Support study to the evaluation of Regulation (EU) No 996/2010 on the Investigation and Prevention of Accidents and Incidents in Civil Aviation

Final Report

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EXECUTIVE SUMMARY

Introduction

The objective of this evaluation is to provide the European Commission with an independent and evidence-based evaluation of Regulation (EU) No 996/2010 on the investigation and prevention of accidents and incidents in civil aviation. The evaluation assesses whether the main objectives of the regulation have been achieved since its entry into force in December of 2010.

This evaluation stems from the Better Regulation[1] initiative in which President Juncker has committed the current Commission to improving the quality of EU policy- and law-making, in order to ensure that legislation better serves the people it affects. This resulted in a stronger emphasis on ex-post evaluation in the policy cycle.

Evaluation criteria and approach

The following five evaluation criteria were used to assess whether or not the goals of Regulation (EU) No 996/2010 are met: relevance, effectiveness, efficiency, coherence and EU-added value. Based on these evaluation criteria, eight main evaluation questions and additional sub-questions were formulated.

To answer these questions and sub-questions, an analysis has been performed based on input from three types of activities: (1) desk research, (2) field research (interviews, a targeted survey and a stakeholder workshop) and (3) an analysis of four selected accident cases.

Conclusions

The main conclusion is that the combination of co-regulation and voluntary cooperation measures required by the Regulation (EU) No 996/2010 led to better safety investigations, resulting in improved aviation safety. The European Network of Civil Aviation Safety Investigation Authorities (ENCASIA), in which the national Safety Investigation Authorities (SIAs) of most Member States are actively participating, is considered to be one of the most effective elements that were brought by the regulation. However, there is still room for further enhancement of safety investigations. This can be achieved by strengthening the role of ENCASIA and by improving the implementation of the regulation at Member State level.

The main conclusion is substantiated by a conclusion for the evaluation criteria.

<u>Relevance</u>
The combination of co-regulation and voluntary cooperation measures required by the Regulation are generally still relevant and appropriate to the initial needs that were to be addressed:

1. lack of uniform investigation capability;
2. tensions between safety investigations and other proceedings;
3. unclear role of the Community (EASA) in safety investigations;
4. weakness in implementation of safety recommendations; and
5. insufficient assistance to the victims of air accidents and their families, including difficulties to quickly obtain complete passenger lists.

New needs are related to drones and cyber-related attacks.

Whether the investigation of accidents involving drones will become a task for SIAs is under consideration. Due to the potential amendment of the Basic Regulation regarding its Annex II and the point of view that EU regulations should remain aligned, it has been proposed via an ENCASIA Opinion[2] to allow flexibility for the SIAs in the decision whether or not to investigate an accident involving drones in order to allocate the resources of the SIA most effectively.

[1] http://ec.europa.eu/commission/priorities/democratic-change/better-regulation_en.
[2] See ENCASIA website: https://ec.europa.eu/transport/modes/air/encasia/.

While it is not the responsibility of the SIAs to investigate aviation accidents caused by cyber related attacks, it is important that SIAs have sufficient expertise to determine as to whether a cyber-attack has occurred. However, currently this expertise is missing (see Recommendation 2).

Effectiveness

Aviation safety is improved by providing high quality unbiased safety investigations which leads to useful safety recommendations that are implemented as soon as possible. A high quality unbiased investigation also contributes to valuable discussions on safety issues within the European aviation community, which result in safety improvement measures that are not a direct result of a specific safety recommendation.

To ensure a high quality unbiased safety investigation capability throughout the EU, it is prerequisite that the SIAs are independent, have sufficient skilled air safety investigators available and are provided with an adequate budget to perform their tasks.

Independence of the SIAs has been achieved in almost all Member States. During this evaluation, study questions were raised regarding the lack of independence of the SIA in four Member States. In only one of those cases, supporting evidence confirms a lack of independence. Although independence had already been established in most Member States prior to the entry into force of the Regulation, the added value of the regulation is that the principle of independence of accident investigations is no longer in dispute or under discussion. At international level, ICAO introduced similar provisions, which became applicable in November 2016 through amendment 15 to ICAO Annex 13.

The SIAs vary in size in terms of number of air safety investigators throughout the EU. Half of the SIAs have five or less investigators and five SIAs have only one air safety investigator. Since the entry into force of the regulation, the number of air safety investigators and the available budgets remained unchanged. For most SIAs, the amount of resources is considered to be sufficient for their normal activities, although for some small SIAs, it has been reported that the resources are insufficient.

Results from this evaluation indicate that not all SIAs can organise a high quality safety investigations in case of a major accident. A major accident will have more impact and different dynamics than a "normal" accident in terms of media attention, judicial investigations, political pressure etc. ENCASIA is working on helping preparing SIAs with limited resources for major accidents by accommodating the collaboration between SIAs and by sharing experiences and lessons learned from major accidents. While this is an important initiative, it might however not be sufficient to fully reach the goals of the regulation (see Recommendation 3).

ENCASIA has strengthened the coordination between the SIAs and has introduced common practices. This has been achieved through plenary discussions, results from the various working groups, forming of opinions, sharing of experiences and lessons learned, issuing guidelines, performing peer reviews and training of air safety investigators. It is important that work of ENCASIA can be continued or even intensified. Currently, ENCASIA activities are supported through a grant from the EU, which covers a significant share of the costs involved, the rest being contributions in kind from SIAs. The annual decision to allocate the requested grant is not a sustainable financial structure because it does not guarantee a long term financial basis. A solution needs to be found to ensure the required budget for ENCASIA activities in a longer term future (see Recommendation 1).

The quality of the safety investigations has improved across Europe because of the regulation and the work of ENCASIA. The improved safety investigation reports and safety recommendations have a positive impact on safety. Better safety recommendations lead to a higher probability that they are actually being implemented. The average response time to safety recommendations is improving although average response times are still longer than the required 90 days.

Advance arrangements are a pragmatic way to arrange the cooperation between SIAs and the judicial authorities so that a safety investigation is not impeded by administrative or judicial proceedings. The advance arrangements enable Member States to accommodate the different national law systems. In several Member States, the advance arrangements have never been practically applied because there has not been a major accident since the arrangement came into force. Where it has been practically applied, it is considered be an effective way of coordinating the various investigations, albeit that there have been examples where the judicial

authorities were insufficiently aware of the existence or content of the advance arrangement or arrangements were established at the last moment. It is therefore important that stakeholders, and in particular the judicial authorities, are familiar with the advance arrangements and that they are regularly reviewed (see Recommendation 4).

The provisions on the protection of sensitive safety information and persons helped to improve the safety investigation. Nevertheless, there have also been some high profile accidents (Spanair, Germanwings) where parts of sensitive safety information became public. The provisions on the protection of sensitive safety information leave some room for interpretation, which is an unwanted situation that needs to be addressed (see Recommendation 5).

Member States are actively participating in ENCASIA and have largely complied with the requirements of coordination of investigations (Article 12), preservation of evidence (Article 13) and protection of safety sensitive information (Article 14) through the establishment of advance arrangements.

There are differences across Europe regarding the use of safety investigation reports in judicial investigations and the subpoenaing of air safety investigators. It is unclear however if this has any consequences on the quality of safety investigations. Therefore, it is worthwhile to investigate the different practises across the Member States and the implications thereof by conducting a comparative study (Recommendation 6).

National emergency plans have not been fully implemented in all Member States. There is a need for guidance on the establishment and content of national emergency plans. There has been some progress in resolving the problems and challenges concerning the assistance to victims and their relatives. However, the MH17 accident made it clear that the problems of obtaining sufficient information to determine who was on board the aircraft still exist (see Recommendation 3).

Efficiency

Benefits of Regulation (EU) No 996/2010 consist of an improved safety environment due to better cooperation between the SIAs and better safety recommendations. Although these benefits are difficult to quantify, a rough calculation considering only fatal accidents shows that the benefit/cost ratio on annual basis of the regulation is greater than 1 if more than 0.55% of all prevented fatalities due to improved aviation safety can be attributed to the regulation. In that case, the benefits of Regulation (EU) No 996/2010 outweigh the costs.

The stakeholders consulted in this evaluation are of the opinion that the resources and costs incurred due to the regulation have been proportional to the results achieved and that the benefits outweigh the costs.

Coherence

The regulation is coherent with the EU Aviation Safety Policy and no incoherence with other regulations was identified, except for a perceived lack of harmonisation between Regulation (EU) No 376/2014 and Regulation (EU) No 996/2010.

Accidents and serious incidents, as defined within Regulation (EU) No 996/2010, are to be reported under Regulation (EU) No 376/2014 (Article 2(7)). It means a double reporting could be required in a situation where a person is subject to mandatory reporting obligations in accordance with Regulation (EU) No 376/2014. For reporters of an incident, it may not be obvious whom to report to as they might not be able to determine whether an incident is serious or not.

The SIAs perceive a lack of harmonisation between Regulation (EU) No 376/2014 and Regulation (EU) No 996/2010. The SIAs have concerns that their obligation to investigate would be subject to a classification by another competent authority. Strictly speaking, this concern is not justified. Another issue for the SIAs is that serious incidents and/or accidents could be reported only to the competent authority under Regulation (EU) No 376/2014 and not to the SIAs.

Hence, people should be aware of the different reporting channels. Member States are responsible for an appropriate set up of the national reporting systems to allow the authorities to be aware of the information and to cope with their respective duties. Effective coordination between the competent authority under Regulation (EU) No 376/2014 and the SIAs is deemed

necessary. It is important that the NAAs, SIAs and EASA establish an appropriate flow of information that leaves as little room as possible for interpretations and subjectivity. This is reflected in Recommendation 7.

EU-added value

Regulation (EU) No 996/2010 has positively contributed to the work that was already being done by Member States on accident investigations, either individually or within the context of their obligations under ICAO Annex 13 and/or the existing regulatory framework at EU level. ENCASIA, in which the SIAs of most Member States are participating actively, is considered to be one of the most effective elements that were brought by the regulation. The European added value results from a combination of factors, namely: enhanced legal certainty on the status of certain ICAO provisions as well as the role of the different actors in the event of an accident or serious incident, in particular the EC, EASA and judicial authorities, gains from coordinated knowledge sharing and pooling of resources, and greater effectiveness of the safety investigations, including safety recommendations.

Recommendations

From the conclusions of this evaluation study, the following recommendations are derived.

Recommendation 1 (to the EC and Member States):

ENCASIA is considered to be one of the most effective elements that were brought by the regulation. Currently, ENCASIA is supported through a grant from the EU, which covers a significant share of the costs involved. Without financial support, ENCASIA cannot exist in its current form. A grand is supposed to be a temporarily means of support. In order to continue the success of ENCASIA it is recommended to ensure a sustainable finance structure for ENCASIA to allow a long term planning.

Recommendation 2 (to ENCASIA):

While it is not necessarily the task of the SIA to investigate aircraft accidents resulting from cyber related attacks, it is important that SIAs have sufficient expertise to determine as to whether a cyber-attack is involved in an accident in order to inform the relevant enforcement authority and to gain safety-related lessons. SIAs are advised to obtain sufficient knowledge on this topic in order to handle the issue appropriately, such as through cooperation arrangements with other States or on a regional level, or through advance arrangements with the appropriate national cyber security entities. It is recommended that the issue of cyber-related matters is addressed within ENCASIA.

Recommendation 3 (to the Member States and EC):

Emergency plans at national level for a civil aviation accident have not been implemented by all Member States, and for those Member States that have implemented national emergency plans those plans are not always complete. It is recommended to the European Commission to publish guidance and minimum standards to support the Member States in improving the level of implementation of the National emergency plans. These civil aviation accident emergency plans at national level should include among others the arrangements for the national SIA to organise sufficient high quality safety investigation capabilities in case of a major civil aviation accident. Additionally, Member States should ensure that the nationality of all passengers is recorded by airlines so that there is sufficient information available to quickly determine who was on board the aircraft and sufficient assistance to victims and their relatives can be provided.

Recommendation 4 (to the Member States):

To make sure that advance arrangements remain effective, it is recommended to ensure that stakeholders are familiar with these advance arrangements and to regularly review the advance arrangements to make sure that they are still appropriate.

Recommendation 5 (to ENCASIA and EC):

Develop additional guidance on the level of protection of sensitive safety information within ENCASIA in coordination with EC, in particular on the different levels of protection required for various types and sources of information.

Recommendation 6 (to the EC):

There are different practices among Member States concerning the use of safety investigation reports in judicial investigations. It is unclear however if this has any consequences on the

quality of safety investigations. Therefore, it is recommended to conduct a comparative study to the different practices among Member States concerning the use of safety investigation reports in judicial investigations and its implications.

Recommendation 7 (to the Member States and EASA):
It is recommended that national aviation authorities, SIAs and EASA collaborate to establish an appropriate flow of information regarding the reporting of occurrences due to Regulation (EU) No 996/2010 and Regulation (EU) No 376/2014 that leaves as little room as possible for interpretations and subjectivity.

SYNTHÈSE

Introduction

La présente évaluation vise à fournir à la Commission européenne une analyse indépendante et justifiée du Règlement (UE) n° 996/2010 régissant les enquêtes et la prévention des accidents et des incidents dans l'aviation civile. L'évaluation vise à établir si les principaux objectifs du règlement ont été atteints depuis son entrée en vigueur en décembre 2010.

Elle s'appuie sur le projet Améliorer la réglementation par lequel le Président Juncker a engagé la Commission à améliorer la qualité de l'élaboration des politiques et de la législation de l'UE, afin de veiller à ce que la législation serve mieux les intérêts des personnes concernées. Cela a donné lieu à un intérêt plus marqué pour l'évaluation a posteriori du cycle politique.

Critères d'évaluation et approche

Les cinq critères d'évaluation suivants ont été utilisés afin d'établir si les objectifs du Règlement (UE) n° 996/2010 ont été atteints, à savoir la pertinence, l'efficacité, l'efficience, la cohérence et la valeur ajoutée pour l'Union. Sur la base de ces critères d'évaluation, huit questions principales et plusieurs questions subsidiaires ont été formulées.

Pour y répondre, une analyse a été réalisée en fonction des données résultant de trois activités : 1) recherche documentaire, 2) recherche sur le terrain (entretiens, sondage ciblé et atelier pour les parties prenantes) et 3) analyse de quatre accidents.

Conclusions

Essentiellement, l'association des mesures de co-régulation et de collaboration volontaire exigées par le Règlement (UE) n° 996/2010 a donné lieu à de meilleures enquêtes, ce qui a renforcé la sécurité dans le secteur de l'aviation. Le réseau européen des autorités responsables des enquêtes de sécurité dans l'aviation civile (ENCASIA), dont les autorités responsables des enquêtes de sécurité (SIA) de la plupart des états membres font activement partie, est considéré comme l'un des éléments les plus efficaces mis en place par le règlement. Toutefois, certains aspects relatifs aux enquêtes de sécurité peuvent encore être améliorés. Pour ce faire, il conviendrait de renforcer le rôle de l'ENCASIA et l'application du règlement au niveau des états membres.

Cette conclusion générale s'appuie sur celle relative aux critères d'évaluation.

<u>Pertinence</u>

L'association des mesures de co-régulation et de collaboration volontaire exigées par le Règlement est en général toujours pertinente et applicable aux besoins élémentaires pris en compte :

1. absence de fonctions d'enquête uniforme ;
2. Frictions entre les enquêtes de sécurité et les autres procédures ;
3. Rôle imprécis de la Communauté (AESA) dans les enquêtes de sécurité ;
4. Application insuffisante des recommandations de sécurité ;
5. Assistance insuffisante aux victimes des accidents aériens et leur famille, dont des difficultés à obtenir rapidement la liste complète des passagers.

Nouvelles exigences associées aux drones et cyber-attaques.

L'enquête pour les accidents impliquant des drones pourrait être attribuée aux SIA. En raison de l'amendement potentiel du règlement de base en ce qui concerne l'Annexe II et le fait que les règlements européens doivent rester alignés, l'ENCASIA a émis un avis selon lequel les SIA pourraient être autorisées à prendre une décision en matière d'enquête dans le cadre d'un accident impliquant des drones en vue d'une affectation plus efficace des ressources des SIA.

Bien qu'il ne relève pas de la responsabilité des SIA d'enquêter sur les accidents d'avion provoqués par des cyber-attaques, il est important que ces dernières disposent d'une expertise suffisante pour établir la présence d'un tel piratage informatique. Mais ces compétences leur font encore défaut (voir la recommandation n° 2).

Efficacité

La sécurité des avions est renforcée grâce à des enquêtes de sécurité objectives de qualité donnant lieu à des recommandations utiles déployées dans les plus brefs délais. Ce type d'approche contribue également aux échanges pertinents sur les questions de sécurité au sein de la communauté aéronautique européenne. Cela donne lieu par ailleurs à des améliorations qui ne résultent pas directement d'une recommandation spécifique en matière de sécurité.

Pour garantir des enquêtes de sécurité objectives de qualité dans toute l'UE, il est essentiel que les SIA soient indépendantes, disposent d'enquêteurs dotés des compétences nécessaires en matière de sécurité aérienne et d'un budget adéquat pour accomplir leur mission.

L'indépendance des SIA est garantie dans presque tous les états membres. Pendant l'évaluation, des questions ont été posées sur le manque d'indépendance des SIA dans quatre états membres. Des preuves confirment la situation dans un seul cas cependant. Bien que l'indépendance soit établie dans la plupart des états membres avant l'entrée en vigueur du règlement, ce dernier apporte une valeur ajoutée étant donné que le principe d'indépendance des enquêtes sur les accidents n'est plus un sujet de litige ou de discussion. A l'échelle internationale, ICAO a introduit des clauses similaires, qui sont entrées en vigueur en novembre 2016 grâce à l'amendement n° 15 à l'Annexe 13 de l'ICAO.

Les SIA varient quant au nombre d'enquêteurs chargés de la sécurité aérienne dans toute l'UE. La moitié d'entre elles comptent cinq enquêteurs tout au plus alors que cinq d'entre elles ne disposent que d'un seul. Depuis l'entrée en vigueur du règlement, le nombre d'enquêteurs chargés de la sécurité aérienne et les budgets n'ont pas évolué. Pour la plupart des SIA, le nombre de ressources est réputé suffisant pour leurs activités normales, bien que pour les plus petites, ces ressources ont été déclarées insuffisantes.

Les conclusions de l'évaluation indiquent que certaines SIA ne peuvent pas mettre en oeuvre des enquêtes de sécurité qualitatives en cas d'accident important. Ce type d'accident aura un impact supérieur et une dynamique différente par rapport un accident « normal » en termes d'intérêt que les médias y accordent, mais aussi d'enquête judiciaire, de pression politique, etc. ENCASIA s'emploie actuellement à la préparation des SIA dont les ressources sont limitées à faire face aux accidents majeurs grâce à une collaboration entre les SIA, un partage d'expérience et des enseignements tirés de ce type d'événements. Bien qu'il s'agisse d'un projet d'envergure, cela pourrait ne pas suffire à atteindre les objectifs du règlement (voir Recommandation 3).

ENCASIA a renforcé la collaboration entre les SIA et introduit des pratiques communes. Pour ce faire, ils ont exploité les discussions plénières, les résultats des différents groupes de travail, l'expression d'avis, le partage d'expériences et d'enseignements, la publication de lignes

directrices, des évaluations collégiales et la formation des enquêteurs pour la sécurité aérienne. Il est important que les travaux d'ENCASIA puissent continuer et gagner en intensité. Actuellement, les activités d'ENCASIA sont financées par une bourse de l'UE qui couvre une grande partie des coûts. Le solde est financé par l'apport en nature des SIA. La décision annuelle quant à l'attribution de la bourse n'est pas une structure financière valable étant donné qu'elle ne comporte aucune garantie à long terme. Une solution doit être obtenue afin que le budget nécessaire aux activités d'ENCASIA lui soit attribué sur une plus longue durée (voir Recommandation 1).

La qualité des enquêtes de sécurité s'est améliorée dans toute l'Europe grâce au règlement et aux travaux d'ENCASIA. Les meilleurs rapports d'enquête et recommandations de sécurité influencent positivement la sécurité. De meilleurs conseils entraînent aussi une plus grande probabilité d'application. Les délais de réponse moyens aux recommandations de sécurité s'améliorent bien que ceux-ci demeurent supérieurs à 90 jours.

Les arrangements préalables constituent une approche pragmatique en ce qui concerne l'organisation de la collaboration entre les SIA et les autorités judiciaires afin que l'enquête de sécurité ne soit pas mise à mal par des procédures administratives ou judiciaires. Les arrangements préalables permettent aux états membres de s'adapter aux différents systèmes légaux nationaux. Dans plusieurs états membres, les arrangements préalables n'ont jamais été mis en pratique car aucun accident majeur n'a eu lieu depuis l'entrée en vigueur de l'arrangement. Là où il a été appliqué, il s'avère un moyen efficace de coordonner les différentes enquêtes malgré certaines situations où les autorités judiciaires n'ont pas eu suffisamment conscience de leur existence ou lorsque son contenu a été défini à la dernière minute. Il est donc essentiel que les parties prenantes, et plus particulièrement les autorités judiciaires, se familiarisent avec les arrangements préalables et que ces derniers soient passés en revue régulièrement (voir Recommandation 4).

Les clauses relatives à la protection des données de sécurité sensibles et des personnes ont contribué à l'amélioration de l'enquête de sécurité. Néanmoins, certains accidents très importants se sont produits (Spanair, Germanwings), dont une partie des données de sécurité confidentielles ont été rendues publiques. Les démarches visant à la protection des données sensibles laissent place à une certaine interprétation. Cette situation délicate doit donc être résorbée (voir Recommandation 5).

Les états membres participent activement à l'ENCASIA et ont en grande partie respecté les normes de coordination en matière d'enquête (article 12), la protection des preuves (article 13) et la protection des données sensibles (article 14) grâce à la mise en place des arrangements préalables.

Il existe plusieurs différences en Europe au regard de l'utilisation des rapports d'enquête de sécurité dans les enquêtes judiciaires et les assignations à comparaître des enquêteurs spécialisés dans la sécurité aérienne. L'on ne sait toutefois pas si cela comporte des conséquences sur la qualité des enquêtes de sécurité. Il convient donc de passer en revue les différentes pratiques adoptées par les états membres et leurs implications par le biais d'une étude comparative (Recommandation 6).

Les plans d'urgence nationaux n'ont pas été mis en oeuvre dans tous les états membres. Des conseils sont nécessaires en ce qui concerne leur contenu et leur instauration. Des progrès ont été réalisés en ce qui concerne la résolution des problèmes et des défis relatifs à l'aide aux victimes et à leur famille. Toutefois, l'accident du MH17 a mis en exergue les problèmes liés à

l'obtention des données suffisant à établir qui était à bord de l'appareil (voir Recommandation 3).

Efficience

Les atouts du Règlement (UE) n° 996/2010 consistent en une amélioration des conditions de sécurité grâce à une meilleure collaboration entre les SIA et de meilleures recommandations en matière de sécurité. Bien que ces atouts soient difficiles à chiffrer, un calcul approximatif des seuls accidents mortels montre que le rapport avantages/coûts sur une année est supérieur à 1 si plus de 0,55 % des décès évités grâce à une meilleure sécurité aérienne peuvent être attribués au règlement. Le cas échéant, les avantages du Règlement (UE) n° 996/2010 en compensent les coûts.

Les intervenants consultés dans le cadre de cette évaluation sont d'avis que les ressources et les coûts résultant du règlement ont été proportionnels aux résultats obtenus et que les avantages dépassent ces coûts.

Cohérence

Le règlement respecte la politique européenne de sécurité aérienne et aucune incohérence avec les autres règlements n'a été détectée hormis un manque d'harmonie entre les règlements (UE) n° 376/2014 et (UE) n° 996/2010.

Les accidents et les incidents graves, selon la définition du Règlement (UE) n° 996/2010, doivent être signalés en vertu du Règlement (UE) n° 376/2014 (Article 2(7)). Un double rapport peut donc s'avérer nécessaire lorsqu'un individu est soumis à des obligations en la matière conformément au Règlement (UE) n° 376/2014. Pour les personnes qui signalent un incident, il est parfois difficile de savoir à qui adresser le rapport étant donné qu'il n'est pas toujours évident d'en établir la gravité.

Les SIA ressentent un manque d'harmonie entre le Règlement (UE) n° 376/2014 et le Règlement (UE) n° 996/2010. Les SIA s'interrogent par ailleurs sur le fait que leur obligation d'enquête pourrait faire l'objet d'un classement par une autre autorité compétente. Cette inquiétude n'est pas justifiée. Selon les SIA, les incidents graves et/ou les accidents ne pourraient être signalés qu'à l'autorité compétente en vertu du Règlement (UE) n° 376/2014, et non aux SIA.

Dès lors, les intervenants doivent connaître les différentes méthodes. Les états membres sont responsables de la mise en place de systèmes nationaux opportuns afin que les autorités puissent prendre connaissance des informations et assumer leurs fonctions. Une coordination efficace entre l'autorité compétente en vertu du Règlement (UE) n° 376/2014 et les SIA est donc nécessaire. Il est important que les NAA, SIA et l'EASA mettent en oeuvre un échange d'informations adéquat ne laissant que peu de place à l'interprétation et à la subjectivité. Tel est l'objet de la Recommandation 7.

Valeur ajoutée pour l'UE

Le Règlement (UE) n° 996/2010 a eu une influence positive sur les travaux déjà effectués par les états membres en ce qui concerne les enquêtes sur les accidents, tant à l'échelle individuelle ou dans le cadre de leurs obligations en vertu de l'Annexe 13 de l'ICAO et/ou du cadre juridique européen existant. L'ENCASIA, dont les SIA de la plupart des états membres font activement partie, est considéré comme l'un des éléments les plus efficaces mis en place par le règlement. La valeur ajoutée pour l'Europe résulte donc d'une combinaison de plusieurs facteurs, à savoir : une meilleure structure juridique quant au statut de certaines dispositions de l'ICAO et le rôle des différents intervenants en cas d'accident ou d'incident grave, et plus particulièrement la CE,

l'EASA et les autorités judiciaires, les avantages associés à un échange de connaissances et de ressources, et une plus grande efficacité des enquêtes de sécurité et des recommandations en la matière.

Recommandations

Les recommandations ci-après résultent des conclusions de l'analyse.

Recommandation 1 (pour la CE et les états membres) :
L'ENCASIA est considéré comme l'un des éléments les plus efficaces mis en place par le règlement. Actuellement, les activités d'ENCASIA sont financées par une bourse de l'UE qui couvre une grande partie des coûts. Sans soutien financier, l'ENCASIA, sous sa forme actuelle, ne peut exister. La bourse n'est qu'une solution temporaire. Pour que l'ENCASIA continue à engranger des résultats positifs, une structure financière durable est recommandée pour l'ENCASIA en vue d'une planification à long terme.

Recommandation 2 (pour l'ENCASIA) :
Bien que l'enquête portant sur les accidents aériens résultant d'un piratage informatique n'incombe pas forcément au SIA, il est important que les SIA disposent d'une expertise suffisante pour établir si une cyber-attaque est à l'origine de l'accident afin d'informer les autorités compétentes et en tirer les enseignements pertinents en matière de sécurité. Il est conseillé aux SIA de rassembler les connaissances suffisantes dans ce domaine afin de régler efficacement le problème, notamment par le biais d'accords de collaboration avec d'autres états ou à l'échelle régionale, ou par le biais d'arrangements préalables avec les organismes nationaux compétents en matière de sécurité informatique. Nous recommandons la prise en charge des questions liées à la sécurité informatique au sein de l'ENCASIA.

Recommandation 3 (pour les états membres et la CE) :
Des plans d'urgence nationaux en cas d'accident d'un avion civil n'ont pas été mis en oeuvre par tous les états membres. Pour ceux qui l'ont fait, ces programmes ne sont pas toujours complets. Nous recommandons à la Commission européenne de publier des conseils et de normes élémentaires afin d'aider les états membres à améliorer la mise en place de ces plans d'urgence. Ceux-ci doivent inclure les accords afin que les SIA nationaux puissent organiser des enquêtes de sécurité de qualité en cas d'accident majeur impliquant un appareil civil. Par ailleurs, les états membres doivent veiller à ce que la nationalité de tous les passagers soit recensée par les compagnies aériennes afin de disposer d'informations suffisantes quant aux personnes à bord et fournir une aide aux victimes et aux familles.

Recommandation 4 (pour les états membres) :
Pour que les arrangements préalables soient efficaces, nous recommandons de veiller à ce que les intervenants en aient connaissance et les passent régulièrement en revue afin d'en vérifier la pertinence.

Recommandation 5 (pour l'ENCASIA et la CE) :
Il convient de fournir des conseils complémentaires en ce qui concerne le niveau de protection des informations de sécurité sensibles au sein de l'ENCASIA en collaboration avec la CE, et notamment au regard des différents niveaux de sécurité nécessaires pour les différents types et sources d'informations.

Recommandation 6 (pour la CE) :

Les états membres adoptent des méthodes différentes quant à l'usage des rapports d'enquête de sécurité dans le cadre des procédures judiciaires. L'on ne sait toutefois pas si cela comporte des conséquences sur la qualité des enquêtes de sécurité. Nous recommandons dès lors la mise en place d'une étude comparative de ces différentes pratiques parmi les états membres en ce qui concerne les rapports d'enquête de sécurité dans les procédures judiciaires et leurs implications.

Recommandation 7 (pour les états membres et l'EASA) :
Nous recommandons que les autorités nationales chargées de l'aviation, les SIA et l'EASA collaborent en vue de mettre en place un flux d'informations adéquat en ce qui concerne le signalement des situations associées au Règlement (UE) n° 996/2010 et au Règlement (UE) n° 376/2014 de sorte à ne laisser que peu de place à l'interprétation et à la subjectivité.

LIST OF ACRONYMS

Abbreviation	Meaning
ATM	Air Traffic Management
CAA	Civil Aviation Authority
CEASIA	Council of European Aviation Safety Investigation Authorities
CERT	Computer Emergency Response Team
CCTV	Closed Circuit Television
CJEU	Court of Justice of the European Union
CVR	Cockpit Voice Recorder
DG MOVE	Directorate-General for Mobility and Transport
EASA	European Aviation Safety Agency
EC	European Commission
ECAC	European Civil Aviation Conference
ECAC-ACC	ECAC's expert group on aircraft accident and incident investigation
ENCASIA	European Network of Civil Aviation Safety Investigation Authorities
ESASI	European Society of Air Safety Investigators
EU	European Union
FDR	Flight Data Recorder
FTE	Full Time Equivalent
GPS	Global Positioning System
ICAO	International Civil Aviation Organization
IIC	Investigator In Charge
ISASI	International Society of Air Safety Investigators
JRC	Joint Research Centre
MS	Member State
NAA	National Aviation Authority
OPC	Open Public Consultation
PNR	Passenger Name Record
QAR	Quick Access Recorder
RAIO	Regional Accident Investigation Organization
SARPs	Standards And Recommended Practices
SIA	Safety Investigation Authorities
SRGC	Safety Recommendation of Global Concern
SRIS	Safety Recommendations Information System
SRUR	Safety Recommendation of Union-Wide Relevance
SWD	Staff Working Document
TFEU	Treaty on the Functioning of the European Union
VOSL	Value of Statistical Life
WG	Working Group

1 INTRODUCTION

1.1 Background and objectives

In December 2016, the European Commission (DG MOVE) tasked a consortium constituted by Ecorys and NLR to evaluate Regulation (EU) No 996/2010 on the investigation and prevention of accidents and incidents in civil aviation.

The objective of the evaluation is to provide the Commission with an independent and evidence-based evaluation of Regulation (EU) No 996/2010 to assess whether the main objectives of the regulation has been achieved since its entry into force in December of 2010.

Regulation (EU) No 996/2010 aims[3] to improve aviation safety by ensuring a high level of efficiency, expediency, and quality of European civil aviation safety investigations, the sole objective of which is the prevention of future accidents and incidents without apportioning blame or liability, including through the establishment of ENCASIA. It also provides for rules concerning the timely availability of information relating to all persons and dangerous goods on board an aircraft involved in an accident. It also aims to improve the assistance to the victims of air accidents and their relatives.

1.2 Structure of this report

The remainder of this report is structured as follows. Chapter 2 provides the methodological aspects of the evaluation study including a description of the tasks performed. Chapter 3 outlines a short overview of the developments relevant for Regulation (EU) No 996/2010. In Chapter 4, an answer is given to each evaluation question, based on the collected information. Chapter 5 contains the conclusions derived from the answers to the evaluation questions. From the conclusions, recommendations are provided in Chapter 6.

In addition, a number of annexes are provided with additional background information on the relevant documentation used for the desk research (Annex 1), the people who participated in the interviews and focus group (Annex 2), the counterfactual scenario (Annex 3), the accident cases (Annex 4), and the detailed analysis to support the answer to the evaluation questions (Annex 5).

1.3 Introduction of the study team

The study has been conducted by a consortium of Ecorys and NLR supported by prof. Pablo Mendes de Leon of Leiden University.

The Netherlands Aerospace Centre NLR[4] is an independent, non-profit organization that provides technological support to aerospace industries, to operators of civil and military aircraft/helicopters, of airports and of ATC systems, to authorities and to international organizations, all over the world since 1937. NLR considers its independency as one of its core competences. It is the central institute for aerospace research and consultancy in the Netherlands. NLR has more than 500 specialists with in-depth expertise in a range of areas within aviation, including air transport safety, aircraft systems, operator performance, flight procedures, air traffic management, airports, regulations and accident investigation.

Ecorys[5] is one of the oldest and largest economic research and consulting companies in Europe, with a remarkable history of 85 years. Ecorys has more than 500 specialists, spread over 18 offices in 12 countries worldwide, providing private and public sector clients. The company's specialists possess in-depth expertise in a range of areas focusing on policy, business, financial, economic, social, spatial and environmental issues. Its unique track record and its ability to deploy economic led, multi-disciplinary and -national skills enables Ecorys to respond to the most challenging problems at all stages of the "policy, strategy and implementation cycle.

[3] According to Article 1(1) of Regulation (EU) No 996/2010.
[4] Website: http://www.nlr.nl.
[5] Website: http://www.ecorys.com.

Prof. Pablo Mendes de Leon[6] is since 15 April 2008 Professor of Air and Space law and Head of Department/executive chair of the Department of Air and Space Law at Leiden University. He brings to the study team unique expertise on matters concerning international aviation legislation and the interaction of the Regulation (EU) No 996/2010 with other legal provisions.

[6] Website: http://www.universiteitleiden.nl/en/staffmembers/pablo-mendes-de-leon.

2 METHODOLOGY

This chapter presents the methodological aspects of the evaluation study. Section 2.1 presents the scope of the evaluation by addressing the evaluation criteria and the associated evaluation questions. Section 2.2 presents the approach to the study to deliver the project objectives. Section 2.3 elaborates on the tasks performed during this study. Section 2.4 summarised the stakeholder consultation. Finally, Section 2.5 provides the limitations of the current analysis.

2.1 Evaluation criteria and questions

To assess whether or not the goals of Regulation (EU) No 996/2010 have been met, the Terms of Reference for this evaluation[7] provides five evaluation criteria:

- The relevance of Regulation (EU) No 996/2010, i.e. the extent to which the measures required by the regulation are still relevant and appropriate to the initial needs;
- The effectiveness of Regulation (EU) No 996/2010, i.e. the extent to which the regulation contributed to the improvement of aviation safety in Europe;
- The efficiency of Regulation (EU) No 996/2010, i.e. the extent to which resources and costs incurred are proportional to the results achieved; the extent to which the distribution of the costs over the different stakeholders is proportionate; and the extent to which additional administrative tasks that have been generated by the regulation are proportional;
- The coherence of Regulation (EU) No 996/2010, i.e. the extent to which the regulation is consistent with, complementary to and non-contradictory to the EU Aviation Safety Policy and other regulations;
- The EU added value of Regulation (EU) No 996/2010, i.e. the value resulting from this regulation which is additional to the value that would have been otherwise created by Member State action alone within the context of Member State obligations under ICAO. And the added value of the regulation to the EU safety environment, in particular the as regards to the role of EASA and the aviation industry.

For these evaluation criteria, the Terms of Reference for this evaluation provides eight main evaluation questions and additional sub-questions. The evaluation questions are repeated in Chapter 4. The approach of the evaluation study is designed to obtain sufficient information to answer these questions and sub-questions.

2.2 Three pillar approach

The very complex and sensitive nature of this evaluation whereby multiple stakeholders are involved with potentially diverging opinions, requires a well-elaborated and solid approach to building up the fact basis on which the analysis is based. The approach entails concrete and triangulated fact finding activities based on three pillars:

1. Desk research deals with the collection of reported facts;
2. Field research aims to collect the experience and viewpoint of a plethora of stakeholders accounting for differences in approach; and finally;
3. Case studies intend to collect empirical evidence on the occasion of the application of the regulation in specific instances.

Stakeholder consultation is a key element of the evaluation. It is aimed at collecting relevant data, stakeholder views and opinions. This is primarily done via a survey, targeted interviews and an open public consultation. Stakeholders are also consulted to get feedback on the methodology and findings. In this respect, stakeholder consultation is a constant process throughout the evaluation. For consulting the stakeholders, the following instruments were used:

- Exploratory interviews;
- Survey;

[7] Request for services № MOVE/E.3/2016 – 440 in the context of the framework contract on impact assessment and Evaluation studies (ex-ante, intermediate and ex-post) in the field of Transport, MOVE/A.3/119-2013- LOT № 1 ”Air", Ref. Ares(2016)4078312 - 03/08/2016.

- Targeted interviews;
- Focus group;
- Stakeholder workshop;
- Open Public Consultation (OPC).

More details on these activities are provided in the task description in Section 2.3 below. A summary on the participation of the stakeholders is provided in Section 2.4.

2.3 Task description

As prescribed in the Terms of Reference, this evaluation study was broken down into eight tasks, which are described below.

Task 1: Study structure

The task was carried out in order to establish the foundation for implementing the evaluation study. Within this task, the following activities have been performed:

- An evaluation framework was developed at the beginning of the evaluation study to facilitate the evaluation;
- Four exploratory interviews were held with key experts. The aim of these exploratory interviews was to refine the understanding of the issues relevant for the evaluation, to consolidate the knowledge of the details of the application of the regulation and to fine-tuning the methodology. The list of experts that were interviewed is provided in Annex 2;
- The kick-off meeting with the European Commission took place on 16 January 2017;
- A focus group was established in order to guide the study team during the evaluation. To goal of the focus group is to bring in initial specialist insights, test the methodology, assess the quality of data sources, assist in approaching the most relevant stakeholders and validate as well as assist in the interpretation of findings; overall generating valuable guidance for the study team. On 8 March 2017, the Commission sent an invitation to candidates of the focus group. The focus group consists of 11 experts. The list of focus group members is provided in Annex 2. The focus group meetings are part of Task 3c.

Task 2: Desk research

The desk research is used to collect factual information. The factual information can be publicly available information or restricted information disclosed to study team. The available information consists of the following sources:

- ICAO Standards And Recommended Practices (SARPs) and supporting documents;
- EU regulations and supporting documents;
- ENCASIA documentation;
- Advance arrangements and supporting documentation;
- Documentation on court cases;
- Accident reports;
- Additional sources including literature, studies and ESASI presentations.

Annex 1 provides an overview of the data sources that were used for this study.

Task 3a: Field research: survey

To reach the maximum number of stakeholders and to collect large amounts of information, an online survey has been developed. To avoid stakeholder fatigue and boost participation, the questions were tailored per stakeholder group.

On 10 March 2017, the targeted survey was launched via internet. In total 175 persons were invited by e-mail to complete the survey. Seven (4%) of the invitations bounced.

After a deadline extension and an additional reminder to the ENCASIA member by the EC, the survey was open for 36 days (until 14 April 2017) and 62 persons responded. Of these respondents 45 (73%) reached the end of the survey.

There were respondents from 26 Member States: Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania,

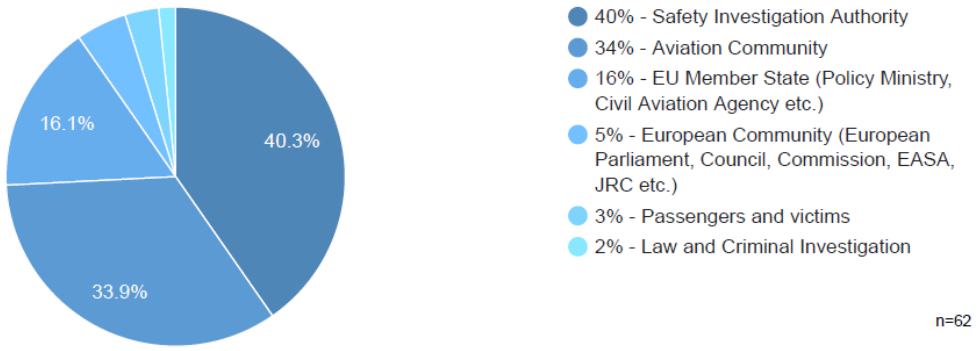
Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom, see also Figure 2.

