B25 No EU organisation



Potential conflicts of interest are regarded by a vast majority of the stakeholders as a disadvantage of extending EUROCONTROL mandates, at least to a certain degree. Only a few CAAs and other service providers disagree with this. Some respondents have no opinion on the matter.

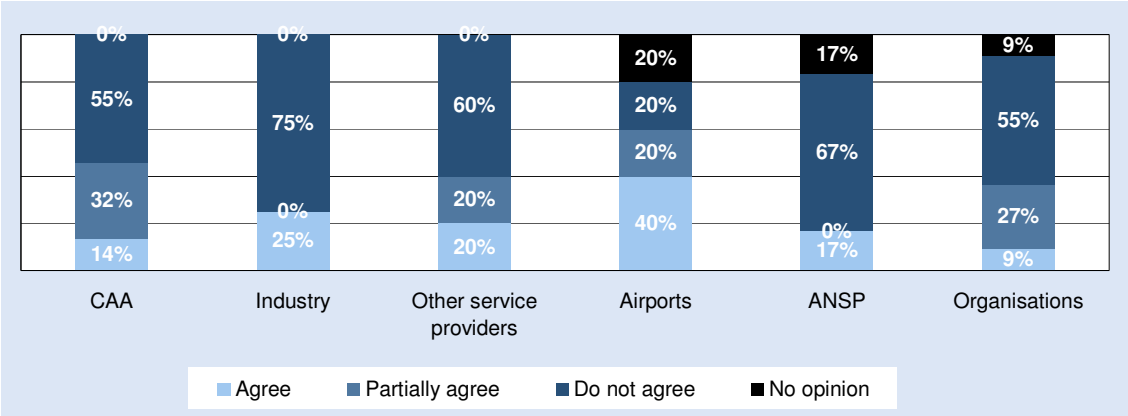
b) To establish a new Agency

We asked the stakeholders to indicate whether they agree or disagree with the following advantages and disadvantages.

Advantage: No risk of overburdening or integration with existing organisations (e.g. EASA)

The figure presented below shows the level of agreement within the six types of stakeholders.

Figure B26 No risk of overburdening existing organisations

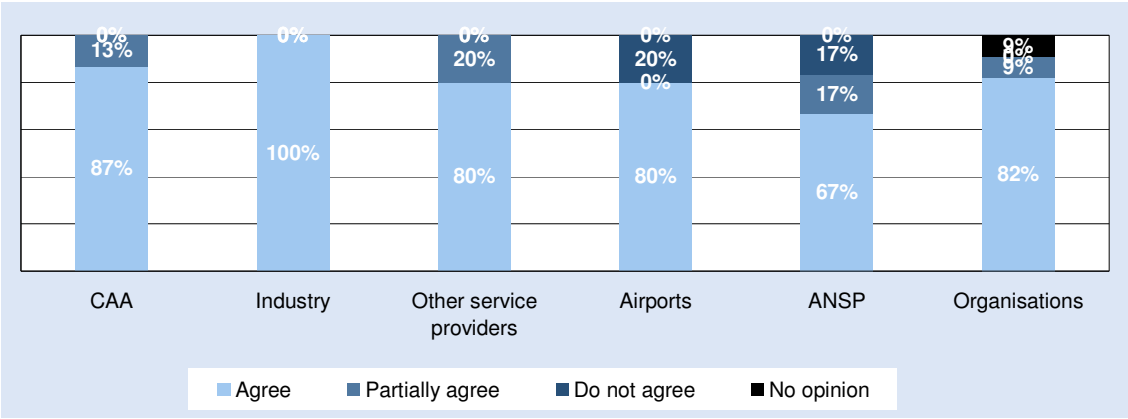


A majority of stakeholders does not agree with the above stated advantage of establishing a new agency. Moreover, some state that there would be a greater risk of fragmentation, duplication and diversification of standards. Only airports do tend to (partially) agree with this being an advantage.

Disadvantage: Cost-inefficient/overlap of activities

The figure presented below shows the level of agreement within the six types of stakeholders.

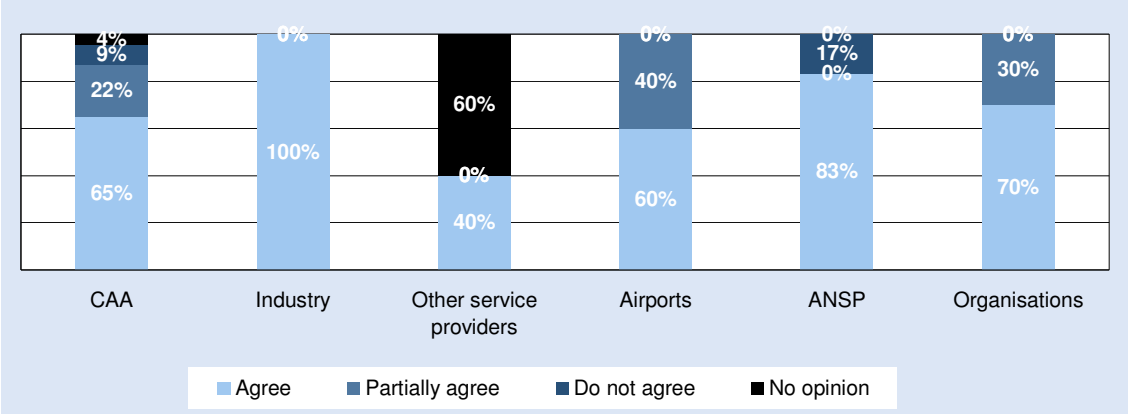
Figure B27 Cost-inefficiencies



The majority of respondents (partially) agree that overlap of activities due to establishing a new agency is cost-inefficient. However, some airports and ANSPs disagree.

Disadvantage: No integration between ANS/ATM/Airport and aircraft/FCL/OPS
The figure presented below shows the level of agreement within the six types of stakeholders.

Figure B28 No full system integration



According to most of the stakeholder a lack of integration between ANS/ATM/Airport and aircraft/FCL/OPS is a disadvantage of the establishment of a new agency. Only a limited number of CAAs and ANSPs disagree with this. According to one stakeholder this disadvantage is so significant that one should disqualify this option altogether.

5. Other possible EASA functions

Apart from the core responsibilities concerning the regulation chain (rulemaking assistance, certification etc) other functions/tasks could possibly be transferred to EASA, for example:

- R&D (regarding ATM/ANS and airports), either undertaken directly or supporting co-ordination;
- Technical training;
- Rulemaking for accident and incident data collection and investigation;
- Development of contingency plans (e.g. emergency planning in special situations that need a co-ordinated action in ATM, ANS or airports).

The stakeholders were invited to indicate which of the following functions they would consider suitable to fall under EASA. The table presented below, gives the percentage of the stakeholders that consider EASA suitable or partially suitable for the functions, as opposed to the ones that do not find EASA suitable (the ones with no opinion are disregarded).