For the purpose of our study, the stakeholders of Regulation (EU) No 996/2010 have been clustered into six categories:

1. European Community (European Parliament, Council, Commission, EASA, JRC etc.);
2. Safety Investigation Authorities;
3. Member States (Policy ministry and Civil Aviation Authorities);
4. Aviation Community;
5. Law and Criminal investigation;
6. Passenger and victims.

A distribution of the respondents over the different categories is given in Figure 1 below.

Figure 1: Distribution of the respondents to the targeted survey over the six stakeholder groups (N=62)



Of the 62 respondents, 56 provided the name of their organisation and 6 did not. The list of organisations that completed the targeted survey is provided in Annex 2.

Task 3b: Field research: targeted interviews

In-depth interviews were used to collect more detailed inputs. This tool proved especially useful in receiving elaborate views on the functioning of the Regulation (EU) No 996/2010. Anonymising the responses ensured openness in the responses. Stakeholders that were considered for interviews were identified in consultation with the Commission and through the evaluation team's professional networks. In total, 31 interviews were conducted. Annex 2 provides a list of the conducted interviews.

Task 3c: Field research: focus group

After the establishment of the focus group, three focus group meeting were held via telephone conference (Skype) on 4 April 2017, 25 April 2017 and 17 May 2017. During all meetings, the participants were briefed about the progress of the study. In the second meeting, the intermediate report was discussed and the participants were invited to perform a review of the report. The main purpose of the third meeting was the preparation of the workshop and the participation of the focus group members therein.

Task 3d: Field research: Stakeholder workshop

On 1 June 2017, a stakeholder workshop was held. The purpose of the workshop was to present the preliminary findings, to obtain feedback from the participants on the results, and to obtain opinions from the participants on possible improvements of the Regulation (EU) No 996/2010.

An important element of the workshop is the break-out sessions. For these break-out sessions, the participants have been assigned to one of the four groups. Each group discussed a number of topics.

The workshop was organised by DG MOVE and hosted in Brussels. Invitations were sent to ENCASIA members, Representatives of Member States (Ministry of Transport and CAAs), Focus group members, persons that have been interviewed for the evaluation study. In total, there

were 41 participants.

In the presentation of the preliminary results, the following seven topics were identified as the current open issues and therefore discussed during this workshop:

1. Quality of safety investigation;
2. Coherence with Regulation (EU) No 376/2014;
3. Implementation of safety recommendations;
4. EU added value;
5. Coordination with other investigations;
6. Use of sensitive information and reports;
7. Emergency plans and assistance to victims & families.

For the break-out sessions, the participants were randomly assigned to one of the four groups. The groups were chaired by a member of the focus group and supported by a study team member of ECORYS/NLR. Each of the groups discussed a number of topics. For each topic, the groups were asked to answer the following three questions:

1. What are the problems that need to be resolved (if any)?
2. What are possible solutions?
3. How can the solution be achieved?

After these break-out sessions, the chairman of each group reported the results of the group's discussion to the plenary meeting. Following these presentations, a plenary discussion was held. The minutes of the workshop have been shared with all participants.

Task 4: Open Public Consultation (OPC)

In parallel to this study, the Commission launched an Open Public Consultation (OPC). The aim of the OPC is to have an additional source of information that will be used in this evaluation study. Because the OPC was only launched too late, it was decided not to integrate the results of the OPC in this report, but to report the results of the OPC in a separate document.

Task 5: Case studies

As part of the study, an analysis of four relevant accident cases is made in order to assess the application of the regulation. In order to select cases that are relevant criteria were determined.

The four cases have been selected based on the following criteria:

1. Case is relevant if it provides supporting evidence for answering the evaluation questions that were defined to assess whether the main objectives of Regulation (EU) No 996/2010 have been achieved;
2. The case is in the scope of the regulation (see Article 3), i.e.:
    a. In the timeframe the regulation was into force (December 2010 – June 2017);
    b. It involved the safety investigations into accidents and serious incidents:
        i. which have occurred in the territories of the Member States to which the Treaties apply, in accordance with the international obligations of the Member States;
        ii. involving aircraft registered in a Member State or operated by an undertaking established in a Member State, which have occurred outside the territories of the Member States to which the Treaties apply, when such investigations are not conducted by another State;
        iii. in which a Member State is entitled, according to international standards and recommended practices, to appoint an accredited representative to participate as a State of Registry, State of the Operator, State of Design, State of Manufacture or State providing information, facilities or experts at the request of the State conducting the investigation;
        iv. in which a Member State having a special interest by virtue of fatalities or serious injuries to its citizens is permitted by the State conducting the investigation to appoint an expert.
    c. It can also involve issues pertaining to the timely availability of information relating to all persons and dangerous goods on board an aircraft involved in an accident and assistance to the victims of air accidents and their relatives;
    d. It does not involve safety investigations into accidents and serious incidents which involve aircraft engaged in military, customs, police or similar services,

except when the Member State concerned so determines, in accordance with Article 5(4) and national legislation.

3. Cases should also relate to Member States compliance, in particular court cases where sensitive safety information was used to apportion liability;
4. Sufficient detail/information about the case must be available.

The selection of cases has been based on an initial proposal by the study team, input provided to us by the Commission, and cases proposed by ENCASIA (Action from ENCASIA meeting on 9 February 2017). In total four cases are selected and approved by ENCASIA and the focus group:

1. Boeing 767 at Warsaw airport (Poland) on 1 November 2011;
2. Pilatus PC-6 at Gelbressée (Belgium) on 19 October 2013;
3. Airbus A320 at Prads-Haute-Bléone (France) on 24 March 2015;
4. UK Court Cases related to air accidents that raised questions on the interpretation of the regulation.

The analysis of accident cases is provided in Annex 4.

Task 6: Analysis

The analysis entails a comprehensive comparison and triangulation of data as obtained through the various collection methods. Following the results from the desk research, the field research (interviews, survey and workshop) and the accident cases, an answer to each evaluation questions was formulated.

Task 7: Conclusions and recommendations

Following the answers to the evaluation questions (Task 6), conclusions were derived for each of the five evaluation criteria: relevant, effectiveness, efficiency, coherence, EU added value and Member State compliance. Based on the conclusions recommendations were formulated to resolve issues that still exist.

Task 8: Development of dissemination strategy

In this task, a dissemination strategy is developed to stimulate the use and uptake of the evaluation results. To this end, a synthesis note is made, summarising the conclusions and recommendations of the evaluation. This synthesis note will be distributed to a large audience, making use of contacts established during the stakeholder consultation process and the wider audience, to be reached in collaboration with the Commission.

2.4 Stakeholder consultation

For consulting the stakeholders, the following instruments were used:

- Exploratory interviews;
- Survey;
- Targeted interviews;
- Focus group;
- Stakeholder workshop;
- Open Public Consultation (OPC).

Table 1 below provides an overview of the number of stakeholders that were consulted per group and consultation method. A number of stakeholders used to opportunity to provide input through multiple channels. This resulted in a total number of 144 responses by stakeholders. It is remarked that some representatives were consulted via more than one method. Annex 2 provides details on the stakeholders that have been interviewed (exploratory interviews and targeted interviews). A characterisation of the respondents to the survey is provided in Section 2.3.3.

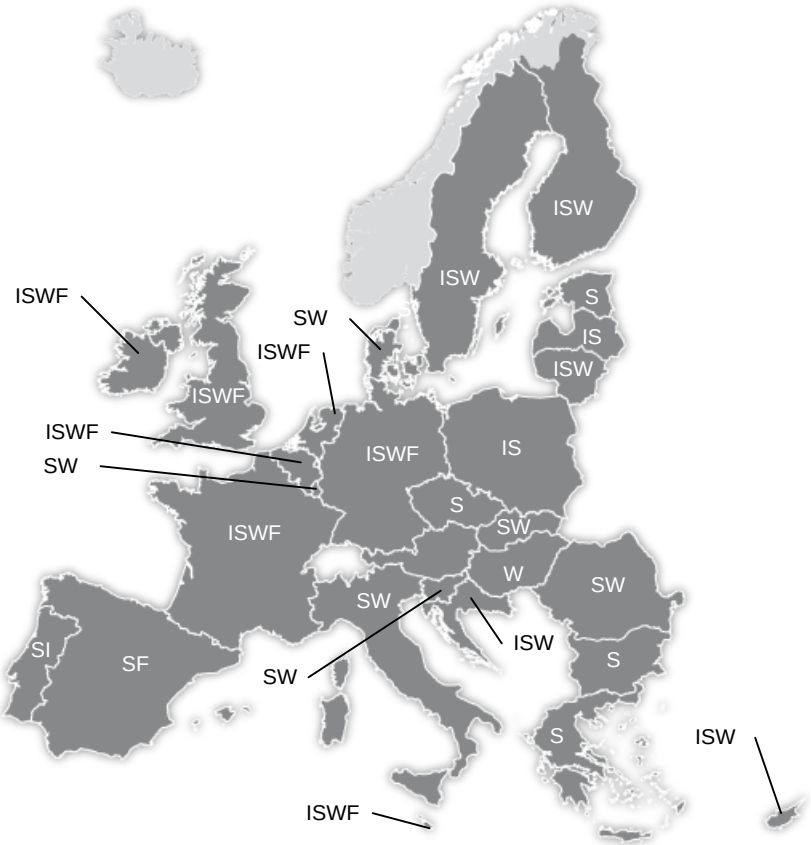
Table 1: Overview of responses per stakeholder group and method

Stakeholder group	Exploratory interviews	Survey	Targeted interviews	Focus Group	Workshop
1. European Community	2	3	4	2	6

2. SIAs	1	25	10	5	19
3. Member States		10	4		2
4. Aviation community	1	21	4	2	7
5. Law & Criminal inv.		1	6	2	2
6. Passengers and victims		2	1		
Total	**4**	**62**	**31**	**11**	**36**

There are many regional differences in Europe including differences in size of SIAs, the law system and culture. These differences could lead to different perspectives on the regulation and its implementation. Deliberate efforts were taken to ensure that all ends of the spectrum were taken into account. There is a high level of participation from the various Member States. Figure 2 below, show the level of stakeholder participation per Member State for the various methods (I=interview, S=survey, W=workshop and F=focus group). For the survey and the workshop all Member States were invited to participate. For the interviews, it was difficult to obtain a response from certain countries. Only Austria has not participated through the survey, interviews, workshop and focus group. There are five Member States that participated only through one method.

Figure 2: Illustration of the participation from the 28 Member States. For each Member State, a letter code has been used to indicate their participation. I = interview, S=Survey, W=workshop and F = focus group



2.5 Limitations of the evaluation

The data collection process (including desk research and field research) has been driven to meet the information needs to answer the evaluation questions. Despite this aim, the two limitations were encountered during the evaluation:

- Unbalanced stakeholder representation
  There was limited interest amongst several stakeholder groups to participate in the evaluation study (interviews and survey). Identified underlying reason is the limited

perceived relevance of the regulation to them. Efforts were taken to mitigate this problem. For the interviews, follow-up mails were sent and several calls were made to invite stakeholders for interviews. Follow-up mails to fill in the survey were sent and the deadline of the survey has been extended. As a result, from these efforts minimal desired input was obtained.

- Regional differences regarding the implementation of the regulation
  There are many differences between Member States in Europe including differences in size of SIAs, the law system and culture. These differences could lead to different perspectives on the regulation and its implementation. Deliberate efforts were taken to ensure that all ends of the spectrum were taken into account by covering these differences in the desk research and by selecting a range of countries for the targeted interviews. There was limited response from several Member States following an invitation for an interview. Figure 2 shows the participation per Member State. Only Austria did not participate in the survey, interviews, workshop or focus group.

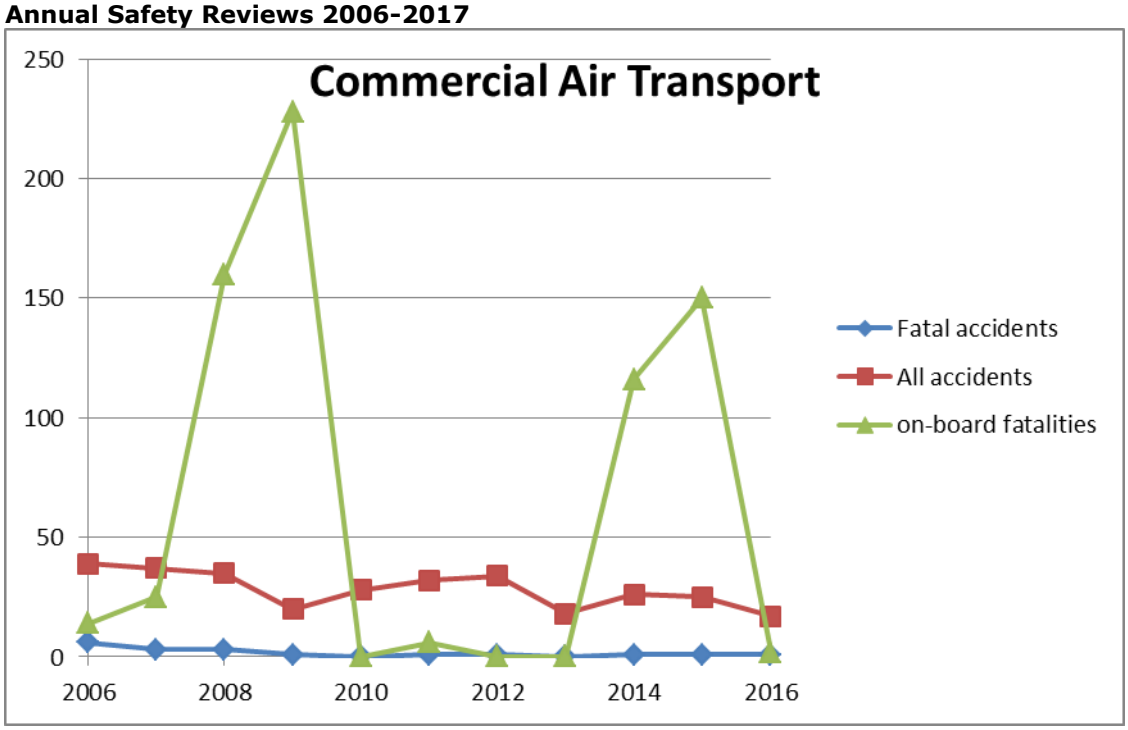
Following efforts to involve stakeholders, the evaluation gathered sufficient inputs to answer the evaluation questions. Therefore, it is concluded that the provided input was found to be sufficiently robust and comprehensive.

3 AVIATION SAFETY TRENDS AND FIGURES

Aviation safety is improving over the years as indicated by a steady reduction of the number of accidents. Information about aviation accidents and fatalities in Europe is presented in the EASA Annual Safety Review which has been published since 2005[8]. Figures 3 and 4 show the number of accidents and fatalities from 2006 up to and including 2016 for commercial aeroplanes involving EASA MS operators and non-commercial aeroplanes having an EASA MS State of Registry (general aviation).

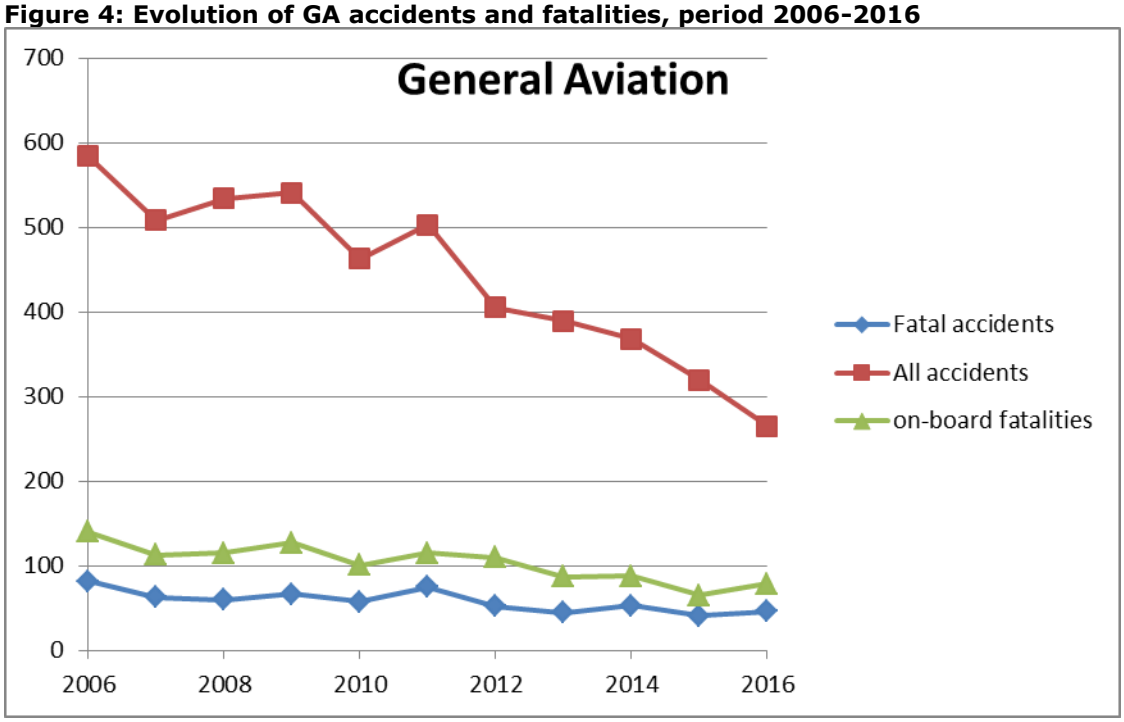
These figures show that for commercial air transport as well as for general aviation the number of accidents has been decreasing with a steady rate since 2006. The number of on-board fatalities in commercial air transport does not show a particular trend; the yearly number of fatal accidents typically varies between 0 and 1, but if an accident occurs, the number of fatalities can be quite high. The number of on-board fatalities in general aviation shows a steadily decreasing trend.

Figure 3: Evolution of CAT accidents and fatalities, period 2006-2016. Source: EASA Annual Safety Reviews 2006-2017



[8] See https://www.easa.europa.eu/document-library/general-publications?publication_type%5B%5D=144.

Figure 4: Evolution of GA accidents and fatalities, period 2006-2016



Source: EASA Annual Safety Reviews 2006-2017.

Table 2 shows the average annual number of aviation fatalities in Europe before and after the introduction of Regulation (EU) No 996/2010. This table shows that the average annual number of aviation fatalities in Europe has reduced since the introduction of the regulation.

Table 2: Average annual number of aviation fatalities in Europe before and after the introduction of Regulation (EU) No 996/2010

Average annual number of fatalities	2005-2010	2011-2016
Commercial Air Transport	114	46
General Aviation	119*	91

* This is the average over 2006-2010. Numbers for 2005 were not published by EASA.

Source: EASA.

Although these results demonstrate continuous safety improvements, it is not possible to determine to what extent Regulation (EU) No 996/2010 has contributed to these improvements. However, it is reasonable to argue that high quality unbiased safety investigations (the aim of the regulation) lead to increased safety. A safety investigation leads to safety recommendations to prevent similar occurrences in the future. These safety recommendations could lead to modification of regulations or to modification of procedures for airlines, air navigation service providers etc. Since the results of the safety investigations are made publicly available by almost all States, the impact of a safety investigation is larger than just the follow-up of the safety recommendations by the organisations to who they are addressed. Many airlines, for example, have changed their operational procedures regarding leaving the cockpit by one of the pilots during the flight as a result of the safety investigation of the Germanwings accident, although changing these procedures was not a recommendation from the safety investigation.

The European Commission, EU Member States, Eurocontrol, EASA and industry have numerous (coordinated) activities to further improve safety. Many of these activities are described in the various editions of the European Plan for Aviation Safety[9]. Some, but not all of these activities are initiated as a result of safety investigations of accidents and are therefore linked with Regulation (EU) No 996/2010.

[9] See https://www.easa.europa.eu/system/files/dfu/EPAS%202016-2020%20FINAL.PDF.

4 DEVELOPMENTS RELATED TO REGULATION (EU) NO 996/2010

The thorough investigation of accidents and incidents that have occurred and the dissemination of the lessons learnt to prevent future accidents is a key element in achieving the high safety performance in aviation. The detailed provisions on the investigation were established by ICAO Annex 13 and have been reflected in EU law through the adoption of Directive No 94/56/EC in 1994.

Over time, it was felt that the current regulation was no longer adequate[10]. Directive No 94/56/EC no longer met the requirements of the EU and of the Member States, because:

- There was more divergence in the investigating capacity of the Member States than in 1994, notably due to the EU enlargements of 2004 and 2007;
- Aircraft were becoming increasingly complex and accident investigation required more expertise and resources;
- The EU common aviation market grew both in size and complexity in the last decade;
- This increase in the complexity of the single aviation market also called for increased responsibility of the Community in aviation safety and establishment of EASA;
- The EU and its Member States gained significant practical experiences since 1994, which should be used to strengthen the current system.

The Commission carried out several activities to resolve some of these issues. This encouraged the establishment of the Council of European Aviation Safety Investigation Authorities (CEASIA) in 2006, a voluntary regrouping of Safety Investigation Authorities aiming to coordinate accident investigation among Member States and to act as a liaison with the institutions of the European Union[11].

In 2009, an impact assessment[12] was conducted to analyse different policy options to assist the Commission in the revision of Directive No 94/56/EC and Directive No 2003/42/EC on occurrence reporting in civil aviation. This impact assessment was supplemented by a support study conducted by Ecorys and NLR, and identified five specific problems:

1. lack of uniform investigation capability;
2. tensions between safety investigations and other proceedings;
3. unclear role of the Community (EASA) in safety investigations;
4. weakness in implementation of safety recommendations; and
5. insufficient assistance to the victims of air accidents and their families, including difficulties to quickly obtain complete passenger lists.

In line with the conclusions of the impact assessment, these problems were to be resolved through co-regulation[13] and voluntary cooperation. Therefore, Regulation (EU) No 996/2010 was adopted on 20 October 2010, revoking Directive No 94/56/EC. The regulation subsequently came into force in December 2010. The regulation emphasises the need to ensure a high level of efficiency, expediency, and quality of European civil aviation safety investigation capability throughout the Union, without apportioning blame or liability.

[10] Commission Staff Working Document Accompanying the Proposal for a Regulation of the European Parliament and of the Council on investigation and prevention of accidents and incidents in civil aviation. Impact Assessment. COM(2009) 611 final, SEC(2009) 1478.
[11] Dempsey, P.S. (2010). Independence of Aviation Safety Investigation Authorities: Keeping the Foxes from the Henhouse. Journal of Air Law and Commerce, 75(1), pp 223-283.
[12] See Footnote 7. The Commission Staff Working Document is based on a support study by Ecorys and NLR: Ecorys. (2007) Impact Assessment on the modification of Directives 94/56/EC and 2003/42/EC. TREN-IA – 016 – TR14923. Rotterdam, Netherlands.
[13] Co-regulation is defined as the mechanism whereby a Community legislative act entrusts the attainment of the objectives defined by the legislative authority to parties which are recognised in the field (such as economic operators, the social partners, non-governmental organisations, or associations). See http://www.eesc.europa.eu/?i=portal.en.self-and-co-regulation-definitions-concepts-examples. See the principles for better self- and co-regulation at https://ec.europa.eu/digital-single-market/en/news/principles-better-self-and-co-regulation-and-establishment-community-practice.

The regulation addressed the above mentioned problems through, among others, the establishment of independent national Civil Aviation Safety Investigation Authorities (SIAs) in every Member State. Prior to the adoption of Regulation (EU) No 996/2010 there were already some independent SIAs established. Additionally, the regulation provides support for voluntary cooperation with the establishment of a formal European Network of Civil Aviation Safety Investigation Authorities (ENCASIA Network), supported by an annual grant and based on the existing informal cooperation and resources of the Member States, for sharing of resources, coordinating of training and to facilitate closer cooperation and exchange of data. It also includes provisions on information on persons on board as well as the obligation for Member States to establish a civil aviation accident emergency plan at national level.

ENCASIA was established on 19 January 2011[14]. According to Article 7(3) of the regulation, ENCASIA is responsible for:

a. preparing suggestions to and advising Union institutions on all aspects of development and implementation of Union policies and rules relating to safety investigations and the prevention of accidents and incidents (opinions);
b. promoting the sharing of information useful for the improvement of aviation safety and actively promoting structured cooperation between SIAs, the Commission, EASA and national civil aviation authorities;
c. coordinating and organising, where appropriate, 'peer reviews', relevant training activities and skills development programmes for investigators;
d. promoting best safety investigation practices with a view to developing a common Union safety investigation methodology and drawing up an inventory of such practices;
e. strengthening the investigating capacities of the SIAs, in particular by developing and managing a framework for sharing resources;
f. providing, at the request of SIAs appropriate assistance, including, but not limited to, a list of investigators, equipment and capabilities available in other Member States for potential use by the authority conducting an investigation;
g. analyse the safety recommendations in the Safety Recommendations Information System (SRIS) database to identifying important safety recommendations of Union-wide relevance.

The activities of ENCASIA are published in their annual work programme and the results are summarised in the annual reports. These documents are available on the ENCASIA website.

Besides the ENCASIA network, there are several other networks or fora in Europe on investigation of accidents and incidents: the accident investigation group of ECAC (ECAC-ACC)[15] and European Society of Air Safety Investigators (ESASI)[16]. ENCASIA is the only network funded and supported by the European Commission and ruled by Regulation (EU) No 996/2010.

ECAC-ACC represents 44 states, plus observer states, industry (including Airbus, Boeing, Rolls Royce) and entities like EASA and Eurocontrol. Hence, it involves also states that are not bounded by Regulation (EU) No 996/2010. The goal of ECAC-ACC is to share expertise, specifically for the benefit of states with limited resources, to promote cooperation between states, and to include involved parties like manufacturers, aviation organisations and entities in the process. ECAC-ACC focusses more on the practical issues of accident investigation.

ESASI is the European chapter of the International Society of Air Safety Investigators (ISASI) with a particular focus on current European issues in the investigation and prevention of accidents and incidents. The main activities involve the organisation of an annual seminar and the issuing of newsletters to inform their members to keep you informed regarding the on-going developments related to safety investigations in Europe.

ICAO promotes the formation of regional accident and incident investigation organization (RAIO) and has developed guidance on this[17] as well as State letters calling on States to join efforts. ENCASIA can be at best qualified as a pre-RAIO[18]. An example of increased collaboration is the network of accident investigation authorities of Nordic countries (Sweden, Norway, Finland,

[14] See ENCASIA website: https://ec.europa.eu/transport/modes/air/encasia_en.
[15] See https://www.ecac-ceac.org/accident-investigation.
[16] See https://www.esasi.eu/.
[17] ICAO, Manual on Regional Accident and Incident Investigation Organization, Doc 9946 AN/481. First edition, 2011.
[18] Mikołaj Ratajczyk, Regional Aviation Safety Organisations, Enhancing Air Transport Safety through Regional Cooperation. Ph. D Thesis, Leiden University, 2014.

Denmark, Iceland, and Canada) which has been established to further enhance cooperation and to provide some support to deal with accidents and incidents.

After the entry into force, a number of developments in other regulations have taken place that impacted Regulation (EU) No 996/2010 and its application.

In April 2014, Regulation (EU) No 376/2014 on the reporting, analysis and follow-up of occurrences in civil aviation was published revoking Directive 2003/42/EC and deleting article 19 of Regulation (EU) No 996/2010. Due to the requirements of Regulation (EU) No 376/2014, cross references exist between Regulation (EU) No 376/2014 and Regulation (EU) No 996/2010 such as occurrence reporting, definitions of 'accident', 'incident' and 'serious incident' (which remain those provided in the latter regulation) and disclosure of sensitive information. This means that double reporting could be required in a situation where a person subject to mandatory reporting obligations in accordance with Regulation (EU) No 376/2014 has to report an accident or a serious incident listed in the Commission Implementing Regulation (EU) 2015/1018. In such cases, this person shall report the accident or serious incident in accordance with Regulation (EU) No 376/2014 and shall also "notify without delay the competent safety investigation authority of the State of Occurrence thereof" in accordance with Article 9 of Regulation (EU) No 996/2010.

Currently, Regulation (EC) No 216/2008 (the 'Basic Regulation') is being revised. This might have some impact on Regulation (EU) No 996/2010. Article 5 mandates the investigation of every accident or serious incident involving aircraft other than specified in Annex II of the Basic Regulation. The latest revision would also mandate the investigation of accidents and serious incidents of drones. ENCASIA has formulated an opinion in 2015 to allow flexibility in the investigation of drones (and manned aircraft with a MTOW of less than 2250 kg). Currently, this proposal is being incorporated in the revision of the Basic Regulation.

After the entry into force of Regulation (EU) No 996/2010, a number of amendments to ICAO Annex 13 has been made: amendment 13 (10th Edition), 14 and 15 (11th Edition). The amendments are such that ICAO Annex 13 and Regulation (EU) No 996/2010 become more aligned. The latest amendment includes a new definition for “accident investigation authority”, standards on establishment of an independent accident investigation authority, new provision on cooperation between investigation authorities and judicial authorities, follow-up of safety recommendations by the State, enhanced protection of investigation records in 5.12, and a new Appendix 2 on protection of investigation records. With this latest amendment “balance tests” which already existed in Article 5.12 of ICAO Annex 13 have been revised as follows:

> *“5.12 The State conducting the investigation of an accident or incident shall not make the following records available for purposes other than accident or incident investigation, unless the competent authority designated by that State determines, in accordance with national laws and subject to Appendix 2 and 5.12.5, that their disclosure or use outweighs the likely adverse domestic and international impact such action may have on that or any future investigations...”*

This article is similar to Article 14(3) of Regulation (EU) No 996/2010.

5 ASSESSMENT OF THE EVALUATION QUESTIONS

This chapter contains the results for each evaluation question, which are categorized under the five evaluation criteria. Some evaluation questions have been broken down into sub-questions. For readability purposes, the detailed analysis for each evaluation question is provided in Annex 5. This annex contains for each evaluation question, the results from the desk research, the results from the field research, the results from the Case studies and the overall answer to the evaluation question. The answers for each evaluation question are presented in this chapter.

The analysis uses a counterfactual scenario, which is presented in Annex 3. This scenario describes the study team's assessment of what would be the situation if Regulation (EU) No 996/2010 had not been issued and is used to determine the effects of the regulation after implementation.

5.1 Relevance

Evaluation question 1:
To what extent are the measures required by the Regulation still relevant and appropriate to the initial needs?

The Regulation (EU) No 996/2010 sought to address five specific problems and needs identified in the impact assessment[19], through a combination of co-regulation and voluntary measures. The initial needs and corresponding mechanisms (i.e., the inputs and activities corresponding to the operational objectives of the regulation) to address them are as follows:

1. Lack of high quality investigation capability at national level

Compared to the situation in 1994, the investigating capacity of the Member States was significantly more disparate in the mid-2000s. Following the enlargements of the EU in 2004 and 2007, the investigating capacity of Member States was primarily concentrated in a small number of States, particularly those with a large aviation manufacturing industry. Related to this, there was a growing need for diverse and specialised expertise and resources to investigate increasingly complex aircraft and aircraft systems.

The investigating capacity of Member States, particularly the smaller ones, was to be reinforced through voluntary cooperation via the establishment of a formal European Network of Civil Aviation Safety Investigation Authorities (ENCASIA Network). This Network is further bolstered by an annual grant and based on existing informal cooperation and resources of the Member States, for sharing of resources, coordinating of training and to facilitate closer cooperation and exchange of data.

2. Tensions between safety investigations and other proceedings

Due to the many different legal systems in Europe, there were significant differences in the way investigators and judicial authorities cooperated with one another throughout an on-going investigation. In this context, there was a need to establish a basic legal framework through which authorities from different proceedings should cooperate. Moreover, there was a need for clarity in terms of both sides' access to and sharing of factual information in order to properly discharge their duties, while also protecting the information. The Directive of 1994 did not address these issues, however ICAO Annex 13 was explicit on them. In this context, it was appropriate to transpose into EU legislation relevant ICAO standards concerning protection of safety information.

The co-regulation measures foresaw the establishment of permanent, independent SIAs in every Member State capable of conducting a full safety investigation, either on its own or through agreements with other safety investigation authorities (Article 4). Independence is defined and addressed in Evaluation question 2.1.2. Regarding coordination of the accident investigation proceedings with other (namely judicial, civil aviation or search and rescue) proceedings at national level, the regulation introduced the requirement to establish advance arrangements (Article 12(3)).

[19]http://ec.europa.eu/transport/sites/transport/files/modes/air/safety/doc/2009_regulatory_impact_assesment.pdf.

3. Lack of clarity in the role of the CAAs and EASA in safety investigations

The EU institutional and legal framework underwent significant changes between 1994 and 2010, particularly concerning the establishment of EASA in 2002. By 2010, safety standards were almost exclusively defined at the EU level, and EASA, on behalf of the Member States, became responsible for certification of aircraft in the Community. In this context, there was a need for a clear framework enabling EASA to support investigations and to take action in response to the outcome of investigations.

Provisions were included to ensure that EASA, as an authority responsible for aircraft certification, and those CAAs, as frequent addressee of safety recommendations, would have access to information from accident investigations in order to take safety actions if needed (Article 8). The regulation clarifies that the advisors are entitled to some rights within the investigation, including visitation to the accident site and participation in follow-up investigation work.

4. Weak implementation of safety recommendations

The lack of any consistent approach across Member States with respect to gathering, processing and implementing safety recommendations resulting from accident investigations was considered to create an accountability deficit on the implementation side. In addition, there was a need to develop a consistent approach for following up safety recommendations of EU-wide relevance in light of the increasing number of recommendations that were being addressed to EASA as the Community regulator.

To address this problem, the regulation introduced the requirement of mandatory replies to every safety recommendation (Article 18) and established a European database of safety recommendations (Article 18).

5. Insufficient assistance to the victims of air accidents and their families

Based on the experience of Spanish authorities in the aftermath of the accident in August 2008 involving Spanish airline Spainair at the Madrid Barajas airport, the management of passenger manifests and the rapid disclosure of passenger manifests to victims' families and the general public, became a need.

The rights of victims and their relatives were to be better protected through the obligation for airlines to have a list of passengers quickly available following an accident (Article 20), and the obligation for Member States to have plans of emergency assistance at the national level (Article 21).

Evidence from desk research, field research and case studies (as elaborated in Annex A5.1) show that the combination of co-regulation and voluntary cooperation measures required by the regulation are generally still relevant and appropriate to the initial needs that were to be addressed by the regulation. While there is some disagreement among stakeholders on the continued persistence of the different problems, and equally on the appropriateness of the measures to address these challenges, the following conclusions are drawn:

By building on the previously existing cooperation between safety investigation authorities and the investigation resources at national level, ENCASIA has contributed to better identify the expertise and resources available in each Member State, as well as gaps and remedial actions to address them. Peer reviews, exchange of information and joint training activities play an important role with respect to promoting and harmonising best practices across Member States, and improving preparedness and response capacities of SIAs in the event of an accident or serious incident (see Evaluation questions 2.4.1 and 2.4.2 below). These tools are highly appropriate to achieve the legislative objective of ensuring that all 28 Member States' SIAs are capable of conducting high quality, independent investigations.

The inclusion of clear language in the regulation identifying the roles and responsibilities of the different actors involved in process of investigating accidents and incidents in civil aviation is highly appropriate and relevant to address the needs related to tensions between safety investigations and other proceedings, and to the lack of clarity in the roles of CAAs and EASA. Although tensions with judicial proceedings are still prevalent in some Member States, the requirement on advance arrangements has in many cases been useful for establishing a dialogue and structuring the relations between the various authorities. On the need to clarify

the roles of EASA and the national CAAs in the process of accident investigations, Article 8 ensures that EASA, as an authority responsible for aircraft certification, and CAAs, as a frequent addressee of safety recommendations, have access to information from accident investigations in order to take safety actions if needed. This provision effectively addressed the identified problem and is still appropriate today.

Likewise, the inclusion of clear language outlining procedures and timeframes for responding to safety recommendations has helped to address the issue of the weak implementation of safety recommendations.

In reference to Articles 20 and 21, the Regulation states in its preamble that prior "experience has shown that reliable lists of persons on board an aircraft are sometimes difficult to obtain in a timely manner," while also recognising the importance of establishing a deadline within which an airline can be required to produce such a list. Similarly, the Regulation notes the necessity of maintaining lists of dangerous goods on board to minimise risks to safety investigators at the site of the occurrence, and that the manner in which an accident and its consequences are dealt with vis-à-vis the public, the victims and their relatives is of crucial importance for maintaining the public's confidence in the quality of the civil aviation safety system (Regulation para. 30 – 32). In this respect, the obligations set out in Articles 20 and 21 directly target the identified needs, which are still relevant today.

The majority of the SIAs, CAAs and aviation community representatives agree with the appropriateness of the regulation's provisions concerning the provision of assistance to victims and their families to address this need. However, concerns were raised whether or not this regulation is the appropriate place for these provisions. As noted above, Articles 20 and 21 are addressed to the level of Member States, whereas the rest of Regulation (EU) No 996/2010 concerns safety investigations. Therefore, the provisions concerning assistance to victims are misinterpreted by some SIAs as an obligation for the SIA to produce a list of passengers or develop assistance plans. This interpretation is not correct. Therefore, there is no necessity to relocate these provisions to a different regulation.

As will be shown below, national regulations implementing provisions of the regulation may still differ, despite the harmonisation efforts of the EU. Also, the different legal systems may shed a different light on the interpretation of provisions, as to which see Evaluation question 2.1.4 below.

Evaluation question 1.1

To what extent are the measures required by the Regulation appropriate to new threats to aviation, such as drones and cybersecurity?

Regarding new or additional problems that could or should be addressed by the regulation, we take into account the Future Aviation Safety Team (FAST) list[20] and stakeholder feedback from the interviews and survey. We identify 5 main emergent threats of relevance to Regulation (EU) No 996/2010. These are:

- Drones;
- Cyber threats;
- Social Media;
- Aircraft complexity and new investigation techniques.

Overall, stakeholders contend that the regulation should not exclude any potential causal factor from the potential mandate of air safety investigators. On the other hand, it should not be necessary to adopt a new regulation and/or amend existing regulations to address each and every new or perceived threat and/or need. Such an approach would create excessive regulatory complexity. Many SIAs are relatively small in terms of personnel and other resources, and thus face constraints to comply with the regulation as currently formulated. In this respect, it would be beneficial for many smaller SIAs if ENCASIA would take a role in

[20] The Future Aviation Safety Team (FAST) is an international and independent group of aviation experts that has actively maintained a list of future changes to aviation and associated hazards since 2000. This list is publicly available on a website hosted by the Netherlands Aerospace Centre NLR (http://www.nlr-atsi.nl/fast/aoc/).

considering how to address new and emerging threats, and support Member States with fewer air safety investigatory resources to implement and comply with new measures. Moreover, airline representatives argued that expanding the regulation to cover new fields of activity (drones / cyber security) should not fundamentally alter the primary focus of investigation bodies, which is the investigation of civil aviation accidents and serious incidents.

Among the emerging challenges and potential threats identified above, the issue of drones and cyber security, respectively, require further reflection. There is a broad consensus among stakeholders surveyed and interviewed that the scopes of Regulation (EU) No 996/2010 and the Basic Regulation should remain aligned in view of potential amendments to Annex II of the latter regulation (see Chapter 3). In light of existing resource constraints at SIAs across the Union, an amendment to Regulation (EU) No 996/2010 requiring the investigation of accidents and serious incidents involving drones could be limited to those which are certified by EASA; when fatalities, serious injuries or commercial air transport operations are involved; or when an investigation is expected to lead to lessons for the improvement of future aviation safety.

On the issue of cyber-attacks, the EU has limited competence to act on security threats. When an accident or serious incident is deemed to have been caused such an attack, the responsibility to investigate will fall outside the safety investigation. In this context, while the investigation into cyber-related attacks is not the competence of SIAs a priori, SIAs must have the capacity and expertise to make a determination as to whether a cyber-attack is involved. This requirement is implicitly covered by Article 4(6)(e), which obligates SIAs to have qualified personnel at their disposal. It is clear from the stakeholder consultations, however, that SIAs do not (yet) currently possess the requisite capacity and expertise to investigate cyber security-related issues, directly, either by means of cooperation agreements of other States' SIAs or by means of advance arrangements with the appropriate cyber security organisations or entities (CERTS). SIAs raise concerns over the feasibility of maintaining an ever-expanding set of expertise in-house. In this context, SIAs are advised to consider actions that will enable better pooling of resources on cyber-related matters, such as through cooperation arrangements with other States or on a regional level, or through advance arrangements with the appropriate national cyber security entities.

Regarding the proliferation of social media, the evidence suggests that the risk is not necessarily to aviation safety, but rather to the ability of the investigators to carry out their duty without interference of outside media forces. In this context, the problem is one of proper framing, which can be supported through the establishment of guidelines and principles for dealing effectively and appropriately with the challenges of rising public exposure, and therefore, pressures. Currently, ENCASIA is developing guidance and a kind of coaching network on dealing with media pressure. This has not yet been fully implemented.

Finally, our legal analysis does not find evidence to support the argument that increasing complexity merits a modification to the Regulation. The investigation bodies should be able to keep up with the technological developments, new complexities and actors in the aviation system without a specific modification to the regulation. Such issues can for example be addressed by developing common operational practices and procedures. But, the decision to use a particular investigation technique is a decision of the individual SIA.