Table B5 Other possible EASA functions

Potential functions to fall under EASA	CAA	IND	OSP	APT	ANSP	ORG
R&D	60%	50%	33%	80%	0%	50%
Technical training	75%	100%	40%	100%	0%	67%
Rulemaking for incident data collection and investigation	83%	100%	100%	80%	50%	91%
Development of contingency plans	59%	25%	75%	75%	17%	82%

Rulemaking for incident data collection and investigation is a function suitable to transfer to EASA according to a majority of the stakeholders. R&D is not considered to be a suitable function of EASA. However, some stakeholders claim that none of these functions would be suitable initially. The organisation would need to have a very clearly defined function and burdening it with additional extraneous functions would be detrimental. In time other functions could be added if considered necessary.

Annex C: Accident summaries

This Annex describes the fatal aviation accidents in Europe in the period 1994-2005. Included are accidents during commercial operations. Test flights, fire fighting, ambulance flights and calibration flights are excluded. Unlawful acts are also excluded. The list includes both turbofan and turboprop aircraft. Accidents in Turkey are included because it is a JAA member. Accidents in Russia are excluded.

The fatal accidents that took place in the summer of 2005 have also been included. However, they have not been incorporated in the analysis of accident causes as these accidents are still under investigation.

The following accident descriptions have been compiled from the NLR Air Safety Database [Ref 18].

25 February 1994, Vickers Viscount, British World Airways, United Kingdom, 1 fatality.
During descent in icing conditions, approaching FL 150, the No 2 engine failed and the propeller auto feathered. Less than a minute later the No 3 engine started to run down and the crew requested an immediate descent and navigational assistance from ATC radar. At that time the aircraft was descending through FL 140. When unsuccessful attempts had been made to re-start Nos 2 and 3 engines, the crew declared an emergency. No 2 engine was re-started successfully but, during this process, No 4 engine failed. In the period between the No 4 engine failing and the No 2 engine starting, there was a momentary loss of all generated electrical power. Cockpit lighting was not restored and the captain needed his flashlight to read instruments. Despite further attempts to re-start Nos 3 and 4 engines, the remainder of the flight was conducted on the two left-hand engines alone. The aircraft was subsequently unable to maintain height and latterly the captain was unable to control the aircraft in yaw. The aircraft struck the ground and an intense fire consumed the cabin section between the rear of the flight deck and the front of the empennage.

4 April 1994, Saab 340, KLM Cityhopper, the Netherlands, 3 fatalities.
During climb, passing flight level 165, the Master warning was triggered by the right engine oil pressure Central Warning panel light. The Captain slowly retarded the right hand power lever to flight idle and called for the emergency checklist. After completion of the emergency checklist procedure, the right hand oil pressure Central Warning panel light was still on and the Captain decided to return to Amsterdam. The right hand engine remained in flight idle during the remainder of the flight. While returning to Amsterdam, the flight was radar vectored by ATC for an ILS approach on runway 06. After passing approximately 200 ft height, the aircraft became displaced to the right of the runway and a go-around was initiated. During the go-around, control of the aircraft was lost and; at

12:26 UTC, the aircraft hit the ground, in a slight nose low attitude with approximately 80° bank to the right, approximately 560 meters to the right from the runway 06 centreline, just outside the airport.

21 December 1994, Boeing 737, Air Algerie, United Kingdom, 5 fatalities.
The accident occurred when the aircraft, which was chartered for the export of live animals to Continental Europe, was making a Surveillance Radar Approach (SRA) to Runway 23 at Coventry airport in conditions of patchy lifting fog. The aircraft was unable to receive the ILS signal from the airport because it was fitted with an ILS receiver which was incompatible with the airport's frequencies. Therefore the crew had to use a non-precision approach procedure. The current actual weather report and Runway Visual Range were not reported to the flight crew by ATC. The ATC controller believed that the current weather report had already been passed to the aircraft by the Aerodrome controller, and therefore did not pass it again. The aircraft descended below the Minimum Descent Height (MDH) for the approach procedure, and collided with electricity cables and a transmission tower which was situated on the extended centreline of the runway, some 1.1 miles from its threshold. The aircraft rolled uncontrollably to the left and impacted the ground.

20 January 1995, Dassault Falcon 20, Leadair Unijet, France, 10 fatalities.
Immediately after rotation, there was an uncontained failure of the left engine due to the ingestion of multiple birds (lapwings). The flight crew immediately recognised the engine failure and decided to continue the take-off, as per procedures. Shrapnel from the engine pierced the rear compartment fuel tank. A fire developed in the rear part of the aircraft. The flight crew were aware of the urgency of their situation and tried to fly a short visual circuit with the objective to land as soon as possible, but, due to the fire damage, control of the aircraft could not be maintained and it crashed, killing all occupants.

31 March 1995, Airbus 310, Tarom, Romania, 60 fatalities.
The aircraft was totally destroyed when it crashed in flat, open fields near the village of Balotesti shortly after getting airborne from Otopeni Airport, Bucharest. There was no distress call. After take-off from Runway 08R the aircraft appeared to be following the STJ3A SID as cleared. The SID calls for the aircraft to climb straight ahead on the runway heading (081deg) to the 'OTR' beacon and then to turn left onto a heading of 327deg towards the Strejnic 'STJ' VOR/DME. However, the left turn continued through about 180deg until, at impact, the aircraft was almost flying a reciprocal course to its take-off heading. The aircraft impacted the ground at high speed in a steep, nose-down attitude (80deg nose-down) and in a 'slight' left bank some 3km. to the north of the airport.

The take-off was flown manually by the co-pilot with auto-throttle and the Flight Directors engaged. After take-off the flight had begun the left turn while climbing through 2,000ft at 190kt. and had apparently reported routinely through 3,000ft. It was subsequently seen on radar to climb to a maximum height of about 4,500ft. still in a left turn before beginning to descend. It is reported that, as the aircraft climbed through 2,000ft. the auto-throttle commanded a power reduction from the take-off to the climb setting. However, for as yet undetermined reasons, power did not reduce significantly on the right engine while, over a period of 42sec. power was gradually reduced on the left

engine, eventually reaching flight idle. This asymmetric thrust situation was apparently not identified by the crew until the aircraft had taken up an extreme attitude.

The accident happened in daylight (0911L) but in poor weather with visibility 1,300m in heavy, driving snow and rain; scattered cloud at 1,000ft, an overcast ceiling at 2,500ft and temperature and dew point both +1C.

On April 10, 1995, Airbus Industries apparently issued a statement, which, as reported, said that the 'improper response by the right-hand throttle lever was most probably due to abnormal stiffness of a related mechanical component'. It is understood that 'similar behaviour' first occurred on March 24th, 1992, when the aircraft was being operated by Delta and continued subsequent to that date.

24 May 1995, Embraer 110, Knight Air, United Kingdom, 12 fatalities.
Shortly after departure, the crew of the aircraft reported a 'problem with the artificial horizon(s)' and arranged to return to the airport. The weather was poor with a low cloud base, precipitation and recent thunderstorm activity. Air Traffic Control (ATC) observed the aircraft on their radar as it climbed to an altitude of 3,600 feet turning continuously left apart from an abrupt right turn while passing 1,700 feet. Despite these turns the crew twice sought confirmation from ATC that the aircraft was 'going straight'. Shortly after reaching 3,600 feet the aircraft entered a steeply descending spiral dive. Due to airspeed in excess of the design maximum, the aircraft began to break-up. It crashed onto open ground and all of the occupants were killed.

13 December 1995, Antonov 24, Romavia, Italy, 49 fatalities.
The aircraft crashed shortly after takeoff. It was reportedly overloaded by 3000 kg and performance was further degraded by ground ice.

8 August 1996, Dassault Falcon 10, Burda Holding, Germany, 4 fatalities.
During the descend the aircraft, whilst flying under VFR, entered clouds. The approach was not aborted and the aircraft collided with a hillside.

29 August 1996, Tupolev 154, Vnukovo Airlines, Norway, 141 fatalities.
The flight was normal until the start of the descent. Before radio contact with Longyear Information, the crew went through the detailed landing procedure for runway 10. The crew were cleared to start the descent. A little later, the crew received additional information consisting of runway in use 28. The crew tried to request runway 10 for landing twice, but the request was not understood as such by Longyear Information due to language difficulties. When the flight was overhead the ADV beacon, the crew reported the position to Longyear Information and entered the base turn. The aircraft came out of this turn on magnetic heading 160deg. The crew then started the turn to bring the aircraft out on the magnetic inbound course 300deg, as prescribed by the approach chart. The distance from the airport at this moment was 14 nm, as prescribed by the approach chart, but the lateral deviation from the outbound magnetic course 155deg from ADV was 2 nm to the left. The aircraft passed through the localizer centreline and when the turn had been completed, the aircraft rolled out on a magnetic heading of 290deg. At this time, there was a discussion within the crew as to whether or not the final turn had been made at the correct time. The discussion led to the roll out of the turn to final approach and a

corrective turn to the right to magnetic heading 306deg. Instead of intercepting the centreline, the crew continued the flight on the right side of the localizer. The flight made a corrective turn, resulting in a track close to 300deg. At this point, the lateral deviation from the approach centreline was 2 nm km to the right. During this corrective turn, the aircraft started descending. The GPWS activated 9 seconds before impact. The crew reacted to this by applying power and initiating a pitch-up but the aircraft collided with the top of a mountain, 2 nm to the right of the approach centreline at a distance of 7.7 nm from the airport.

8 October 1996, Antonov 124, Aeroflot, Italy, 2 fatalities.
The aircraft crashed just north of the runway end during an attempted go-around manoeuvre. The runway 36 at that time was undergoing resurfacing works near the 36 threshold. The Cat.III ILS was operating as Localizer only, because the glide slope was inoperative off during the works. The usable length of the runway was reduced to 2350 meters from 3300, due to work in progress. Poor approach planning and crew coordination were factors to the accident.

30 July 1997, ATR-42, Air Littoral, Italy, 1 fatality.
The aircraft landed long and fast and subsequently overran Florence's 1650m long runway 23. The runway threshold had been displaced resulting in 1030m landing distance remaining.

17 December 1997, Yakovlev 42, Aerosweet Greece, 70 fatalities.
After an ILS missed approach the aircraft was instructed to climb and proceed north and hold for a second attempt. The aircraft instead deviated to the west-southwest and struck a mountain at 3,300 ft, 71.8 km from the airport. The aircraft deviated because the crew did not: adequately plan and execute the missed approach; utilize the Macedonia airport radio-navigational aids; declare an emergency when they lost orientation; maintain cockpit discipline.

The accident investigation recommended to the Hellenic CAA to render operational the modern technical infrastructure already available, including radar at Macedonia Airport.

4 February 1998, Antonov 12, Air Luxor, Portugal (Azores), 7 fatalities.
According to unconfirmed press reports, shortly after lift off from Runway 33 at Lajes, as the aircraft climbed through about 80ft. it was seen to suddenly veered to one side. The pilot apparently attempted to return to Lajes but the aircraft lost height and it crashed on a low hill some 500m. from the runway. The aircraft was destroyed by impact and post impact fire. It is reported that, at impact, 'two engines on the same side had failed.'

18 February 1998, Fairchild Metro II, Ibertrans Aérea, Spain, 2 fatalities.
Shortly after departure, the flight crew requested a turn back to the airport because of an engine malfunction. During the subsequent approach, the aircraft descended prematurely and crashed into the ground. Flight crew fatigue was a contributing factor.

28 July 1998, Swearingen Metro III, Swiftair, Spain, 2 fatalities.
During the approach, one engine was shut down as part of a refresher training for the co-pilot. Due to a technical malfunction, the engine could not be restarted. The approach

continued single engine but control was lost when speed reduced below minimum control speed.

One of the recommendations of the accident investigation was that the Civil Aviation General Directorate, in coordination with "Spanish Airports and Air Navigation" (AENA), evaluate the possibility of carrying out the necessary modifications to runway 07/25 of Barcelona Airport in order to ensure compliance with the recommendations of ICAO Annex 14, last edition, relating to its physical characteristics and the restriction and elimination of obstacles.

30 July 1998, Beech 1900, Proteus Air, France, 14 fatalities.
The aircraft collided with a Cessna 177 at an altitude of 2000 ft. The aircraft had requested permission to modify the flight plan and to descend below 3000 ft into uncontrolled airspace to overfly the cruise ship 'Norway'. The aircraft were not using the same frequency and both flight crews were probably focussing their attention on the cruise ship.

12 January 1999, Fokker 27, Channel Express, United Kingdom, 2 fatalities.
During the final stages of the approach, moments after the wing flaps were lowered to their fully down position, the nose of the aircraft rose and the crew were unable to prevent it rising further. The nose continued to rise until the aircraft's pitch attitude was near vertical. Although the crew applied nose down pitch trim and high engine power, the aircraft lost flying speed, stalled and entered an incipient spin. It descended in a shallow nose down pitch attitude with little forward speed and crashed at the rear of a private house, striking the house with its port wing. Both the house and the aircraft caught fire. The aircraft had been improperly loaded by the handling agent.

25 February 1999, Dornier 328, Minerva Airlines, Italy, 4 fatalities.
On landing on Runway 29 at Genoa the aircraft reportedly touched down 'long and fast' with a tail wind component. As the end of the runway approach, the pilot apparently attempted to turn the aircraft off to one side but without success. The aircraft subsequently overran and fell into the waters of the Golfo di Genova.

7 April 1999, Boeing 737, Türk Hava Yollari, Turkey, 6 fatalities.
The aircraft crashed 9 minutes after take-off. The flight crew had not activated the pitot-static system anti-ice prior to take-off. They failed to recognise the cause of subsequent erratic airspeed indications and failed to use other cockpit indications for control and recovery of the aircraft.