5.2 Effectiveness

Evaluation question 2
How far did the Regulation contribute to improve aviation safety in Europe?

This evaluation question is answered by answering sub-question 2.1 through 2.7. The answer is provided in the conclusions (Chapter 5).

Evaluation question 2.1
To what extent has the Regulation contributed to better coordinate the various investigations (civil, judicial, safety) into the causes of the accident?

This evaluation question will be answered by answering the sub-questions 2.1.1 through 2.1.5.

Evaluation question 2.1.1

To what extent the requirement that all Member States create an independent Safety Investigation Authority led to the expeditious holding of unbiased safety investigations?

On the "expeditious holding": According to Article 16(6), the SIA shall make public the final report in the shortest possible time and if possible within 12 months of the date of the accident or serious incident. This timeliness of reporting is a challenge for SIAs, as they cannot control the number and the complexity of accidents that must be investigated. An analysis of a sample of 104 accidents involving large aircraft (maximum take-off mass more than 5700 kg) in EU Member States between 1 January 2010 and 1 April 2016 shows that for approximately 40% of the sample the safety investigation report is realised within 12 months of the date of the accident. About 20% of the safety investigation reports required more than 2 years to complete. The average duration of an investigation of an accident involving a large aircraft is similar to that in the US.

During the interviews and the survey, staff turnover and limited number of staff were mentioned as reasons why the duration of an investigation regularly exceeds the recommended 12 months. As the investigation capacity of SIAs has altogether remained unchanged since the entry into force of the regulation (see Evaluation question 2.2), it is reasonable to conclude that Regulation (EU) No 996/2010 has not significantly influenced the length of the investigation process.

On the "unbiased": A safety investigation is unbiased if the investigation is objective in determining the causes of the occurrence being investigated and impartial, i.e. showing no prejudice for, or against, a certain person or organisation21 .The majority of the survey respondents are of the opinion that investigations are unbiased. Several interviewees mentioned that in some investigations there seems to be a strong influence from other parties, although specific examples were not mentioned. It was also recognised that any bias is very difficult to prove and therefore is unlikely to be mitigated by European Commission intervention. Independence of the SIA is a prerequisite for an unbiased investigation. The independence of SIAs is addressed in Evaluation question 2.1.2. It is concluded that Regulation (EU) No 996/2010 has not significantly influenced the impartiality of the investigation process.

Evaluation question 2.1.2

To what extent is the independence of the Safety Investigation Authorities achieved?

The independence of a Safety Investigation Authority (SIA) is used in several provisions of Regulation (EU) No 996/2010, especially in conjunction with the absence of external interference and conflict of interest[22]. The regulation, however, contains no definition[23]. Article 4(3) requires that the SIA shall have "unrestricted authority over the conduct of the safety investigation". According to Demsey[24], the essence of independence is a strict objectiveness and total impartiality. Therefore the independence of a SIA is defined as (1) being free from external interference and conflict of interest; and (2) having unrestricted authority over the conduct of the safety investigation. The last element of the definition covers unrestricted control of the use of its available resources (budget).

Being free from external interference and conflict of interest is, according to several interviewees, not only matter of functional (formal) independence which can be provided by legislation, but also a matter of mind set, culture and experience of the air safety investigators to withstand (political) pressure.

[21] Oxford dictionaries, https://en.oxforddictionaries.com/definition/unbiased.
[22] Commission Staff Working Document on the implementation of the Regulation on Safety Investigation, a targeted consultation of stakeholders, including MS and their SIAs, industry associations and accident victims and their relatives associations, Part 1 and 2, SWD (2016) 151, April 2016.
[23] See also Note on Independence – Regulation 996/2010 by M. Osiecki, DG MOVE.
[24] Dempsey, P.S. (2010). Independence of Aviation Safety Investigation Authorities: Keeping the Foxes from the Henhouse. Journal of Air Law and Commerce, 75(1), pp 223-283.

The available budget for a SIA is a delicate issue. Independence does not imply unlimited budget. On one hand it is clear that a SIA needs sufficient budget to carry out its tasks, while on the hand if a government needs to mind his expenses this could consequently also affect the budget for a SIA.

Independence of the SIAs has been achieved in almost all Member States. During this evaluation, study questions were raised regarding the lack of independence of the SIA in four Member States, including Poland. Independence of the SIAs is not achieved in Poland. Due to an amendment of the Polish Aviation Law, the Minister of Infrastructure and Construction can influence the composition of the SCAAI. Therefore, the SCAAI cannot be considered as independent. For the other Member States no evidence was provided that the independence of the SIA was indeed affected.

Regulation (EU) No 996/2010 has helped in accomplishing the independence to some extent. While a survey conducted by the Commission in the first half of 2016[25] concluded that the majority of SIAs indicated that the regulation had no practical effect on their independence, as this had already been established under Directive No 94/56/EC, in the interviews and survey it is indicated that the regulation has helped. One interviewee stated that an important effect of the regulation is that the principle of independence of accident investigations is no longer an item of discussion. At international level, ICAO introduced similar provisions, which became applicable in November 2016 through amendment 15 to ICAO Annex 13.

Evaluation question 2.1.3

Have the provisions on the protection of sensitive safety information and persons helped to improve the safety investigation?

The majority of the survey respondents are of the opinion that the provisions on the protection of sensitive safety information and persons helped to improve the safety investigation. They have helped to ensure that testimony provided during the safety investigation is not used against witnesses and that parties such as manufacturers fully contribute to the investigation.

Nevertheless, there have also been some high profile cases (Spanair[26], Germanwings[27]) where parts of sensitive safety information became public. There is also room for interpretation. There is no common understanding of how to ensure confidentiality of safety sensitive information. The necessary information flows between the many organisations involved in an accident investigation can be a concern with regard to possible unintentional leaking of information and managing those information flows requires a lot of effort. Accordingly, one fourth of survey respondents are of the opinion that the protection of sensitive safety information is not sufficiently guaranteed. It was particularly mentioned that some guidance material of the level of protection provided for 'cockpit image recordings' (Article 14(1)(g)) and other types of recordings such as the content of Quick Access Recorders (QARs), recordings from closed circuit television (CCTV), Global Positioning System (GPS), etc. is needed.

Evaluation question 2.1.4

In how far did the decisions from the National courts influence the safety investigation?

Courts in certain EU States (for instance France[28] and Spain)[29] may organise their own investigations in order to assist victims when they request compensation from the airline or other parties, which were involved with the accident.

[25] SWD(2016) 151.
[26] See CIAIAC (2009). Spanair accident report. Although the accident occurred before the regulation entered into force, i.e. under Directive No 94/56/EC and ICAO Annex 13. These regulations already contained provisions on the protection of the CVRs.
[27] See accident case 3 in annex 4.
[28] Pursuant to Art. 145 of the Code of Civil Procedure; see: Cour administrative d'appel (CAA) (Administrative court of appeal of) de MARSEILLE, 8ème chambre, decision du 24 mars 2015, n° 13MA00581.
[29] See Franscesco Rossi Dal Pozzo. (2015) EU legal framework for safeguarding air passenger rights, Springer; And Judgment of the Provincial Court of Barcelona of 7 May 2012, ECLI:ES:APB:2012:6351, and Judgment of the Supreme Court of 13 Jan. 2015, ECLI:ES:TS:2015:181, cited by Dr Hanna Schebesta, Risk

While court decisions may not directly affect the safety investigation, because the safety investigation is independent of such parallel judicial proceedings, there may be pressure from the public and the media on the SIA to share technical information with the persons involved performing parallel proceedings. The decision in Rogers v Hoyle case[30] may illustrate this tendency. The court in the UK decided that the published AAIB report should be admitted as evidence and it could "see no reasonable basis" for the suggestion that aviation people might be deterred from making statements before the AAIB in the future as they might be blamed for them, thus foregoing the safety argument. It is however not yet clear whether there is a 'tendency' as courts may take different positions in other proceedings. This issue is also addressed in Evaluation question 2.7.

Evaluation question 2.1.5
Did Advance Arrangements help to solve these problems?

The establishment of 'advance arrangements' stipulates that Member States should ensure cooperation between its accident investigation authority and judicial authorities so that an investigation is not impeded by administrative or judicial proceedings.

In some Member States, such as the Netherlands and Sweden, coordination between the accident investigation authority and judicial authorities was already prescribed in national law before Regulation (EU) No 996/2010 was implemented.

In a number of Member States, the advance arrangement has never been practically applied because there has not been a major accident since the arrangement came into force. Where applied in practise, the advance arrangements are considered be an effective way of coordinating the various investigations, according to the consulted stakeholders and shown in the Germanwings accident case. However, there have been examples where the judicial authorities were insufficiently aware of the existence or content of the advance arrangement and examples where advance arrangements were established after the accident occurred. It is therefore important that all stakeholders are aware of the advance arrangements and that the advance arrangements are reviewed regularly to ensure that they are still appropriate.

Evaluation question 2.1.6[31]:
What is the level of compliance of Member States with respect to coordination of investigations, preservation of evidence and protection of sensitive safety information?

Member States have largely complied with the requirements of coordination of investigations through the establishment of advance arrangements (see Evaluation question 2.1.5), the preservation of evidence and the protection of sensitive safety information (see Evaluation question 2.1.3).

Evaluation question 2.2
To what extent do the outcomes or observed effects in terms of high level of investigation capability in each Member State and the improvement of aviation safety correspond to the objectives?

Regulation Through Liability Allocation: Transnational Product Liability and the Role of Certification, 42(2) Air & Space Law (2017) in section 3.6 where the author states that the überlingen cases show however that Spanish courts' investigations "went beyond the Accident Investigation Report's analysis of the technology." Whereas the French decision adopted by the Administrative Court of Appeal of Marseille cited in the previous footnote refers to a confirmation by the court's investigation ('expertise judiciaire') of the SIA's investigation (BEA in France).

[30] See accident case 4 in Annex 4.

[31] In the Terms of Reference this questions was labelled as "Other". The study team found it more appropriate to put it under "Effectiveness".

The overall capacity of SIAs remained practically unchanged. Between 2012 and 2016, the number of available air safety investigators decreased 3.36% from 238 FTE in 2012 to 230 FTE in 2016.

The SIAs vary greatly in size according to an analysis of available air safety investigators (in FTE) in 2012 and 2016. Table 3 below gives a summary of the different sizes of the SIAs for 2016. Half of the SIAs have 5 or less FTE air safety investigators available. Five (18%) SIAs have only 1 FTE.

Table 3: Distribution of sizes of SIAs according the number of air safety investigators (in FTE) estimates of 2016

Size of the SIAs	Number of SIAs
Small (5 or less FTE)	14 (50%)
Medium (6 to 10 FTE)	9 (32%)
Large (more than 10 FTE)	5 (18%)
Total	**28**

The budget for the SIAs also remained unchanged. Of the 22 SIA, respondents to the survey 76% answered that the change in budget between 2010 and 2017 was between -5% and +5%. Four SIA's (19%) reported a decrease of more than 5%. One SIA (5%) reported an increase of more than 5%. From the survey and the interviews, it is concluded that for the majority of the SIAs the amount of resources are sufficient (but could of course always be more). For some the small SIAs (especially SIAs with only one air safety investigator) it has been reported that the resources are insufficient for their normal activities.

One SIA respondent added that "if we consider the incidents and accidents that happened in that period, [the budget] is sufficient. If we are talking about the potential to investigate if something large happened, then the answer would be disagree". This observation is in line with the results from the interviews. In several interviews, it has been questioned if small SIAs can deliver sufficient high quality investigation capability in case of a major accident. A major accident will have much more impact and different dynamics than a "normal" accident, in terms of media attention, judicial investigations, political pressure etc. The interviewees agree that the small Member States in terms of aviation activities cannot size a SIA based on a major event, but only based on typical events that occur. In order to accommodate a major accident, the SIA should collaborate with other SIAs. The collaborations could be established via agreements.

One third of the respondents to the survey indicated that there have been safety investigations that were of insufficient quality. Concerns were mentioned regarding lack of specific domain knowledge, lack of transparent methodology, lack of resources, lack of training, lack of experience and insufficient quality in analysing. However, no specific investigations were mentioned by the respondents of the survey or the interviewees.

According to the interviewees, the quality of the safety investigations across Europe has improved. It is believed that the regulation and the activities of ENCASIA have helped to improve the quality. This is mainly due to training of investigators, sharing of best practises, collaboration between SIAs and obtaining a better understanding what the main difficulties are during a major accident. The improved quality of the safety investigations has also an impact on the derived safety recommendations. Better safety recommendations resulted in a higher likelihood that the safety recommendations are implemented.

Evaluation question 2.3

Has the Regulation led to any unexpected effects?

The large majority of the respondents to the targeted survey stated that there were no unexpected effects or they don't know. During the interviews no unexpected effects were reported.

Unexpected negative effect reported in the targeted survey involves the incorrect interpretation or understanding of the text. For example in one Member State national rules to comply with Article 21 (on assistance to victims of air accidents) resulted in delayed response capability of air safety investigators as assistance to victims required resources from the SIA.

An unexpected positive effect reported by another respondent in the targeted survey is that the regulation has brought the debate on just culture into mainstream.

Evaluation question 2.4
To what extent the ENCASIA Network contributed to the strengthening of the coordination role of Safety Investigation Authorities?

ENCASIA is considered by the interviewees and the respondents of the survey to be one of the most effective elements that were brought by the regulation. The Network has strengthened coordination between the SIAs as it provides a platform for SIAs to cooperate and exchange information and experiences according to the majority of the interviewees and respondents of the survey. ENCASIA had a large influence by introducing a common doctrine, establishing communication and the introduction of SRIS. In one of the interviews, it was indicated that sometimes the work in the working groups goes slowly because the core activities of the SIAs have priority, but the working groups are doing an excellent job for standardisation and harmonisation.

ENCASIA concerns all Member States bounded by Regulation (EU) No 996/2010. Therefore, it is considered by the interviewees as "stronger" than the ECAC-ACC platform and provides the possibility to formulate a shared opinion concerning specific EU issues.

Evaluation question 2.4.1
To what extent have the ENCASIA Network Peer Reviews contributed to improve safety investigations?

As of April 2017, 16 Member States have been peer reviewed. The results of first series of peer reviews were kept internal to build trust. Member States were concerned that serious repercussions could follow if the peer review identified shortcomings. ENCASIA expects that in the next round some results will be shared with the Commission and even be published. The participating Member States appreciate the concept of peer reviews because it is not enforced as a formal audit. According to the participating Member States, the peer reviews have helped to bring them at the same level by identifying shortcomings in the implementation of the regulation and sharing best practices. These improvements will lead to better safety investigations.

Evaluation question 2.4.2
To what extent have the ENCASIA Network joint trainings contributed to improve safety investigations?

As of April 2017, 58 air safety investigators have been trained in the context of the ENCASIA network. ENCASIA joint trainings harmonize and promote best practices in accident investigation across Member States. The trainings have contributed to reinforce formal and informal cooperation and exchange of information between SIAs. This will therefore lead to better safety investigations.

Evaluation question 2.5:
To what extent has the EU Safety Recommendation database led to the identification of issues of Union wide relevance?

Based on an analysis of the SRIS database, in the period 2012 – 2016 on average 161 Safety Recommendations per year of Union wide relevance (SRUR) and/or Global concern (SRGC) were identified. It should be noted that a safety recommendation can be both SRUR and SRGC.

The fields for SRUR and SRGC were only introduced to SRIS in 2016. Therefore, any safety recommendation that predates 2016 may not necessarily have the SRUR/SRGC flagged when it should. Only a few Member States are retrospectively looking at this. Therefore, the statistics should be treated with care.

In the accident, cases that were analysed (see Annex 4) a number of SRURs and SRGCs have been identified. A large majority of the respondents to the targeted survey agreed that safety recommendations from other EU SIAs are relevant for their work. This indicates that certain

safety recommendations indeed have a Union-wide relevance.

Within ENCASIA, Working Group 6 (WG6) is dedicated to Safety Recommendations. As one of their tasks, they have been working on harmonising the way Safety Recommendations are formulated and handled across the Member States. Another task involves the improvement of the analysis of the content of the database with a view to identifying important Safety Recommendations of union-wide relevance as required by Article 7(3)(g) of Regulation (EU) No 996/2010. Guidance was developed on the formulation of Safety Recommendations and the identification of Safety Recommendations of Union-wide relevance (SRUR).

According to the interviews, SRIS and the work of ENCASIA WG6 has helped to improve the identification of Safety Recommendations of Union-wide Relevance.

Evaluation question 2.5.1:
Have the deadlines for issuing the safety report and following up the safety recommendations and follow-up been met?

The timeliness of safety investigation reports has been analysed in Evaluation question 2.1.1. There it is concluded that the timeliness of reporting is a challenge for SIAs, as they cannot control the number and the complexity of accidents that must be investigated. An analysis of a sample of 104 accidents involving large aircraft (maximum take-off mass more than 5700 kg) in EU Member States between 1 January 2010 and 1 April 2016 shows that for approximately 40% of the sample the safety investigation report is released within 12 months of the date of the accident.

An analysis of the SRIS database over the period 2010 – 2016 shows that average response time is longer than 90 days, but the trend shows an overall improvement towards the 90 days. However, for almost 50% of the safety recommendations, no response has been provided.

The analysis of the SRIS database shows also that 49% of all safety recommendations are open. This could be an indication that there is a delay in following up safety recommendations. However, the "open" and "closed" status usage on SRIS should be handled with care as there is not a standard for this, nor is there a requirement in the regulation to "close" a recommendation.

During the interviews, the issues were raised regarding when to close a safety recommendation and when is the response considered "adequate". There are some differences in the assessment of the responses. Some SIAs close a safety recommendation only if all the actions have been completed. Others close a safety recommendation if there is no (further) response from the addressee to be expected. This happens for instance when the action plan is agreed, but some actions can still be open because they could take years to complete. Also the term "response is adequate" is a confusing term for the public. Currently, these items are being discussed within ENCASIA WG6.

Within ENCASIA WG6, guidance has been developed on the formulation of safety recommendations. These guidelines in combination with an improved quality of the safety investigation lead to better safety recommendations. In the interviews and the workshop it has been argued that better safety, recommendations result in a higher likelihood that the safety recommendations are implemented.

A majority of the respondents of the survey agreed that the regulation proved to be of added value regarding the formulation of safety recommendations and a majority also agreed that the regulation helped in the follow-up of the safety recommendations. In an interview, it was concluded that also the 90 days response time has improved over the years.

The overall conclusion is that the regulation and the activities of ENCASIA have helped in following up the safety recommendations.

Evaluation question 2.6:
What improvements have been made with regard to establishing civil aviation accident emergency plans at national level?

On 31 January 2014, the European Commission held a workshop on the establishment of civil aviation accident emergency plans at national level. The workshop concluded that a number of Member States have difficulties establishing an emergency plan at national level. The difficulties experienced by the Member States are mainly due to the following factors (in isolation or combination):

- National emergency plans are strongly linked to the administrative structure of Member States. For Member States structured around regions, the coordination of a unique plan or of consistent plans at regional level is very challenging;
- The establishment of the plans requires the involvement of many different actors belonging to various institutions, with sometimes different perspective and objectives;
- Factors such as geographical location and language barrier can become challenges when the authorities should deal with victims and their relatives with various nationalities and backgrounds, in particular in the case of a large commercial air transport accident.

It was concluded that there is a need to develop guidance for the establishment and content of national emergency plans, but so far such guidance material has not been established. Results for the survey indicate that 27% of the respondents (9) are of the opinion that national civil accident emergency response plans have not been sufficiently developed and implemented.

The speed of communication that is established when the emergency plans are executed is much slower than that of social media. Speculation emerges quickly on social media. Victims and their relatives may therefore have the perception that emergency plans do not work. These evolving communication landscapes are something to consider in the future.

There has been a lot of progress in resolving the problems and challenges concerning assistance to victims and their relatives, and Regulation (EU) No 996/2010 kick-started this progress. Due to Regulation (EU) No 996/2010 there is a greater focus in the beginning of any investigation on adequately informing victims and their families. The appointment of a national contact person responsible for communication with victims' families is a clear benefit from the regulation. How the national contact persons engage in the process and how victims are supported varies somewhat from Member State to Member State.

Evaluation question 2.6.1:
Are there any difficulties in the process of establishing the list of passengers and then comparing it to the list of victims?

On the question if the national emergency plans sufficiently describe the requirements on obtaining passenger lists and comparing it to the list of victims, half of the survey respondents could not answer the question. Of the respondents that could answer it 11 (46%) agreed and 4 (17%) disagreed. However, a majority could not answer the question if this has led to any problems or stated that there have been no major investigations in which obtaining the list of passengers was an issue.

The accident of Malaysian Airlines Flight MH17 made it clear that the passenger list that was available immediately after the crash of flight MH17 was not sufficient to establish who was on board the aircraft[32]. To this end, Malaysia Airlines first had to retrieve additional information about the passengers, such as their nationality and date of birth, from the underlying registration systems. Since the related information had not been entered for all passengers, this took some time to obtain. In their report, the Dutch Safety Board also describes that the bottlenecks in the collection and verification of passenger information were not new and were described previously in relation to a crash of a Turkish Airlines aircraft near Amsterdam in 2009.[33] According to the Dutch Safety Board, this situation could be improved if the airlines were to record the nationalities of all passengers in the system that provide passenger information in the event of an aircraft accident.

Evaluation question 2.7:
What are the National practices and legal constraints for handling confidential

[32] Dutch Safety Board (2015). MH17 Passenger Information.
[33] Dutch Safety Board. (2010). Emergency assistance after Turkish Airlines incident, Haarlemmermeer, 25 February 2009.

safety information (e.g. CVR, witness statements, medical data)?

In some Member States the public prosecutor has custody of sensitive safety information (and the SIA can have access), while in other Member States the SIA has custody of sensitive safety information over the data and the public prosecutor can have access. According to the interviewees, this did not lead to any problems. The majority of survey respondents are of the opinion that confidential safety information is sufficiently protected in their country see Table 4 below.

There are differences across Europe regarding the use of safety investigation reports in judicial investigations. The difference between the different Member States and the implications thereof are understood insufficiently.

Table 4: Percentage of respondents to the survey agreeing that the information is sufficiently protected differentiated per type of information

Type of information	Percentage of respondents agreeing that data is sufficiently protected
Names of persons involved	91% (40 of 44)
Medical information	89% (39 of 44)
Witness statements	84% (37 of 44)
CVR data	83% (35 of 42)
FDR data	79% (34 of 43)

5.3 Efficiency

Evaluation question 3:
Have resources and costs incurred been proportional to the results achieved?

The answer to this question is based on the answers to Evaluation questions 3.1, 3.2 and 4 and an analysis of monetary benefits due to an increased safety.

The benefits of the regulation are the result of a decrease in the risk of aviation accidents due to improved safety recommendations. Assuming a Value of a Statistical Life (VOSL) of € 2.1 million, the monetary benefit of fatalities prevented in Europe since 2010 due to improved aviation safety amounts to €143 million per year for commercial air transport, €59 million per year for general aviation and €202 million for commercial air transport and general aviation combined.

The costs for Regulation (EU) No 996/2010 were estimated at € 6.3 – 7.7 million for the period 2011-2017 as summarised in table 5, i.e. an average of € 1.1 million per year. This means that the benefit/cost ratio on annual basis of the Regulation is greater than 1 if more than 0.55% of all prevented fatalities due to improved aviation safety can be attributed to the regulation.

The consulted SIAs during this evaluation study indicate that the benefits indeed outweigh the costs, and expect that this will remain the case in the future.

Table 5: Summary of costs per stakeholder category for the period 2011-2017

Stakeholder category	Costs (€)
European Commission	1.9 million
Member States	1.4 million

Stakeholder category	Costs (€)
SIAs	3.2 million – 4.7 million
Airlines	Negligible[34]
Total	**6.3 – 7.7 million**

Evaluation question 3.1:
Are the means provided by the Commission sufficient to support MS cooperation?

The Commission has provided support aimed at supporting member state cooperation in the field of aviation accident investigation, mostly focusing on the ENCASIA Network. This support has taken various forms, such as grants, secretarial support, translations as well as provision of trainings, assistance during ENCASIA meetings, and the development and maintenance of a dedicated ENCASIA website and SRIS database. In total, quantifiable Commission support for Member State cooperation amounted to € 1.9 million in the period 2010 – 2017.

A majority of SIAs, the main beneficiaries of this support, indicate this is sufficient to support ENCASIA's various activities and to facilitate Member State cooperation; there were 2 SIAs (9%) hat indicated the Commission support was insufficient for the preparation of the annual report. At the same time, when focusing solely on the Commission's grants specifically, no conclusion can be drawn on their sufficiency: a large segment indicates the grants were sufficient, whereas there is also a large segment arguing the opposite (although it is noted those who disagreed indicated they 'somewhat' disagreed, while none strongly disagreed that grants were sufficient).

It should be kept in mind that cooperation between Member States has indeed increased significantly and that substantial benefits have been derived from it.

Evaluation question 3.2:
Could other means of support deliver better support?

As indicated in the answer to the previous Evaluation question 3.1, current support is deemed to be sufficient by a majority of the stakeholders. Most suggestions for improvement in Commission support relate not to alternative means of support, but amount to an extension of the current means of support. For example reimbursing travel to ENCASIA meetings for more than one SIA representative, and reimbursing accommodation costs and daily allowances.

At the same time, some suggestions have been made for alternative means of support. Further integration and formalisation of the ENCASIA Network could be considered as a way to economise resources, where an ENCASIA board composed of SIA members could lay out the ENCASIA strategy and act as a support organisation for various national (or potentially regional) SIAs. Such board could be a formal organisation structure with statutes, structural budget and staff (which may be seconded from SIAs). In the same vein, a permanent ENCASIA Network office in Brussels could be created as a way to further institute and formalise the ENCASIA Network.

Although these suggestions would merit further consideration, it should be noted that this study has not found an express wish either in favour or against these ideas.

On the basis of the evidence collected, it is considered that alternative means of support would not deliver better support, but that alternative means of support could be considered to complement them. Alternatives could in any case be considered keeping in mind that long-term sustainability of depending on large Commission grants for support is questionable.

Evaluation question 4:
Have the attributable costs to different stakeholders been proportionate?

[34] Airlines representatives have indicated in a separate interview that the main 'cost category' for them – providing information to victims and families – was already an obligation under the ICAO guidelines and thus does not represent an additional cost as such.

To answer this question of proportionality, the total costs and benefits need to be taken into account. Total costs for all stakeholder categories have been estimated at a range of € 6.3 – 7.7 million in total for the period 2011-2017, including the costs for additional administrative tasks (see Evaluation question 5 below). The benefits of the regulation are the result of a decrease in the likelihood of aviation accidents due to improved safety recommendations. It is known that a single aviation accident with a commercial airliner can easily amount to a few hundred million euros in case of many fatalities.[35] Overall the conclusion is that the benefits of Regulation (EU) No 996/2010 have outweighed the costs.

From the analysis, it becomes clear that the benefits of improved safety largely accrue to passengers, airlines and society as a whole, while the costs are borne by the European Commission and Member States. These are stakeholders who together represent European societies and whose mission it is to provide goods for the public interest.

Therefore, it can be concluded that the costs have indeed been distributed proportionally to the benefits incurred across stakeholders.

Evaluation question 5:
Which additional administrative tasks have been generated by the Regulation?

Based on a review of the regulation and on inputs from the survey and interviews, the additional administrative tasks have been identified:

- Preparing advance arrangements;
- Developing procedures of recording responses to safety recommendations and implementing these;
- Developing plans to provide assistance to victims and families;
- Recording safety recommendations and responses in SRIS database;
- Preparing ENCASIA meetings, organising travel;
- Peer reviews;
- Plans and programmes for training, which have to be accepted by the national civil aviation authorities.

The tasks "Developing procedures of recording responses to safety recommendations and implementing these" (second item) and "Recording safety recommendations and responses in SRIS database" (forth item) are considered administrative burden as per the definition in the Better Regulation Guidelines[36]:

These tasks have mostly incurred additional work for SIAs. The total costs incurred by SIAs amounts to €3.3-4.7 million for the 2011-2017 period.

5.4 Coherence

Evaluation question 6:
To what extent is the intervention coherent with the EU Aviation Safety Policy and regulations? Are there any gaps, overlaps or inconsistencies?

A comparison of the study team of Regulation (EU) No 996/2010 with Aviation Safety Policy and the relevant EU regulations as listed in Annex A did not identify any incoherence. Additionally, a large majority of the respondents to the survey agreed that Regulation (EU) No 996/2010 is coherent with the Aviation Safety Policy and EU regulations. Only Regulation (EU) No 376/2014 led to a lack of harmonisation. This question will be further answered by answering the sub-questions 6.1 through 6.5.

[35] See Ecorys, NLR et al, Aviation Safety Improvement using Cost Benefit Analysis (ASICBA) reseach study, FP6 project No 12242, and for an estimation of the costs of aviation accidents in the US http://www.sciencedirect.com/science/article/pii/S0965856412001577.

[36] Administrative costs are defined as the costs incurred by enterprises, the voluntary sector, public authorities and citizens in meeting legal obligations to provide information. The administrative burdens stem from the part of the process, which is done solely because of a legal obligation.

Evaluation question 6.1:
To what extent is the intervention coherent with EU Aviation Safety Policy, and in particular to Regulation 216/2008?

The evaluation did not identify incoherence with the EU Aviation Safety policy.

In principle, Regulation (EU) No 996/2010 is coherent with Regulation (EC) No 216/2008 (the Basic Regulation), although the latest revisions have raised a concern. Article 5 of Regulation (EU) No 996/2010 mandates the investigation of every accident or serious incident involving aircraft other than specified in Annex II of the Basic Regulation. The latest revision would also mandate the investigation of accidents and serious incidents of drones. ENCASIA has formulated an opinion in 2015 to allow flexibility in the investigation of drones (and manned aircraft with a MTOW of less than 2250kg). Although this is not incoherence per se, it is questioned whether the implication is in line with the intentions behind Regulation (EU) No 996/2010. Currently, the alternative text formulated in the ENCASIA opinion has been incorporated in the revision of the Basic Regulation. The revision of the Basic Regulation has not been completed.

Evaluation question 6.2:
To what extent is the intervention coherent with other EU instruments?

No incoherence with other regulations was identified, except for a perceived lack of harmonisation between Regulation (EU) No 376/2014 and Regulation (EU) No 996/2010.

Accidents and serious incidents, as defined within Regulation (EU) No 996/2010, are to be reported under Regulation (EU) No 376/2014 (Article 2(7)). It means a double reporting could be required in a situation where a person is subject to mandatory reporting obligations in accordance with Regulation (EU) No 376/2014. The SIAs perceive a lack of harmonisation between Regulation (EU) No 376/2014 and Regulation (EU) No 996/2010.

There are several aspects here:

- For the reporter – Regulation (EU) No 376/2014 contains the occurrences (including accidents and serious incidents) that shall be reported through the mandatory reporting systems[37] to the competent authority established by Regulation (EU) No 376/2014. In the majority of the cases, the SIA is not that competent authority. In addition, if the reporter considers that the occurrence is a serious incident or an accident, the reporter must report to the SIA as well under Regulation (EU) No 996/2010 article 9. Moreover, for reporters of an incident, it may not be obvious whom to report to as they might not be able to determine whether an incident is serious or not;
- For the SIAs – The SIAs have concerns that if occurrences are classified as representing a significant risk to aviation safety by the competent authority under Regulation (EU) No 376/2014, this would mean that there are considered as 'serious incidents', hence the SIA's obligation to investigate would be subject to a classification by another competent authority. Strictly speaking, this concern is not justified, as the safety risk classification of occurrence reports in Regulation (EU) No 376/2014 does not define what is a serious incident or accident. Another issue for the SIAs is that serious incidents and/or accidents could be reported only to the competent authority under Regulation (EU) No 376/2014 and not to the SIAs.

Hence, people should be aware of the different reporting channels. Member States are responsible for an appropriate set up of the national reporting systems to allow the authorities to be aware of the information and to cope with their respective duties. Effective coordination between the competent authority under Regulation (EU) No 376/2014 and the SIAs is deemed necessary.

Evaluation question 6.3:
In how far was the Regulation coherent with other rules on protecting data and human rights?

[37] Not all occurrences are to be reported and not everybody is subject to the mandatory occurrence reporting system. This information can be found in Regulation (EU) No 376/2014.

The first question that must be addressed in this context is whether the provisions of the regulation must comply with human rights and data protection as the subject of the regulation is a very specific one, allowing for divergences from the general rules, because of reasons of protecting public order and aviation safety. The regulation focuses on aviation safety, but leaves it to the laws of Member States to set a balance between the two objectives, as to which see in particular Article 14(3) of the regulation on the disclosure of safety sensitive information.

For instance, Sweden knows a Freedom of Information legislation, which comes under constitutional provisions of that country. Thus, judicial authorities may obtain evidence from investigation and data laid down in the SIA reports. In practice, the final report of the SIA can be used for the prosecution of crimes. Sweden is a country in which the issue of matching the 'safety culture' with the protection of human rights and data is illustrated in the most articulated fashion.

In 2016, the EU has adopted the General Data Protection Regulation, and the Passenger Name Record (PNR) directive, integrating the privacy legislation in these instruments. The objective of this new set of rules is to give citizens back control over their personal data, and to simplify the regulatory environment for business. This point is, among others, the subject of Opinion (1/15) of the CJEU requested by the European Parliament concerning the compatibility of the preservation of with EU treaties and the EU Charter of Fundamental Rights, especially Articles 7 and 8 on the right to privacy and data protection. The decision of the European Court is expected to be given on 26 July 2017[38].

Up to now, there have been no incoherencies found with other rules on protecting data and human rights.

Evaluation question 6.4:
In how far do the provisions of the "solidarity clause" (Art.222 TFEU) address the authorities cooperation, in particular with regard to civil protection?

The solidarity clause only marginally affects the provisions on cooperation between SIAs of different Member States. Article 222 TFEU concerns the duties of the EU rather than those of the Member States. It would seem that Member States do not even have to undertake their 'best efforts' to provide mutual assistance when a disaster arises.

The next question is whether an aviation accident can be qualified as a disaster as meant in Article 222 TFEU. This could be the case in specified but not all instances.

Furthermore, Council Decision 2014/415/EU on the arrangements for implementation by the Union of the solidarity clause employs a relatively restrictive language when it comes to the duties of the Member States in respect of demonstrating solidarity. Thus, the solidarity clause as interpreted and elaborated in the Council Decision 2014/415/EU has basically a complementary nature – supplementing the existing special provisions, such as those of Article 6 of Regulation (EU) No 996/2010.

This is not to say that the solidarity clause has no added value at all, that is, added to the commitments which EU States have undertaken in Article 6 of Regulation (EU) No 996/2010. Hence, it could be relied on because of its "inspirational value" as it makes clear that the challenges can only be overcome by showing solidarity. This conclusion is also supported by the obligation of mutual assistance drawn up in Article 4(3) of the Treaty on the European Union, underpinning intra-EU solidarity.

Evaluation question 6.5:
To what extent is the intervention coherent with other EU instruments with regard to safety and security possible overlaps?

[38] http://curia.europa.eu/juris/document/document.jsf?docid=193216&doclang=EN.

Interviewees have been asked if they are aware of any EU instruments with regard to safety and security possible overlaps with which Regulation (EU) No 996/2010 is not coherent. No indications were received on any incoherencies with other EU instruments with regard to safety and security possible overlaps.

5.5 EU added value

Evaluation question 7:
What does the Regulation add to the work on accident investigation being done by the Member States either individually and within the context of Member States' obligations under ICAO?

Regulation (EU) No 996/2010 has positively added to the work that was being done by Member States on accident investigations, either individually or within the context of their obligations under ICAO Annex 13 and/or the existing regulatory framework at EU level (i.e. Directive 94/56/EC). The European added value of Regulation (EU) No 996/2010 is generated in three main ways: (1) through the introduction of additional or new requirements in the regulation, (2) through the provision of additional clarification on requirements or roles in the existing Community legislation, and (3) by giving legal force to certain Standards and Recommended Practices of ICAO (SARPs). On the latter point, while States must implement the ICAO SARPs in their national laws in order to give them legal force, ICAO does not have enforcement powers. The EU regulation fulfils a very useful role in this respect, as certain SARPs are now embedded in the regulation, and have thus received legal force in the EU Member States as Regulation (EU) No 996/2010 is directly applicable in the Member States and can be enforced by the European Commission in case of non-compliance. In this respect, the EU regulation is designed to achieve harmonisation of the SARPS on the EU level.

The European added value results from a combination of factors, namely: enhanced legal certainty on the status of certain ICAO provisions as well as the role of the different actors in the event of an accident or serious incident, in particular the EU Commission, EASA and judicial authorities; gains from coordinated knowledge sharing and pooling of resources; and greater effectiveness of the safety investigation actors, procedures and outputs (i.e. safety recommendations). The positive effects of the various mechanisms are generally larger for Member States that did not have such well-established cooperation procedures, investigation processes and/or which did not have a sufficiently independent accident investigation bureau in place prior to Regulation (EU) No 996/2010.

The main benefits of European value, which would not have materialised under a counterfactual scenario, are summarised below for each of the five problem areas:

<u>Investigation capabilities</u>
ENCASIA reinforces the coordination role of SIAs in a European context by building on the previously existing cooperation between such authorities, and their available resources, through peer reviews, training activities and knowledge sharing. No such networks with a European focus existed in the counterfactual scenario. These activities, which are supported by the European Commission, will generate long term added value in the form of higher investigation capacities throughout the Union.

<u>Tensions with other proceedings</u>
The provision obligating States to establish advance arrangements implements Recommendation 5.4.4 of Annex 13 of ICAO, which recommends that States should ensure cooperation between its accident investigation authority and judicial authorities so that an investigation is not impeded by administrative or judicial proceedings. The EU has therefore enhanced the legal status of the respective ICAO provision with the implementation of Article 12(3) in the regulation. The same applies to the implementation of Standard 5.12 of ICAO Annex 13 in Regulation (EU) No 996/2010 concerning the protection of sensitive safety information. The safeguard is not absolute, however, and questions remain as to the scope and application of Article 14 in practice (see Evaluation question 2.1.5).

<u>Unclear role of the Community in safety investigations</u>
EASA certify and approve products and organisations and provide oversight for certain fields in aviation. Therefore, they foresaw a role for themselves within safety investigations. Article 8 of

the regulation provides clarity as to the role of EASA as well as CAAs in safety investigations. The ICAO regime is addressed to States without legal articulation as to the contributions from international organisations such as the EU and its bodies. Therefore, the provision establishes and clarifies the role of the Community in safety investigations and it works in practise according to the consulted stakeholders.

Weak implementation of safety recommendations

The regulation enacts more stringent requirements on the follow-up of safety recommendations, while also ensuring that the requirements are consistent with the latest edition of ICAO Annex 13 at the time the regulation was adopted. The provision offers greater clarity and accountability regarding the safety recommendation process than existed previously. In addition to the added clarity, the added value of Article 18 stems from the fact that ICAO has no enforcement powers, therefore the provision(s) gives legal force to the ICAO norms.

The regulation also established the SRIS database (Article 18(5)), which is the instrument for identify safety recommendations with Union-wide relevance. Despite divergent levels of implementation and access restrictions, the Union dimension of the instrument creates European added value compared to what is achieved in the counterfactual scenario.

Victims assistance

The assistance provided to victims of accidents and their relatives after such accidents is not dealt with under the ICAO regime and it was not previously addressed at the Community level. The inclusion of specific provisions in the current regulation created new areas of potential benefit to be realised by relevant stakeholders compared to what would have been achieved in the counterfactual scenario.

Another important added value of the regulation is more future-oriented: the functional separation of accident investigations is no longer in dispute or under discussion. That is, it is openly agreed that different government bodies have different investigation objectives and issues to investigate. In the long-term, the regulation makes clear the position and role of safety investigations vis-à-vis other proceedings, and thus making the very question a non-issue.

Evaluation question 8:

What is the relevance of this Regulation for the EU safety environment, in particular as regards to the role of EASA and the aviation industry?

The regulation appropriately clarified the role of EASA in accident investigations, enabling EASA to participate in the safety investigations and to advise the investigator-in-charge and/or the accredited representatives. This is widely considered a positive development compared to the previous situation. Aviation community representatives (manufacturing, airlines) have suggested that EASA's involvement could be further strengthened to make the investigation process, including the resulting safety recommendations, more efficient and effective (respectively).

Regarding CAAs, a majority of States consider that the regulation did not lead to any change in the role of CAAs, which was already well defined in the national regulatory frameworks. Consequently, the regulation generally had no impact on the nature of cooperation between CAAs and SIAs. The same finding applies to aviation community representatives, whose role was already considered to be clearly defined in national legislations.

Stakeholder feedback, combined with evidence from the case studies, shows that the involvement of the State of Design and Manufacture (as required by Article 10), along with their technical advisor(s), throughout the entire investigation process has a strong positive impact on the quality of the investigation and its outcomes. Specifically, the expertise of these actors leads to more complete descriptions and understanding of aircraft system behaviour, and consequently, contribute to more accurate and effective recommendations. It can be concluded that the involvement of EASA, as well as industry representatives acting as technical advisors (albeit, the latter already well-established in many States prior to the regulation) positively impacts the EU safety environment.