30 June 1999, Beech 99, Nightexpress, Belgium, 2 fatalities.
The aircraft was on a cargo flight from Luton to Frankfurt. During cruise flight, while flying at FL 110, one of the engines failed. The flight crew informed ATC and requested a clearing to FL 90. Shortly afterwards, the second engine failed as well. The flight crew requested radar directions to the nearest field. They were told to maintain a course of 60 degrees and were cleared to descend to FL060. The crew switched to ATC Brussels Approach and were cleared to descend further. Brussels Approach informed the crew that Liège runway 23L was available for landing and requested the crew to maintain 4000 feet. The flight crew replied that this was not possible because both engines were not

operating and asked for a direct course to Liège. Brussels Approach directed the flight to head 320 degrees. The flight crew reported descending through 1700 ft and asked their distance to the runway. ATC replied that distance to the runway was 5 nm, there were no more replies from the flight crew. The aircraft crashed in a wooded area approximately 5 nm southeast from the airport.

14 September 1999, Dassault Falcon 900, Olympic Airways, Romania, 7 fatalities.
During climb, after flap and slats were retracted, the flight crew noticed illumination of the “PITCH FEEL” light on the warning panel. The "PITCH FEEL" warning light, remained continuously ON during cruise and descent until the slats were extended. During descent the Indicated Air Speed (IAS) increased from 240 Kts to 332 Kts. Approaching FL 150, the first officer requested a further descent. Just before FL 150 the ATC re-cleared the flight to continue descent to FL 50. One second later, the autopilot disengaged and for the next 1 minute and 36 seconds the aircraft was manually flown by the Captain. Between FL 150 and FL 140, for approximately 24 seconds, the aircraft experienced 10 oscillations in the pitch axis which exceeded the limit manoeuvring load factor. Maximum recorded values of the vertical accelerations recorded by an accelerometer located in the landing gear bay were: +4.7 g and -3.26 g. Due to accelerations occurring during the pitch oscillations the passengers (who were not wearing seatbelts) were thrown against the cabin ceiling and aircraft furniture. This caused fatal injuries to 7 passengers, serious injuries to 1 crew member and 1 passenger and minor injuries to 2 passengers. The crew declared an emergency and the aircraft made a further uneventful landing at Bucharest.

12 November 1999, ATR-42, SiFly, Kosovo, 24 fatalities.
On 22 November 1999 the ATR 42 chartered by the World Food Program was going to land at Pristina after a flight from Rome. The meteorological conditions at the aerodrome corresponded to visibility of four thousand metres with a layer of compact clouds at three thousand feet. In radar and radio contact with the military air traffic control organisation for an ILS approach, the aircraft, which was outbound to the north at an altitude of 4,600 feet, entered a sector where the minimum safety altitude is 6,900 feet and struck a mountain whose peak is at 4,650 while turning to return towards the airport.

Provision of ATC services was performed according to military rules. Civil crews serving Pristina did not, for the most part, know its contents, nor the specifications linked with the operation of Pristina, which were only described in detail in aeronautical documentation which was not available to civilians. The approach controller on duty on the day of the accident was not familiar with civil procedures.
Aeronautical Information about Pristina came from six different sources. This information could present certain ambiguities and might not completely conform to everyday reality. The existence of disparate and sometimes contradictory information, which was more or less easily accessible, did not favour a uniform and rigorous application of clear procedures.

11 December 1999, British Aerospace ATP, SATA Air Açores, Portugal (Azores), 35 fatalities.
Weather en route was affected by a frontal system with scattered cumulonimbus, heavy showers, turbulence and strong winds from southwest, so the crew decided to alter the

flight plan, opting for a route that included a descent over the channel between Pico and Sao Jorge Islands to intercept the 250 deg VOR Horta radial. Horta tower initially cleared the aircraft to FL 100. The crew then requested a descent to 5 000 ft and was cleared with the instruction of maintaining visual contact with Pico Island. During descent heavy rain and turbulence were reported. Seven minutes after initiating the descent, the aircraft collided with the north hillside of Pico da Esperanca, Sao Jorge island, in IMC. GPWS alerted the crew 17 seconds before impact

22 December 1999, Boeing 747, Korean Air, United Kingdom, 4 fatalities.
Following what appeared to have been a normal take-off roll and initial climb, the aircraft climbed on the runway heading to a height of about 2,150ft amsl (1,802ft above the airfield elevation) before commencing a left turn in compliance with the Standard Instrument Departure, which calls a turn onto a heading of 158 degrees at 1.5 DME. As the aircraft climbed through 900ft, the Attitude Director Indicator (ADI) comparator buzzer sounded three times. It then sounded twice more and, after the start of the left turn, 9 more times. During this last period the flight engineer made two calls of 'Bank'. The aircraft banked left progressively and entered a descent until it struck the ground in a approx. 40deg nose down pitch and 90deg bank to the left.

Post crash examination revealed that the Captain's Attitude Director Indicator (ADI) unreliable in roll

10 January 2000, Saab 340, Crossair, Switzerland, 10 fatalities.
On 10 January 200, at 16:54 UTC, in darkness, the Saab 340B began its scheduled flight from runway 28 of Zurich airport to Dresden. Immediately after departure, ATC changed the departure clearance by instructing a left turn. The first officer entered this change in the FMS without selecting a turn direction. The FMS system logic selected the shortest turn direction which was right. The captain, who was flying the aircraft manually, followed the flight director and gradually put the aircraft in bank to the right, but was apparently still under the impression that the aircraft was turning to the left. Two minutes and 17 seconds later, after a right-hand spiral dive, the aircraft crashed on an open field. The captain was a citizen of the Republic of Moldova, and had previously flown on Antonov AN-2 and Antonov AN-24 aircraft. The attitude indicators in these aircraft are based on a different construction principle from western aircraft. Whereas in the west a so-called inside-out representation was chosen, the Russian instruments follow the outside-in principle.

2 May 2000, Learjet 35, Northern Executive Aviation, France, 2 fatalities.
The Learjet 35A registered was undertaking a flight between Farnborough and Nice. While in cruise at FL 390, it suffered a failure on the left engine. The crew decided to divert to Lyon-Satolas airport. The aircraft was guided on final approach to runway 36L by the ILS. On short final, when just over the runway threshold, the aircraft banked sharply to the left, the wing touched the ground and it crashed and caught fire. The accident resulted from a loss of yaw and then roll control which appears to be due to a failure to monitor flight symmetry at the time of the thrust increase on the right engine. The hastiness exhibited by the Captain, and his difficulty in coping with the stress following the engine failure, contributed to this situation.

25 May 2000, Shorts 330, Streamline, France, 1 fatality.
An MD 83 was cleared to take off from runway 27 at Paris Charles de Gaulle Airport. The Shorts 330 was then cleared to line up and to wait as "number two". The controller believed that the two aircraft were at the threshold of the runway, whereas the Shorts had been cleared to use an intermediate taxiway. The Shorts entered the runway at the moment the MD 83 was reaching its rotation speed. The tip of the MD 83's left wing went through the Shorts 330's cockpit and hit both pilots. The MD 83 aborted its takeoff. The captain of the Shorts was killed, the first officer was seriously injured.

25 July 2000, Concorde, Air France, France, 109 fatalities.
During take-off, shortly before rotation, the front right tyre (tyre No 2) of the left landing gear ran over a strip of metal, which had fallen from another aircraft, and was damaged. Debris was thrown against the wing structure leading to a rupture of tank 5. A major fire, fuelled by the leak, broke out almost immediately under the left wing. Problems appeared shortly afterwards on engine 2 and for a brief period on engine 1. The crew shut down engine 2, then only operating at near idle power, following an engine fire alarm. They noticed that the landing gear would not retract. The aircraft flew for around a minute at a speed of 200 kt and at a radio altitude of 200 feet, but was unable to gain height or speed. Engine 1 then lost thrust, the aircraft's angle of attack and bank increased sharply. The thrust on engines 3 and 4 fell suddenly. The aircraft crashed onto a hotel.

27 February 2001, Shorts 360, Loganair, United Kingdom, 2 fatalities.
A crew of two was operating the aircraft on a scheduled mail service from Edinburgh Airport to Belfast International Airport, with 1,040 kg of cargo aboard. The aircraft suffered a double engine flameout shortly after takeoff. The flight crew ditched the aircraft in shallow water in the Firth of Forth, close to the shoreline. The aircraft was severely damaged on impact with the water and the forward fuselage section became submerged. Neither crew member survived. The engines had flamed out because a significant amount of snow entered into the engine air intakes as a result of the aircraft being parked heading directly into strong surface winds during conditions of light to moderate snowfall overnight.

29 August 2001, CASA CN 235, Binter Méditerraneo , Spain, 4 fatalities.
During the approach the engine fire warning was activated. The flight crew advised ATC that they had lost power on one engine and followed the emergency procedures, during which both engines were inadvertently switched off. The aircraft crashed 500 meters short of the runway.

8 October 2001, McDonnell-Douglas MD-87, SAS, Italy, 110 fatalities.
SAS flight 686 taxied to Milan Linate's Runway 36R for departure. At the same time, a Cessna CitationJet received instructions to taxi out from the general aviation ramp "north via Romeo 5". The Citation crew were instructed to "call back at the stop bar of the main runway extension". The CitationJet crew acknowledged "Roger, Romeo 5 and call you back before reaching the main runway". Unchallenged by the controller, the CitationJet taxied to the east via taxiway Romeo 6. The MD-87 was instructed to line up and wait on runway 36R. The Citation crew reported approaching Sierra and they were told to hold at the stop bar. The ground controller then cleared them to "continue your taxi on to the main apron". Ten seconds later flight SK 686 was cleared for take-off. Immediately after

rotation, the MD-87 collided with the CitationJet. The MD-87 remained airborne for a few seconds and then crashed into a baggage handling building.

The west apron and R5 and R6 taxiways lacked most of the visual aids required. Existing visual aids configuration for the west apron was degraded and not consistent with ICAO requirements: the yellow lines on the pavement were rather deteriorated and partially cancelled with black paint. The marks meant to discriminate R5 and R6 were rather worn out and written in 'broken' digits and letters, not in conformity with ICAO Annex 14. Airport information contained in the AIP Italy was incomplete and not descriptive of the actual conditions. Information contained in Jeppesen charts was not fully consistent with information in AIP Italy. Stop bar red lights were not controllable by ATC. This is a deviation from ICAO Annex 14 that states "stop bars shall be switched on to indicate that all traffic shall stop and switched off to indicate that traffic may proceed". This resulted in a situation where aircraft from the west apron regularly had to cross stop bars illuminated in red. At the stop bar of taxiway R6 there had been an associated anti invasion sensor system, but this was deactivated in 1998.

10 October 2001, Fairchild Merlin IV, Flightline, Spain, 10 fatalities.
The aircraft crashed into sea about half-way between Barcelona and the North African coast. Earlier the pilots request deviation from Valencia Air Traffic Control to fly around bad weather en-route. This was the last transmission of the plane. Two days later debris was found in waters about 60 kilometres off the coast.

24 November 2001, British Aerospace 146, Crossair, Switzerland, 24 fatalities.
On 24 November 2001 at 20:01 UTC the aircraft took-off from Berlin-Tegel airport as a scheduled flight to Zurich. At 20:58 UTC, after an uneventful flight, the aircraft received the clearance for a standard VOR/DME approach 28 at Zurich airport. Ahead of the aircraft involved in the accident, an Embraer EMB 145, flight CRX 3891, landed on runway 28 at Zurich airport. The crew informed the control tower that the weather was close to the minimum for this runway. At 21:0 UTC flight CRX 3597 reported on the aerodrome control frequency. When the aircraft reached the minimum descent altitude (MDA) of 2,390 ft at 21:06, the commander mentioned to the copilot that he had certain visual ground contact and continued the descent. Shortly afterwards the aircraft collided with treetops and subsequently crashed into the ground.

The airport is characterised by a system of three runways; Runways 16 and 14 are equipped with a Category CAT III instrument landing system (ILS) and are therefore suitable for precision approaches. Runway 28 allows non-precision approaches on the basis of the VOR/DME KLO. The approach sectors of runways 14 and 16 are equipped with a minimum safe altitude warning system (MSAW). This system triggers a visual and acoustic alarm in air traffic control if aircraft infringe defined minimum altitudes. No MSAW is installed in the runway 28 approach sector. At the time of the accident the noise abatement procedures in force for Zurich airport played a decisive role in determining take-off and landing runways, above all for takeoffs before 07:00 and after 21:00 local time (LT). Until 19 October 2001, the standard VOR/DME approach was only used sporadically. On 19 October however, the operating concept was changed with regard to landings before 6:00 and after 22:00 LT. Approaches from 22:00 Lt to 06:00 LT had to take place on Runway 28. During the development of the runway utilisation

concept, in particular concerning approaches on runway 28, the appropriateness or quality of the standard VOR/DME approach was never a topic.

4 January 2002, Canadair 604, Agco Corp. United Kingdom 5 fatalities.
Immediately after takeoff from Runway 15 at Birmingham International Airport the aircraft began a rapid left roll, which continued despite the prompt application of full opposite aileron and rudder. The left winglet contacted the runway shoulder, the outboard part of the left wing detached and the aircraft struck the ground inverted, structurally separating the forward fuselage. Fuel released from ruptured tanks ignited and the wreckage slid to a halt on fire. It was concluded that the roll had resulted from the left wing stalling at an abnormally low angle of attack due to flow disturbance resulting from frost contamination of the wing. A relatively small degree of wing surface roughness had a major adverse effect on the wing stall characteristics and the stall protection system was ineffective in this situation.

14 January 2002, Embraer 120, Ibertrans Aérea, Spain, 3 fatalities.
The aircraft was destroyed when it flew into a hillside during an ILS approach to Runway 30 at Bilbao. The point of impact was at the 2,215ft amsl level, about 50ft below the top of the hill, roughly on the extended centreline of the runway but at 18DME. (The flight should have been at 4,900ft. amsl at this point.) The aircraft impacted the ground in a wings level attitude, belly first, with its undercarriage retracted. Last contact with the flight was when the pilot reported at 5,000ft.to Approach Control. The flight was then instructed to change to the Tower but contact with the Tower was never established. The accident happened in darkness. It is thought likely that the area of high ground where the aircraft crashed would have been shrouded in fog. The aircraft was not equipped with a GPWS.