6 CONCLUSIONS

The main conclusion is that the various stakeholders consulted during the evaluation are of the opinion that the combination of co-regulation and voluntary cooperation measures required by the Regulation (EU) No 996/2010 led to better safety investigations, resulting in improved aviation safety. ENCASIA, in which the SIAs of most Member States are actively participating, is considered to be one of the most effective elements that were brought by the regulation. The general consensus is that the regulation has led to a substantial improvement. However, there is still room for further enhancement of safety investigations by strengthening the role of ENCASIA and by improving the implementation of the regulation at Member State level.

The main conclusion is substantiated by a conclusion for each of the five evaluation criteria.

Relevance

The combination of co-regulation and voluntary cooperation measures required by the regulation at the time are generally still relevant and appropriate to the initial needs. These were to be addressed by the regulation, namely to resolve the following five problems:

1. lack of uniform investigation capability;
2. tensions between safety investigations and other proceedings;
3. unclear role of the Community (EASA) in safety investigations;
4. weakness in implementation of safety recommendations; and
5. insufficient assistance to the victims of air accidents and their families, including difficulties to quickly obtain complete passenger lists.

New needs are related to drones and cyber-related attacks.

Whether the investigation of accidents involving drones will become a task for SIAs is under consideration. Due to the potential amendment of the Basic Regulation and the point of view that Regulation (EU) No 996/2010 should remain aligned with the Basic Regulation, it has been proposed via an ENCASIA opinion to allow flexibility for the SIAs in the decision whether or not to investigate an accident involving drones in order to allocate the resources of the SIA most effectively.

While it is not in the competence of the SIA to investigate aviation accidents involving cyber related attacks, it is important that SIAs have sufficient expertise to determine as to whether a cyber-attack has occurred. However, currently this expertise is missing (see Recommendation 2).

Effectiveness

Aviation safety is improved by providing high quality unbiased safety investigations which leads to useful safety recommendations that are implemented as soon as possible. A high quality unbiased investigation also leads to valuable discussions on safety issues within the European aviation community and lead to relevant changes that are not a direct result of a specific safety recommendation.

To ensure a high quality unbiased safety investigation capability throughout the EU, it is prerequisite that the SIAs are independent, have sufficient skilled air safety investigators available and are provided with an adequate budget to perform their tasks.

Independence of the SIAs has been achieved in almost all Member States. During this evaluation, study questions were raised regarding the lack of independence of the SIA in four Member States. In only one of those cases, supporting evidence shows that there is a lack of independence.

Although independence had already been established in most Member States prior to the entry into force of the regulation, the added value of the regulation is that the principle of independence of accident investigations is no longer in dispute or under discussion. At international level, ICAO introduced similar provisions, which became applicable in November 2016 through amendment 15 to ICAO Annex 13.

The SIAs vary in size in terms of number of air safety investigators throughout the EU. Half of

the SIAs have five or less investigators and five SIAs have only one investigator. Since the entry into force of the regulation, the number of investigators and the available budgets remained unchanged. For most SIAs, the amount of resources is considered to be sufficient for their normal activities, although for some small SIAs, it has been reported that the resources are insufficient.

Results from this evaluation indicate that not all SIAs can organise sufficient high quality safety investigations in case of a major accident. Especially since a major accident will have more impact and different dynamics than a "normal" accident in terms of media attention, judicial investigations, political pressure etc. ENCASIA has helped preparing smaller SIAs for major accidents by accommodating the collaboration between SIAs and by sharing experiences and lessons learned from major accidents that happened. While, it is believed that this in an important initiative, it might however not be sufficient to fully reach the goals of the regulation (see Recommendation 3).

ENCASIA has a large influence by strengthening the coordination between the SIAs and by introducing common practices. This has been achieved through plenary discussions, results from the various working groups, forming of opinions, sharing of experiences and lessons learned, issuing guidelines, performing peer reviews and training of air safety investigators. It is important that work of ENCASIA can be continued or even intensified. Currently, ENCASIA activities are supported through a grant from the EU, which covers a significant share of the costs involved, the rest being contributions in kind from SIAs. The annual decision to allocate the requested grant is not a sustainable financial structure because it does not guarantee a long term financial basis and a solution needs to be found to ensure the required budget for ENCASIA activities in a longer term future (see Recommendation 1).

The quality of the safety investigations has improved across Europe through the regulation and the work of ENCASIA. The improved safety investigation reports and safety recommendations have a positive impact on safety. Better safety recommendations lead to a higher probability that they are actually being implemented. The average response time to safety recommendations is improving although average response times are still longer than the required 90 days.

Advance arrangements are a pragmatic way to arrange the cooperation between SIAs and the judicial authorities so that a safety investigation is not impeded by administrative or judicial proceedings. The advance arrangements enable Member States to accommodate the different national law systems. In several Member States, the advance arrangements have never been practically applied because there has not been a major accident since the arrangement came into force. Where it has been practically applied, it is considered be an effective way of coordinating the various investigations, albeit that there have been examples where the judicial authorities were insufficiently aware of the existence or content of the advance arrangement or arrangements were established at the last moment. It is therefore important that stakeholders, and in particular the judicial authorities, are familiar with the advance arrangements and that they are regularly reviewed (see Recommendation 4).

The provisions on the protection of sensitive safety information and persons helped to improve the safety investigation. Nevertheless, there have also been some high profile accidents (Spanair, Germanwings) where parts of sensitive safety information became public. The provisions on the protection of sensitive safety information leave some room for interpretation, which is an unwanted situation that needs to be addressed (see Recommendation 5).

Member States are actively participating in ENCASIA and have largely complied with the requirements of coordination of investigations (Article 12), preservation of evidence (Article 13) and protection of safety sensitive information (Article 14) through the establishment of advance arrangements.

There are differences across Europe regarding the use of safety investigation reports in judicial investigations and the subpoenaing of air safety investigators. It is unclear however if this has any consequences on the quality of safety investigations. Therefore, it is worthwhile to investigate the different practises across the Member States and the implications thereof by conducting a comparative study (Recommendation 6).

National emergency plans have not been fully implemented in all Member States. There is a need to have guidance for the establishment and content of national emergency plans. There has been some progress in resolving the problems and challenges concerning the assistance to

victims and their relatives and Regulation (EU) No 996/2010 kick-started this process. However, the MH17 accident made it clear that the problems of obtaining sufficient information to determine who was on board the aircraft still exist (see Recommendation 3).

Efficiency

Benefits of Regulation (EU) No 996/2010 consist of an improved safety environment due to better cooperation between the SIAs and better safety recommendations. Although these benefits are difficult to quantify, a rough calculation considering only fatal accidents shows that the benefit/cost ratio on annual basis of the regulation is greater than 1 if more than 0.55% of all prevented fatalities due to improved aviation safety can be attributed to the regulation. In that case the benefits of Regulation (EU) No 996/2010 outweigh the costs.

The stakeholders consulted in this evaluation that are of the opinion that the resources and costs incurred due to the regulation have been proportional to the results achieved and that the benefits outweigh the costs.

Coherence

The regulation is coherent with the EU Aviation Safety Policy and no incoherence with other regulations was identified, except for a perceived lack of harmonisation between Regulation (EU) No 376/2014 and Regulation (EU) No 996/2010. Accidents and serious incidents, as defined within Regulation (EU) No 996/2010, are to be reported under Regulation (EU) No 376/2014 (Article 2(7)). It means a double reporting could be required in a situation where a person is subject to mandatory reporting obligations in accordance with Regulation (EU) No 376/2014. The SIAs perceive a lack of harmonisation between Regulation (EU) No 376/2014 and Regulation (EU) No 996/2010.

There are several aspects here:

- For the reporter – Regulation (EU) No 376/2014 contains the occurrences (including accidents and serious incidents) that shall be reported through the mandatory reporting systems[39] to the competent authority established by Regulation (EU) No 376/2014. In the majority of the cases, the SIA is not that competent authority. In addition, if the reporter considers that the occurrence is a serious incident or an accident, the reporter must report to the SIA as well under Regulation (EU) No 996/2010 article 9. Moreover, for reporters of an incident, it may not be obvious whom to report to as they might not be able to determine whether an incident is serious or not;
- For the SIAs – The SIAs have concerns that if occurrences are classified as representing a significant risk to aviation safety by the competent authority under Regulation (EU) No 376/2014, this would mean that there are considered as 'serious incidents', hence the SIA's obligation to investigate would be subject to a classification by another competent authority. Strictly speaking, this concern is not justified, as the safety risk classification of occurrence reports in Regulation (EU) No 376/2014 does not define what is a serious incident or accident. Another issue for the SIAs is that serious incidents and/or accidents could be reported only to the competent authority under Regulation (EU) No 376/2014 and not to the SIAs.

Hence, people should be aware of the different reporting channels. Member States are responsible for an appropriate set up of the national reporting systems to allow the authorities to be aware of the information and to cope with their respective duties. Effective coordination between the competent authority under Regulation (EU) No 376/2014 and the SIAs is deemed necessary. It is important that the NAAs, SIAs and EASA establish an appropriate flow of information that leaves as little room as possible for interpretations and subjectivity. This is reflected in Recommendation 7.

EU-added value

Regulation (EU) No 996/2010 has positively contributed to the work that was already being done by Member States on accident investigations, either individually or within the context of their obligations under ICAO Annex 13 and/or the existing regulatory framework at EU level. ENCASIA, in which the SIAs of most Member States are participating actively, is considered to be one of the most effective elements that were brought by the regulation. The European added

[39] Not all occurrences are to be reported and not everybody is subject to the mandatory occurrence reporting system. This information can be found in Regulation (EU) No 376/2014.

value results from a combination of factors, namely: enhanced legal certainty on the status of certain ICAO provisions as well as the role of the different actors in the event of an accident or serious incident, in particular the EC, EASA and judicial authorities, gains from coordinated knowledge sharing and pooling of resources, and greater effectiveness of the safety investigations, including safety recommendations.

7 RECOMMENDATIONS

From the conclusions of this evaluation study, the following recommendations are derived.

Recommendation 1 (to the EC and Member States):
ENCASIA is considered to be one of the most effective elements that were brought by the regulation. Currently, ENCASIA is supported through a grant from the EU, which covers a significant share of the costs involved. Without financial support, ENCASIA cannot exist in its current form. A grand is supposed to be a temporarily means of support. In order to continue the success of ENCASIA it is recommended to ensure a sustainable finance structure for ENCASIA to allow a long term planning.

Recommendation 2 (to ENCASIA):
While it is not necessarily the task of the SIA to investigate aircraft accidents resulting from cyber related attacks, it is important that SIAs have sufficient expertise to determine as to whether a cyber-attack is involved in order to inform the relevant enforcement authority and to gain safety-related lessons. SIAs are advised to obtain sufficient knowledge on this topic in order to handle the issue appropriately, such as through cooperation arrangements with other States or on a regional level, or through advance arrangements with the appropriate national cyber security entities. It is recommended that the issue of cyber-related matters is addressed within ENCASIA.

Recommendation 3 (to the Member States and EC):
Emergency plans at national level for a civil aviation accident have not been implemented by all Member States, and for those Member States that have implemented national emergency plans those plans are not always complete. It is recommended to the European Commission to publish guidance and minimum standards to support the Member States in improving the level of implementation of the National emergency plans. These civil aviation accident emergency plans at national level should include among others the arrangements for the national SIA to organise sufficient high quality safety investigation capabilities in case of a major civil aviation accident. Additionally, Member States should ensure that nationality of all passengers is recorded by airlines so that there is sufficient information available to quickly determine who was on board the aircraft so that sufficient assistance to victims and their relatives can be provided.

Recommendation 4 (to the Member States):
To make sure that advance arrangements remain effective, it is recommended to ensure that stakeholders are familiar with these advance arrangements and to regularly review the advance arrangements to make sure that they are still appropriate.

Recommendation 5 (to ENCASIA and EC):
Develop additional guidance on the level of protection of sensitive safety information within ENCASIA in coordination with EC, in particular on the different levels of protection required for various types and sources of information.

Recommendation 6 (to the EC):
There are different practices among Member States concerning the use of safety investigation reports in judicial investigations. It is unclear however if this has any consequences on the quality of safety investigations. Therefore, it is recommended to conduct a comparative study to the different practices among Member States concerning the use of safety investigation reports in judicial investigations and its implications.

Recommendation 7 (to the Member States and EASA):
It is recommended that national aviation authorities, SIAs and EASA collaborate to establish an appropriate flow of information regarding the reporting of occurrences due to Regulation (EU) No 996/2010 and Regulation (EU) No 376/2014 that leaves as little room as possible for interpretations and subjectivity.

ANNEX 1 OVERVIEW OF RELEVANT DOCUMENTS

ICAO documents:

1. ICAO Chicago convention. http://www.icao.int/publications/pages/doc7300.aspx;
2. ICAO Annex 13 Aircraft Accident and Incident Investigation;
3. ICAO's Universal Safety Oversight Audit Programme (USOAP). http://www.icao.int/safety/pages/usoap-results.aspx.

EU documents:

1. Regulation (EU) No 996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation and repealing Directive 94/56/EC;
2. Council Directive 94/56/EC of 21 November 1994 establishing the fundamental principles governing the investigation of civil aviation accidents and incidents;
3. Communication from the Commission on "An Aviation Strategy for Europe", COM/2015/0598, December 2015;
4. Commission Staff Working Document Accompanying the Proposal for a Regulation of the European Parliament and of the Council on investigation and prevention of accidents and incidents in civil aviation. Impact Assessment. COM(2009) 611 final, SEC(2009) 1478;
5. Commission Staff Working Document on the implementation of the Regulation on Safety Investigation, a targeted consultation of stakeholders, including MS and their SIAs, industry associations and accident victims and their relatives associations, Part 1 and 2, SWD (2016) 151, April 2016;
6. Commission Decision 2012/780/EU on access rights to the European Central Repository of Safety Recommendations and their responses (and its successors);
7. Regulation (EU) No 376/2014 on the reporting, analysis and follow-up of occurrences in civil aviation;
8. Regulation (EC) No 216/2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/E. OJ L 79, 19/03/2008, p. 1 (and its successors);
9. Decision of the European Parliament and of the Council on a Union Civil Protection Mechanism – 1313/2013/EU in relation to civil aviation accident emergency plans;
10. Commission Implementing Decision No 2014/762/EU laying down rules for the implementation of Decision No 1313/2013 of the European Parliament and of the Council on a Union Civil Protection Mechanism;
11. Council Regulation (EC) No 2027/97 as amended by Regulation (EC) No 889/2002 on air carrier liability in the event of accidents;
12. Regulation (EC) No 785/2004 of the European Parliament and of the Council of 21 April 2004 on insurance requirements for air carriers and aircraft operators for the support of air accident victims and their relatives;
13. Regulation (EU) 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data;
14. Charter of Fundamental Rights of the European Union (2012/C 326/02);
15. Council Decision 2014/415/EU on the arrangements for implementation by the Union of the solidarity clause;
16. The Treaty on the Functioning of the European Union (consolidated version). Official Journal of the European Union C 202, 7 June 2016;
17. The Treaty of the European Union (consolidated version). Official Journal of the European Union C 202, 7 June 2016.

ENCASIA Network:

1. European Network of Civil Aviation Safety Investigation Authorities (ENCASIA), Annual Reports 2011, 2012, 2013, 2014 and 2015, http://ec.europa.eu/transport/modes/air/encasia/activities/index_en.htm;
2. European Network of Civil Aviation Safety Investigation Authorities (ENCASIA), Annual Work Programmes 2011, 2012, 2013, 2014, 2015, 2016, http://ec.europa.eu/transport/modes/air/encasia/activities/index_en.htm;
3. ENCASIA Peer Review Reports.

Advance Arrangements with judicial authorities

1. HR; EE; GR; BE;FR; IE; LV; MT; PT; ES; IT; PL; RO; BG; CZ; DK; BE; LU; UK; NL.

Safety recommendations:
1. EU SRIS database ECCAIRS Web Portal, managed by the Joint Research Centre (JRC) of the European Commission: http://eccairsportal.jrc.ec.europa.eu/index.php?id=114;
2. Future Aviation Safety Team (FAST) list of 'Areas of change' and associated future hazards. http://www.nlr-atsi.nl/fast/aoc/.

National Safety Investigation Authorities:
1. National procedures and arrangements on safety investigations and the Safety Investigation Authorities;
2. National advance arrangements between Safety Investigation Authorities and other authorities such as judicial, civil aviation and search and rescue.

Documents related to the accident cases
1. Preliminary Report (rev. 1). SCAAI-1400/2011-EPWA-SP-LPC (rev.1). 30/11/2011. In Polish and English;
2. Interim Statement of the State Commission on Aircraft Accident Investigation on investigation into air accident No 1400/2011. Dated 31/10/2012 in Polish and English;
3. Second Interim Statement of the State Commission on Aircraft Accident Investigation on investigation into air accident No 1400/2011. Dated 31/10/2013 in Polish and English;
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5. BEA, Final report, Accident on 24 March 2015 at Prads-Haute-Bléone (Alpes-de-Haute-Provence, France) to the Airbus A320-211 registered D-AIPX operated by Germanwings, Published March 2016. https://www.bea.aero/uploads/tx_elydbrapports/BEA2015-0125.en-LR.pdf;
6. BEA, 2016; EASA, Task Force on Measures Following the Accident of Germanwings Flight 9525 – Final Report, 17 July 2015;
7. Nicola Clark and Dan Bilefsky, "Germanwings Pilot Was Locked Out of the Cockpit Before Crash in France," The New York Times, 25 March 2015;
8. Senha Shenkar, "Germanings Crash: Pilots, Upset over hasty conclusions and media leaks, to file lawsuit," IBTimes, 27 March 2015, http://www.ibtimes.com/germanwings-crash-pilots-upset-over-hasty-conclusions-media-leaks-file-lawsuit-1861486;
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11. Kate Connolly, "Father of Germanwings pilot accused of killing 150 questions inquiry verdict," The Guardian, 24 March 2017;
12. AAIB (2012). AAIB Bulletin: 6/2012 G-AOIL EW/C2011/05/02;
13. Hoyle v Rogers & Anor. EWCA Civ 257, Court of Appeal, Lady Justice Arden, Lord Justice Treacy, Lord Justice Christopher Clarke, 13 March 2014, http://www.bailii.org/ew/cases/EWCA/Civ/2014/257.html;
14. AAIB (2017) Report on the accident to Hawker Hunter T7, G-BXFI near Shoreham Airport on 22 August 2015. Aircraft Accident Report 1/2017, March 2017;
15. The Queen –v–Her Majesty's Senior Coroner for Norfolk [2016] EWHC 2279 (Admin);
16. Chief Constable of Sussex Police v Secretary of State for Transport & BAPA [2016] EWHC 2280;
17. AAIB (2014). Report on the accident to Agusta A109E, G-CRST Near Vauxhall Bridge, Central London on 16 January 2013. Air Accident Report: 3/2014;
18. AAIB (2015) AAIB Bulletin: 10/2015 G-LBAL EW/C2014/03/02.

Accident reports (other)
1. Dutch Safety Board, MH17 crash, Crash of Malaysia Airlines flight MH17, Hrabove, Ukraine, 17 July 2014, published October 2015. http://onderzoeksraad.nl/uploads/phase-docs/1006/debcd724fe7breport-mh17-crash.pdf;
2. Dutch Safety Board (2015) Passenger Information. The Hague, Netherlands;
3. Dutch Safety Board (2010). Emergency assistance after Turkish Airlines incident, Haarlemmermeer, 25 February 2009;
4. CIAIAC. Accident involving a McDonnell Douglas DC-9-82 (MD-82) aircraft, registration EC-HFP, operated by Spanair, at Madrid-Barajas Airport on 20 August 2008, Report A-

032/2008. Published August 2011, http://www.fomento.es/NR/rdonlyres/EC47A855-B098-409E-B4C8- 9A6DD0D0969F/107087/2008_032_A_ENG.pdf.

The emergency plans at national level and assistance plans for victims

1. The workshop organised by the Commission in January 2014 on Civil Protection and Emergency identified a need for guidance of many Member States to develop coherent plans at national level.

Additional sources

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15. H. Schebesta (2017), Risk Regulation through Liability Allocation: Transnational Product Liability and the Role of Certification, 42(2) Air & Space Law (2017);
16. European Economic and Social Committee (EESC). Open reporting in civil aviation; Assessment of the EESC’s prospective role in designing a ‘European Just Culture Charter’. EESC-2013-87-EN. 2013. http://www.eesc.europa.eu/resources/docs/qe-02-13-501-en-c--2.pdf;
17. RAND (2000). Safety in the skies, personnel and parties in NTSB aviation accident investigation: Master volume. Rand Corporation, Institute for Civil Justice.

ANNEX 2 LIST OF PARTICIPANTS

Exploratory interviews

Name	Organisation
Mikolaj Ratajczyk	European Commission, DG MOVE
Frederic Combes	Airbus
Bernard Bourdon	EASA
Keith Conradi	Formerly AAIB (SIA UK)

Target interviews

Name	Organisation
Mr. A. Golubevas	CAA Lithuania
Mr. S. Posluk	CAA Sweden
Mr. U. Mauriņš	CAA Latvia
Mr. R. Prunean	EBAA
Mr. M. Jones Mr. V. de Vroey	ASD
Mr. K. Martin Mr. N. Chabbert	GAMA
Mr. G. Buono	IATA
Mr. S. Lewyllie	European Passengers' Federation
Mr. W. Post Mr. S. Neuvonen	European Commission, JRC
Mr. C. Orr Mr. P. Sleight	SIA UK (AAIB)
Mr. M. Colavita	EASA
Mr. O. Ferrante	SIA France (BEA)
Mr. F. Zammit Mrs. R. Tanti-Dougall	SIA Malta
Mr. J. Bäckstrand Mr. P. Swaffer	SIA Sweden
Mr. R. van Dam	President IFPA & Eurocontrol Just Culture Task Force (JCTF)
Mr. G. Vogelaar Mrs. A. Schuite	SIA Netherlands (OVV)

Name	Organisation
Mr. E. Giemulla	Professor in Law
Mr. J. Burke	European Commission, DG MOVE
Mr. L. Naujokaitis	SIA Lithuania
Mrs C. Challinor	Lawfirm Stephenson Harwood in London
Mr. A. Neves	SIA Portugal (former)
Mrs. I. Vasiliu	European Commission, DG JUST
Mr. C. Johnson	Professor of Computer Science (cyber), University of Glasgow
Mr. G. Černjava	CAA Croatia
Mr. S. Erdmann	A4E
Mr. P Lipiec	SIA Poland (former)
Mr. L. Michel	ECA *Mr. Michel collected responses from the following ECA member association: ACA, ANPAC, BeCA, SEPLA, SNPL, VC and VNV*
Mrs. I. van Nieuwkerk	Eurojust
Mr. R.	ENCASIA chairman and SIA France (BEA)
Mr. J.	Chair ECAC-ACC, vice-chair ENCASIA, AAIU (Ie)
Mrs. H.	SIA Finland

Focus group members

Name	Organisation
John Burke	European Commission, DG MOVE
Rob Carter	AAIB (UK)
Luc Blendeman	AAIU (Belgium)
Annemarie Schuite	DSB (the Netherlands)
Jurgen Whyte	AAIU (Ireland)
Olivier Ferrante	BEA (France)
Oliver Hussi	Lufthansa
Maria Jesus Guerrero	University of Seville

Job Brüggen	LVNL
Mario Colavita	EASA
Chris Johnson	Professor of Computer Science (cyber), University of Glasgow
Jean-Jacques Woeldgen (as client)	European Commission, DG MOVE

Targeted survey

In total 62 respondents completed the targeted survey. Of these respondents, 56 provided the name of their organisation and 6 did not.

The following organisations responded to the targeted survey: European Passengers' Federation, Transport Accident Incident Investigation Bureau (TAIIB), AAIASB, Hellenic Air Accident Investigation and Aviation Safety Board, Transport Accident and Incident Investigation Division of the Ministry of Justice of the Republic of Lithuania, IFATCA, Croatian Civil Aviation Agency, LVNL, Directorate General Civil Aviation Administration Bulgaria, Air Accident Investigation Unit (AAIU) (Ireland), air accidents and incidents investigation board (Cyprus), Civil Aviation Agency of the Republic of Slovenia, Comisión de Investigación de Accidentes e Incidentes de Aviación Civil (CIAIAC), Civil Aviation Safety Investigation and Analysis Center (Romania), SCAAI, Agenzia nazionale per la sicurezza del volo (ANSV), Air Crash Victims' Families' Federation International (ACVFFI), Bureau of Air Accident Investigation (Malta), German Federal Bureau of Aircraft Accident Investigation (BFU), AMIA, Estonian Safety Investigation Bureau, Air Accidents Investigation Branch (UK),Administration des enquêtes techniques (Luxembourg), AOPA UK, Civil Aviation Agency of the Republic of Latvia, JRC, Ente Nazionale per l'Aviazione Civile, Consejo General del Poder Judicial, Alitalia, Air-Glaciers SA, Cargolux, Cargolux Airlines, Directorate General for the Environment and International Affairs/ Civil Aviation Department (the Netherlands), Civil Aviation Administration of the Republic of Lithuania, Air Accident Investigation Unit (Belgium), Statens haverikommission (SHK) - Swedish Accident Investigation Authority, Rolls-Royce Deutschland Ltd&Co. KG, Air Accidents Investigation Institute (Czech Republic), Dutch Safety Board, Rolls-Royce plc, Short Brothers PLC, Accident Investigation Board of Denmark, Wamos Air, prosecutor office (Lithuania), Aer Lingus, Swedish Transport Agency (CAA), KLM, IATA - International Air Transport Association, Japan Airlines, Air, Maritime and Railway Traffic Accident Investigation Agency (Croatia), Air, Maritime and Railway Accident and Incident Investigation Unit Republic of Slovenia, ATR, EBAA, Safety Investigation Authority Finland, AirFrance, AeroSpace & Defense Industries Association of Europe (ASD).

ANNEX 3 COUNTERFACTUAL SCENARIO

To analyse the effectiveness, efficiency, costs, benefits and added value of Regulation (EU) No 996/2010, it is necessary to establish the counterfactual scenario: what would be the situation if the regulation had not been issued?

It is reasonable to assume that ICAO Annex 13 would have evolved in the absence of Regulation (EU) No 996/2010, but the experience of Regulation (EU) No 996/2010 has been instrumental in some of the revisions that are incorporated in the eleventh edition of Annex 13. It is therefore assumed that in the absence of Regulation (EU) No 996/2010, the eleventh edition of Annex 13 does not exist and that the tenth edition of ICAO Annex 13 is applicable.

The regulation was established to replace Directive No 94/56/EC. In the counterfactual scenario, Directive No 94/56/EC would still be in place. The impact assessment conducted in 2009[40] to analyse the best options for replacing the Directive identified five specific problems that were not being addressed through Directive No 94/56/EC:

1. lack of uniform investigation capability;
2. tensions between safety investigations and other proceedings;
3. unclear role of the Community (EASA) in safety investigations;
4. weakness in implementation of safety recommendations;
5. insufficient assistance to the victims of air accidents.

For the counterfactual scenario, it is necessary to estimate if these problems would have persisted in the absence of Regulation (EU) No 996/2010.

Lack of uniform investigation capability
A key objective of the regulation was to strengthen the independence of the national SIAs in line with ICAO Annex 13. In the counterfactual scenario, the requirements of Directive No 94/56/EC would still be in force and no additional emphasis is put on the need to establish an independent SIA in each Member State.

In the counterfactual scenario ENCASIA does not exist. The available networks for SIAs to stay in contact with each other and to share best practices are the International Society of Air Safety Investigators (ISASI) and its European chapter (ESASI) and ECAC-ACC. International cooperation between SIAs does take place, for instance in providing CVR and FDR readout capabilities, but is less obvious.

Tensions between safety investigations and other proceedings
In the counterfactual scenario, there are only a few Member States that have arrangements for cooperation between safety and other investigations. Additionally, no special clarification has been provided on the protection of safety sensitive information.

Unclear role of the community (EASA) in safety investigations
In the counterfactual scenario, the role of EASA in safety investigations is not formally described. In practice, it is reasonable to assume that, in view of the increasing responsibilities of EASA, some sort of working model would have been achieved, even without this being formally described in a regulation. The lack of a formal description will, however, lead to confusion between EASA and other parties involved in the investigation in the counterfactual scenario on a case by case basis.

Weakness in the implementation of safety recommendations
In the counterfactual scenario, the SRIS database does not exist. There is no overview on a European level of whether deadlines for issuing the safety report and following up the safety recommendations and follow-up have been met. There is no instrument to identify if safety recommendations are relevant locally or at a Union-wide level.

[40] Commission Staff Working Document Accompanying the Proposal for a Regulation of the European Parliament and of the Council on investigation and prevention of accidents and incidents in civil aviation. Impact Assessment. COM(2009) 611 final, SEC(2009) 1478.

Insufficient assistance to the victims of air accidents

In the counterfactual scenario, there are no provisions for assistance to victims of air accidents.

Additionally, the following items are relevant:

- Regulation (EU) No 996/2010 introduces the obligation to establish penalties for non-compliance with the regulation's provisions, an obligation that was absent in the repealed Directive No 94/56/EC. In the counterfactual scenario these penalties are absent;
- Due to the economic turndown from 2010 onwards, budgetary pressure on governments and civil aviation authorities as well as SIAs has only increased. It is assumed that in the counterfactual scenario this budgetary pressure also exists.

The described scenario is in line with the baseline of the impact assessment of 2009.

ANNEX 4 ACCIDENT CASES

Introduction

As part of the study, an analysis of 4 relevant accident cases is made in order to assess the application of the regulation. In order to determine when an accident case is relevant, criteria have been established (see Section 2.3). The cases have been based on an initial proposal by the study team, input provided to us by the Commission, and cases proposed by ENCASIA (Action from ENCASIA meeting February 9th). In total 4 cases have been selected:

1. Boeing 767 at Warsaw airport (Poland) on 1 November 2011;
2. Pilatus PC-6 at Gelbressée (Belgium) on 19 October 2013;
3. Airbus A320 at Prads-Haute-Bléone (France) on 24 March 2015;
4. UK Court Cases.

This annex contains the analysis of the four accident cases.

Case 1: Boeing 767 at Warsaw airport (Poland) on 1 November 2011

The information for this case study was collected during a telephone interview with Piotr Lipiec (investigation team member and later Investigator in Charge for this accident) and through e-mail conversations with Andrzej Lewandowski (Chairman of the SCAAI - State Commission on Aircraft Accident Investigation). Additionally, the published reports and statements were used.

Summary of the accident

LOT Polish Airlines 16 was a scheduled flight from Newark Liberty Airport (EWR) to Warsaw Chopin Airport (WAW). On November 1, 2011 LO16, it made an emergency landing at WAW due to a landing gear that failed to extend. On board were 220 passengers and 11 crew – all survived. The investigation was held by Polish Air Accident Investigation Commission (SCAAI) who reported the event to be an accident. A preliminary report has been published but no final report has been published. After the preliminary safety investigation report was issued, multiple claims were submitted to court by passengers blaming LOT and Boeing for improper handling of aircraft.

Prior to the flight, the airplane was inspected by a U.S. maintenance organization, acting under a contract with LOT Polish Airlines. As a result of this inspection, the airplane was released for flight. There were no failures, which would require application of the Minimum Equipment List (MEL). After take-off, during retracting of the landing gear and flaps, a leakage of the hydraulic fluid from the central hydraulic system (installation "C") occurred, resulting in a reduction of pressure in the central hydraulic system. The pressure drop was announced on the EICAS (Engines Indications and Crew Alerting System) and recorded by the flight data recorder. After completing the QRH procedure and consultation with the operator's operations centre, the flight crew decided to continue the flight to Warsaw.

During approach for landing at Warsaw the flight, crew performed the QRH procedure for alternate gear extension, but the landing gear could not be extended. The crew checked correctness of the procedure and then reported to the air traffic control service (ATC) inability to extend the landing gear and asked the operations centre for help.

The airplane was directed to a holding zone and the flight crew declared an emergency. Polish Air Force fighters were sent to the Boeing to visually check visually the position of landing gear. The air force pilots informed the LOT flight crew that the landing gears were still retracted. The flight crew unsuccessfully attempted to extend the landing gear by gravity. Because of the low fuel state, the flight crew decided to execute an emergency landing with landing gear retracted. After the airplane came to rest, the flight crew carried out an emergency evacuation of the passengers.

After lifting the aircraft from the runway, a test of the landing gear extension with the alternate landing gear extension system was carried out. After connecting the ground power unit, setting C829 (A1) BAT BUS DISTR circuit breaker in the position “On” and activation of the alternate landing gear extension system, the landing gear was extended. The aircraft was towed to the

operator's technical base.

In the interim statement (Ref. 2), released on 31/10/2012, it is concluded that the "most likely cause of the malfunction of the alternate landing gear extension system was the "OFF" position of the the C829 (A1) BAT BUS DISTR circuit breaker (on P6-panel) during the attempt of landing gear extension by using the alternate system".

Accident investigation process

On 3 November 2011, the SCAAI forwarded the Event Notification to EASA, the EU, ICAO and the NTSB. In accordance with ICAO Annex 13, the NTSB designated its Accredited Representative and his technical advisors from the FAA and the Boeing Company. The SCAAI also cooperated with the BFU for the Cockpit Voice Recorder (CVR) read out. The cooperation with the BFU was reported as excellent.

On 30 November 2011, a preliminary report was released in Polish and English (Ref. 1). On 31/10/2012 an Interim statement was released (Ref. 2). On 31 October 2013 a second interim statement was released (Ref. 3). In this report it is stated that "The SCAAI Investigating Team is currently working on the draft Final Report". After that statement, no additional reports were released.

On June 13, 2017, Mr. Lewandowski stated that "now we will send Report to NTSB and in my opinion after 2-3 months report will be published." This would imply that the final report would be available in August or September 2017.

US court litigation

A lawsuit was filed on the first anniversary of the accident, i.e. on 1 November 2012, against the manufacturer of the aircraft, Boeing Company, as well as the servicing company Mach II (Ref. 4). When the claim was filed, the group of the plaintiffs covered 95 passengers. Subsequently there joined other plaintiffs who were successively assed to the claim. The predominant element of the claims of all passengers involved non-pecuniary damages (emotional distress, negative experience, trauma).

In April 2015, the dispute was ultimately settled between the parties. The settlement is subject to confidentiality, it is therefore not possible to provide any information about its terms and conditions.

Investigation capability

Since the occurrence of the accident, there have been several changes to the investigating team.

According to the preliminary report (Ref.1) initially the team consisted of Waldemar Targalski (IIC), Stanislaw Zukowski, Piotr Lipiec and Tomasz Makowski (November 2011).

Since May 1st, 2013 the investigation team consisted of Piotr Lipiec (IIC), Stanisław Żurkowski, Bogdan Fydrych, Edward Łojek and Tomasz Makowski. The former IIC, Waldemar Targalski, is reported as an "additional expert" according to the interim statement (Ref. 2). In the interim statement the following elaboration is given:

"Due to the fact that Mr. Waldemar Targalski terminated his contract with SCAAI, the SCAAI Chairman appointed Mr. Piotr Lipiec, to take over the position of the Investigator-In-Charge for investigation of the air occurrence No 1400/11. The appointment came into force on 1 May 2013. Mr Piotr Lipiec has been involved in the investigation into causes and circumstances of the accident since the beginning."

Furthermore, during the course of the investigation, Mr. Lipiec was hospitalised for a few months because of an illness, and that delayed the investigation process.

In November 2016 (following a dispute) the contracts were terminated for 4 of the 5 air safety investigators. Mr. Lewandowski stated that "of the investigation team In Polish SCAAI only is still working Mr Tomasz Makowski. Team has changed after November 2016."

Mr. Lipiec stated that when he left the SCAAI, in November 2016, the final safety investigation report was approximately 95% complete and preparations were made for the English

translation.

Coordination between safety investigation and other proceedings
A judicial investigation ran in parallel with the safety investigation. The safety investigation team met with the prosecutor. There were no difficulties in the cooperation between the safety investigation and the judicial investigation. The SIA has trained some of the prosecutors in accident investigation and this improves the cooperation. The air safety investigators and judicial investigators work almost as colleagues. The Polish SIA had access to information collected by the prosecutor. For instance, the prosecutor interviewed all passengers, and the SIA had access to those interviews. The judicial authorities did not have access to data collected by the SIA, for instance the CVR and the FDR.

Role of EASA in the investigation
The accident investigation team was not supported by EASA.

Implementation of safety recommendations
In the interim statement (Ref. 2) it is stated that "in June this year [2012] the State Commission on Aircraft Accident Investigation forwarded to the appropriate authorities the proposed preliminary safety recommendations related to the accident investigation:

B-767 airplane manufacturer (Boeing Company):

1. Verify and modify the above mentioned checklists taking into account the conclusions of the Commission;
2. Modify the appropriate checklist by adding a subsection that in case of failure in the alternate landing gear extension the flight crew should check C4248 LANDING GEAR – ALT EXT MOTOR and C829 BAT BUS DISTR circuit breakers;
3. Develop a checklist specifying the flight crew actions in case of the total failure in the landing gear extension;
4. Introduce an appropriate Bulletin providing for a physical protection of the circuit breakers located in the areas of direct contact with shoes, cleaning equipment, hand luggage etc. (i.e. places in which the breakers may be damaged or accidentally set in wrong positions). This applies to all B-767 operators, which did not construct such a protection on the operated aircraft below production line No 863.

LOT Polish Airlines in consultation with B-767 manufacturer:

1. Verify and modify the above mentioned checklists taking into account the conclusions of the Commission;
2. Modify the appropriate checklist by adding a subsection that in case of failure in the alternate landing gear extension the flight crew should check C4248 LANDING GEAR – ALT EXT MOTOR and C829 BAT BUS DISTR circuit breakers;
3. Develop a checklist specifying the flight crew actions in case of the total failure in the landing gear extension;
4. Introduce a physical protection of the circuit breakers located in the areas of direct contact with shoes, cleaning equipment, hand luggage etc. (i.e. places in which the breakers may be damaged or accidentally set in wrong positions). This applies to all B-767 used by the operator, which do not have such a protection.

Management of Warsaw Chopin Airport:

1. Develop procedures for arrangement of fast and smooth movement of passengers evacuated from an aircraft to designated area of means of transportation."

In the second interim statement (issued on 31 October 2013), it is stated that the SCAAI "still deems valid all proposed safety recommendations forwarded in June 2012 to the appropriate authorities".

On the progress of the implementation of the Safety Recommendations, the second interim statement reports:

"SCAAI was informed in writing that the safety recommendations proposed to the LOT Polish Airlines had been partially implemented. The safety recommendations proposed to the

Management of the Warsaw Chopin Airport were discussed during the meeting of the airport and SCAAI representatives. The safety recommendations proposed to FAA (USA) and BOEING have not been commented by the addressees until the day of release of the Second Interim Statement."

The Investigator in Charge (IIC) at that time stated that the response from the airport was considered sufficient; the response from the aircraft manufacturer was considered partially sufficient for one recommendation and not sufficient for the other recommendations. The response from the airline was considered not sufficient, but because the airline does not operate the type of aircraft involved anymore, it will most likely be dismissed.

The recommendations above are registered in the SRIS database as four SRs as follows:

- Recommendations 1, 2 and 3 to Boeing are registered as one SR to Boeing with SRIS number PL.SIA-2012-0002 (current status "open");
- Recommendation 4 to Boeing is registered as one SR to the FAA with SRIS number PL.SIA-2012-0001 (current status "open");
- The four recommendations to LOT are registered as a SR to LOT with SRIS number PL.SIA-2012-0003 (current status "closed");
- The recommendation to the Management of Warsaw Chopin Airport is registered as one SR to Aerodrome operator (Warsaw Chopin Airport) with SRIS number PL.SIA-2012-0004 (current status "open").

All Recommendations are dated 8 June 2012.

Assistance to victims and their families

According to Mr. Lipiec, assistance to victims and relatives is not an issue because the final report has not been published for this case. During the investigation no inquiries for information has been made. Everybody is waiting for the final report to be released.

References

1. Preliminary Report (rev. 1). SCAAI-1400/2011-EPWA-SP-LPC (rev.1). 30/11/2011. In Polish and English;
2. Interim Statement of the State Commission on Aircraft Accident Investigation on investigation into air accident No 1400/2011. Dated 31/10/2012 in Polish and English;
3. Second Interim Statement of the State Commission on Aircraft Accident Investigation on investigation into air accident No 1400/2011. Dated 31/10/2013 in Polish and English;
4. Budzowska & Fiutowski and Partners website News. "The US Court Litigation Involving Captain Wrona's Landing Has Finished!" URL: http://en.bfp.biz/compensations//us-court-litigation-involving-captain-wrona-landing-has-finished (19 April 2015).

Case 2: Pilatus PC-6 at Gelbressée (Belgium) on 19 October 2013

The information for this case study was collected during an interview at the AAIU in Brussels on 3 May 2017. Interviewees were Luc Blendeman, Henri Metillon and Sam Laureys.

Summary of the accident

The aeroplane was used for the dropping of parachutists from the parachute club of Namur1. It was the 15th flight of the day. The aeroplane took off from the Namur/Suarlée (EBNM) airfield at around 13:25 with 10 parachutists on board. After 10 minutes of flight, when the aeroplane reached FL50, a witness noticed the aeroplane in a level flight, at a lower altitude than normal. He returned to his occupation. Shortly after he heard the sound he believed to be a propeller angle change and turned to look for the aeroplane. The witness indicated that he saw the aeroplane diving followed by a steep climb (major pitch up, above 45°), followed by the breaking of the wing. Subsequently, the aeroplane went into a spin. Another witness standing closer to the aircraft reported seeing the aeroplane flying in level flight with the wings going up and down several times and hearing, at the same time an engine and propeller sound variation before seeing the aeroplane disappearing from his view. The aeroplane crashed in a field in the territory of Gelbressée, killing all occupants. The aeroplane caught fire. A big part of the left wing and elements thereof were found at 2 km from the main wreckage.

The cause of the accident is a structural failure of the left wing due to a significant negative g aerodynamic overload, leading to an uncontrollable aeroplane and subsequent crash. The most

probable cause of the wing failure is the result of a manoeuvre intended by the pilot, not properly conducted and ending with an involuntary negative g manoeuvre, exceeding the operating limitations of the aeroplane.

The accident was the largest aircraft accident, in terms of the number of fatalities, in Belgium since 1971. As a result, the accident received much attention in the press. The crash site was visited by Prime Minister Elio di Rupo and king Philippe while the on-site investigation was still on-going.

Investigation capability

The safety investigation was conducted by the Air Accident Investigation Unit (Belgium). This is a functionally independent section of the Federal Public Service Mobility and Transport. The AAIB(Be) consists of 3 investigators and one support staff member. Additional investigation capability is routinely arranged if specialist knowledge or equipment is needed. A protocol is signed with Belgian Defence for providing support.

After the onsite investigation, the wreckage was transported to the facility of the Belgian Defence Air Safety Directorate (ASD), at EBBE for further examination. Experts from the Belgian Defence Air Component and from the Belgian CAA also helped the AAIU(Be) investigators to carefully examine the wreckage. The Belgian Royal Military Academy was contracted to conduct a fractographical analysis of components of the crashed aircraft.

A specialist from BEA (France) was asked, via ENCASIA, for assistance in fracture analysis of structural components. His experience was relevant as he had participated in the investigation of a Pilatus PC-6 accident in France involving a structural failure.

Coordination between safety investigation and other proceedings

Before this accident, there had not been any difficulties in the coordination between safety and judicial investigations. When Regulation (EU) No 996/2010 was introduced, the AAIU took some effort to come to an agreement with the judicial authorities on coordination of the investigations, without remarkable success. When the accident occurred, the AAIU as well as the judicial authorities (examining judge requested by the Senior Crown prosecutor of Namur) started an investigation. During the course of the investigation of this accident however, it became clear that the coordination between the two investigations required improvement. Approximately six months after the accident, a meeting with relatives of victims was organised to inform them on the status of the investigation. The meeting was hosted by the judicial authority of Namur. This meeting, as relayed by the press, gave the impression the AAIU investigation was used by the judicial authorities for their own purpose, and this perception was also shared to some extend for a while by the examining judge. One year after the accident the AAIU was planning to publish an interim report on the status of the investigation (as is required by Regulation (EU) No 996/2010 and ICAO Annex 13). A draft version was also sent to the judicial authorities who then expressed their reservations on the publication of the interim report as it contained factual information, which according to the judicial authorities could not be published as long as the judicial investigation was on-going. The AAIU adapted the interim report by limiting it to the strict minimum in accordance with Regulation (EU) No 996/2010, giving information on the investigation without providing any factual information. At the same time, AAIU continued to develop advance arrangements for the coordination of safety and judicial investigations. The text of other European arrangements (French, among others) was used as a model. This advance arrangement was instrumental in solving the issues on roles and responsibilities that surfaced during the investigation. Publication of the final safety investigation report published by the AAIU happened without friction with the judicial authorities.

Role of EASA in the investigation

The accident investigation team was supported by EASA. Difficulties regarding the role of EASA were not encountered.

Implementation of safety recommendations

The final safety investigation report contains 11 recommendations, including a recommendation to the Belgian Civil Aviation Authority that had already been issued on 2 January 2014 (i.e. less than 3 months after the accident) and to which the BCAA had reacted positively in a response letter dated 1 April 2014. Of the remaining 10 recommendations, four are addressed at EASA, three are addressed at Pilatus and three are addressed at the BCAA. Of one recommendation addressed at Pilatus it is indicated in the safety investigation report that it already had been

implemented and therefore the recommendation is considered closed.

The AAIU archives responses by the addresses and also enters this information in the European Central Repository for Safety Recommendations in aviation (SRIS). The user interface of SRIS is not considered user friendly.

Status of the recommendations:

- 2014-P-2 (BCAA): closed
- BE-2015-0001 (EASA): open
- BE-2015-0002 (EASA): open
- BE-2015-0003 (EASA): open
- BE-2015-0004 (EASA): open
- BE-2015-0005 (Pilatus): closed
- BE-2015-0006 (BCAA): closed
- BE-2015-0007 (Pilatus): closed
- BE-2015-0008 (BCAA): closed
- BE-2015-0009 (BCAA): closed
- BE-2015-00010 (Pilatus): closed

The recommendations to EASA are identified as Safety recommendations of Union-wide relevance SRUR).

Assistance to victims and their families

Due to the relatively high number of fatalities, this accident received substantial media attention. Approximately six months after the accident a meeting with relatives of victims was organised to inform them on the status of the investigation. The AAIU perceived a need for such a meeting from articles that appeared in the media. When the final report was completed, AAIU sought to send a copy, prior to the official publication, to relatives of the victims. As the judicial authority was the only organisation maintaining a list of addresses of victim's relatives, AAIU could not perform this task directly, causing some delays in the publication of the report; AAIU eventually sent copies to the judicial authorities who subsequently sent the reports to the relatives.

Case 3: Airbus A320 at Prads-Haute-Bléone (France) on 24 March 2015

The information for this case study was collected during two separate interviews with the Bureau d'Enquêtes et d'Analyses pour la sécurité de l'aviation civile (BEA) and Lufthansa, respectively. These interviews were complemented with desk research and follow-up calls as needed. Interviewees were Olivier Ferrante and Arnaud Desjardin (BEA), and Oliver Hussi (Lufthansa).

Summary of the accident

On 24 March 2015, the Airbus A320-211 registered D-AIPX operated by Germanwings was programmed to undertake scheduled flight 4U9525 between Barcelona El Prat airport (Spain) and Düsseldorf Airport (Germany). The aeroplane took-off from the Barcelona airport at 9 h 00 with six crewmembers (2 flight crew and 4 cabin crew) and 144 passengers on board.

- At 9 h 27 min 20, the aeroplane levelled off at a cruise altitude of 38,000 ft (FL380);
- At 9 h 30 min 00, the Captain read back the air traffic controller's clearance allowing him to fly direct to the IRMAR point. This was the last communication between the flight crew and ATC;
- At 9 h 30 min 08, the Captain told the co-pilot that he was leaving the cockpit and asked him to take over radio communications, which the co-pilot acknowledged. Noises indicating the opening and closing of the cockpit door were recorded at 9 h 30 min 24;
- At 9 h 30 min 53 the selected altitude on the FCU changed in one second from 38,000 ft to 100 ft, which is the minimum value that is possible to select on an Airbus 320, and the autopilot changed to OPEN DES mode and autothrust changed to THR IDLE. The aeroplane started to descend and both engines' speed decreased. Shortly thereafter, the selected speed target was increased;
- At 9 h 33 min 47 the controller asked the flight crew what cruise level they were cleared for, with no answer from the co-pilot. The aeroplane was then at an altitude of 30,000 ft in descent. There was no answer from the co-pilot. Over the next 7 minutes, there were more than 13 attempts to contact the flight crew, including from the controller, the

Marseille control centre, an air traffic controller from the French Air Defence system and the flight crew of another aeroplane, without any answer; noises similar to knocks, escalating to violent blows against the cockpit door were recorded during this time;
- At 9 h 41 min 06, the CVR recording stopped at the moment of the collision with the terrain.[41]

The accident was caused by the deliberate and planned action of the co-pilot to commit suicide while alone in the cockpit. The co-pilot was inflicted with a mental disorder with psychotic symptoms. The process of medical certification of pilots, in particular the process of self-reporting in case of a decrease in medical fitness between two medical evaluations, did not successfully prevent the pilot from exercising the privilege of his license. [42]

Organisation of the investigation

At around 10 h 15, the Marseille en-route control centre informed the BEA of the accident to an Airbus A320, registered D-AIPX that had occurred while overflying the French Alps. In accordance with the provisions of Regulation (EU) No 996/2010 of the European Parliament and Council of the 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation, a Safety Investigation was immediately initiated by the BEA, and the relevant Spanish and German investigation bodies were duly notified.

The Safety Investigation was organised with three working groups in the following areas: aircraft, aeroplane systems and operations. The Accredited Representatives and the technical advisers were divided between the three groups.

With the German and Spanish counterparts, the BEA identified the issues that needed to be investigated, namely: medical examination / certification process, and the security of the cockpit doors (areas for improvement to allow access). A preliminary report was published on 6 May 2015 based on the information from the flight recorders and a preliminary review of the aeromedical certificates of the flight crew. The investigation went further to employ medical specialists (doctors) to try to understand what kind of medical condition the co-pilot had; procedures in place regarding selection of pilots; peer-support groups to provide assistance to pilots in case of personal, emotional or mental problems. The investigation was completed within a year, at which point the final report was released (13 March 2016). The work performed by the working groups was included in the Draft Final Report, which was sent for consultation in December 2015 to the participants in the investigation. Review and integration of the comments received led to the final drafting and publication of the Report on 13 March 2016.

Investigation capability

On the day of the crash, a team of 7 investigators from the BEA travelled as close to the accident site as possible by car on the afternoon of 24 March. In coordination with the authorities in charge of the judicial investigation, and with helicopter transport provided by the Gendarmerie, the air safety investigators were able to access the site the following day. A team of 10 BEA investigators was involved in this accident investigation.

The BEA associated a number of foreign counterparts with the Safety Investigation, which then appointed Accredited Representatives, requiring a substantial amount of coordination on-site. Foreign counterparts appointed the following Accredited Representatives to the investigation:

- the BFU (Germany), the aeroplane being registered in Germany and operated by a German airline, which served as technical advisor to the accredited representative (see below);
- the CIAIAC (Spain), enabling the IIC to obtain information relating to the aeroplane's stop at Barcelona and data from the Spanish ATC service;
- the AAIB (UK), to obtain information on the aeromedical certification in the UK;
- the NTSB (USA), to obtain information on the aeromedical certification in the USA and aerospace medical expertise from AsMA.

[41] BEA, Final Report on the Safety Investigation of the accident on 24 March 2015 at Prads-Haute-Bléone (Alpes-de-Haute-Provence, France) to the Airbus A320-211 registered D-AIPX operated by Germanwings, published March 2016.
[42] BEA, 2016; EASA, Task Force on Measures Following the Accident of Germanwings Flight 9525 – Final Report, 17 July 2015.

Because Germanwings GmbH (GWI) is a 100% subsidiary of Lufthansa Group, the accident was treated as a Lufthansa accident. The Accident / Incident Investigation Team from Germanwings also had / has fewer investigators under its purview than its parent company, so it was immediately decided that the Accident / Incident Investigation Team of Lufthansa, together with Lufthansa Technik (also a 100% subsidiary of Lufthansa, providing maintenance, repair and overhaul (MRO) services for aircraft, engines and components), would be jointly involved in the safety investigation. The Lufthansa Accident / Incident Investigation Team served as advisors to the accredited representatives to the investigation from BFU.

The BEA also associated:

- technical advisers from EASA, the DGAC, Snecma (on behalf of CFM) and Airbus;
- experts in medical certification from the Civil Aviation Authorities of Israel, Canada, Norway, and Spain as well as from EDF and SNCF;
- other medical experts, including psychiatrists.

Australia, Israel and Japan appointed experts to follow the Safety Investigation, in accordance with standards and recommended practices in ICAO Annex 13, since some of the victims came from these countries.

The BEA / the investigation team more broadly did not experience any shortcomings with respect to the amount of investigators available, nor the expertise / level of knowledge. Both Germany and France have sufficient resources available – both in terms of the number and capabilities of investigators. There was a good understanding and strong coordination between the investigators. For example, the BFU in Germany was able to coordinate interviews with Lufthansa Aeromedical Centre and gain access to the co-pilot's medical files.

Regarding other resources, as mentioned above, the site was located on difficult terrain, which meant that it was only accessible within the first 5 days by helicopter. The investigators therefore needed to be accompanied by high-mountain specialists of the gendarmerie, who provided the helicopters. There was no difficulty or limitation in this respect.

Coordination between safety investigation and other proceedings

The French investigatory landscape is constituted by two different types of investigation, which involve three different actors: (1) the safety investigation of the BEA; (2) judicial / criminal investigation led by prosecutors and assisted by the gendarmerie unit that deals with airline / aircraft accidents. The safety investigation and judicial investigation take place in parallel in France: They run separately and independently, though they share some factual information, e.g. on-site observations and flight recorder data. There were therefore three competing actors and it was not immediately clear which type of investigation was required / should take precedent, according to foreign counterparts involved in the investigation and there were sometimes three competing actors, notably regarding public communication on the progress of the investigation. This created some tensions at the beginning of the investigation. According to BEA representatives, the main source of tension was the fact that the prosecutor had not been exposed to a similar situation before, as it was a brand new office that had just been created in Marseille to deal with major collective accidents. As a result, the prosecutor's office did not initially understand the right of the BEA to communicate.

The CVR was found on the afternoon of 24 March 2015 and transferred under judicial seal the following day to the BEA for readout. After reading out the data from the recorders at the BEA, it appeared to the BEA that an act of unlawful interference was involved in the accident. In accordance with Article 12.2 of Regulation (EU) No 996/2010 and the advance arrangement between the French ministry of Justice and the BEA of 16 September 2014, the relevant elements gathered during the safety investigation were then communicated to the judicial authorities as soon as they became available. On day 2 (following the accident), the safety investigation was temporarily put on hold while it was being decided whether the accident would only be investigated as a criminal act, or whether a safety investigation would also be warranted. The FDR was recovered nine days later; it was sent to the BEA on 2 April under judicial seal. Following several discussions between the investigation team and the BEA management, it was decided that the safety investigation should proceed as the various parties anticipated that relevant safety lessons would be derived. From this point forward, the two investigations were conducted in parallel. The FDR was recovered nine days later; it was sent to the BEA on 2 April 2015 under judicial seal.

On 25 March 2017, a news article was published in The New York Times, which revealed that CVR data "indicated one pilot left the cockpit before the plane's descent and was unable to get back". The article went on to quote an unnamed senior French military official involved in the investigation, who revealed the sound of light knocking on the cockpit door, followed by pounding as the second pilot attempted to gain entry.[43] A French pilots' Union (Le Syndicat National des Pilotes de Ligne, SNPL), filed a lawsuit over the leaked information, taking issue with the fact that the information was revealed to the media before it was made known to prosecutors. The lawsuit was based on a violation of French law that dictates that information concerning ongoing judicial investigations must remain confidential. French law also does not require lawsuits to name a party; judicial investigators determine who it can be targeted at.[44] The complaint was dismissed on the grounds that it was not possible to identify the perpetrator of the breach of professional secrecy due to the fact that too many individuals had access to the CVR data. The SNPL also asserts that the BEA contacted the counterparts at BFU and the French Ministry of Transport before contacting the prosecutor or the families, which would go against Article 12 of the advance arrangement between the BEA and French prosecutors.[45]

Despite early tensions between the various proceedings, there were no problems in terms of coordinating the work on the investigation site: the gendarmerie forces controlling the accident site to make sure no one damaged the evidence and the gendarmerie unit assisting the prosecutor were present. The gendarmerie managed the administrative and logistics aspects to make the site accessible to investigators. Although these issues are covered in the advance arrangement, the existence of the arrangement itself was not necessarily known by all actors at the time. The BEA and the French gendarmerie convened coordination meetings every morning and debriefing meetings each night. Then IIC would de-brief the management team.

A positive outcome of the case is that the visibility of the case itself led the French Ministry of Justice (Directorate for Criminal Matters and Pardons) to develop a dispatch, which was presented to French prosecutors and courts, communicating the primacy of safety investigations. The objective of the dispatch was "to support the implementation of the [advance arrangement] agreement, having regard to the impact of the European regulation on the different phases of the investigation and the specific ways it affects the investigation process."[46] The dispatch was supplemented by practical tools for courts, including a glossary of terminology pertinent to Regulation (EU) No 996/2010. The note further explains the content of the advance arrangements to judicial authorities and how such authorities should work with the BEA in the event of an investigation. As a result, Article 12.3 has had a positive impact, and the situation is far clearer than it was before. Article 12.2 also had a positive benefit thanks to the inclusion of a dedicated paragraph outlining the requirements related to unlawful interference, allowing the safety investigation to continue. The question is whether the regulation in general, and the existence of advance arrangements in particular, help when it is unclear which type of investigation should be pursued. It was not clear who was in the lead for a few days. The benefits / effects of the advance arrangement were therefore not immediately visible or present in this particular case.

After the publication of the BEA report, a separate investigation was opened by the father of the co-pilot, Günter Lubitz, and an aviation journalist. The BEA reached out to the father during the official investigation with the aim to cross-check the BEA's data and findings with any potential information gathered in the course of their own investigation; however, Mr. Lubitz was unwilling to cooperate. The investigator hired by Mr. Lubitz has requested documents and information from the BEA, to which the BEA responds that all information pertinent to explaining what happened and preventing future accidents is included in the BEA's Final Report.[47]

[43] Nicola Clark and Dan Bilefsky, "Germanwings Pilot Was Locked Out of the Cockpit Before Crash in France," *The New York Times*, 25 March 2015.
[44] Senha Shenkar, "Germanings Crash: Pilots, Upset over hasty conclusions and media leaks, to file lawsuit," *IBTimes*, 27 March 2015, http://www.ibtimes.com/germanwings-crash-pilots-upset-over-hasty-conclusions-media-leaks-file-lawsuit-1861486.
[45] Francois Duclos, "Crash de Germanwings: plainte du SNPL contre le BEA", *AirJournal*, 5 January 2016, http://www.air-journal.fr/2016-01-05-crash-de-germanwings-plainte-du-snpl-contre-le-bea-5156076.html.
[46] French Republic Ministry of Justice, Directorate for Criminal Matters and Pardons, "Presentation of the agreement on aviation safety investigations between the Investigation and Analysis Bureau (BEA) for civil aviation safety and the Directorate for Criminal Matters and Pardons," Ref. No: 2014/0098/E13, Paris, 13 June 2016.
[47] Kate Connolly, "Father of Germanwings pilot accused of killing 150 questions inquiry verdict," *The Guardian*, 24 March 2017.

Role of the CAAs and EASA in safety investigations

The BEA associated EASA as a technical advisor to the investigation. EASA sent an investigator to France by Day 2 and the role of EASA was clear throughout the investigation. EASA was not present at the crash site, but rather supported the BEA team by providing information on regulatory issues / questions. BEA representatives commended the fact that EASA quickly (at a very early stage) issued the requirement to always have 2 pilots in the cockpit. The BEA considers the EASA contribution as very effective (Article 8). From the airline point of view, it was expected that EASA would have been more involved considering the role of the flight deck entrance / flight door.

The French DGAC did not visit the accident site, but it provided relevant data as needed. The BEA also conducted a benchmark of medical certification practices around the world, to which DGAC participated.

A representative of Lufthansa noted that the process for involving airlines as advisors to the accredited representatives worked very well from the start of the investigation through to the final report. Lufthansa established good contacts and worked closely with the full investigation team, particularly with Airbus; Lufthansa was allowed to join the BEA investigators for the FDR reading. The extent to which this situation reflects a change or improvement compared to the pre-2010 situation, however, is difficult to judge given that Germany did not experience a real accident in the last 20 years involving a German air carrier with multiple fatalities (prior to the Germanwings case). Nevertheless, the current relationship between accredited representatives and advisors is really strong.

Implementation of safety recommendations

The final report contained 11 Safety Recommendations (SRs), addressed to the World Health Organisation (1), IATA (1), the European Commission (1), EASA (6), BMVI (2) and BÄK (2). The SRs relate to:

- Medical evaluation of pilots with mental health issues:
  - Recommendation FRAN-2016-011 (EASA).
- Routine analysis of in-flight incapacitation:
  - Recommendation FRAN-2016-012 (EASA);
  - Recommendation FRAN-2016-013 (EASA).
- Mitigation of the consequences of loss of licence:
  - Recommendation FRAN-2016-014 (EASA);
  - Recommendation FRAN-2016-015 (IATA).
- Anti-depressant medication and flying status:
  - Recommendation FRAN-2016-016 (EASA).
- Balance between medical confidentiality and public safety:
  - Recommendation FRAN-2016-017 (WHO);
  - Recommendation FRAN-2016-018 (EC);
  - Recommendation FRAN-2016-019 (BMVI, BÄK);
  - Recommendation FRAN-2016-020 (BMVI, BÄK).
- Promotion of pilot support programmes:
  - Recommendation FRAN-2016-021 (EASA).

Two years later, the BEA's assessment of their follow-up is as follows:

- EASA has provided generally satisfactory responses. EASA launched a task force that was running independently. The conclusions of the BEA final report were rather in line with the conclusions of EASAs findings. Theirs went a bit further with regard to random drug testing. The BEA did not elaborate on this topic because no related contributing factor could be established in the Germanwings accident. However, the safety recommendations issued by BEA were accepted by EASA and are generally being implemented. EASA has a webpage dedicated to the follow-up of actions taken after the Germanwings accident, which outlines what they have done, steps, etc.; [48]
- One SR was issued to the EC regarding the balance between medical confidentiality and public safety: The BEA does not consider the answer from the EC to be satisfactory. The objective of the SR was to enable medical doctors to breach medical confidentiality

[48] https://www.easa.europa.eu/easa-and-you/aircrew-and-medical/follow-up-germanwings-flight-9525-accident.

when there is a risk to public safety. The Commission's response did not go as far as the SR intended, giving access only to files by aero-medical doctors;
- Another SR was issued to IATA about the mitigation of consequences of loss of license. The BEA considers that the response is only partially adequate, believing that IATA could take a more proactive action to encourage the use of loss of license insurance to its member airlines;
- The BEA did not receive an answer from the World Health Organisation (WHO), which received a similar recommendation as the one to EC, but on a global level.

The process of drafting the safety recommendations functioned well, though interviewees consulted for this case study generally indicate that it's too soon to judge the impact and efficacy of the SR's in this particular case. The SR's have not yet been fully / completely implemented, therefore they have not yielded measurable effects. For example, one of the recommendations deals with how doctors treat the confidentiality clause, which is difficult to solve within German regulation. This is not a technical recommendation, but rather more politically motivated, which takes longer to implement. Safety recommendations that are technical in nature are easier to address and to assess. The safety recommendation that was directed to the association of airlines (of which Lufthansa is a member) was forwarded to the association's members. Lufthansa already had such a programme in place as was proposed by the safety recommendation, however Lufthansa amended the programme following the safety recommendation.

Article 18, which requires entities receiving a safety recommendation to give a reply to the issuing SIA (the BEA) and allows the BEA to, in turn, provide a formal response, is considered to represent a positive improvement as ICAO Annex 13 does not impose such a requirement.

In the end, the findings were communicated: to the families of the victims in person (in Bonn and Barcelona) and in separate meetings with the families of the pilots and flight crews prior to a press conference to the broader public. Later, the BEA also presented the results to the Aerospace Medical Association (AsMA), which had been associated to the investigation. This was seen to be a good way to promote the lessons learnt of the investigation.

Assistance to victims and their families

A national Point Of Contact of the German government, in coordination with Lufthansa, was able to put together a list of victims and families. The formal contact in Germany was the BFU. The Ministry of Transportation and Digital Infrastructure (BMVI) is the office responsible for dealing with victims assistance in Germany. Lufthansa's internal post-emergency organisation (PEO) was in charge of working with BMVI and supporting the victims' families. The Lufthansa investigation team, together with the BMVI team, acted as the liaison between the investigator in charge (IIC) of BEA and Lufthansa's PEO regarding timing for the disclosure of the information (Note: the IIC was responsible for deciding the information that could be disclosed). Meetings were held between BEA and the families, organised by the PEO before the press conference; the PEO organised the flight of victims' families, translations, making sure special assistance teams were present at the press conference. The whole process is said to have worked well with the Lufthansa PEO, which received positive comments from the relatives' victims as well.

There were no major differences in the approach of Germany and Spain, which also has a government appointed point of contact as well as a permanent office that deals with victims assistance, called Oficina de Asistencia a las Víctimas de Accidentes Aéreos (OAV). The BEA experienced some difficulties to obtain access to the list of relatives from Lufthansa, though no difficulties were reported in relation to the Spanish counterparts.

The requirements to interact with families and victims can be difficult in practice given the quick timeframe in which information unfolds. Unfortunately, victims' families still receive most of the early information / news from the media, which is simply because the appropriate channels are not yet in place. This is mainly an issue in the immediate aftermath of the accident; by the time of the final report, these communication channels are well established. The BEA interviewees acknowledge the good intentions of the regulation on this matter.

Case 4: UK Court cases

Introduction

This section analyses a number of accident cases. It involves accidents investigated by the Air

Accidents Investigation Branch (AAIB) that gave rise to judicial proceedings revealing the complex relationship between the safety investigation and other legal proceedings. It involves the following accidents:

1. An accident near Witchampton, Dorset (UK) on 15 May 2011 involving a vintage DH82A Tiger Moth propeller bi-plane;
2. An accident at the Royal Air Force Association air show at Shoreham, West Sussex (UK) on 22 August 2015 involving a Hawker Hunter T7;
3. An accident near Gillingham Hall, Norfolk on 13 March 2014 involving an Agusta Westland helicopter;
4. An accident involving an Augusta A109E (operated by Rotormotion) near Vauxhall Bridge, Central London on 16 January 2013.

The fourth case, namely the Augusta A109E accident on 16 January 2013 near Vauxhall Bridge in London was brought to our attention, but, apart from hearings before the Coroner's Court of Southwark, the AAIB investigation was not followed by civil or criminal proceedings yielding results for the questions raised in this study. Therefore, this last case has been dismissed.

For each of the three cases, a summary of the accident is given, followed by the legal proceedings and finally the Implications of the case for the application of Regulation (EU) No 996/2010. At the end of the three cases an overall conclusion is given.

UK Court Case 1: DH82A Tiger Moth near Witchampton, Dorset (UK) on 15 May 2011

Summary of the accident

On 15 May 2011, Mr. Rogers was a passenger in a vintage Tiger Moth propeller bi-plane manufactured in 1940 of which Mr. Hoyle was the pilot. In the course of the flight, the aircraft` crashed to the ground. Mr Rogers was killed. Mr Hoyle was seriously injured but survived. This aircraft was used in general aviation, and was not equipped with CVR and FDR. The relatively limited evidence was based on eyewitnesses.

The AAIB examined the accident. On 14 June 2012, it published its official accident report. The report stated, among other things, that the aircraft "was seen by observers on the ground to pull into a loop and during the manoeuvre it entered into a spin from which it did not recover. The manoeuvre started at 1,500 feet agl (above ground level) and there was insufficient height for the pilot to recover from the subsequent spin."

Legal proceedings

Mr Roger's mother and sister started legal proceedings against Mr Hoyle on behalf of his estate and dependants claiming damages in a civil suit against Mr Hoyle and his insurer, Lloyds of London. They argued that the accident was caused by Mr Hoyle's negligence.

The case was brought to the English High Court were the claimants - the relatives of Mr Rogers -put forward that they wanted to access the AAIB report, because it included statements which were made in the context of the AAIB investigation which could help them, the claimants, to underpin their line of arguments in the civil procedure for claim for damages. The claimants stated that:

- Mr Hoyle had no formal training in aircraft aerobatics;
- The aircraft was observed pulling into a loop;
- The loop manoeuvre started at around 1,500 feet above ground level in the same geographic location as a loop performed by Mr Hoyle with his first passenger in the previous flight that day;
- during the loop manoeuvre the aircraft entered into an unintentional spin;
- Mr Hoyle did not have sufficient knowledge or training in the correct spin recovery for a Tiger Moth; and
- there was insufficient height for Hoyle to recover from the spin.

The Roger's party's insurers, namely, Lloyds of London, disagreed with the use of the AAIB report in the civil proceedings and found that it had to be excluded as evidence. The High Court sided with the Roger's party, and decided that the published AAIB report should be admitted as evidence.

The English High Court was attacked by the mentioned insurance company before the UK Court of Appeals. In the procedure, the insurer was supported by the UK Department of Transport,

and the International air Transport association (IATA). They asked the High Court not to accept the AAIB report as evidence in the civil proceedings. However, the claimants won on every point put forward by them, as a consequence of which the decision of the High Court was confirmed.

The High Court very much analysed the case from the perspective of the UK Investigation of Air Accidents and Incidents Regulations of 1996, henceforth also referred to as: the UK Regulations of 1996 which implemented provisions of the Chicago Convention, in particular its Article 26, and Standards of ICAO Annex 13, as well as those of Directive 94/56/EC which is the predecessor of Relation (EU) No 996/2010. We shall discuss the relationship between the UK Regulations of 1996 and Regulation (EU) No 996/2010 in the sections below.

The Court of Appeal held:

> "I agree with the judge … when he said that a non-lawyer would be astonished that the report of the AAIB was not something to which a court could even have regard".

The Court also decided that:

> "Some measure of the value of AAIB reports is to be found in the fact that, according to the evidence of Mr Healy-Pratt, AAIB reports have been routinely referred to and used as evidence in English Litigation; their use considerably assists the efficient and speedy resolution of claims; and the majority of potential civil claims arising from civil aviation accidents settle on the basis of AAIB reports... In practice, many litigants who would wish to advance claims in respect of dead or injured passengers would find it either impossible or very difficult to assess the relevant information such as cockpit voice/flight data recordings, and to finance the gathering of the necessary evidence to mount a claim..."

The English High Court adopted a somewhat pragmatic rather than principal approach towards the question of the admissibility of the AAIB report in the civil proceedings. The court found that it had a discretionary power to decide on its admissibility, and that it could "see no reasonable basis" for the suggestion that aviation people might be deterred from making statements before the AAIB in the future as they might be blamed for them, thus foregoing the safety argument.

This was not the first UK case in which the AAIB report was used in other legal proceedings. However, in these other proceedings the parties agreed on its use, which was not the case here.

The surviving pilot, Mr Hoyle, is now also involved with the on-going criminal investigation into the accident, which together with the Coroner's Inquest and the High Court Case will continue.

Implications of the case for the application of Regulation (EU) No 996/2010

The UK Court of Appeal and High Court had to address Standard 5.12 of ICAO Annex 13 dealing with the non-disclosure of specified data and records kept in aircraft equipment which has no binding force per se as it is not a treaty rule. This standard is carefully implemented in Article 14 of Regulation (EU) No 996/2010, which has binding force as a provision of primary EU law.

Annex 13, and, with it, Regulation (EU) No 996/2010 proceeds from the generally applicable principle that listed records should not be disclosed in civil or criminal proceedings. General aviation accidents are not excluded from that principle which is the reason why these judgements have been criticised.

The High Court stated the following on the relationship between the UK Investigation of Air Accidents and Incidents Regulations of 1996, henceforth also referred to as: the UK Regulations of 1996, and Regulation (EU) No 996/2010:

> "Regulation (EU) No 996/2010 on the Investigation and Prevention of Accidents and Incidents in Civil Aviation ("the EU Regulation") establishes a parallel regime with direct effect in Member States. The EU Regulation came into force on 2 December 2010. There is a substantial overlap between the EU Regulation and the Regulations. The Regulations have not, however, been repealed. It is sufficient to outline the statutory scheme for the investigation of air accidents established by the Regulations without also referring to the corresponding provisions of the EU Regulation."

Hence, because the UK Regulations of 1996 and Regulation (EU) No 996/2010 largely overlap and the first mentioned regulations came into force before Regulation (EU) No 996/2010, the High Court proceeded from the UK Regulations of 1996, without mentioning the EU Regulation. The court in the next two cases adopted a somewhat more fine-tuned approach towards this relationship.

The High Court did not genuinely analyse the principal question pertaining to the balance, which has to be struck between the safety interests involved with an aviation accident and the aim of conducting judicial proceedings in accordance with air transport rules and rules pertaining to such proceedings as required by ICAO Standards and provisions of Regulation (EU) No 996/2010.

UK Court Case 2: Hawker Hunter T7at the Royal Air Force Association air show at Shoreham, West Sussex (UK) on 22 August 2015

Summary of the accident

On 22 August 2015, a Hawker Hunter T7 G-BXFI aircraft, piloted by Andrew Hill, crashed while performing a manoeuvre at the Royal Air Force Association air show at Shoreham, West Sussex. The air show took place at Brighton City Airport also known as Shoreham Airport. The aircraft was approximately 60 years old. The aircraft struck the westbound carriageway of the highway A27. Eleven people were killed as a result. The pilot survived although he was injured.

On 3 March 2017, the AAIB published the accident report. The report concluded that the aircraft was carrying out a manoeuvre involving both a pitching and rolling component, which commenced from a height lower than the pilot's authorised minimum for aerobatics, at an airspeed below his stated minimum, and proceeded with less than maximum thrust. This resulted in the aircraft achieving a height at the top of the manoeuvre less than the minimum required to complete it safely, at a speed that was slower than normal. Although it was possible to abort the manoeuvre safely at this point, it appeared the pilot did not recognise that the aircraft was too low to complete the downward half of the manoeuvre. An analysis of human performance identified several credible explanations for this, including: not reading the altimeter due to workload, distraction or visual limitations such as contrast or glare; misreading the altimeter due to its presentation of height information; or incorrectly recalling the minimum height required at the apex.

The legal proceedings

In accordance with ICAO Annex 13 as implemented in the UK Investigation of Air Accidents and Incidents Regulations of 1996, henceforth also referred to as: the UK Regulations of 1996, made under section 75 of the UK Civil Aviation Act of 1982 the Police of Sussex applied for disclosure of specified items before the English and Wales Court, henceforth also referred to as: the Court. Seemingly, it was the first time that such an application was made before that Court.

In arriving at its decision, the court adopted a principal legal approach, departing from the main provisions of the Chicago Convention and the Standards of ICAO Annex 13 as implemented in the 1996 UK Regulations of 1996. Special attention was paid to the protection given to the non-disclosure of cockpit voice recordings (CVR) and transcripts from such recordings. The Court considered that these CVRs should not be disclosed for purposes other than accident or incident investigation unless the appropriate authority for the administration of justice determines that "disclosure outweighs the adverse domestic and international impact such action may have on that or any future investigations." The relevant norms of ICAO, UK and EU regulations were extensively quoted in the judgment drawn up by the judgement of the High Court of England and Wales.

Also, the Court referred to three other cases in which disclosure of CVRs was sought, namely, cases which were decided in Australia, New Zealand and Canada. The High Court of England and Wales opined however that none of these cases were helpful in the current proceedings because the facts of the domestic provisions were different from those, which were related to the present case.

The Court identified three categories of materials requested for disclosure by the police, to wit:

1. The statements made by the pilot, Mr Hill;
2. The film footage of the flight which was made by cameras which had been installed on the aeroplane in question on a voluntary basis;
3. Materials, which have been produced by various other people after the accident, for

instance, experiments and tests conducted on various aspects of the accident.

The materials of these three categories were assembled by the AAIB and kept in its report.

The Court refused the request for disclosure of the first category, as compliance with the request made by the Police would contravene the international, European and domestic regulations referred to above. Factors pertaining to fairness and the protection of personal privacy also mitigate against disclosure. Finally, and pragmatically, nothing prevents the policy from interviewing the pilot.

This is different for the second category because the legal provisions referred to above are not designed to protect those materials from disclosure. The Court stressed that there is no legal duty to produce these materials, which sets them apart from the CVRs.

Thirdly, the experiments and tests mentioned under the third category were also refused to be transmitted to the police for reasons, which have been explained in the confidential annex to the judgment of the Court.

Implications of the case for the application of Regulation (EU) No 996/2010

To begin with, the Court analysed the relationship between the UK Regulations – on accident and incident investigation – of 1996 and Regulation (EU) No 996/2010. It argued that the provisions of this regulation have "generally become part of the domestic law of Member States even without the need for national implementing regulations." However, the Court also stated that that does not mean that every provision of every EU Regulation is sufficiently precise to have direct effect.

It is therefore not unusual for EU Regulations to be given effect in national law by specific implementing legislation. It continued by holding that:

"it is also not unusual for a later EU measure to be given effect in domestic law by earlier legislation: this may well happen where a Member State takes the view that is own domestic law already complies with the requirements of EU law."

The UK which had implemented and specified some of the Standards of ICAO Annex 13 in domestic law whereas the UK Regulations of 1996 preceded the provisions of Regulation (EU) No 996/2010.

From a methodological point of view, it would seem that that High Court of England and Wales adopted a more principal than a pragmatic line of reasoning than the court applied in the Rogers vs Hoyle case explained in the previous accident case (UK Court Case 1). The Court of England and Wales prudently weighed the legal arguments and conducted a careful balancing check, which this led to a result, which is in line with the Standards of ICAO Annex 13, domestic law and Regulation (EU) No 996/2010.

UK Court Case 3: Agusta Westland helicopter near Gillingham Hall, Norfolk on 13 March 2014

Summary of the accident

On 13 March 2014, an Agusta Westland helicopter departed from a private site with little cultural lighting at night and in fog. Although the commander had briefed a vertical departure, the helicopter pitched progressively nose-down until impacting the ground near Gillingham Hall, Norfolk. The four occupants were fatally injured.

On 8 October 2015, a report into this accident was produced by the AAIB. According to the report evidence suggests that the flight crew may have been subject to somatogravic illusion caused by the helicopter's flight path and the lack of external visual cues.

The absence of procedures for two pilot operation, the pilots' lack of formal training in such procedures, and the limited use of the automatic flight control system, may have contributed to the accident.

Also, inquests into the deaths were heard before the Coroner and a jury between 12 and 15 January 2016.

The legal proceedings

In the period leading up to the inquests the Coroner ordered the AAIB and its Chief Inspector to disclosure to her of a cockpit voice and flight data recorder ("CVFDR") and/or a full transcript of that voice recording. The first notice requiring disclosure was dated 24 December 2015. Further notices were issued on 11, 12 and 13 January 2016.

The AAIB submitted that the Coroner did not have the power to make such orders and invited the Coroner to revoke them. The Coroner rejected those submissions in rulings dated 7 January 2016, 11 January 2016 and 12 January 2016, and fined the Chief Inspector £100 for non-compliance with these notices and the fines imposed on the Chief Inspector.

The orders from the Coroner and the related fines for non-compliance with these orders are the subject of the legal proceedings before, again, the High Court of England and Wales between the claimant, that is, The Queen, on the application of the Secretary of State, and Her Majesty's Senior Coroner for Norfolk as defendant, with the British Pilots Association as intervener. The Lord Chief Justice is the same person as the judge who decided the case explained in the previous section, and he did so on the same day, that is, on 28 September 2016.

The combination of these circumstances led to the adoption of a line of reasoning which is the same as the one, which was applied, in the previous case (3). The Court proceeded from the Chicago Convention, and then examined ICAO Standards laid down in Annex 13, including their implementation in the UK Regulations on accident and incident investigation of 1996, as related to Regulation (EU) No 996/2010.

The Claimant found that it was entitled to require documents on the cause of the accident, such as the CVFDR, in light of the UK Act of 2009 on the position of the Coroner. The Court did not follow that line of reasoning as it held that the law regulating that question, that is, the obligation or lack thereof to transmit these materials to the Coroner is laid down in specific regulations, namely, the Regulations on accident and incident investigation of 1996, and Regulation (EU) No 996/2010. Those specific regulations override the UK Act of 2009.

That said, the Court acknowledged that under certain circumstances, that is, when disclosure is balanced against different public interests mentioned in, among others, Article 14(3) of EU Regulation 2010, such disclosure can be ordered by the High Court, and by the High Court only.

Implications of the case for the application of Regulation (EU) No 996/2010

The High Court of England and Wales analysed securely Regulation (EU) No 996/2010, and its relationship with the facts of the case and UK law, including the UK accidents and incident Act of 1996, and general UK procedural law. It arrived at the conclusion that disclosure of confidential materials gathered by the AAIB may be sanctioned by an order of the High Court.

The Court also argued that the EU regulation had to be recognised as a special law, which has precedence over general procedural law of the UK. Moreover, it was said that the special investigation conducted by the AAIB should not duplicate other investigations. In this case, the coroner should "treat the findings and conclusion of the report" of the AAIB "as the evidence as to the cause of the accident."

Finally, one of the judges advised the coroner to reconsider the Memorandum of Understanding (MoU) with the AAIB in the light of this judgment, also for guidance in the future when a new MoU may govern their relationship. This last remark pertains to advance arrangements.