14 April 2002, Fairchild Metro III, Tadair, Spain, 2 fatalities.
The aircraft was destroyed when it crashed during the final approach to runway 24L at Palma. The accident happened in darkness and instrument meteorological conditions

1 July 2002, Tupolev 154, Bashkirskie Avialinii & Boeing 757, DHL, Germany, 69 resp. 2 fatalities.
Bashkirian Airlines flight 2927 was operating on a charter flight from Moscow to Barcelona. The aircraft has just been handed over to the Swiss Air Traffic Control when the Tupolev's TCAS gave a traffic advisory, warning against probable conflicting traffic. Seven seconds later, ACC Zurich instructed the crew of the Tupolev to conduct an 'expedite descent' from FL 360 to FL 350 and advised the crew of the conflicting traffic. This descent was needed to achieve a vertical separation with respect to a DHL Boeing 757 cargo aircraft en-route from Bergamo to Brussels. The Tupolev crew initiated a descent. Simultaneously, the Tupolev's TCAS issued the command to climb. Another seven seconds later the radar controller repeated his instruction to the Tupolev crew to conduct an 'expedite descent' to FL 350, which was immediately acknowledged by the crew. Nineteen seconds later the Tupolev's TCAS commanded to 'increase climb'. On board the DHL aircraft, the TCAS had first alerted the crew of probable conflicting traffic simultaneously with the Tupolev's initial TCAS traffic advisory. The Boeing's TCAS then issued an avoidance command to descent, which was immediately followed by the crew. Fifteen seconds later the Boeing's TCAS commanded to increase the decent. The

crew reported to ACC Zurich that they had initiated a TCAS descent. At 23:36 both aircraft collided.

6 November 2002, Fokker 50, Luxair, Luxembourg, 20 fatalities.
During the approach, immediately after the landing gear was lowered, the pitch angle of the two propellers simultaneously reached a value that is lower than the minimum values for flight. This propeller pitch setting brought a rapid decrease of speed and altitude. During the following seconds, the left engine stopped, then the right engine stopped. The aircraft crashed 700 meters to the north of the runway centreline and 3.5 kilometres to the east of the threshold.

8 January 2003, British Aerospace 146, Türk Hava Yollari, Turkey, 75 fatalities.
Weather conditions were foggy during the approach to the final destination. A VOR/DME approach was flown to runway 34. During this approach, the aircraft collided with terrain 900 m short of the runway threshold.

10 February 2003, Antonov 28, Enimex, Estonia, 2 fatalities.
On take-off from Runway 08 at Tallinn, shortly after getting airborne and while the aircraft was climbing through about 40m., people on the ground heard a 'loud noise' come from it. The aircraft then veered to the right, lost height and crashed about 1km. from the runway. The flight engineer, who survived the crash, reportedly told his rescuers that 'the engine burst.' The accident happened in darkness and in poor weather with an overcast sky, sleet and snow and temperature 'near zero.'

26 May 2003, Yakovlev Yak 42, UM Air, Turkey, 75 fatalities.
The aircraft carried 62 Spanish peacekeeping forces, heading back home from Kabul. It crashed into a steep mountainside on its third attempt to land in thick fog.

1 June 2003, Learjet 45, Eurojet Italia, Italia, 2 fatalities.
As the aircraft took off from Milan, it reportedly struck a number of pigeons. The pilots declared an emergency and requested an immediate return to Linate. The Learjet lost control and crashed into a warehouse near a road on the outskirts of Milan, some 300 metres from the runway.

22 June 2003, Canadair RJ 100, Brit Air, France, 1 fatality.
During the approach the airplane gradually deviated to the left of the centreline. At first the aircraft was above the glideslope, but then descended below the glideslope. Just before impact, a go-around was initiated, but aircraft crashed into the ground at a distance of 2150m from the runway threshold and 450m to the left of the extended centreline.

The following cases represent fatal accidents in Europe in 2005. Conclusions on the causes should be seen as preliminary as these cases were still under investigation at the time of this impact assessment.

6 August 2005, ATR72, Tuninter, Italia, 16 fatalities

The aircraft was destroyed when it crashed in the Tyrrhenian Sea some 12 miles off Palermo, Sicily. Reportedly, the aircraft suffered a loss of power on both engines. It is believed that the double engine failure resulted from fuel exhaustion. Subsequently, the aircraft ditched in the sea resulting in 16 fatalities and a number of the occupants sustaining serious injuries. The aircraft remained floating but with the fuselage submerged. The accident occurred in daylight and in good weather.

10 August 2005, Sikorsky S-76C+ helicopter, Copterline, 12 fatalities

The helicopter crashed into the Baltic Sea, on a flight from Talinn to Helsinki. Prior to falling into the water, the helicopter spun 13 times around its axel. The four inflatable safety pontoons were not inflated prior to the fall. Reportedly both of the helicopter's motors and rotors were in good condition, as was the gearing. Bad weather, terrorism or a flock of birds have all been ruled out as causes of the accident.

The cause of death of all 12 passengers and the two pilots was identified as drowning. All the passengers' seatbelts were still closed when the helicopter was lifted, but those of the pilots had been opened.

14 August 2005, B737-300, Helios Airways 121 fatalities

The pilot advised ATC that the aircraft was suffering 'air conditioning' problems, when climbing through 14,000 ft, after take-off from Larnaca, Cyprus. Shortly thereafter all contact with the aircraft was lost. The pilots of two scrambled Greek F-16s reportedly stated that they were unable to see the captain in the cockpit, and that the co-pilot appeared to be slumped in his seat. The aircraft crashed into a mountain 40km north of Athens.

It is currently believed that the aircraft suffered a loss of cabin pressure leading to the pilots becoming incapacitated and continued to fly on the autopilot until eventual fuel exhaustion. Most of the passengers were reportedly wearing oxygen masks at impact.

Annex D: Costs of the options

Introduction

A separate analysis has been made of the expected costs implication of the various options. Starting point was the implications of an extension of EASA. The other options have been assessed on the basis of this base analysis.

The costs implications are related to additional personnel and overhead costs related to the additional responsibilities and tasks. The costs assessment is made against the 'do-nothing' option. The analysis is based on an internal consortium workshop on the issue (with input from AirEurosafe), key figures from some CAAs and analysis of the report of Deloitte & AirEurosafe[28] which provides a costs estimate for the current EASA activities.

The analysis has been based on an organisation model in which a strong delegation of activities to lower levels has been foreseen (see Chapter 7). The role of the Agency would be focused on:

- Rulemaking (preparation and support)
- Standardisation of practices
- Supervision of distributed responsibilities
- Certification and licensing of pan-European services providers

All other necessary activities are assumed to be undertaken by e.g. national aviation authorities, supporting entities[29] or self declaration. In addition, it is assumed that EASA will use the knowledge of EUROCONTROL and Member States for technical support in their rulemaking activities.

Extension of EASA competences

Cost implications are as much as possible based on current experiences. A separate analysis has been carried out for staff requirements in the fields of Airports, ANS/ATM and support staff.

Airports

Central rulemaking concerning airport safety is not well advanced currently. Also on a national level, the amount of rulemaking activities differs over countries. In the current

[28] Deloitte and AirEurosafe, 2002, European Aviation Safety Agency: an overview.