Overall conclusions

Knowingly, case law plays a prominent role in judicial proceedings in the UK. A court in the UK looks to past precedential decisions of relevant courts, and synthesizes the principles of those past cases as applicable to the current facts. For example, in England, the High Court and the Court of Appeal are each bound by their own previous decisions, which is different from civil law jurisdictions. From that general point of view, the above decision shed a light on future cases.

The first case (Rogers v Hoyle) concerned the question whether a final report drawn up by the AAIB may be used as evidence in – in this case – civil proceedings, given that the report was not made for that purpose as stated in Article 16 of Regulation (EU) No 996/2010. The test was therefore on admissibility and not on the disclosure of information. The regulation does not

prevent the final report from being used in other proceedings.

That said, Regulation (EU) No 996/2010 was relevant in the second and the third case as they pertained to specific materials that are protected from disclosure under Article 14 of Regulation (EU) No 996/2010. Only the film footage of the flight which was made by cameras which had been installed on the aeroplane in question on a voluntary basis was disclosed because it was not regarded as sensitive safety information as protected under Article 14.

ANNEX 5 DETAILED ANALYSIS

This annex contains the detailed analysis for the evaluation questions. For each evaluation question, first the question is stated. Next, the associated results of the desk research, of the field research (interviews, survey and workshop), and of the case studies are given. Finally, an answer to the evaluation question is given. This answer is exact the same text as provided in Chapter 4.

A5.1 Evaluation question 1

Evaluation question 1:
To what extent are the measures required by the Regulation still relevant and appropriate to the initial needs?

Results from Desk Research
The regulation was aimed at resolving the problems listed in Chapter 3 through a combination of co-regulation and voluntary cooperation measures. In particular, the co-regulation measures foresaw the establishment of permanent, independent SIAs in every Member State capable of conducting a full safety investigation, either on its own or through agreements with other safety investigation authorities (Article 4). Independence is defined and addressed in Evaluation question 2.1.2. Regarding coordination of the accident investigation proceedings with other (namely judicial, civil aviation or search and rescue) proceedings at national level, the regulation introduced the requirement to establish advance arrangements (Article 12(3)).

The investigating capacity of the Member States, particularly the smaller ones, was to be reinforced through voluntary cooperation with the establishment of a formal European Network of Civil Aviation Safety Investigation Authorities (ENCASIA Network), supported by an annual grant and based on existing informal cooperation and resources of the Member States, for sharing of resources, coordinating of training and to facilitate closer cooperation and exchange of data.

Regarding the implementation of safety recommendations, the regulation introduced the requirement of mandatory replies to every safety recommendation (Article 18) and established a European database of safety recommendations (Article 18). The rights of victims and their relatives were to be better protected through the obligation for airlines to have a list of passengers quickly available following an accident (Article 20), and the obligation for Member States to have plans of emergency assistance at the national level (Article 21).

Finally, on the need to clarify the roles of EASA and the national civil aviation authorities in the process of accident investigations, provisions were included to ensure that EASA, as an authority responsible for aircraft certification, and CAAs, as frequent addressee of safety recommendations, would have access to information from accident investigations in order to take safety actions if needed (Article 8). Provided that there is no conflict of interest, SIAs may invite EASA and/or CAAs to participate in the investigation as an advisor to the IIC. In these cases, the regulation clarifies that the advisors are entitled to some rights within the investigation, including visitation to the accident site and participation in follow-up investigation work.

The full list of measures required by Regulation (EU) No 996/2010 is mapped against the initial needs that were to be addressed by the regulation in Table A.1. The results of this mapping exercise show that each of the 5 needs were addressed by a combination of multiple mechanisms introduced by the regulation, whereas the "obligation to investigate" and the "obligation to notify accidents and serious incidents" did not ostensibly address any of the 5 needs. The inclusion of the latter two provisions nevertheless is important to ensure consistency with ICAO Annex 13.

Table A.1: Mapping of Regulation (EU) No 996/2010 measures to initial needs

	Mechanisms introduced by Regulation (EU) No 996/2010	Need 1: Investigation Capability	Need 2: Tensions with other proceedings	Need 3: Clarity of CAA / EASA roles	Need 4: Implement Safety	Need 5: PAX & Victim assistance
1	Civil Aviation Safety Investigation Authority	X	X			
2	Obligation to investigate					
3	Cooperation between safety investigation authorities	X			X	
4	European Network of Civil Aviation Safety Investigation Authorities	X	X	X	X	
5	Participation of EASA and national CAAs in safety investigations			X	X	
6	Obligation to notify accidents and serious incidents					
7	Participation of the Member States in safety investigations			X		
8	Status of the safety investigators		X			
9	Coordination of investigations		X			
10	Preservation of evidence		X			
11	Protection of sensitive safety information		X			
12	Communication of information				X	X
13	Investigation report				X	
14	Safety recommendations				X	
15	Follow-up to safety recommendations and safety recommendations database				X	
16	Occurrence reporting				X	
17	Information on persons and dangerous goods on board					X
18	Assistance to the victims of air accidents and their relatives					X

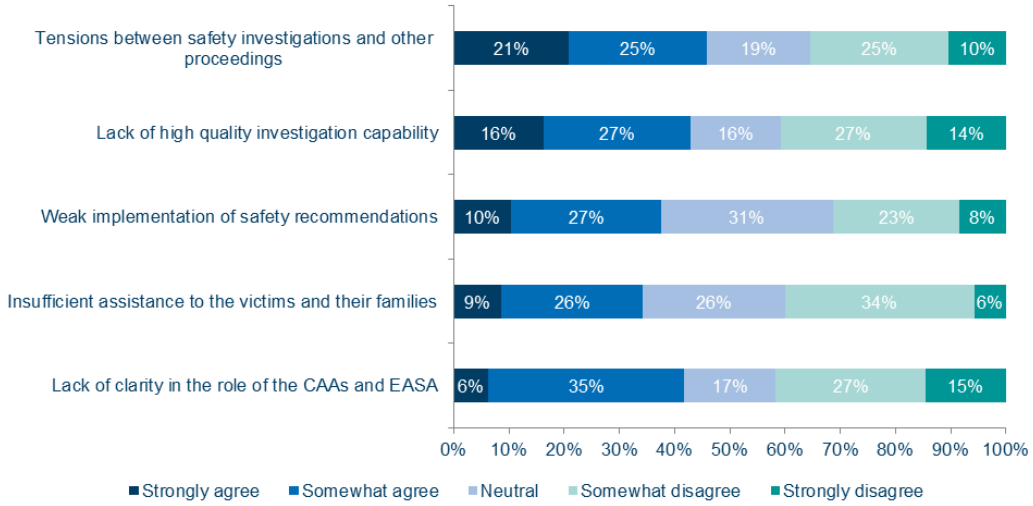
Results from Field Research

Relevance of initial needs

Respondents to the targeted survey were requested to indicate their view as to whether the abovementioned problems are still present today (strongly agree that the problems are still present to strongly disagree that the problems are still present). Figure A.1 shows the distribution of views concerning the continued relevance of the 5 identified problems.

Overall, the most frequently cited problem that is still considered to be relevant today is 'tensions between safety investigations and other proceedings', indicated by 46% of respondents (i.e. responses 'somewhat agree' or 'strongly agree'). This is followed by 'lack of high quality investigation capability' (43%) and 'lack of clarity in the role of CAAs and EASA' (42%). By way of contrast, respondents offer a relatively positive assessment of the situation concerning assistance to victims, with just over a third indicating that the problem is still relevant, while 40% disagree. It should be noted, however, that the results for 'assistance to victims' should be treated with caution as one-third of respondents did not provide an answer on this issue. Respondents are most neutral on the question of safety recommendations (30%).

Figure A.1: Continued relevance of 5 main problems today (N=49)



Categorising respondents according to stakeholder group, 13 of 25 SIAs state that the problem of lack of clarity in the roles of EASA and CAAs is no longer relevant today due to the regulation. 10 of the 25 SIA respondents state that the lack of investigation capabilities at national level and the tensions between safety investigations and other proceedings are still a problem today.

Comments accompanying these responses were as follows:

- Regarding investigation capacity, there are some Member States that do not have sufficient capacity – in terms of personnel (staff and expertise) and equipment – to conduct high quality investigations into major accidents or incidents. This is particularly observed among smaller Member States. However, in Member States that do have sufficient capacity, the standard of quality is considered to be high. One SIA representing a small State suggests that the staff criteria of SIAs should be defined more specifically in the regulation (Article 4, item 6(c));
- One SIA observed an increasing focus on apportioning blame and liability among the wider public. Because SIAs have access to some vital information sources (e.g. CVRs), and because SIAs conduct an investigation into most accidents, this respondent states that SIAs increasingly face pressures to apportion blame and liability despite existing provisions in the regulation intended to mitigate this risk. Depending on local conditions and the specificities of a particular accident, politicians, justice administrations and other actors want either to interfere or to use the results of an investigation for purposes outside the safety investigation itself;
- On the issue of EASA and CAA participation, it is suggested that Article 8 should instead read "CAA and/or EASA" to nominate a contact person;
- Finally, despite improvements to the implementation of safety recommendations, several SIAs also note that responses are not always adequate. One SIA indicated that the monitoring of safety actions is inconsistent across Member States and is generally not aligned with ICAO Annex 13. Furthermore, the requirement applies only to European States.

9 of 19 aviation community respondents indicate that investigation capacities of Member States' SIAs remain insufficient. The primary concern among aviation community respondents, however, is the continued tensions between safety investigations and other proceedings (10 of 19 respondents). On both issues, respondents represent a mix of ANSPs, manufacturers, airlines and air traffic controllers.

Comments accompanying the responses provided by aviation community representatives are summarised as follows:

Discrepancies remain between States' SIAs, both in terms of investigation capacity and the degree of independence of safety investigations from other proceedings. According to one representative of airline organisations, the capabilities of individual investigation bodies are mostly shaped by the resources available to them and the extent of their aviation activities.

Nevertheless, the various cooperation activities between States, particularly in the framework of ENCASIA, appear to have had some mitigating effect. By contrast, one airline argues that even the most aeronautically advanced countries (e.g. France) have insufficient investigative capacity, acting in most cases merely as a 'paper pusher' of documents produced by manufacturing industry entities, which also have their own commercial interest.

Despite Article 12, proper coordination between legal investigations and safety investigations has not been achieved in all Member States. On high profile cases, there is still a "competition" between the judicial and safety investigations. The existence of parallel investigations (judicial and safety) also is said to coerce and interfere with the aviation investigation bodies in some States. One airline suggests that regulation in this area should be further developed, for instance, requiring that judicial investigations be based on the outcome of the safety investigation (i.e. root cause findings and identification of responsibilities), rather than running in parallel. In addition, mixed messages sent through the media have the effect of undermining Just Culture and the protection and use of safety information for strictly safety purposes. This is particularly concerning given tendency towards criminalizing accidents.

The roles of EASA and CAAs are generally considered to be clear to aviation community stakeholders, though there is some recognition that the clarity of CAAs' role may vary depending on the State. The involvement of EASA is positive considering the European Aviation Safety Plan and the rulemaking programme, however some stakeholders suggest that EASA's involvement remains relatively low in practice.

Regarding safety recommendations, several aviation community stakeholders indicate that implementation remains too slow and that the recommendations (and the investigations themselves) tend to focus on micro problems rather than the more important systemic issues. As one representative of air traffic controllers noted, it is "still easier to allocate training than questioning the entire system and the economic dispositions." Similarly, airlines and operators highlight the fact that many recommendations tend to propose regulatory measures and requirements related to new systems and tools on board the aircraft. The airline representative goes on to suggest that safety recommendations could better focus on safety promotion tasks, as opposed to making additional requirements.

Finally, aviation community stakeholders indicate that some items related to assisting victims are not possible to implement in certain circumstances. For example, the requirement to provide a passenger manifesto and list of dangerous goods on board within 2 hours of the incident or accident occurrence is not always feasible, for instance in the middle of the night when an airport is closed, or in the case of manual ticket conciliation at the departure airport (mostly on flight outside the EU performed by EU operators). Stakeholders suggest that a more flexible provision should be considered based on the size of the airport and the available infrastructure.

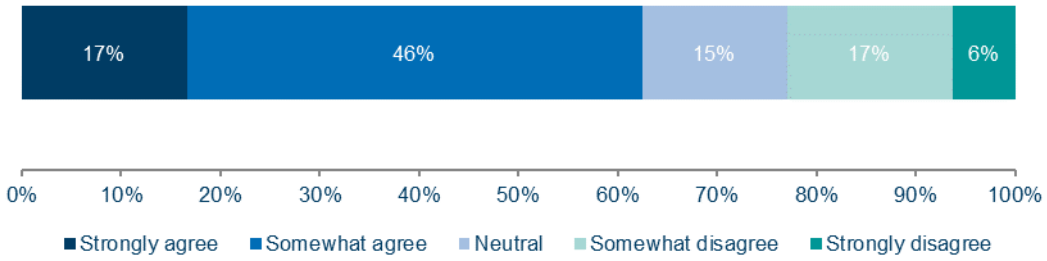
CAA respondents are generally evenly split between agreement, disagreement and neutral positions on the continued relevance of the measures.

Appropriateness of measures to address the identified problems

Respondents to the survey were requested to indicate whether the measures required by the regulation proved appropriate to address the five main problems. Figure A.2 and Figure A.3 show the distribution of views concerning the appropriateness of the mechanisms to address these needs. Comments accompanying these responses are summarised below.

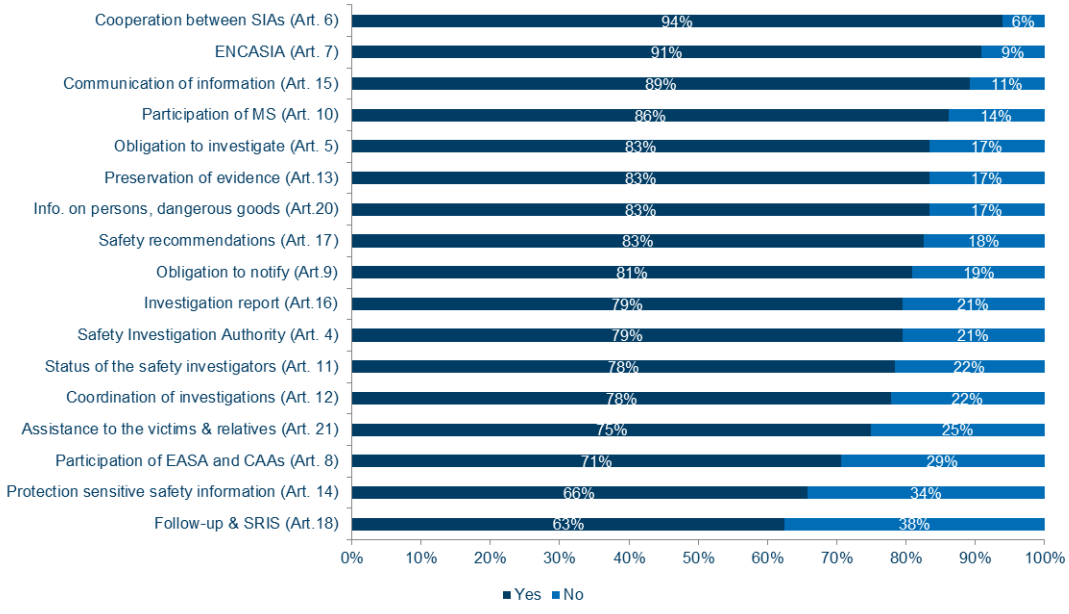
Across all measures, the majority of stakeholders consider the regulation appropriate to cover the initial needs of the accident investigation community / system, with 63% of all respondents to the survey indicating that they at least somewhat agree that the regulation covers the identified problems. Just 23% of respondents disagree ('somewhat disagree' or 'strongly disagree').

Figure A.2: Appropriateness of measures to address the main problems (N=44)



Regarding the appropriateness of the individual measures introduced by the regulation to address the respective problems, the majority of respondents offer a favourable view across all measures. Considering only those respondents who answered the question (excluding 'don't know' answers), the most appropriate measures identified by respondents are the provisions pertaining to cooperation and coordination between SIAs (i.e. Article 6 on 'Cooperation between SIAs' and Article 7 on 'ENCASIA'), both indicated favourably by more than 90% of respondents. At the other end of the appropriateness spectrum, slightly more than one-third raise concerns about the appropriateness of measures on the protection of sensitive safety information (34%) and the obligation to follow-up safety recommendations and the establishment of the SRIS (38%). Moreover, many SIAs reported to the Commission during its review in 2016 that they do not find the Articles 20 and 21 to be appropriate in the regulation. According to the SIAs, these provisions are addressed to the level of Member States, whereas the rest of Regulation (EU) No 996/2010 concerns safety investigations. It could imply that SIAs should produce a list of passengers or develop assistance plans.

Figure A.3: Appropriateness of measures to address the main problems (N=44)



Article 11 and Article 12

Beyond comments raising concerns that not all Member States are in conformity to Article 12, the following observations were made:

- Although Article 12(1) states that the investigator-in-charge shall retain custody of flight recorders and any physical evidence, the text then goes on to state 'where the judicial authority is entitled to seize any evidence...', which one SIA says may create uncertainty. Article 12(2) also creates uncertainty when it states that the control of the site may have been transferred to the judicial authorities;

- One SIA argued that the obligation to inform authorities of a (suspected) unlawful interference and the obligation to hand over relevant investigation information should be left upon national laws;
- Regarding Article 11, one SIA notes that in some Member States, the investigators can be called upon as a witness or expert in court proceedings.

Article 14

With regard to Article 14(3), one SIA argues that, in taking into account the principle of Just Culture, the decision on whether or not to disclose specified records should be taken by the SIA. Other SIAs also point out the need for clarification of Article 14, particularly in assessing whether or not information can be disclosed.

Article 18

- According to one SIA, article 18(4) lacks a strict definition as to who is responsible for the monitoring of the implementation of the Safety Recommendations implementation;
- According to one SIA, Article 18(5) lacks a clarification on the obligation for safety authorities to record in the central repository all safety recommendations received from third countries (for example, whether it includes only safety recommendations addressed to the SIA or all safety recommendations).

Article 20 and 21

Regarding Article 20, one SIA noted that the registration of the nationality of passengers should be included in the guidance material. Regarding Article 21, several SIAs indicate that the roles and responsibilities of relevant actors requires further definition, as it is not clear in some Member States who should be responsible for coordinating the actions.

Overall, however, many SIAs reported to the Commission during its review in 2016 that they do not find the Articles 20 and 21 to be appropriate in the regulation. According to the SIAs, these provisions are addressed at the level of Member States, whereas the rest of the regulation (EU) No 996/2010 concerns safety investigations. Moreover, a number of Member States face specific difficulties to implement the requirements due to their administrative structures. For instance, in countries where administration is structured around regions, the coordination of a single plan at national level is uniquely challenging.49 Despite these challenges and objections, the majority of Member States consulted in the frame of this study report that they have implemented or are in the process of developing a plan (see effectiveness chapter 3.2 for more on this issue).

A final observation relates to the statement of one survey respondent representing a passenger and victims organisation, who indicated being aware of only two plans that have been implemented in the EU (from Italy and Spain), despite evidence that suggests more plans have indeed been implemented to date.

Other comments

Regarding Article 9, reporting obligations are not currently aligned with Regulation (EU) No 376/2014, a view that was also raised in several interviews with CAAs and aviation community representatives. Regarding Article 14, one SIA has been questioned by the police authority, judges and insurance companies regarding of using a final report as evidence or give evidence to blame somebody. It is also argued that hangars shouldn't be mandatory. Issue can be handled other way (rent, from military etc.) (see Article 4).

The obligation to investigate is considered by one SIA as creating excessive burden / workload, and thus suggests to amend the provision to read "authority to investigate". For instance, in general aviation, many accidents occur (many more than in commercial aviation) as a repetition of previous scenarios. Therefore, the obligation to investigate those events is felt as a waste of energy. On the other hand, one airline representative argues that the obligation to investigate is not sufficiently adhered to and that more can be done to ensure investigations are performed. According to the respondent, a study conducted by members of the IATA ACTF revealed that a large number of accidents over the past 10 years were not properly investigated. Accident reports were available for only 300 of the approximately 1,000 accidents that occurred over the

[49] European Commission, SWD(2016) 151 final, Commission Staff Working Document on the implementation of Regulation (EU) No 996/2010 on the investigation and prevention of accidents and incidents in civil aviation, Brussels, 27 April 2016.

decade worldwide. Furthermore, a considerable number of those 300 reports showed opportunity for improvement.

One ATCO representative organisation questions the appropriateness of the regulation from a systemic perspective, arguing that the investigations are addressing the wrong issues altogether: Almost all investigations are still occupied with finding details that might seem important but distract efforts for safety improvement towards more training, new procedures or more alertness instead of systemic changes.

Results from Accident Cases

In both the Pilatus and Germanwings cases, investigators did not experience any shortcomings with respect to the amount of investigators available, expertise needs, nor any other material resource requirements. The involved parties were sufficiently equipped with all necessary resources. In the LOT case, turnover among the investigation staff at the Polish SCAAI contributed to delays in finalising the investigation.

The regulation's provisions concerning coordination of the various investigations by means of advance arrangements proved relevant to address the underlying needs in both the Pilatus and Germanwings cases. At the outset of the Pilatus case, the judicial authorities and the safety investigative authorities had not come to an agreement on the coordination of investigations, though the issue had not caused problems in the past. By contrast, the advance arrangement had already been agreed and adopted in France at the time the accident occurred, though the French judicial authority in charge was unaware of its existence. Insufficient coordination and/or application of the advance arrangement at the outset of the investigation led to the emergence of tensions between the various proceedings. In the UK, an agreement was reached on the advance arrangement mid-way through the investigation. In both cases, the full application of the States' respective advance arrangement assuaged prior tensions and enabled the investigations to proceed unimpeded.

A different picture emerges in the UK court case DH82A Tiger Moth near Witchampton, Dorset on 15 May 2011. In this case, significant tensions emerged between the safety investigation and the civil proceedings on whether the AAIB report could be admitted as evidence in the latter proceedings. The High Court admitted the report as evidence.

The regulation's provision concerning the participation by EASA and CAAs in safety investigations appropriately addressed the initial needs in the Pilatus and Germanwings cases. This is evidenced by the absence of any challenges relating to their participation in the cases: both EASA and the respective CAA effectively supported the investigation team and no difficulties were encountered. EASA did not support the Lot case investigation team.

In all case studies, the provisions concerning safety recommendations have been relevant for clarifying the procedures and ensuring that the involved parties issue a response within given timeframes. The extent to which the regulation has improved the implementation of safety recommendations is as yet unclear from the accident case studies.

Finally, the regulation's provisions concerning victims' assistance have been appropriate to address the respective need insofar as procedures and contacts points were set up in the different cases. This is most evident in the Germanwings case, which saw the mobilisation of victims assistance and emergency contact points in Germany, Spain and within the BEA. The issue was not deemed pertinent in the Lot case. According to the Polish investigation team, no inquiries for information were made to the Polish SCAAI.

Answer to the question

The Regulation (EU) No 996/2010 sought to address five specific problems and needs identified in the impact assessment[50], through a combination of co-regulation and voluntary measures. The initial needs and corresponding mechanisms (i.e., the inputs and activities corresponding to the operational objectives of the regulation) to address them are as follows:

[50]http://ec.europa.eu/transport/sites/transport/files/modes/air/safety/doc/2009_regulatory_impact_assesment.pdf.

1. Lack of high quality investigation capability at national level

Compared to the situation in 1994, the investigating capacity of the Member States was significantly more disparate in the mid-2000s. Following the enlargements of the EU in 2004 and 2007, the investigating capacity of Member States was primarily concentrated in a small number of States, particularly those with a large aviation manufacturing industry. Related to this, there was a growing need for diverse and specialised expertise and resources to investigate increasingly complex aircraft and aircraft systems.

The investigating capacity of Member States, particularly the smaller ones, was to be reinforced through voluntary cooperation via the establishment of a formal European Network of Civil Aviation Safety Investigation Authorities (ENCASIA Network). This Network is further bolstered by an annual grant and based on existing informal cooperation and resources of the Member States, for sharing of resources, coordinating of training and to facilitate closer cooperation and exchange of data.

2. Tensions between safety investigations and other proceedings

Due to the many different legal systems in Europe, there were significant differences in the way investigators and judicial authorities cooperated with one another throughout an on-going investigation. In this context, there was a need to establish a basic legal framework through which authorities from different proceedings should cooperate. Moreover, there was a need for clarity in terms of both sides' access to and sharing of factual information in order to properly discharge their duties, while also protecting the information. The Directive of 1994 did not address these issues, however ICAO Annex 13 was explicit on them. In this context, it was appropriate to transpose into EU legislation relevant ICAO standards concerning protection of safety information.

The co-regulation measures foresaw the establishment of permanent, independent SIAs in every Member State capable of conducting a full safety investigation, either on its own or through agreements with other safety investigation authorities (Article 4). Independence is defined and addressed in Evaluation question 2.1.2. Regarding coordination of the accident investigation proceedings with other (namely judicial, civil aviation or search and rescue) proceedings at national level, the regulation introduced the requirement to establish advance arrangements (Article 12(3)).

3. Lack of clarity in the role of the CAAs and EASA in safety investigations

The EU institutional and legal framework underwent significant changes between 1994 and 2010, particularly concerning the establishment of EASA in 2002. By 2010, safety standards were almost exclusively defined at the EU level, and EASA, on behalf of the Member States, became responsible for certification of aircraft in the Community. In this context, there was a need for a clear framework enabling EASA to support investigations and to take action in response to the outcome of investigations.

Provisions were included to ensure that EASA, as an authority responsible for aircraft certification, and those CAAs, as frequent addressee of safety recommendations, would have access to information from accident investigations in order to take safety actions if needed (Article 8). The regulation clarifies that the advisors are entitled to some rights within the investigation, including visitation to the accident site and participation in follow-up investigation work.

4. Weak implementation of safety recommendations

The lack of any consistent approach across Member States with respect to gathering, processing and implementing safety recommendations resulting from accident investigations was considered to create an accountability deficit on the implementation side. In addition, there was a need to develop a consistent approach for following up safety recommendations of EU-wide relevance in light of the increasing number of recommendations that were being addressed to EASA as the Community regulator.

To address this problem, the regulation introduced the requirement of mandatory replies to every safety recommendation (Article 18) and established a European database of safety recommendations (Article 18).

5. Insufficient assistance to the victims of air accidents and their families.

Based on the experience of Spanish authorities in the aftermath of the accident in August 2008

involving Spanish airline Spainair at the Madrid Barajas airport, the management of passenger manifests and the rapid disclosure of passenger manifests to victims' families and the general public, became a need.

The rights of victims and their relatives were to be better protected through the obligation for airlines to have a list of passengers quickly available following an accident (Article 20), and the obligation for Member States to have plans of emergency assistance at the national level (Article 21).

Evidence from desk research, field research and case studies (as elaborated in Annex A5.1) show that the combination of co-regulation and voluntary cooperation measures required by the regulation are generally still relevant and appropriate to the initial needs that were to be addressed by the regulation. While there is some disagreement among stakeholders on the continued persistence of the different problems, and equally on the appropriateness of the measures to address these challenges, the following conclusions are drawn:

By building on the previously existing cooperation between safety investigation authorities and the investigation resources at national level, ENCASIA has contributed to better identify the expertise and resources available in each Member State, as well as gaps and remedial actions to address them. Peer reviews, exchange of information and joint training activities play an important role with respect to promoting and harmonising best practices across Member States, and improving preparedness and response capacities of SIAs in the event of an accident or serious incident (see Evaluation questions 2.4.1 and 2.4.2 below). These tools are highly appropriate to achieve the legislative objective of ensuring that all 28 Member States' SIAs are capable of conducting high quality, independent investigations.

The inclusion of clear language in the regulation identifying the roles and responsibilities of the different actors involved in process of investigating accidents and incidents in civil aviation is highly appropriate and relevant to address the needs related to tensions between safety investigations and other proceedings, and to the lack of clarity in the roles of CAAs and EASA. Although tensions with judicial proceedings are still prevalent in some Member States, the requirement on advance arrangements has in many cases been useful for establishing a dialogue and structuring the relations between the various authorities. On the need to clarify the roles of EASA and the national CAAs in the process of accident investigations, Article 8 ensures that EASA, as an authority responsible for aircraft certification, and CAAs, as a frequent addressee of safety recommendations, have access to information from accident investigations in order to take safety actions if needed. This provision effectively addressed the identified problem and is still appropriate today.

Likewise, the inclusion of clear language outlining procedures and timeframes for responding to safety recommendations has helped to address the issue of the weak implementation of safety recommendations.

In reference to Articles 20 and 21, the Regulation states in its preamble that prior "experience has shown that reliable lists of persons on board an aircraft are sometimes difficult to obtain in a timely manner," while also recognising the importance of establishing a deadline within which an airline can be required to produce such a list. Similarly, the Regulation notes the necessity of maintaining lists of dangerous goods on board to minimise risks to safety investigators at the site of the occurrence, and that the manner in which an accident and its consequences are dealt with vis-à-vis the public, the victims and their relatives is of crucial importance for maintaining the public's confidence in the quality of the civil aviation safety system (Regulation para. 30 – 32). In this respect, the obligations set out in Articles 20 and 21 directly target the identified needs, which are still relevant today.

The majority of the SIAs, CAAs and aviation community representatives agree with the appropriateness of the regulation's provisions concerning the provision of assistance to victims and their families to address this need. However, concerns were raised whether or not this regulation is the appropriate place for these provisions. As noted above, Articles 20 and 21 are addressed to the level of Member States, whereas the rest of Regulation (EU) No 996/2010 concerns safety investigations. Therefore, the provisions concerning assistance to victims are misinterpreted by some SIAs as an obligation for the SIA to produce a list of passengers or develop assistance plans. This interpretation is not correct. Therefore, there is no necessity to relocate these provisions to a different regulation.

As will be shown below, national regulations implementing provisions of the regulation may still

differ, despite the harmonisation efforts of the EU. Also, the different legal systems may shed a different light on the interpretation of provisions, as to which see Evaluation question 2.1.4 below.

A5.2 Evaluation question 1.1

Evaluation question 1.1
To what extent are the measures required by the Regulation appropriate to new threats to aviation, such as drones and cybersecurity?

Regarding new or additional problems that could or should be addressed by the regulation, we take into account the Future Aviation Safety Team (FAST) list51 and stakeholder feedback[52], we identify 5 main emergent threats of relevance to Regulation (EU) No 996/2010. These are:

- Drones;
- Cyber threats;
- Social Media;
- Aircraft complexity;
- New investigation techniques.

Results from Desk Research

Drones

Regulation (EU) No 996/2010 currently does not extend the obligation to investigate accidents or serious incidents involving aircraft specified in Annex II of Regulation (EC) No 216/2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency (hereinafter "Basic Regulation"). Annex II of the Basic Regulation contains "unmanned aircraft with an operating mass of no more than 150 kg". As a result, light drones are not currently subject to mandatory investigations in the event that they are involved in an accident or serious incident. It is also important to note that light drone operators, including hobbyists, comprise a distinct user category from those concerned by aviation rules. The scopes of Regulation (EU) No 996/2010 and Basic Regulation should remain aligned, particularly if the Basic Regulation is to be revised. In the opinion formulated by ENCASIA on this topic, a proposal is made that is currently being included in the revision of Basic Regulation.

Cyber threats

The application of the regulation to cyber security is complicated from a legal perspective. Whereas the safety investigation conducted under the regulation looks at causes, which result from the operation of the aircraft, and the behaviour of the crew in relation to that operation, cyber security concerns attacks from the outside. Hence, terms like 'operator of the aircraft', 'person involved' and even 'accident' do not appear to be applicable to cases involving cyber-attacks, which have so far caused no injuries or fatalities but only operational disruptions. To date, international conventions and declarations such as the Dubai Declaration on Cyber security in Civil Aviation of 6 April 2017 are instruments that deal with this matter, albeit marginally, while EU law or policy has not yet been engaged with it.

Moreover, and in contrast to issues of public safety, the EU has limited competence to act on security threats. Therefore, if defined as a matter of security concern, the responsibility to investigate will fall outside the scope of the safety investigation. A key issue in this respect is that SIAs must have the capacity and expertise to investigate whether or not an accident or serious incident has been caused by a cyber-attack. This requirement is implicitly covered by Article 4.e, which obligates Member States' SIAs to have at their disposal "qualified personnel…to enable the examination" into the causes of the accident or serious incident. This can be achieved either directly, by means of cooperation with another States' SIA subject to mutual agreement, or by means of an advance arrangement with other national authorities or entities, such as national cyber security organisations (CERTS). In practice, however, SIAs do not have sufficient cyber-related expertise available (see below).

[51] The Future Aviation Safety Team (FAST) is an international and independent group of aviation experts that has actively maintained a list of future changes to aviation and associated hazards since 2000. This list is publicly available on a website hosted by the Netherlands Aerospace Centre NLR (http://www.nlr-atsi.nl/fast/aoc/).
[52] Based on interview consultations and survey responses.

Social media

Accidents or serious incidents involving passenger or cargo aircraft increasingly attract substantial media and public interest, particularly in the event of large numbers of fatalities and well-known airline operators. The proliferation of social media channels since 2010, in combination with the exponential growth in smartphone use, creates a unique challenge for air safety investigators today that did not exist in 2010. In particular, the pervasiveness and speed of social media means that news of an accident or major incident can be disseminated with rapid speed to a wide global audience via social media channels (Twitter, Facebook, etc.), including photos, commentary and streaming video in real time, even before the involved companies are made fully aware of what has happened[53]. Related to this is the pressure to provide information to the news media and journalists as soon as possible. On both counts, the risk is not necessarily to aviation safety, but rather to the ability of the investigators to carry out their duty without interference of outside media forces. In this context, the problem is one of proper framing, which can be supported through the establishment of guidelines and principles for dealing effectively and appropriately with the challenges of rising public exposure, and therefore, pressures. Currently, ENCASIA is developing guidance and a kind of coaching network on dealing with media pressure. This has not yet been fully implemented.

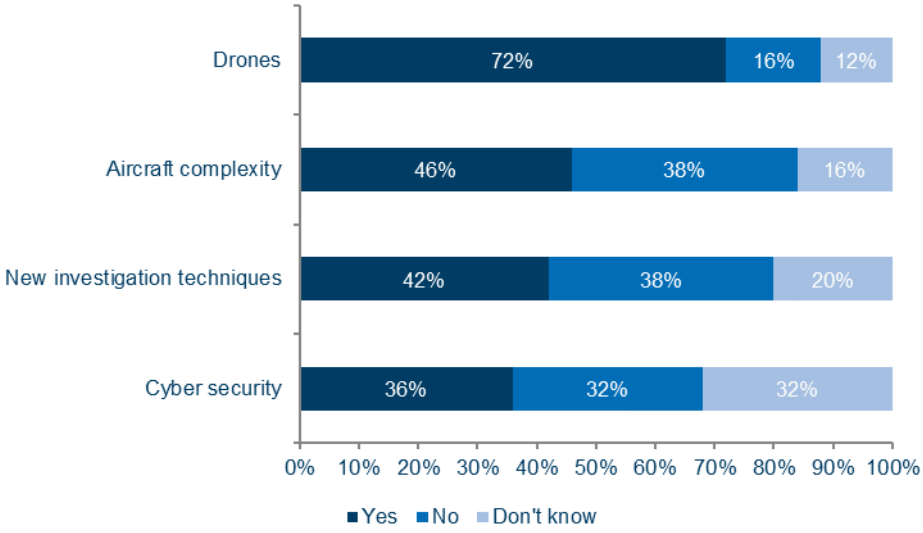
New investigation techniques and aircraft complexity

In general, as aircraft and engines become more complex there is a need to ensure that SIA inspectors and technical advisors are capable of working with industry effectively. However, as both SIAs and aviation community stakeholders noted in their responses to the survey (see below), the investigation bodies should be able to keep up with the technological developments, new complexities and actors in the aviation system without a specific modification to the regulation. Such issues can for example be addressed by developing common operational practices and procedures. But, the decision to use a particular investigation technique is a decision of the individual SIA.

Results from Field Research

Stakeholders surveyed and interviewed were requested to indicate whether there are new or additional problems and/or needs that could or should be addressed by the regulation. Figure A.4 shows the distribution of views among the survey respondents. Comments accompanying these replies, as well as observations from interviews are summarised below.

Figure A.4: Appropriateness of measures to address new problems (N=50)



The majority of stakeholders consulted (interviews and survey respondents) hold the view that the scopes of Regulation (EU) No 996/2010 and Basic Regulation should remain aligned. 72% of the respondents surveyed (36 of 50) agree that drones could or should be addressed by an amended Regulation (EU) No 996/2010, while a further 12% (6) were not confident to make a conclusion ('don't know' answers). At the same time, given that SIAs' resources are limited, any amendment should not result in overstretching the SIAs' resources. For example, one SIA suggests that the obligation to investigate drone incidents should be limited to incidents or

[53] http://www.iata.org/publications/Documents/crisis-communications-guidelines.pdf.

accidents that result in fatalities or serious injury, or where the safety of the aviation system is compromised.

Regarding cyber security, there is a general agreement among stakeholders interviewed that cyber-attacks pose a real threat to aviation safety and security, however there is no real consensus on the appropriateness of including cyber threats within the accident investigation framework. The main concern raised by stakeholders is that the SIAs are unlikely to have the required expertise available in-house to conduct investigations into accidents and serious incidents involving cyber-attacks. On this basis, it is possible to conclude that the regulation does not currently contain provisions that would ensure SIAs to maintain in-house the required expertise to investigate such a threat. Just over one-third of respondents to the survey agree that cyber threats are a relevant issue to be addressed under an amended regulation (36%), while the remaining two-thirds are evenly split between respondents indicating 'not relevant to the regulation' and 'don't know'.

Survey respondents are somewhat more split on the question of investigation techniques and aircraft complexity, with 46% (23) in support of including provisions to address aircraft complexity, and 42% (21) are for new investigation techniques. Respondents represent a mix of the different groups on both sides. The central question is whether it is necessary to adopt a new regulation and/or amend existing regulations to address each new threat and/or need.

Challenges associated with social media were not directly addressed in the survey; rather, this issue was raised throughout the interview consultations. The risk here is not necessarily to aviation safety, but rather to the ability of the investigators to carry out their duty without interference of outside media forces. In this context, the problem is one of proper framing, which can be supported through the establishment of guidelines and principles for dealing effectively and appropriately with the challenges of rising public exposure, and therefore, pressures.

Other potential threats and/or needs identified by stakeholders include:

- Human factors (general);
- Pilots distracted by texting or other electronic devices while flying an aircraft;
- Laser beam influence to aircraft;
- Better use of final reports and lessons learned;
- Systemic issues and interdependencies.

Results from Accident Cases

Not applicable.

Answer to the question

Regarding new or additional problems that could or should be addressed by the regulation, we take into account the Future Aviation Safety Team (FAST) list[54] and stakeholder feedback from the interviews and survey. We identify 5 main emergent threats of relevance to Regulation (EU) No 996/2010. These are:

- Drones;
- Cyber threats;
- Social Media;
- Aircraft complexity and new investigation techniques.

Overall, stakeholders contend that the regulation should not exclude any potential causal factor from the potential mandate of air safety investigators. On the other hand, it should not be necessary to adopt a new regulation and/or amend existing regulations to address each and every new or perceived threat and/or need. Such an approach would create excessive regulatory complexity. Many SIAs are relatively small in terms of personnel and other resources, and thus face constraints to comply with the regulation as currently formulated. In this respect, it would be beneficial for many smaller SIAs if ENCASIA would take a role in

[54] The Future Aviation Safety Team (FAST) is an international and independent group of aviation experts that has actively maintained a list of future changes to aviation and associated hazards since 2000. This list is publicly available on a website hosted by the Netherlands Aerospace Centre NLR (http://www.nlr-atsi.nl/fast/aoc/).

considering how to address new and emerging threats, and support Member States with fewer air safety investigatory resources to implement and comply with new measures. Moreover, airline representatives argued that expanding the regulation to cover new fields of activity (drones / cyber security) should not fundamentally alter the primary focus of investigation bodies, which is the investigation of civil aviation accidents and serious incidents.

Among the emerging challenges and potential threats identified above, the issue of drones and cyber security, respectively, require further reflection. There is a broad consensus among stakeholders surveyed and interviewed that the scopes of Regulation (EU) No 996/2010 and the Basic Regulation should remain aligned in view of potential amendments to Annex II of the latter regulation (see Chapter 3). In light of existing resource constraints at SIAs across the Union, an amendment to Regulation (EU) No 996/2010 requiring the investigation of accidents and serious incidents involving drones could be limited to those which are certified by EASA; when fatalities, serious injuries or commercial air transport operations are involved; or when an investigation is expected to lead to lessons for the improvement of future aviation safety.