[29] Supporting entities can either be commercial enterprises (like e.g. the Classification companies in shipping) or NAAs that have a permit to work internationally and perform their task in multiple countries.

policy option it is foreseen that at the labour-intensive activities will be carried out on a national level. For an assessment of the required staffing at EASA, a comparison is made with the UK CAA. This CAA is relatively advanced in the regulatory activities in the airport domain. Regarding the oversight of aerodromes in the UK, the UK CAA has a department (called Aerodrome Standards) totalling 32 staff, broken down into two sections; one operational, and one on policy. The Operations section consists of 18 people which are Aerodromes Inspectors and inspectors of rescue and fire fighting services. The Policy Section is involved in the co-ordination and administration of aerodrome licensing as well as operational policy issues, with 9 people in total excluding administration support. It is considered that the staffing in this policy section can serve as the minimum reference for the EASA department for airports in terms of rulemaking activities. Considering that central rulemaking activities in Europe is still a relative unexplored domain, the upward bandwidth may go to approximately 15.

Additionally, there is a need for supervision of distributed responsibilities, in order to assist the involved entities in the implementation of the regulatory framework. Since EASA is already responsible to carry out standardisation inspections of National Authorities (in the field of airworthiness), for the inspection tasks linked to airport safety regulation, it is calculated that 3 additional persons will be sufficient to cover the 25 NAAs

Hence, in total it is estimated that approximately 12-18 persons are required to cover the activities in the airport domain. This is excluding support staff.

ATM/ANS

The effort involved in the development of a European regulatory framework in the domain of ANS/ATM should not be underestimated. The current Safety Regulation Commission, supported by the Safety Regulation Unit has been established in 1998. Before that time a dedicated European regulatory ANS/ATM framework did not exist. In effect to that time the regulatory framework consisted of ICAO Annex 11, and the underlying guidance material, defining the standards and recommended practices which provided the regulatory basis for the European States. The establishment of the SRC was primarily focussed on the anticipated introduction of safety management systems within the European Community. The requirement for safety management programmes and associated target levels of safety stems from a single (one page) chapter (2.26) in ICAO Annex 11, which itself is a 72 page document.

Within the European ATM community, it was felt to be an urgent need to devise a more detailed regulatory framework to direct the uniform introduction of safety management systems (SMS) within Europe. This task has been primarily delegated to the SRU. As a result the SRU has produced a number of EUROCONTROL Safety Regulatory Requirements (ESARRs), specifically aimed at the introduction of SMS (viz. ESARR2 on occurrence reporting, ESARR3 on Safety Management, and ESARR4 on Risk Assessment). These documents comprise in total around 70 pages, complemented with an extensive volume of guidance material.

This clearly shows the effort required to transpose a single requirement into a proper regulatory framework. Evidently, safety management is only a part of the overall

regulatory framework that has to be developed within Europe in the ATM/ANS domain. And therefore it can be expected that a substantial effort and associated staffing will be required to develop this framework under the auspices of EASA, before it will reach a similar level of maturity and depth as the certification specification and implementing rules that are currently in force for the certification of aircraft. Just as an example the ICAO Annex 6 on Airworthiness comprises around 250 pages, whereas the detailed certification specifications of EASA on aircraft, helicopters, engines and propellers comprise in total around 1800 pages, excluding all guidance material.

It therefore may be expected that the current staffing level of the SRU (8 persons for rulemaking,) will not be sufficient to develop the required ATM/ANS regulatory framework at the required level of detail within a reasonable timeframe. It is estimated that an additional number of 7 persons is likely needed to carry out the tasks sufficiently. Hence it is expected that the minimum number of staff amounts to **8**, but a possible upper bandwidth to **15** persons is more apparent.

However, the activities to be undertaken by EASA are broader than is done by the SRU. This concerns merely the implementation of the regulatory framework and the monitoring of it on lower level. It would be necessary to assist the Member States in the implementation of the regulatory framework and to monitor and supervise whether the implementation is done correctly. With 25 Member States, it is expected that additionally **3** persons are necessary to carry out this assistance and supervision tasks.

Finally, EASA would have the responsibility for certification of pan-European service providers. The amount of work for this certification is limited when the actual certification is done, and the number of these pan-European service providers would be limited as well. If we assume 10 pan-European service providers, and we assume that these service providers would receive yearly attention and a 3-yearly inspection, approximately **3** persons would be sufficient to cover this task.

The total staffing for the ATM/ANS domain would then amount 14-21 persons (8-15, plus 3 for monitoring and 3 for pan-European certification). This is excluding support staff.

Support staff

The total staffing need to undertake the required activities in the Airport and ATM/ANS domains would require about 26 – 39 persons at EASA. This excluding support staff. Support staff falls apart in two categories: (i) direct support staff in the departments Airport and ATM/ANS (e.g. secretaries etc) and (ii) support staff in the rest of the organisation (e.g. Communications, IT).

In the Deloitte & AirEurosafe study it is indicated that in for every person active in the rulemaking activity about 0.33 person is required for a support function in rulemaking. It may be expected that the regulatory process has been optimised and that the Agency has learned from its experiences by then. Also, office automation is likely to have a larger role. Therefore we will calculate with a ration of 0.25 support staff per person in rulemaking. Then the number of support staff in the Airport and ATM/ANS departments amounts to 6 – 9 (0.25 * 26 to 39).

In addition, the same study indicates that for the second category of support staff, outside the direct department itself, another 0.25 person (excl. management) is required for each person (e.g. for communications and corporate infrastructure). It may be expected as well in this respect that economies of scale can be obtained, and hence the ratio will be lower. We estimate a ratio of 0.20. This would amount again to approximately 3 – 5 extra persons (0.20 * 32 to 48). The grand total additional staff for the EASA extension would then amount to 35 - 53 persons.

Overall staffing costs

A summary overview of the estimated overall staffing requirements is presented in table D1. In this table, the salary costs which are related with this increase of staff are provided as well. The average salaries per staff category are based on the report of Deloitte & AirEurosafe.

Table D1 Required number of staff and staff costs in the EASA extension option

	Staff function grade			
	A1-A4 (Management)	**A5-A8**	**C (support)**	**Total**
Staff requirements				
Airport	1	11-17	3-4	15-22
ANS/ATM	1	13-20	3-5	17-26
Subtotal	2	24-37	6-9	32-48
Support (Communication + corporate infrastructure)		2-3	1-2	3-5
Grand total	*2*	*26-40*	*7-11*	*35-53*
Associated costs				
Average salary / year (k€)	172	103	60	
Staff costs (m€)	*0.34*	*2.7-4.1*	*0.4-0.7*	*3.4-5.1*

Total costs

In addition to the costs for staff at EASA as a result of the extension, we have assessed the **additional administrative costs** needed at EASA. This concerns a/o costs for information technology, travels, training etc. These costs come as a consequence of the activities indicated above.