On the issue of cyber-attacks, the EU has limited competence to act on security threats. When an accident or serious incident is deemed to have been caused such an attack, the responsibility to investigate will fall outside the safety investigation. In this context, while the investigation into cyber-related attacks is not the competence of SIAs a priori, SIAs must have the capacity and expertise to make a determination as to whether a cyber-attack is involved. This requirement is implicitly covered by Article 4(6)(e), which obligates SIAs to have qualified personnel at their disposal. It is clear from the stakeholder consultations, however, that SIAs do not (yet) currently possess the requisite capacity and expertise to investigate cyber security-related issues, either directly, by means of cooperation agreements of other States' SIAs or by means of advance arrangements with the appropriate cyber security organisations or entities (CERTS). SIAs raise concerns over the feasibility of maintaining an ever-expanding set of expertise in-house. In this context, SIAs are advised to consider actions that will enable better pooling of resources on cyber-related matters, such as through cooperation arrangements with other States or on a regional level, or through advance arrangements with the appropriate national cyber security entities.

Regarding the proliferation of social media, the evidence suggests that the risk is not necessarily to aviation safety, but rather to the ability of the investigators to carry out their duty without interference of outside media forces. In this context, the problem is one of proper framing, which can be supported through the establishment of guidelines and principles for dealing effectively and appropriately with the challenges of rising public exposure, and therefore, pressures. Currently, ENCASIA is developing guidance and a kind of coaching network on dealing with media pressure. This has not yet been fully implemented.

Finally, our legal analysis does not find evidence to support the argument that increasing complexity merits a modification to the Regulation. The investigation bodies should be able to keep up with the technological developments, new complexities and actors in the aviation system without a specific modification to the regulation. Such issues can for example be addressed by developing common operational practices and procedures. But, the decision to use a particular investigation technique is a decision of the individual SIA.

A5.3 Evaluation question 2.1.1

Evaluation question 2.1.1

To what extent the requirement that all Member States create an independent Safety Investigation Authority led to the expeditious holding of unbiased safety investigations?

Results from Desk Research

According to Article 16.6 of Regulation (EU) No 996/2010, "The safety investigation authority shall make public the final report in the shortest possible time and if possible within 12 months of the date of the accident or serious incident". To analyse the timeliness of safety investigations, a sample of aircraft accidents was selected from the NLR Air Safety Database by applying the following criteria:

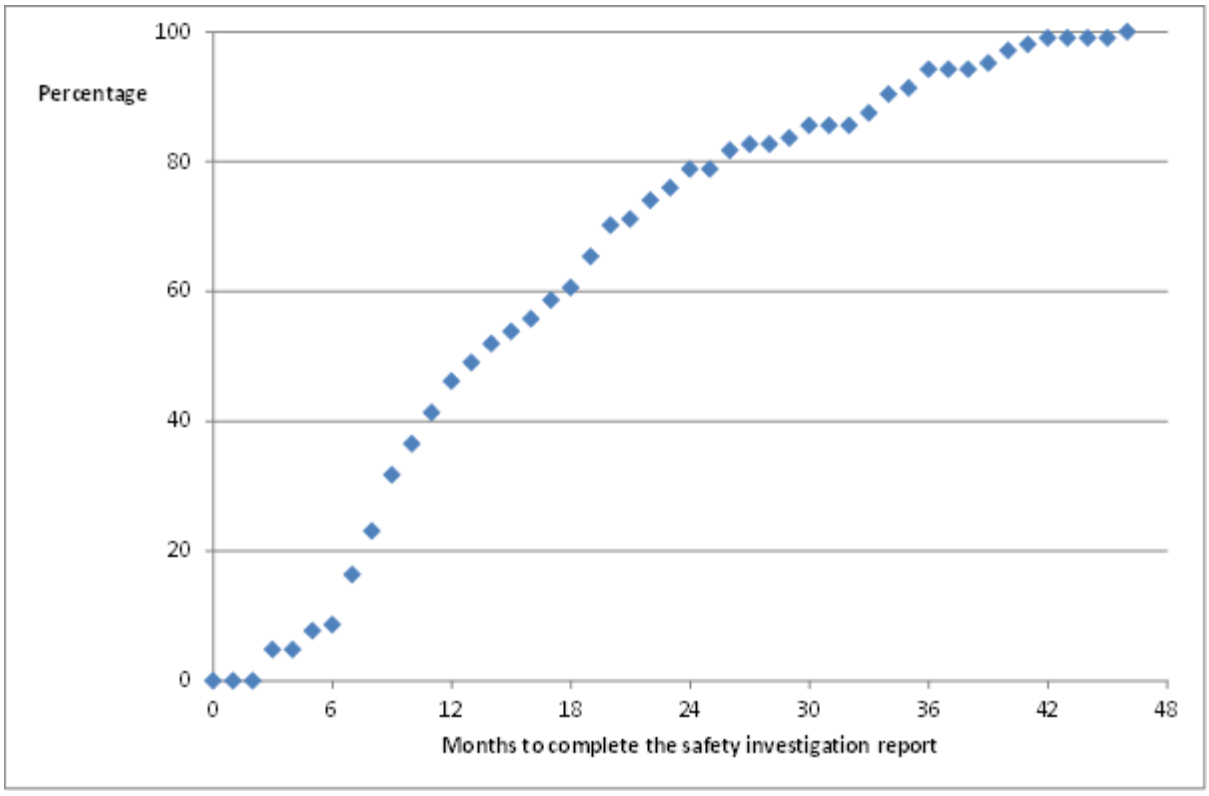
- Occurrence is classified as an accident in the database;
- Accident date is between 1 January 2010 and 1 April 2016;
- Location of the accident is in one of the 28 EU Member States;
- Aircraft involved has a maximum certificated take-off mass of more than

5701 kg.

For each of the accidents in the sample, it was investigated, using publicly available sources, if a final safety investigation report has been released and at what date the safety investigation report was published. For some accidents in the sample, the safety investigation authority decided not to conduct an investigation[55]. These cases were removed from the sample. The resulting sample included 104 accidents.

Figure A.5 shows the time (in months) between the occurrence data of the accident and the publication date of the final investigation report. The information is presented cumulatively as a percentage value. The figure shows that for approximately 40% of the accidents in the study sample, the safety investigation report is released within 12 months of the date of the accident, while approximately 80% of the safety investigation reports are released within 24 months of the date of the accident. About 20% of the accident investigation reports require more than 2 years for completion. The average duration of the safety investigation is 16.8 months. This is similar to the average duration of approximately 18 months of investigations conducted in the US by the National Transportation Safety Board (NTSB) of accidents involving FAR Part 121 (domestic, flag and supplemental) air carriers.[56]

Figure A.5: Time (in months) between the occurrence data of the accident and the publication date of the final investigation report. The information is presented cumulatively as a percentage value



Results from Field Research

Interviews

IATA statistics show that only 30% off all worldwide accidents of the past 10 years were investigated. The situation might be more favourable in Europe but a 100% score is not realised. The timeliness of reporting is a challenge for SIAs as they cannot control the number and the complexity of accidents that must be investigated. Due to staff turnover and shortage of staff, safety investigations in some Member States have taken longer to complete or have not been conducted at all. Many accidents (mostly General Aviation) that qualified for investigation were in fact not investigated.

[55] For instance because it was a relatively minor event such as a collision between a service truck and an aircraft parked at the gate resulting in marginal damage.

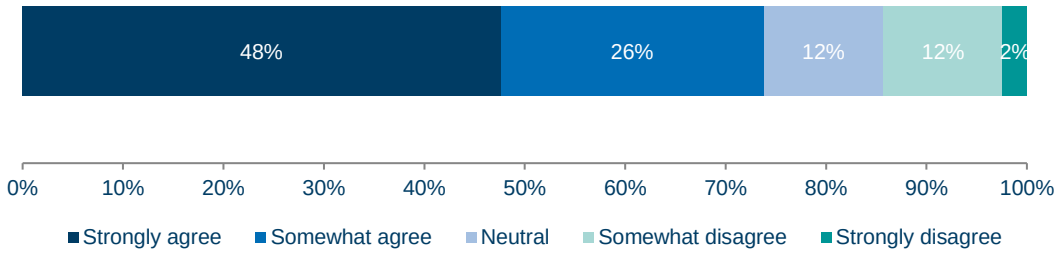
[56] See RAND (2000). Safety in the skies, personnel and parties in NTSB aviation accident investigation: Master volume. Rand Corporation, Institute for Civil Justice.

For Member States that lack expertise in certain areas and depend on external experts on those topics, there is a risk that the investigation becomes biased. This may not be an intentional influence but could be a result of the fact that the external experts are not sufficiently trained to 'stand back' and provide an independent view. Several interviewees mentioned that in some investigations there seems to be a strong influence from other parties. However, it was recognised that it is very difficult to prove and therefore is unlikely to be mitigated by European Commission intervention.

Survey

In the survey, respondents were asked to which extent they agreed or disagreed with the claim that the safety investigations by the SIAs are unbiased. The distribution of the 46 respondents to this question is provided in Figure A.6 below.

Figure A.6: Unbiased safety investigations by SIAs (N=46)



Results from Accident Cases

The final safety investigation report for the LOT accident has, almost 6 years after the accident, not yet been published. The long duration of the investigation process was influenced by the termination of the contract of 4 of the 5 members of the investigation team of the Polish SIA, and hospitalisation of the IIC of several months.

Answer to the question

On the "expeditious holding": According to Article 16(6), the SIA shall make public the final report in the shortest possible time and if possible within 12 months of the date of the accident or serious incident. This timeliness of reporting is a challenge for SIAs, as they cannot control the number and the complexity of accidents that must be investigated. An analysis of a sample of 104 accidents involving large aircraft (maximum take-off mass more than 5700 kg) in EU Member States between 1 January 2010 and 1 April 2016 shows that for approximately 40% of the sample the safety investigation report is realised within 12 months of the date of the accident. About 20% of the safety investigation reports required more than 2 years to complete. The average duration of an investigation of an accident involving a large aircraft is similar to that in the US.

During the interviews and the survey, staff turnover and limited number of staff were mentioned as reasons why the duration of an investigation regularly exceeds the recommended 12 months. As the investigation capacity of SIAs has altogether remained unchanged since the entry into force of the regulation (see Evaluation question 2.2), it is reasonable to conclude that Regulation (EU) No 996/2010 has not significantly influenced the length of the investigation process.

On the "unbiased": A safety investigation is unbiased if the investigation is objective in determining the causes of the occurrence being investigated and impartial, i.e. showing no prejudice for, or against, a certain person or organisation[57] .The majority of the survey respondents are of the opinion that investigations are unbiased. Several interviewees mentioned that in some investigations there seems to be a strong influence from other parties, although specific examples were not mentioned. It was also recognised that any bias is very difficult to prove and therefore is unlikely to be mitigated by European Commission intervention. Independence of the SIA is a prerequisite for an unbiased investigation. The independence of

[57] Oxford dictionaries, https://en.oxforddictionaries.com/definition/unbiased.

SIAs is addressed in Evaluation question 2.1.2. It is concluded that Regulation (EU) No 996/2010 has not significantly influenced the impartiality of the investigation process.

A5.4 Evaluation question 2.1.2

Evaluation question 2.1.2
To what extent is the independence of the Safety Investigation Authorities achieved?

Results from Desk Research
The independence of a Safety Investigation Authority (SIA) is used in several provisions of Regulation (EU) No 996/2010, especially in conjunction with the absence of external interference and conflict of interest[58]. The regulation, however, contains no definition[59]. Article 4(3) requires that the SIA shall have "unrestricted authority over the conduct of the safety investigation". According to Demsey[60], the essence of independence is a strict objectiveness and total impartiality.[61] Therefore the independence of a SIA is defined as (1) being free from external interference and conflict of interest; and (2) having unrestricted authority over the conduct of the safety investigation. The last element of the definition covers unrestricted control of the use of its available resources.

In response to a survey conducted by the Commission to examine the current functioning of Regulation (EU) No 996/2010 in the first half of 2016[62], the majority of SIAs indicated that the regulation had no practical effect on their independence, as this had already been established under Directive No 94/56/EC. However, some SIAs reported that the qualification of "authority" has had a demonstrable added value, having "contributed to change the perception of some organisations who consider the SIAs more independent than before the regulation."

In 2017, the Romanian SIA, CIAS, performed a survey on the subordination status of the European Safety Investigation Authorities. They collected 23 responses from SIAs in Europe (Belgium, Cyprus, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Hungary, Ireland, Latvia, Luxembourg, Malta, Norway, Poland, Republic of Lithuania, Romania, Slovakia, Slovenia, Spain, Sweden, Ukraine, and United Kingdom). Based on this survey CIAS concluded that "according to the responses received, more than 65% of the respondents are currently subordinated to a specific Ministry or Minister, but more than 78% of the respondents consider that the SIAs they represent should be ideally subordinated to the Parliament or have other subordination status, other than that of being subordinated to a specific Ministry or Minister".

At international level, ICAO introduced similar provisions on independence as Regulation (EU) No 996/2010, which became applicable in November 2016 through amendment 15 to ICAO Annex 13[63].

Following an amendment of the Polish Aviation Act of 3 July 2002(Art. 17 sec. 6 of Aeronautical Law[64] as amended by the Act of 22 July 2016) which entered into force on September 13, 2016, the Minister of Infrastructure and Construction can amend the composition of the SCAAI, the Polish SIA. Following this amendment of the Polish Aviation Act, the Minister of Infrastructure and Construction replaced the head of the SCAAI[65]. Additionally, the amendment terminated the contract of the current SCAAI employees unless they agreed to the new terms. As a consequence, the contracts of 12 out of the 15 air accident investigators were terminated. Due

[58] SWD(2016) 151.
[59] See also Note on Independence – Regulation 996/2010 by M. Osiecki, DG MOVE.
[60] Dempsey, P.S. (2010). Independence of Aviation Safety Investigation Authorities: Keeping the Foxes from the Henhouse. Journal of Air Law and Commerce, 75(1), pp 223-283.
[61] See also Chloe A. S. Challinor (2017) Accident Investigators Are the Guardians of Public Safety: The Importance of Safeguarding the Independence of Air Accident Investigations as Illustrated by Recent Accidents. Air & Space Law 42, no. 1 (2017): 43–70.
[62] SWD(2016)151.
[63] See Chloe A. S. Challinor (2017) Accident Investigators Are the Guardians of Public Safety: The Importance of Safeguarding the Independence of Air Accident Investigations as Illustrated by Recent Accidents. Air & Space Law 42, no. 1 (2017): 43–70.
[64] Journal of Laws of 2016, item 605, with later amendments.
[65] https://wiadomosci.wp.pl/maciej-lasek-odwolany-z-funkcji-przewodniczacego-pkbwl-6040019516318849a?ticaid=117c79 and http://www.rp.pl/Polityka/160929692-Maciej-Lasek-odwolany-z-funkcji-przewodniczacego-Panstwowej-Komisji-Badania-Wypadkow-Lotniczych.html#ap-1 (both in Polish).

to this, amendment the Minister of Infrastructure and Construction can influence the SCAAI. Therefore, the SCAAI cannot be considered as independent.

Results from Field Research

Interviews

From the interviews, it is concluded that the functional independence of the SIAs is achieved in most of the Member States and Regulation (EU) No 996/2010 has helped in accomplishing this. One interviewee stated that an important effect of the regulation is that the principle of independence of accident investigations is no longer an item of discussion.

How the SIA is embedded varies in Europe. In some Member States the SIA is an independent governmental body, in some Member States the SIAs are subordinated to the Parliament while in other Member States the SIA is organisationally placed under the Ministry of Transportation but the SIA functions independently. In one interview, it is stated that the Ministry of Transport is only administratively responsible for the budget and the parliament decides on the budget. In one Member State, the SIA has been moved from the Ministry of Transportation to the Ministry of Justice following an infringement procedure from implementation of Directive 2004/49/EC on safety on the Community railways.

According to a number of interviewees budget is a delicate issue. Independence does not imply unlimited budget. On one hand it is clear that a SIA needs sufficient budget, while on the hand if a government needs to mind his expenses this could consequently also affect the budget for a SIA. The important questions related to independence are: what is a reasonable budget for a SIA depending on the magnitude of the aviation activities? And is the SIA economic independent, i.e. can the SIA spend its budget the way they believe is best used?

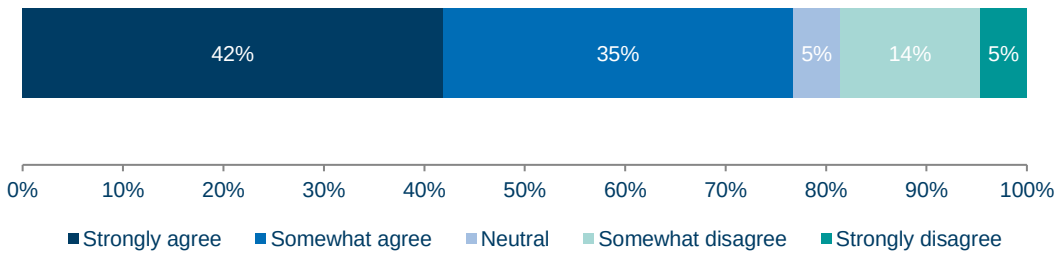
As raised in several interviews, independence is not only matter of functional (formal) independence, which can be provided by legislation, but also a matter of mindset, culture and experience of the investigators to withstand (political) pressure. In this respect, the influence from the judicial authorities was raised in some interviews as an issue that could influence the independence of an investigation.

In some interviews, a few cases were brought forward where the independence of the SIA was potentially jeopardised. In total four cases were brought forward. Except for Poland, no evidence was provided that the independence of the investigations was indeed affected.

Survey

In the targeted survey, respondents were asked whether or not the functional independence of the SIAs is achieved in practise. From the 46 respondents, three did not provide an answer. From the other respondents, 77% (33) agreed, while 19% (8) disagreed.

Figure A.7: Functional independence of the SIAs is achieved in practice (N=43)



The respondents of the SIAs and the Member State stakeholder groups replied almost identical to this question: 80% agreed while 13% disagreed. The respondents from the Aviation Community stakeholder group (N=14) had a different view: 70% agreed, while 30% disagreed.

As an elaboration it is stated multiple times that, there are differences between Member States and that this is dependent upon financial budgets and organisational control (embedding in

Ministry).

Workshop
During the workshop, the following statements were made related to independence:

- SIAs are subjected to pressures from various sources when they are carrying out the investigation, and the need to resist these pressures can be very difficult;
- Independence is critically linked to the quality of the investigation. The budget issue is key to the issue of functional independence. When it comes to budgets and financial resources made available to SIAs, it is mentioned that the situation in most SIAs has not changed significantly since the regulation came into force, which is identified as a real problem. This may be partly a function of the economic crisis. There are some smaller SIAs that simply don't have the resources to perform the tasks that they should be performing. The question is whether there is a way to make Member States take the task of funding of SIAs seriously;
- There were questions regarding the conflict of interest with respect to the location of the SIA itself: for example, in Lithuania, the SIA is under the Ministry of Justice. It does not necessarily create non-compliance, so long as there is a formal legislation or strong internal rules that say that the head of the unit dealing with investigation cannot be interfered with regarding investigatory measures, SRs being drafted. The regulation speaks of functional independence. The EU does not get involved / has no opinion as to the role the Ministry of Justice plays in the investigation. You can be inside the Ministry of Justice if you have the rules in place to ensure the technical investigation is functionally independent. It is also mentioned that there is no such thing as complete independence, as this would essentially imply a private company / society (non-governmental).

Results from Accident Cases
Not applicable.

Answer to the question
The independence of a Safety Investigation Authority (SIA) is used in several provisions of Regulation (EU) No 996/2010, especially in conjunction with the absence of external interference and conflict of interest[66]. The regulation, however, contains no definition[67]. Article 4(3) requires that the SIA shall have "unrestricted authority over the conduct of the safety investigation". According to Demsey[68], the essence of independence is a strict objectiveness and total impartiality. Therefore the independence of a SIA is defined as (1) being free from external interference and conflict of interest; and (2) having unrestricted authority over the conduct of the safety investigation. The last element of the definition covers unrestricted control of the use of its available resources (budget).

Being free from external interference and conflict of interest is, according to several interviewees, not only matter of functional (formal) independence which can be provided by legislation, but also a matter of mind set, culture and experience of the investigators to withstand (political) pressure.

The available budget for a SIA is a delicate issue. Independence does not imply unlimited budget. On one hand, it is clear that a SIA needs sufficient budget to carry out its tasks, while on the other hand if a government needs to mind his expenses this could consequently also affect the budget for a SIA.

Independence of the SIAs has been achieved in almost all Member States. During this evaluation, study questions were raised regarding the lack of independence of the SIA in four Member States, including Poland. Independence of the SIAs is not achieved in Poland. Due to an amendment of the Polish Aviation Law, the Minister of Infrastructure and Construction can influence the composition of the SCAAI. Therefore, the SCAAI cannot be considered as

[66] Commission Staff Working Document on the implementation of the Regulation on Safety Investigation, a targeted consultation of stakeholders, including MS and their SIAs, industry associations and accident victims and their relatives associations, Part 1 and 2, SWD (2016) 151, April 2016.
[67] See also Note on Independence – Regulation 996/2010 by M. Osiecki, DG MOVE.
[68] Dempsey, P.S. (2010). Independence of Aviation Safety Investigation Authorities: Keeping the Foxes from the Henhouse. Journal of Air Law and Commerce, 75(1), pp 223-283.

independent. For the other Member States no evidence was provided that the independence of the SIA was indeed affected.

Regulation (EU) No 996/2010 has helped in accomplishing the independence to some extent. While a survey conducted by the Commission in the first half of 2016[69] concluded that the majority of SIAs indicated that the regulation had no practical effect on their independence, as this had already been established under Directive No 94/56/EC, in the interviews and survey it is indicated that the regulation has helped. One interviewee stated that an important effect of the regulation is that the principle of independence of accident investigations is no longer an item of discussion. At international level, ICAO introduced similar provisions, which became applicable in November 2016 through amendment 15 to ICAO Annex 13.

A5.5 Evaluation question 2.1.3

Evaluation question 2.1.3

Have the provisions on the protection of sensitive safety information and persons helped to improve the safety investigation?

Results from Desk Research

During the investigation of the Spanair JK5022 accident[70], parts of sensitive safety information (including CVR recordings) became public[71]. Although the accident occurred before the regulation entered into force, i.e. under Directive No 94/56/EC and ICAO Annex 13. These regulations already contained provisions on the protection of the CVRs.

Results from Field Research

Interviews

When the regulation was developed, the right balance had to be found for the protection of safety information because there are so many differences across EU Member States.

Regulation regarding the protection of sensitive safety information and persons is not well understood outside the investigation community. There is also room for interpretation. There is no common understanding of how to ensure confidentiality of safety sensitive information. This sometimes results in difficulties between the air safety investigator and other parties. The provisions related to protecting sensitive safety information are generally respected, but this is not always the case. Sometimes safety sensitive information is made public before the safety investigation report is finished and occasionally the regulation has not prevented the misuse of safety information.

The necessary information flows between the many organisations involved in an accident investigation can be a concern with regard to possible unintentional leaking of information. For instance, managing relations with families of victims while preventing disclosure of sensitive information requires a lot of effort.

The regulation is very explicit and has stood up in a number of court cases, but it could be clearer, e.g. in defining 'cockpit image recordings' (Article 14(1)(g)) and other types of recordings such as the content of Quick Access Recorders (QARs), recordings from closed circuit television (CCTV), Global positioning System (GPS), etc. One SIA suggested that Article 14(3) should be amended such that decisions to disclose records are made in consultation with the SIA.

The use of the final accident investigation report as evidence in civil courts is an issue since one of the parties challenged the other on the use of this evidence (the Rogers vs Hoyle case). The accident investigation report had been used as evidence in similar cases before without this being an issue. It is difficult to say whether Regulation (EU) No 996/2010 should address this point. There probably should be some flexibility for Member States. Accidents reports are publicly available. A hard rule that they are admissible is probably not a good idea, as this might influence the way in which the accident investigation is being performed. Investigators might be

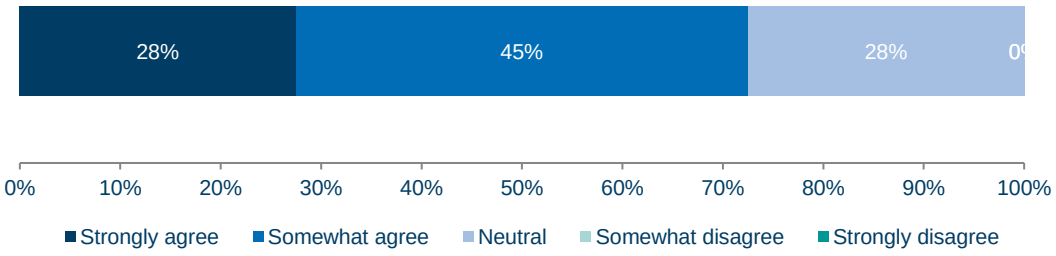
[69] SWD(2016) 151.
[70] Spanair flight JK5022, a McDonnell-Douglas MD-82, crashed during take-off from Madrid's Barajas airport on 20 August 2008.
[71] Source: The Telegraph. 11 May 2010. Last moments of doomed Spanair flight caught on tape.

worried about defending the conclusions or being subpoenaed and forced in (cross-) examinations to provide information beyond what is contained in the safety investigation report, but it was also mentioned that the provisions on sensitive safety information have helped to ensure that testimony provided during the safety investigation is not used against witnesses.

Survey

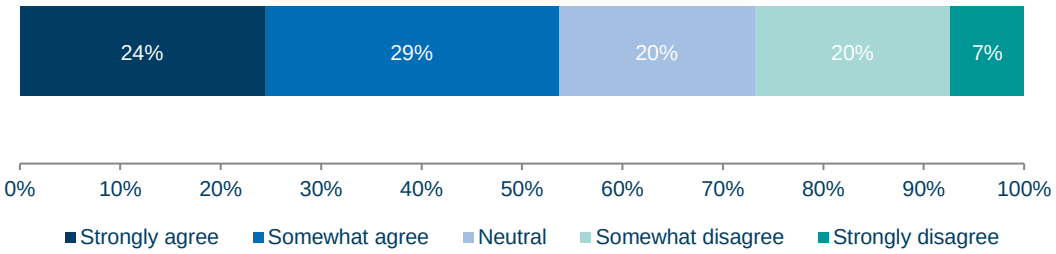
In the targeted survey, respondents were asked whether or not the provisions on the protection of sensitive safety information and persons have positively affected the safety investigations. From the 46 respondents, six did not provide an answer. From the remaining 40 respondents, 73% (29) agreed, while nobody (0) disagreed, see Figure A.8.

Figure A.8: The provisions on the protection of sensitive safety information and persons have positively affected the safety investigations (N=40)



Respondents were asked whether or not the protection of sensitive safety information and persons is sufficiently guaranteed. From the 46 respondents, five did not provide an answer. From the remaining 41 respondents, 53% (22) agreed, while 27% (11) disagreed, see Figure A.9.

Figure A.9: the protection of sensitive safety information and persons is sufficiently guaranteed (N=41)



Workshop

Under Article 14(1)(f) drafts of preliminary or final reports or interim statements shall not be made available or used for purposes other than safety investigation. During the workshop it was suggested that comments provided in response to the draft report should be protected as well.

The current level of protection in Article 14 is considered 'appropriate' but some guidance material of the level of protection provided for 'image recorders' is welcome. There is also room for interpretation. There is no common understanding of how to ensure confidentiality of safety sensitive information. This sometimes results in difficulties between the air safety investigator and other parties.

Results from Accident Cases

Germanwings

On 25 March 2017 (one day after the accident), a news article was published in The New York

Times, which revealed that CVR data "indicated one pilot left the cockpit before the plane's descent and was unable to get back". The article went on to quote an unnamed senior French military official involved in the investigation, who revealed the sound of light knocking on the cockpit door, followed by pounding as the second pilot attempted to gain entry. A French pilots' Union (Le Syndicat National des Pilotes de Ligne, SNPL) filed a lawsuit over the leaked information, taking issue with the fact that the information was revealed to the media before it was made known to prosecutors. The lawsuit was based on a violation of French law that dictates that information concerning on-going investigations must remain confidential. French law also does not require lawsuits to name a party; investigators determine who it can be targeted at. The complaint was dismissed on the grounds that it was not possible to identify the perpetrator of the breach of professional secrecy due to the fact that too many individuals had access to the CVR data.

Answer to the question

The majority of the survey respondents are of the opinion that the provisions on the protection of sensitive safety information and persons helped to improve the safety investigation. They have helped to ensure that testimony provided during the safety investigation is not used against witnesses and that parties such as manufacturers fully contribute to the investigation.

Nevertheless, there have also been some high profile cases (Spanair[72], Germanwings[73]) where parts of sensitive safety information became public. There is also room for interpretation. There is no common understanding of how to ensure confidentiality of safety sensitive information. The necessary information flows between the many organisations involved in an accident investigation can be a concern with regard to possible unintentional leaking of information and managing those information flows requires a lot of effort. Accordingly, one fourth of survey respondents are of the opinion that the protection of sensitive safety information is not sufficiently guaranteed. It was particularly mentioned that some guidance material of the level of protection provided for 'cockpit image recordings' (Article 14(1)(g)) and other types of recordings such as the content of Quick Access Recorders (QARs), recordings from closed circuit television (CCTV), Global Positioning System (GPS), etc. is needed.

A5.6 Evaluation question 2.1.4

Evaluation question 2.1.4

In how far did the decisions from the National courts influence the safety investigation?

Results from Desk Research

Courts in certain EU States (for instance France[74] and Spain)[75] may organise their own investigations in order to assist victims when they request compensation from the airline or other parties, which were involved with the accident.

While these court decisions may not directly affect the safety investigation, because the safety investigation is independent of such parallel judicial proceedings, there may be pressure from the public and the media on the SIA to share information with the persons involved performing parallel proceedings. The information that is disclosed could impact future safety investigations.

[72] See CIAIAC (2009). Spanair accident report. Although the accident occurred before the regulation entered into force, i.e. under Directive No 94/56/EC and ICAO Annex 13. These regulations already contained provisions on the protection of the CVRs.

[73] See Accident case 3 in Annex 4.

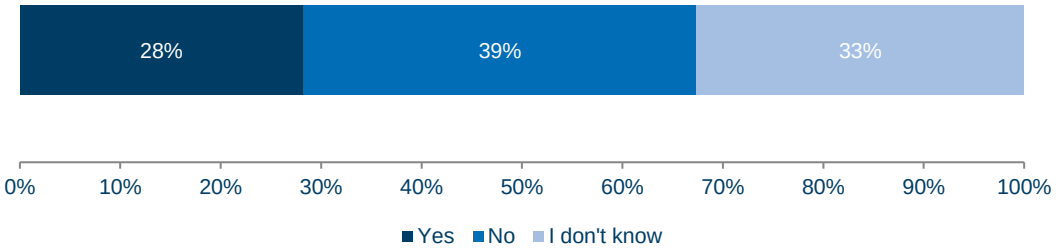
[74] Pursuant to Art. 145 of the Code of Civil Procedure; see: Cour administrative d'appel (CAA) (Administrative court of appeal of) de MARSEILLE, 8ème chambre, decision du 24 mars 2015, n° 13MA00581.

[75] See Franscesco Rossi Dal Pozzo. (2015) EU legal framework for safeguarding air passenger rights, Springer; And Judgment of the Provincial Court of Barcelona of 7 May 2012, ECLI:ES:APB:2012:6351, and Judgment of the Supreme Court of 13 Jan. 2015, ECLI:ES:TS:2015:181, cited by Dr Hanna Schebesta, Risk Regulation Through Liability Allocation: Transnational Product Liability and the Role of Certification, 42(2) Air & Space Law (2017) in section 3.6 where the author states that the überlingen cases show however that Spanish courts' investigations "went beyond the Accident Investigation Report's analysis of the technology." Whereas the French decision adopted by the Administrative Court of Appeal of Marseille cited in the previous footnote refers to a confirmation by the court's investigation ('expertise judiciaire') of the SIA's investigation (BEA in France).

Results from Field Research

In the survey, the respondents were asked if national courts or administrative bodies or institutions in your country have made decisions on the protection of sensitive safety information and persons, 13 out of the 46 (28%) respondents replied yes.

Figure A.10: National courts or administrative bodies or institutions in your country have made decisions on the protection of sensitive safety information and persons (N=46)



Of the 13 respondents that replied with yes, 8 provided an elaboration. In two cases, it involved a data protection authority. In 5 responses, it was stated that the decision was in favour of the SIA in line with Regulation (EU) No 996/2010. One respondent replied that the law gives power to criminal courts over the aeronautical investigation. This provides inconsistencies between the criminal law and Regulation (EU) No 996/2010 according to this respondent.

Results from Accident Cases

From the UK, court cases it is concluded that case law plays a prominent role in judicial proceedings in the UK. A court in the UK looks to past precedential decisions of relevant courts, and synthesizes the principles of those past cases as applicable to the current facts. For example, in England, the High Court and the Court of Appeal are each bound by their own previous decisions, which is different from civil law jurisdictions. From that general point of view, the above decision shed a light on future cases.

The case of Rogers v Hoyle concerned the question whether a final report drawn up by the AAIB may be used as evidence in – in this case – civil proceedings, given that the report was not made for that purpose as stated in Article 16 of Regulation (EU) No 996/2010. The test was therefore on admissibility and not on the disclosure of information. The regulation does not prevent the final report from being used in other proceedings. The UK court sees no reasonable basis for the suggestion that aviation people might be deterred from making statements before the AAIB in the future as they might be blamed for them, thus foregoing the safety argument.

Regulation (EU) No 996/2010 was relevant in two other UK court cases (Shoreham accident and the helicopter accident in Norfolk) as they pertained to specific materials that are protected from disclosure under Article 14 of EU Regulation (EU) No 996/2010. Only the film footage of the Shoreham accident which was made by cameras which had been installed on the aeroplane in question on a voluntary basis was disclosed because it was not regarded as sensitive safety information as protected under Article 14.

Answer to the question

Courts in certain EU States (for instance France[76] and Spain)[77] may organise their own investigations in order to assist victims when they request compensation from the airline or other parties, which were involved with the accident.

[76] Pursuant to Art. 145 of the Code of Civil Procedure; see: Cour administrative d'appel (CAA) (Administrative court of appeal of) de MARSEILLE, 8ème chambre, decision du 24 mars 2015, n° 13MA00581.

While court decisions may not directly affect the safety investigation, because the safety investigation is independent of such parallel judicial proceedings, there may be pressure from the public and the media on the SIA to share technical information with the persons involved performing parallel proceedings. The decision in Rogers v Hoyle case[78] may illustrate this tendency. The court in the UK decided that the published AAIB report should be admitted as evidence and it could "see no reasonable basis" for the suggestion that aviation people might be deterred from making statements before the AAIB in the future as they might be blamed for them, thus foregoing the safety argument. It is however not yet clear whether there is a 'tendency' as courts may take different positions in other proceedings. This issue is also addressed in Evaluation question 2.7.

A5.7 Evaluation question 2.1.5

Evaluation question 2.1.5
Did Advance Arrangements help to solve these problems?

Results from Desk Research

The establishment of 'advance arrangements'[79] is required by Article 12(3) of the regulation. It implements Recommendation 5.4.4 of ICAO Annex 13[80], which stipulates that States should ensure cooperation between its accident investigation authority and judicial authorities so that an investigation is not impeded by administrative or judicial proceedings. Cooperation may be achieved through arrangements, or other means. Paragraph 3.4.3 of the Manual on Protection of Safety Information of ICAO specifies that such advance arrangements with regards to disclosure or use may also be agreed among States before the information is exchanged.

19 Member States have issued advance arrangements between the judicial authorities and the SIA (Croatia, Estonia, Greece, Belgium, France, Ireland, Latvia, Malta, Portugal, Spain, Italy, Poland, Romania, Bulgaria, Czech Republic, Denmark, Luxembourg, UK and the Netherlands). An analysis of the written documents makes clear that there are countries which:

- closely follow the provisions of the regulation, for instance, Italy, to a certain extent Poland, and, in particular, Portugal;
- appear to give priority to the public prosecutor rather than to the SIA when it comes to the preservation of sensitive information, that is, Belgium, subject to specified conditions, Latvia, Luxembourg and Spain;
- appear to give priority to the SIA in this respect (Greece);
- aim to follow a balanced approach between the two without ranking the parties in terms of the preservation of sensitive information, as exemplified by Austria, France and Malta;
- leave it to courts whether or not such information can be disclosed and/or has to be transmitted by the SIA to the public prosecutor, as to which see Denmark and the UK;
- issued rather concise arrangements or arrangements which contain unspecified provision as to the coordination of various investigations, namely, Bulgaria, Croatia, Estonia, Hungary and Romania;
- have not made available the arrangements either because they:
  - may have implemented them in national regulations; and/or
  - have nothing on the subject; or

[77] See Franscesco Rossi Dal Pozzo. (2015) EU legal framework for safeguarding air passenger rights, Springer; And Judgment of the Provincial Court of Barcelona of 7 May 2012, ECLI:ES:APB:2012:6351, and Judgment of the Supreme Court of 13 Jan. 2015, ECLI:ES:TS:2015:181, cited by Dr Hanna Schebesta, Risk Regulation Through Liability Allocation: Transnational Product Liability and the Role of Certification, 42(2) Air & Space Law (2017) in section 3.6 where the author states that the überlingen cases show however that Spanish courts' investigations "went beyond the Accident Investigation Report's analysis of the technology." Whereas the French decision adopted by the Administrative Court of Appeal of Marseille cited in the previous footnote refers to a confirmation by the court's investigation ('expertise judiciaire') of the SIA's investigation (BEA in France).

[78] See Accident case 4 in Annex 4.

[7979] Regulation (EU) No 996/2010 does not define 'advance arrangements'. The list of definitions of ICAO Annex 13 does not include 'advance arrangements'.

[80] "A State should ensure cooperation between its accident investigation authority and judicial authorities so that an investigation is not impeded by administrative or judicial investigations or proceedings".

- the arrangements are in local language only[81].

Several countries have arrangements between the SIA and the Ministry of Defence / the Air Force (including Croatia, Belgium, Portugal, Denmark, Ireland, the Netherlands and Italy); others between the SIA and Rescue Centres (including Cyprus, Croatia, Estonia, Malta, Hungary and Spain), or between the SIA and the police (including Cyprus, Hungary and Latvia, and/or the Ministry of Transport and the Ministry of the Interior/ for the Environment (including Austria, the Czech Republic and France). Yet another category of agreements concern arrangements[82] established between the CAA and the SIA, namely, in Cyprus, Denmark, Greece, Spain, France, Greece, Italy, Latvia, Luxembourg, Malta, Poland, Romania and Spain.

Results from Field Research

Interviews

The added value of the advance arrangements differ per Member Sate. Positive effects are observed in Member States that have specific prosecutors dealing with aviation incidents and accidents who have been trained in air transport law. However, there are also Member States where the judicial system often intervenes.

The tensions between the SIAs and the judicial authorities have become less because of Regulation (EU) No 996/2010, mainly because of the clear description of roles and the advance arrangements that have been made.

Article 12.3 has been very important. It resulted in the authorities thinking about how they are going to collaborate. This has been a huge step forward. Without advance arrangements, the different investigating authorities would act separately.

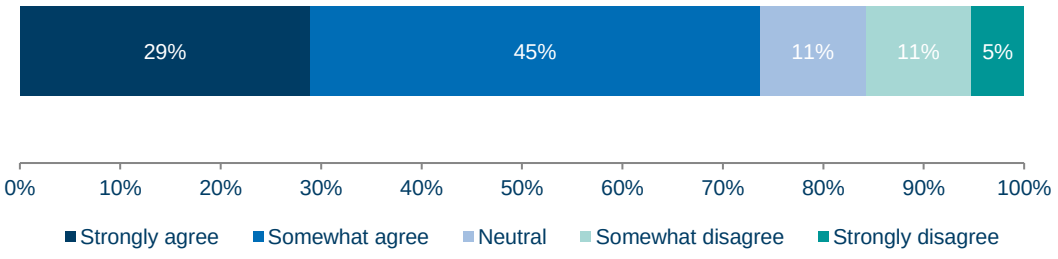
The advance arrangements are not harmonised across Member States. This is due to the fact that criminal law is not within the EU mandate and because of the difference in judicial systems across Member States.

Some harmonisation of advance arrangements is taking place via ENCASIA, where SIAs are sharing their experiences with and documents on these arrangements.

Survey

In the targeted survey, respondents were asked if the advance arrangements help to ensure the independence of the safety investigation. From the 46 respondents, eight did not provide an answer. From the remaining 38 respondents, 74% (28) agreed, while 16% (6) disagreed, see Figure A.11.

Figure A.11: Advance arrangements help to ensure independence of the safety investigation (N=38)

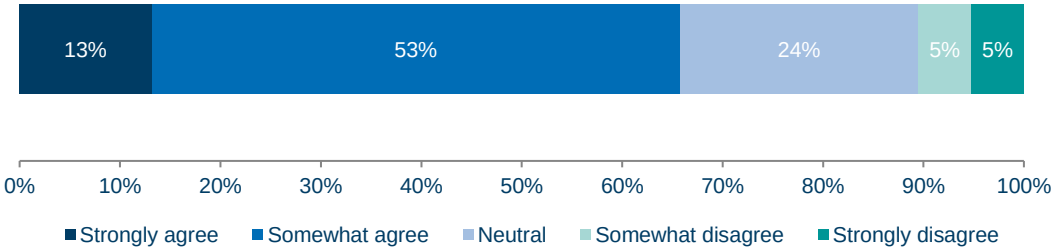


[81] No arrangements were supplied on Finland, Germany, Lithuania, Slovakia and Sweden. Arrangements in the Czech Republic are available in Czech language only.