From the AirEurosafe study it can be derived that this is foreseen to amount to 33% of the personnel costs. However, part of this percentage contains costs that in the extension of EASA not longer would have to be made. This concerns the development of the information technology infrastructure and the costs for security. Corrected for these items, the overhead percentage amounts to 28%. This would result in a total costs of m€ 4.4 – 6.5. The set-up is depicted in the table below.

Table D2 Total costs in the EASA extension option

Costs category	M€
Staff costs	3.4 - 5.1
Other administrative expenditures	1.0 - 1.4
Total costs	4.4 – 6.5

Extension of EUROCONTROL mandates

The costs for the option to extend the EUROCONTROL mandates are considered to be more or less comparable with the costs as calculated for the extension of EASA option. After all, the distribution of responsibilities between the central agency and the national level would be the same in both options. Furthermore, the salary level at EUROCONTROL and EASA are comparable. The only difference is that there would be an additional need for co-ordination with EASA for those issues that would relate to the competence of both EUROCONTROL and EASA (e.g. air-ground communication). It is difficult to estimate what this additional co-ordination would mean in financial terms. We assume a 5% additional effort necessary for co-ordination in terms of staffing and hence staffing costs. This results in the following costs estimate for the EUROCONTROL option.

Table D3 Total costs for the option to extend EUROCONTROL mandates

Costs category	M€
Staff costs	3.6 - 5.4
Other administrative expenditures	1.0 - 1.5
Total costs	4.6 – 6.9

Major difference with the EASA option though is the way the expenditures are financed. It is expected that the costs of an extension of the mandates of EUROCONTROL would be (partly) recovered from the user charges, as currently is the practice for all EUROCONTROL costs. The EASA budget would be under EC budgetary control, with possibly a stricter monitoring system.

Establish a New Agency

Also in case of a New Agency, there would be an additional need for co-ordination with EASA, for the same reason as indicated for the EUROCONTROL option. In addition, The New Agency would require additional overhead in terms of persons for general management positions and for management position of the supporting departments (e.g. IT department). The total staff and staff costs that would be required for this option are provided in the table below.

Table D4 Required number of staff and staff costs in the New Agency option

	Staff function grade			
	A1-A4 (Management)	**A5-A8**	**C (support)**	**Total**
Staff requirements				
Airport	1	11-17	3-4	15-22
ANS/ATM	1	13-20	3-5	17-26
Subtotal	2	24-37	6-9	32-48
Support (Communication + corporate infrastructure)	2	2-3	1-2	3-5
Management	2		1	3
Legal support	1	1	1	3
Grand total	*7*	*27-41*	*9-13*	*43-61*
Associated costs				
Average salary / year (k€)	172	103	60	
Subtotal Staff costs (m€)	*1.2*	*2.7-4.2*	*0.5-0.8*	*4.5-6,2*
Additional co-ordination (5%)				0.2-0.3
Total staff costs (m€)				*5.7-6.5*

Additionally, administrative expenditures would be necessary. The overhead percentage for these expenditures is estimated at 33%, based on the Deloitte & AirEurosafe study. The total costs for the option would then result in m€ 7.5 to 8.6.

Table D5 Total costs in the New Agency option

Costs category	**M€**
Staff costs	5.7 – 6.5
Other administrative expenditures	1.8 – 2.1
Total costs	7.5 – 8.6

Annex E: References

1. IVW, Aviation Safety Statistics
2. G.W.H. van Es, Review of Air Traffic Management-related accidents worldwide:
3. 1980 - 2001. NLR-TP-2003-378, Amsterdam.
4. Solar Alliance (2003) Study on benchmarking for best practices in Air Traffic Management in European Union candidate States.
5. Booz Allen Hamilton (2003) Study on benchmarking for best practices in Air traffic Management (European Community)
6. European Commission, Annual Policy Strategy for 2006 (COM(2005)73.
7. G.W.H. van Es, A review of civil aviation accidents, air traffic related accidents: 1980-1999, NLR-CR-2001-059, NLR Amsterdam, 2001.
8. FAA, The report of the FAA Associate Administrator for Regulation and Certification's Study on the Commercial Airplane Certification Process, March 2002.
9. Columbia Accident Investigation Board, Report Volume 1, August 2003.
10. A.L.C. Roelen, R. Wever, M.J. Verbeek, Improving aviation safety by better understanding and handling of interfaces, A pilot study, NLR-CR-2004-025, NLR Amsterdam, December 2003.
11. A.L.C. Roelen, A description of main safety affecting interface problems between different aviation disciplines, NLR-CR-2004-398, NLR Amsterdam, October 2004.
12. G.W.H. van Es, Air-ground communication study, an analysis of pilot-controller occurrences, NLR-CR-2004-019, NLR Amsterdam, 2004.
13. P.J. van der Geest, M.A. Piers, H.H. de Jong, M. Finger, D.H. Slater, G.W..H. van Es, G.J. van der Nat, Aviation safety management in Switzerland, recovering from the myth of perfection, NLR-CR-2003-316, NLR Amsterdam, 2003.
14. "The Greening of Aviation" Air Transport World, June 2005, pp24-27
15. Deloitte and AirEurosafe, 2002, European Aviation Safety Agency: an overview.
16. EUROCONTROL, SRC document 35; Annual Safety Report 2004, Brussels
17. European Commission, 2005, Impact Assessment Guidelines, Brussels.
18. G.W.H. van Es, Overview of the most important Accident/Incident data sources in the NLR Air Safety Database, NLR Memorandum LV-2003-09, NLR Amsterdam 2003.

Annex F: Acronyms

Acronym	Meaning
AC	Aircraft
ACAS	Airborne Collision Avoidance System
ANS	Air Navigation Services
ANSP	Air Navigation Service Provider
ATC	Air Traffic Control
ATM	Air Traffic Management
CAA	Civil Aviation Administration
CMIC	Civil-Military Interface standing Committee
CNS	Communication, Navigation and Surveillance
DGAC	Directorate General of Civil Aviation
EASA	European Aviation Safety Agency
EC	European Commission
ECAC	European Civil Aviation Conference
EMAA	European Military Aviation Agency
ENPRM	EUROCONTROL Notice of Proposed Rulemaking
EP	European Parliament
ESARR	EUROCONTROL Safety Regulatory Requirement
EURAMID	The European ATM Military Directors Conference
FAB	Functional Airspace Block
FCL	Flight Crew Licensing
FMS	Flight Management System
GASR	Group of Aerodrome Safety Regulators
HRO	High Reliability Organisation
ICAO	International Civil Aviation Organisation
JAA	Joint Aviation Authorities
JAR	Joint Aviation Requirements
MEL	Minimum Equipment List
MIL	EUROCONTROL Military Unit
MILHAG	Military Harmonisation Group
MILT	The Military team
NAA	National Aviation Authority
NATMC	The NATO ATM Committee
OPS	Operations
R&D	Research and Development
RC	Regulatory Committee
SARPs	Standards and Recommended Practices
SES	Single European Sky

SESMiC	Single European Sky civil Military Committee
SRC	Safety Regulation Commission
TALIS	Total Information Sharing for Pilot Situational Awareness Enhanced by Intelligent Systems
TLS	Target level of safety
WP	Regulatory Work Programme