[82] Neither 'agreement' nor 'arrangement' is a term with legal significance, although 'agreement' is normally used to mean a legally binding, and enforceable contract whereas arrangement is a more vague term. For instance, as a matter of English law, there is a binding contract if there is a promise by one party to do something in return for 'consideration' given by the promise (which may or may not be the payment of money). Such an arrangement will be a binding contract whether it is called agreement or arrangement.

Respondents were also asked if the regulation improved cooperation with other authorities involved with the prevention and investigation of accidents and incidents in civil aviation. From the 46 respondents, eight did not provide an answer. From the remaining 38 respondents, 66% (25) agreed, while 10% (4) disagreed, see Figure A.12.

Figure A.12: The regulation improved cooperation with other authorities involved with the prevention and investigation of accidents and incidents in civil aviation (N=38)



Workshop

In most Member States, the advance arrangement has never been practically applied because there has not been a major accident since the arrangement came into force. Where it has been practically applied, it is considered be an effective way of coordinating the various investigations, albeit that there have been examples where the judicial authorities were insufficiently aware of the existence or content of the advance arrangement. It was recommended to encourage that the advance arrangements are reviewed and signed regularly, at least every time a position changes and after a major accident.

Results from Accident Cases

Germanwings Airbus A320 on 24 March 2015

At the beginning of the investigation, there were some tensions between the safety investigation and the judicial investigation. This was cause by the fact that the prosecutor had not been exposed to a similar situation before and was not fully aware of the rights of the SIA. Despite these early tensions, there were no problems in terms of coordinating the work on the accident site. Although such coordination was covered in the advance arrangement, the existence of the arrangement was not known to all parties involved. As a result, the French Ministry of Justice (Directorate for Criminal Matters and Pardons) developed a dispatch, which was presented to French prosecutors and courts, communicating the primacy of safety investigations. The objective of the dispatch was "to support the implementation of the [advance arrangement] agreement, having regard to the impact of the European regulation on the different phases of the investigation and the specific ways it affects the investigation process." The dispatch was supplemented by practical tools for courts, including a glossary of terminology pertinent to Regulation (EU) No 996/2010. The note further explains the content of the advance arrangements to judicial authorities and how such authorities should work with the BEA in the event of an investigation.

Pilatus PC-6 on 19 October 2013

When Regulation (EU) No 996/2010 was introduced, the AAIU took some effort to come to an agreement with the judicial authorities on coordination of the investigations, without remarkable success. When the accident occurred, the AAIU as well as the judicial authorities started an investigation. During the course of the investigation of this accident however, it became clear that the coordination between the two investigations required improvement. The AAIU continued to develop advance arrangements for the coordination of safety and judicial investigations. The text of other European arrangements (French, among others) was used as a model. This advance arrangement was instrumental in solving the issues on roles and responsibilities that surfaced during the investigation.

Answer to the question

The establishment of 'advance arrangements' stipulates that Member States should ensure cooperation between its accident investigation authority and judicial authorities so that an

investigation is not impeded by administrative or judicial proceedings.

In some Member States, such as the Netherlands and Sweden, coordination between the accident investigation authority and judicial authorities was already prescribed in national law before Regulation (EU) No 996/2010 was implemented.

In a number of Member States, the advance arrangement has never been practically applied because there has not been a major accident since the arrangement came into force. Where applied in practise, the advance arrangements are considered be an effective way of coordinating the various investigations, according to consulted stakeholders and shown in the Germanwings accident case. However, there have been examples where the judicial authorities were insufficiently aware of the existence or content of the advance arrangement and examples where advance arrangements were established after the accident occurred. It is therefore important that all stakeholders are aware of the advance arrangements and that the advance arrangements are reviewed regularly to ensure that they are still appropriate.

A5.8 Evaluation question 2.1.6

Evaluation question 2.1.6:
What is the level of compliance of Member States with respect to coordination of investigations, preservation of evidence and protection of sensitive safety information?

In the Terms of Reference this questions was labelled under "Other" with no specific question number. The study team found it appropriate to add this question under "Effectiveness".

Answer to the question
Member States have largely complied with the requirements of coordination of investigations through the establishment of advance arrangements (see Evaluation question 2.1.5), the preservation of evidence and the protection of sensitive safety information (see Evaluation question 2.1.3).

A5.9 Evaluation question 2.2

Evaluation question 2.2
To what extent do the outcomes or observed effects in terms of high level of investigation capability in each Member State and the improvement of aviation safety correspond to the objectives?

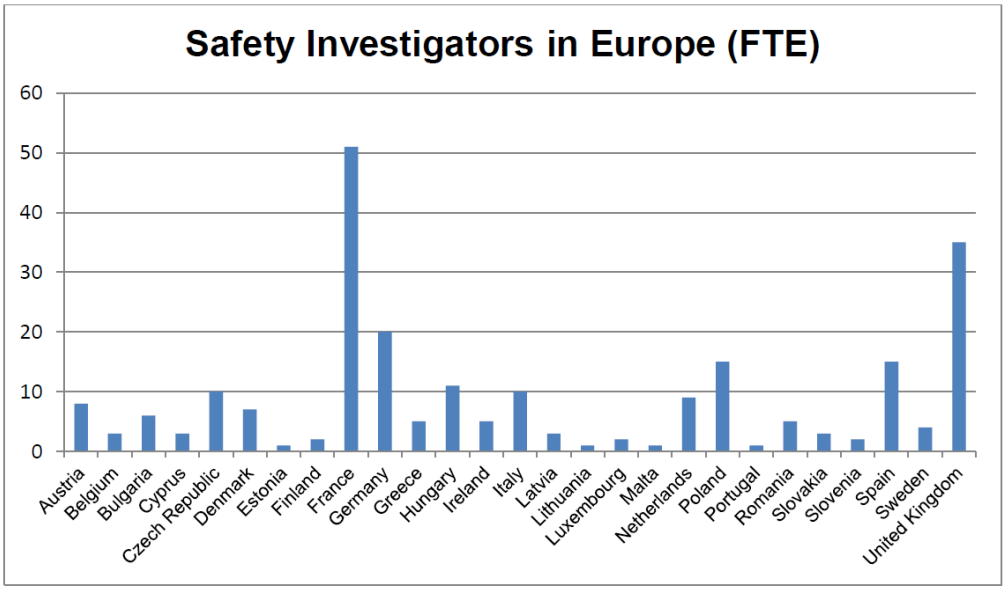
Results from Desk Research
One of the specific objectives of the regulation is to ensure a high level of investigation capability in the EU. This means that there are sufficient numbers of properly qualified air safety investigators available to the SIA in every Member State.

Number of air safety investigators
An analysis of the number of available air safety investigators for each SIA in FTE has been made. Table A.3 contains estimates of FTEs for 2012 and 2016. The estimates of 2012 are based on a questionnaire sent by ENCASIA to the 27 Member States. The results are reported in the ENCASIA Annual report 2012[83]. Figure A.13 shows the graph from the ENCASIA Annual Report 2012. In this annual report it is emphasised that the graph must be associated with caveats related to the various scopes of each safety investigation authority, including multimodal or not, if the SIA is also responsible for military investigations or not, and that some SIAs have part time investigators.

[83] ENCASIA Annual report of 2012.

The estimates of 2016 are based on results of the peer reviews in the period 2014-2016, the conducted interviews and direct contact via e-mail. The second column lists if the SIA is multimodal or not based on the information of the ENCASIA website[84].

Figure A.13: Graph with a breakdown of air safety investigators (full-time equivalent) throughout Europe



Source: ENCASIA Annual report 2012.

From the data it is observed that there is a great variety in size of the SIAs between the Member States. Table A.2 below gives a summary of the different sizes of the SIAs. The numbers are based on the estimates of the number of air safety investigators (in FTE) in 2016.

Table A.2: Distribution of sizes of SIAs according the number of air safety investigators (in FTE) estimates of 2016

Size of the SIAs	Number of SIAs
Small (5 or less FTE)	14 (50%)
Medium (6 to 10 FTE)	9 (32%)
Large (more than 10 FTE)	5 (18%)
Total	**28**

It is observed that 50% of the SIAs have 5 or less FTE air safety investigators available. Five (18%) SIAs have only 1 FTE. The five SIAs with more than 10 FTE (18%) are AAIB (UK), CIAIAC (Spain), BFU (Germany), BEA (France) and the SCAAI (Poland).

The number of resources has been analysed in the Commission Staff Working Document from 2016 on Regulation (EU) No 996/2010. In this report, it is concluded that:

"Regarding resources, it appears that the national investigation capacity of SIAs has globally remained unchanged since the entry into force of the regulation. A few Member States have experienced increased capacity, whereas some others, due to external reasons, such as the economic crisis and cuts in government spending, have rather experienced decreased investigation capacity. On this point and in general terms, the effect of the regulation, in terms of increased capacity, was offset by the consequences of the economic crisis."

"On the other hand regarding staff, Article 4.6(c) and its reference to "at least on available investigator" have been criticised by a number of SIAs, as it could be interpreted that a SIA only requires one investigator. However, it should be highlighted that this provision refers to at least one investigator being "*available*", which could be understood as requiring at least one on-duty

[84] Website visited in June 2017.

investigator being able to perform the function of investigator-in-charge, which would mean at least two individuals in reality"

The above conclusion that capacity of SIAs has globally remained unchanged is confirmed by comparing the total number of estimated FTE of 2016 with the figures for 2012. For 2016, the number of air safety investigators is estimated to be 230 FTE, while for 2012 the number of air safety investigators is estimated to be 238 FTE. This means a reduction of 3.36%. For this comparison the SIA of Croatia has been excluded because it was not included in the 2012 estimate.

Table A.3: Estimates of the number of air safety investigators (in FTE) for 2012 en 2016. The estimates of 2012 are based on the ENCASIA Annual report 2012. The estimates of 2016 are based on results from the Peer reviews in the period 2014-2016, from the interviews and from direct contact via e-mail. The second column lists if the SIA is multimodal or not based on the information of the ENCASIA website

Member State	Multimodal	FTE in 2012	FTE in 2016
Austria	No	8	8
Belgium	No	3	3
Bulgaria	No	6	5
Cyprus	No	3	3
Czech	No	10	10
Germany	No	20	18
Denmark	Yes	7	6
Estonia	Yes	1	1
Finland	Yes	2	2
France	No	51	46
Greece	No	5	7
Croatia (*)	*Yes*	-	*3*
Hungary	Yes	11	10
Ireland	No	5	7
Italy	No	10	7
Lithuania	Yes	1	1
Luxembourg	Yes	2	1
Latvia	Yes	3	2
Malta	No	1	1
Netherlands	Yes	9	8
Poland	No	15	15
Portugal (**)	Yes	1	3
Romania	No	5	6
Sweden	Yes	4	5
Slovenia	No	2	1
Slovakia	Yes	3	4
Spain	No	15	15
United Kingdom	No	35	35

(*) Member State since 2013 (**) Portugal is currently multimodal according their website. The ENCASIA website still reports that it is single modal.

Multimodal

It has been suggested that there is a trend that within a Member State SIAs are merging with other modalities. The second column of Table A.3 lists if the SIA is multimodal or not based on

the information of the ENCASIA website[85] [86]. From the table above it is concluded that 12 out of the 28 SIAs are multimodal (43%). In the ENCASIA report of 2012, it is reported that 12 out of the 27 44% of the SIAs are multimodal. There are some doubts about the correctness of the 2012 numbers, because in 2017 the Portuguese SIA became multimodal.

High level of expertise
In the Commission Staff Working Document from 2016 on Regulation (EU) No 996/2010 the following is stated:

The relative scarcity of major air accidents have made them more challenging to investigate, not only from a technical point of view but even more so in terms of communication. Safety investigations require a high level of expertise in various domains. Despite the progress achieved in many areas since the entry into force of the regulation, it remains uncertain whether a major accident would be treated with the same level of efficiency and effectiveness wherever it occurs in the Union. It cannot be excluded that certain Member States which until today have not faced a major accident on their territory may not be sufficiently prepared to face the challenges raised by such a disaster. Therefore, the Commission intends to continue supporting preparatory activities and peer review exercises. It also intends to further assess the effectiveness/efficiency of the current system of strengthening national accident investigation capability through cooperation to ensure a consistent response to accidents.

Results from Field Research

Interviews
From the interviews, it is concluded that there is a large variety in sizes and quality of SIAs across Europe. For most SIAs the number of resources, in terms of budget and manpower are sufficient but could always be more. For some the small SIAs (especially the SIAs with only one air safety investigator) it has been reported that the resources are insufficient for their normal activities.

It has been questioned in several interviews if small SIAs can deliver sufficient high quality investigation capability in case of a major accident. A major accident will have much more impact and different dynamics than a "normal" accident, in terms of media attention, judicial investigations, political pressure etc. The interviewees agree that the small Member States in terms of aviation activities cannot size a SIA based on a major event, but only based on eh typical events that occur. In order to accommodate a major accident, the SIA should collaborate with other SIAs. The collaborations could be established via agreements. According to the interviewees, there is currently a lot of assistance provided especially in the initial stages of the investigation. An example of increased collaboration is the network of accident investigation authorities of Nordic countries (Sweden, Norway, Finland, Denmark, Iceland, Canada) which has been established to further enhance cooperation and to provide some support to deal with accidents and incidents.

Lack of resources could, according to the interviewees, result in a less extensive accident investigation or impact the delivery times of the report.

According to the interviewees, the quality of the safety investigations across Europe has improved. It is believed that the regulation and the activities of ENCASIA has helped especially regarding training of investigators, sharing of best practises, collaboration between SIAs and obtaining a better understanding what the main difficulties are during a major accidents. The improved quality of the safety investigations has also an impact on the derived safety recommendation. Better Safety Recommendations resulted in a higher likelihood that the safety recommendations are implemented.

During the interviews some interviewees reported that there cases where the outcome of the investigation was less than satisfactory. However, no explicit cases were reported.

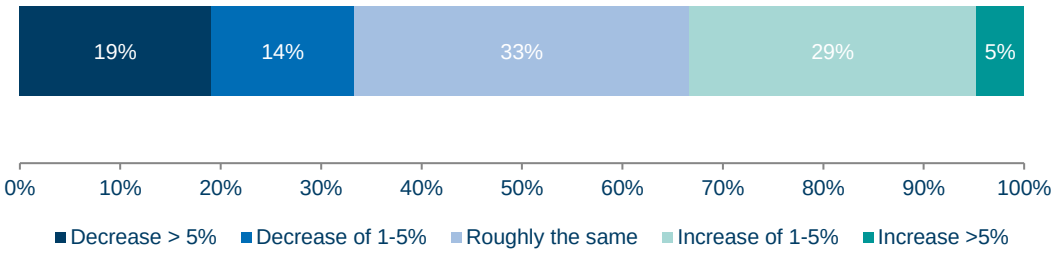
[85] Website visited in June 2017.
[86] Recently it was announced that Malta is probably going to be multimodal. But in the current analysis, Malta has been treated as single modal.

During the interviews, it was argued that multimodal agencies are justifiable because of the shared infrastructure and resources. This is cost effective, but also brings the danger of loss of specialised skills.

Targeted survey

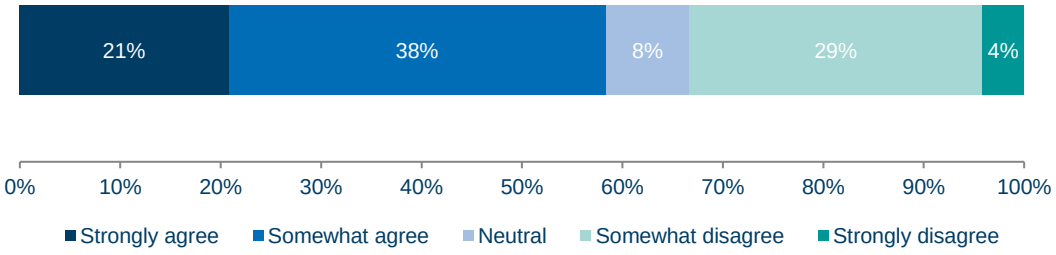
In the survey, respondents were asked to which extent the yearly budget of the SIA has changed from 2010 onwards. 21 out of the 45 respondents answered, "I don't know". When limited to the 24 SIA respondents, only 2 stated that they did not know. From the remaining 22 SIA respondents 16 (76%) answered that the change in budget was between -5% and +5%. Four SIA's (19%) reported a decrease of more than 5%. One SIA (5%) reported an increase of more than 5%.

Figure A.14: Change in budget reported by the SIAs in the survey. N=24 (2 of which replied "I don't know")



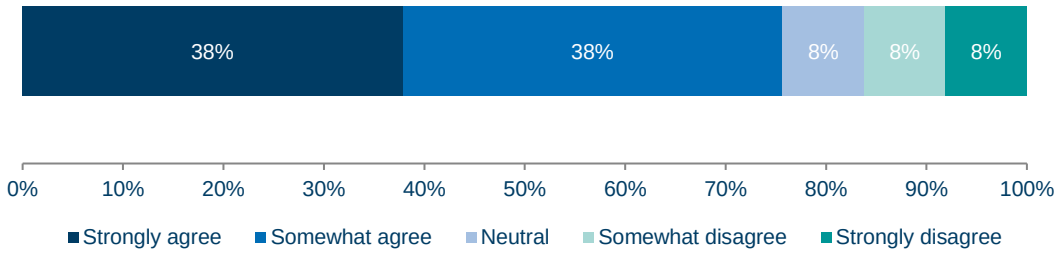
On the question to what extent are the resources (in terms of experts, budget and equipment) sufficient) for the SIA in the reference period, of the 45 respondents, 9 did not know and of the others 19 (53%) agreed while 15 (42%) disagreed. When focussing only on the 24 SIA respondents that provided an answer 14 (59%) agreed and 8 (33%) disagreed. 2 respondents (8%) neither disagreed nor agreed. The results for the 24 SIA respondents are provided below in Figure A.15. One SIA respondent added that "if we consider the incidents and accidents that happened in that period, it is sufficient. If we are talking about the potential to investigate if something large happened, then the answer would be disagree".

Figure A.15: Distribution of the 24 SIA respondents on the question if the resources have been sufficient in the reference period



On the question if the air safety investigators were properly trained, 45 respondents provided an answer of which 8 provided no answer. Of the remaining 37 respondents 28 (76%) agreed that the investigators were properly trained and six respondents (16%) disagreed, see Figure A.16. Of the 24 SIA respondents, 20 (83%) agreed that the investigators were properly trained, while 3 (13%) disagreed.

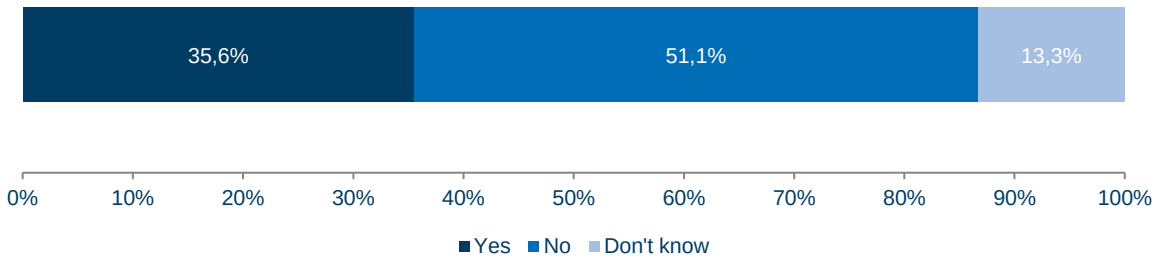
Figure A.16: Distribution of the 37 respondents that provided an answer on the question if the air safety investigators were properly trained



Next, the respondents were questioned if they believe there have been investigations in the reference period that were of insufficient quality. Of the 45 respondents, 16 (36%) replied "yes'. The responses varied per stakeholder group. Six of the 24 SIA respondents (25%) replied "yes" while 10 out of the 21 other respondents (48%) replied "yes", see Figure A.17.

In the elaboration, no specific investigations were referred to. The following reasons for investigations with insufficient quality were provided: lack of specific domain knowledge, lack of transparent methodology, lack of resources, lack of training, written by very inexperienced investigators with insufficient supervision, and insufficient quality in analysing.

Figure A.17: Distribution of the 45 respondents that provided an answer on the question if there has been any investigation in the reference period of insufficient quality



One respondent added that a global level study conducted by members of the IATA ACTF (Aircraft Classification Task Force) revealed that a large number of accidents over the past 10 years were not properly investigated. Accident reports were available for only 300 of the approximately 1,000 accidents that occurred over the decade. Furthermore, a considerable number of those 300 reports showed opportunity for improvement. Again, some parts of the world are better at this than others. As aviation is a global industry, the EU should support and influence the other Regions in improving the investigation capabilities since any accident not investigated is a lost opportunity. For the EU – the lack of accidents should not bring a reduction of the overall number of investigations – but a more targeted focus on significant incidents.

<u>Workshop</u>

One group agreed that the quality of the investigators can be improved not so much through amending the regulation but through more detailed guidance, e.g. investigator in charge needs to have a pilot license, certain degrees, x years of experience.

During the workshop, it is reported that staffing is an issue for a certain SIAs. Most investigators of that SIA are seconded from the air force and they rotate every 3 years, meaning that although the staff is very experienced (pilots, engineers) they are not trained on

investigation of accidents. The regulation does not help in this area.

Results from Accident Cases
Not applicable.

Answer to the question
The overall capacity of SIAs remained practically unchanged. Between 2012 and 2016, the number of available investigators decreased 3.36% from 238 FTE in 2012 to 230 FTE in 2016.

The SIAs vary greatly in size according to an analysis of available air safety investigators (in FTE) in 2012 and 2016. Table A.4 below gives a summary of the different sizes of the SIAs for 2016. Half of the SIAs have 5 or less FTE air safety investigators available. Five (18%) SIAs have only 1 FTE.

Table A.4: Distribution of sizes of SIAs according the number of air safety investigators (in FTE) estimates of 2016

Size of the SIAs	Number of SIAs
Small (5 or less FTE)	14 (50%)
Medium (6 to 10 FTE)	9 (32%)
Large (more than 10 FTE)	5 (18%)
Total	**28**

The budget for the SIAs also remained unchanged. Of the 22 SIA, respondents to the survey 76% answered that the change in budget between 2010 and 2017 was between -5% and +5%. Four SIA's (19%) reported a decrease of more than 5%. One SIA (5%) reported an increase of more than 5%. From the survey and the interviews, it is concluded that for the majority of the SIAs the amount of resources are sufficient (but could of course always be more). For some the small SIAs (especially SIAs with only one air safety investigator) it has been reported that the resources are insufficient for their normal activities.

One SIA respondent added that "if we consider the incidents and accidents that happened in that period, [the budget] is sufficient. If we are talking about the potential to investigate if something large happened, then the answer would be disagree". This observation is in line with the results from the interviews. In several interviews, it has been questioned if small SIAs can deliver sufficient high quality investigation capability in case of a major accident. A major accident will have much more impact and different dynamics than a "normal" accident, in terms of media attention, judicial investigations, political pressure etc. The interviewees agree that the small Member States in terms of aviation activities cannot size a SIA based on a major event, but only based on typical events that occur. In order to accommodate a major accident, the SIA should collaborate with other SIAs. The collaborations could be established via agreements.

One third of the respondents to the survey indicated that there have been safety investigations that were of insufficient quality. Concerns were mentioned regarding lack of specific domain knowledge, lack of transparent methodology, lack of resources, lack of training, lack of experience and insufficient quality in analysing. However, no specific investigations were mentioned by the respondents of the survey or the interviewees.

According to the interviewees, the quality of the safety investigations across Europe has improved. It is believed that the regulation and the activities of ENCASIA have helped to improve the quality. This is mainly due to training of investigators, sharing of best practises, collaboration between SIAs and obtaining a better understanding what the main difficulties are during a major accident. The improved quality of the safety investigations has also an impact on the derived safety recommendations. Better safety recommendations resulted in a higher likelihood that the safety recommendations are implemented.

A5.10 Evaluation question 2.3

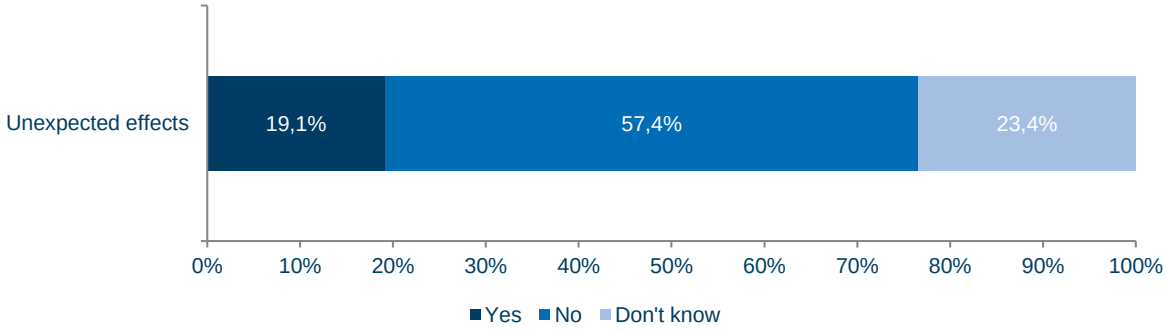
Evaluation question 2.3
Has the Regulation led to any unexpected effects?

Results from Desk Research
Not applicable.

Results from Field Research
Interviews
During the interviews, no unexpected effects were reported.

Targeted Survey
In the targeted survey, respondents were asked if there have been any unexpected effects of Regulation (EU) No 996/2010 (positive or negative). Out of the 47 respondents, 9 respondents (19%) answered 'Yes'.

Figure A.18: Unexpected effects of Regulation (EU) No 996/2010 (positive or negative)? (N=47)



In the following questions, the respondents were asked to elaborate on their response. The following unexpected effects were reported:

- Brought the debate about just culture into main stream;
- In order to comply with regulation, the Government developed rules that have politicized the operational needs to assist the victims, delaying the response capabilities. This rule has also been heavily influenced by victims associations what with a good intention to assure the welfare of the victims and relatives have forgotten crucial aspects as their safety and security.

Workshop
Not applicable.

Results from Accident Cases
Not applicable.

Answer to the question
The large majority of the respondents to the targeted survey stated that there were no unexpected effects or they don't know. During the interviews no unexpected effects were reported.

Unexpected negative effect reported in the targeted survey involves the incorrect interpretation or understanding of the text. For example in one Member State national rules to comply with Article 21 (on assistance to victims of air accidents) resulted in delayed response capability of air safety investigators as assistance to victims required resources from the SIA.

An unexpected positive effect reported by another respondent in the targeted survey is that the regulation has brought the debate on just culture into mainstream.

A5.11 Evaluation question 2.4

Evaluation question 2.4
To what extent the ENCASIA Network contributed to the strengthening of the coordination role of Safety Investigation Authorities?

Results from Desk Research
This question is also addressed in Evaluation question 1 and 7.

Results from Field Research
Interviews
ENCASIA is considered by the interviewees to be one of the most effective elements that were brought by the regulation. The Network has strengthened coordination between the SIAs as it provides a platform for SIAs to cooperate and exchange information and experiences according to the majority of the interviewees.

ENCASIA had a large influence by introducing a common doctrine, establishing communication and the introduction of SRIS. In one of the interviews, it was indicated that sometimes the work in the working groups goes slowly because the core activities of the SIAs have priority, but the working groups are doing an excellent job for standardisation and harmonisation.

ENCASIA concerns all Member States bounded by Regulation (EU) No 996/2010. Therefore, it is considered by the interviewees as "stronger" than the ECAC-ACC platform and provides the possibility to formulate a shared opinion concerning specific EU issues.

Survey
Also according to the respondents of the survey, ENCASIA is considered to be one of the most effective elements that were brought by the regulation. The Network has strengthened coordination between the SIAs as it provides a platform for SIAs to cooperate and exchange information and experiences according to 24 out of 31 respondents (77%) of the survey.

Workshop
The success of ENCASIA (crucial for small states, good leverage for large states) has been well recognised and should be retained by financial support from the EC according to participants to the workshop. Is has been stated that the mutual assistance is a good concept, but limited by finance. It was suggested that ENCASIA should focus more on the facilitation and arranging of mutual assistance.

Results from Accident Cases
Not applicable.

Answer to the question
ENCASIA is considered by the interviewees and the respondents of the survey to be one of the most effective elements that were brought by the regulation. The Network has strengthened coordination between the SIAs as it provides a platform for SIAs to cooperate and exchange information and experiences according to the majority of the interviewees and respondents of the survey. ENCASIA had a large influence by introducing a common doctrine, establishing communication and the introduction of SRIS. In one of the interviews, it was indicated that sometimes the work in the working groups goes slowly because the core activities of the SIAs have priority, but the working groups are doing an excellent job for standardisation and harmonisation.

ENCASIA concerns all Member States bounded by Regulation (EU) No 996/2010. Therefore, it is considered by the interviewees as "stronger" than the ECAC-ACC platform and provides the possibility to formulate a shared opinion concerning specific EU issues.

A5.12 Evaluation question 2.4.1

Evaluation question 2.4.1
To what extent have the ENCASIA Network Peer Reviews contributed to improve safety investigations?

Results from Desk Research

As of April 2017, 16 Member States have been peer reviewed[87]. The peer review results were not available to the study team.

Results from Field Research

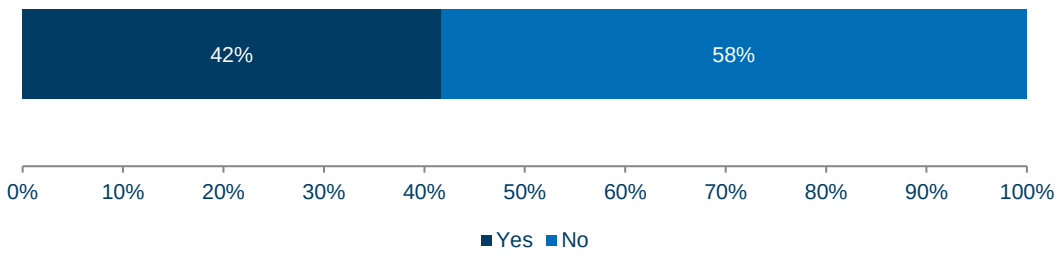
Interviews

ENCASIA's peer review activity is regarded as very good. It clearly helped to bring the participating States to the same level. The participating States appreciate the concept of peer reviews because it is not enforced as a formal audit. However, one interviewee mentioned that an official audit from the Commission could have more effect.

Survey

In the survey, the SIAs were asked if they have been subject to an ENCASIA peer review. Of the 24 SIA respondents, 10 (42%) answered yes and 14 (58%) answered no. According to the respondents, the peer reviews identified shortcoming in the implementation of Regulation (EU) No 996/2010 for several Member States. Peer reviews were used to share best practices.

Figure A.19: SIAs subjected to an ENCASIA peer review (N=24)



Workshop

The results of first series of peer reviews were kept internal and consequently the peer reviews were regarded as a 'black box' for the European Commission. Keeping results internal was needed to build trust. Member States were concerned that serious repercussions could follow if the peer review identified shortcomings. ENCASIA expects that in the next round some results will be shared with the EC and even published.

Results from Accident Cases

Not applicable.

Answer to the question

As of April 2017, 16 Member States have been peer reviewed. The results of first series of peer reviews were kept internal to build trust. Member States were concerned that serious repercussions could follow if the peer review identified shortcomings. ENCASIA expects that in the next round some results will be shared with the Commission and even be published. The participating Member States appreciate the concept of peer reviews because it is not enforced as a formal audit. According to the participating Member States, the peer reviews have helped to bring them at the same level by identifying shortcomings in the implementation of the regulation and sharing best practices. These improvements will lead to better safety investigations.

A5.13 Evaluation question 2.4.2

Evaluation question 2.4.2

To what extent have the ENCASIA Network joint trainings contributed to improve safety investigations?

[87] Presentation at the European Society of Air Safety Investigators (ESASI) Seminar 2017 – Ljubljana, Slovenia - 19 and 20 April 2017.

Results from Desk Research
As of April 2017, 58 air safety investigators have been trained in the context of the ENCASIA network.[88]

Results from Field Research
Interviews
The limited budget of ENCASIA should be used as much as possible on bilateral training.

Survey
ENCASIA joint trainings harmonize and promote best practices across Member States. The trainings have contributed to reinforce formal and informal cooperation and exchange of information.

Results from Accident Cases
Not applicable.

Answer to the question
As of April 2017, 58 air safety investigators have been trained in the context of the ENCASIA network. ENCASIA joint trainings harmonize and promote best practices in accident investigation across Member States. The trainings have contributed to reinforce formal and informal cooperation and exchange of information between SIAs. This will therefore lead to better safety investigations.

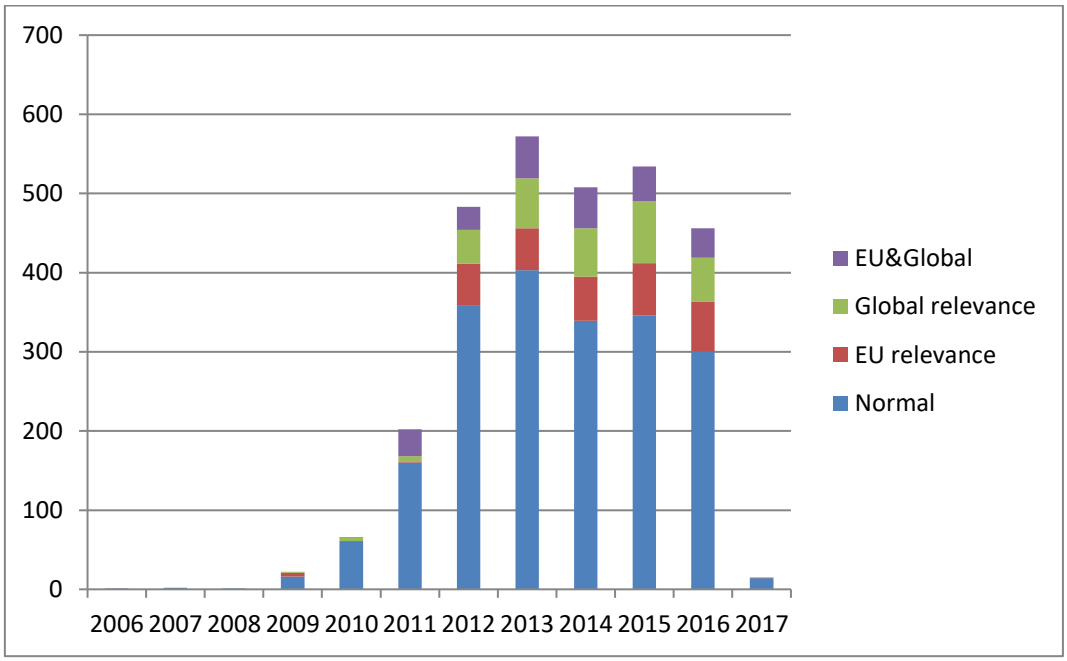
A5.14 Evaluation question 2.5

Evaluation question 2.5:
To what extent has, the EU Safety Recommendation database led to the identification of issues of Union wide relevance?

Results from Desk Research
To determine the identification of issues of Union wide relevance, the SRIS database has been analysed. The database contains in total 2432 Safety Recommendations (date March 16, 2017). Of these entries, 587 were classified as of Union wide relevance. 614 were classified as of Global concern and 251 entries were classified as of Union wide and Global concern. The Figure A.20 below gives a distribution of the Safety Recommendations over the years. In the period, 2012-2016 on average 161 Safety Recommendations per year of Union wide relevance and/or Global concern were identified.

[88] Presentation at the European Society of Air Safety Investigators (ESASI) Seminar 2017 – Ljubljana, Slovenia - 19 and 20 April 2017.

Figure A.20: Histogram of the number of Safety Recommendations added per year in the SRIS database



Within ENCASIA, Working Group 6 (WG6) is dedicated to Safety Recommendations. As one of its tasks, WG6 has been working on harmonising the way Safety Recommendations are formulated and handled across the Member States. Another task involves the improvement of the analysis of the content of the database with a view to identifying important Safety Recommendations of union-wide relevance as required by Article 7.3(g) of Regulation (EU) No 996/2010. Guidance was developed on the formulation of Safety Recommendations and the identification of Safety Recommendations of union-wide relevance.

The fields for SRUR and SRGC (SR of Union wide relevance and Global concern respectively) were only introduced to SRIS in 2016. Therefore, according to the chair of ENCASIA WG6, any safety recommendation that predates 2016 may not necessarily have the SRUR/SRGC flagged when it should. Only a few States are retrospectively looking at this. Overall, you therefore need to be careful when interrogating SRIS for some of the statistics.

Results from Field Research

Results from interviews

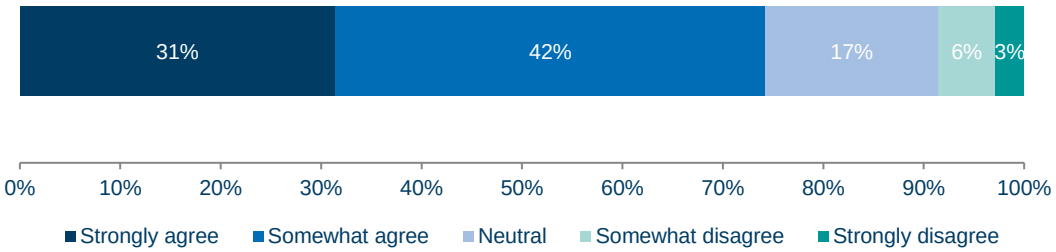
According to the interviewees, the implementation of SRIS is now taking effect. ENCASIA had a large influence by introducing a common doctrine, establishing communication and the introduction of SRIS. The regulation formalised the follow-up of safety recommendations and also caused a shift in focus for safety recommendations from quantity to quality in selection and justification. SRIS is useful in managing SRs.

SRIS helps EASA, because many contributors have identified systemic issues that need to be solved (Safety Recommendations of Union Relevance). This information is used by EASA as input to the European Aviation Safety Plan. EASA has a joint agreement with ENCASIA which gives EASA access to SRIS. EASA has a local version of SRIS, which help them to track SRs assigned to them.

Results from survey

In the targeted survey, respondents were asked if the safety recommendations coming from SIAs from other EU Member States have proven to be useful for their work in the field of aviation safety. From the 44 respondents, 37 provided an answer. A large majority of the respondents 26 (73%) agreed, while 3 (9%) disagreed.

Figure A.21: Safety recommendations coming from SIAs of other Member States are useful for my work (N=37)



Results from Accident Cases

In the LOT accident case, none of the four safety recommendations as registered in SRIS was classified as SRUR or SRGC.

In the Pilatus case, the AAIU identified 4 of the 11 safety recommendations as of Union-wide Relevance. These recommendations were addressed to EASA.

In the Germanwings case, 11 safety recommendations were identified of which 9 were of Union-wide Relevance and of Global Concern (SRUR and SRGC).

Answer to the question

Based on an analysis of the SRIS database, in the period 2012 – 2016 on average 161 Safety Recommendations per year of Union wide relevance (SRUR) and/or Global concern (SRGC) were identified. It should be noted that a safety recommendation can be both SRUR and SRGC.

The fields for SRUR and SRGC were only introduced to SRIS in 2016. Therefore, any safety recommendation that predates 2016 may not necessarily have the SRUR/SRGC flagged when it should. Only a few Member States are retrospectively looking at this. Therefore, the statistics should be treated with care.

Within ENCASIA, Working Group 6 (WG6) is dedicated to Safety Recommendations. As one of their tasks, they have been working on harmonising the way Safety Recommendations are formulated and handled across the Member States. Another task involves the improvement of the analysis of the content of the database with a view to identifying important Safety Recommendations of union-wide relevance as required by Article 7(3)(g) of Regulation (EU) No 996/2010. Guidance was developed on the formulation of Safety Recommendations and the identification of Safety Recommendations of Union-wide relevance (SRUR).

According to the interviews, SRIS and the work of ENCASIA WG6 has helped to improve the identification of Safety Recommendations of Union-wide Relevance.

A5.15 Evaluation question 2.5.1

Evaluation question 2.5.1:
Have the deadlines for issuing the safety report and following up the safety recommendations and follow-up been met?

Results from Desk Research

Deadlines for issuing the safety report

The timeliness of safety investigation reports has been analysed in Evaluation question 2.1.1. It is concluded that the timeliness of reporting is a challenge for SIAs, as they cannot control the number and the complexity of accidents that must be investigated. An analysis of a sample of 104 accidents involving large aircraft (maximum take-off mass more than 5700 kg) in EU Member States between 1 January 2010 and 1 April 2016 shows that for approximately 40% of the sample the safety investigation report is released within 12 months of the date of the accident. About 20% of the safety investigation reports requires more than 2 years to complete. The average duration of an investigation of an accident involving a large aircraft is similar to that in the US.

Deadlines for following up the safety recommendations and follow-up

Article 18 states that following a safety recommendation, the addressee of a safety recommendation shall reply to the SIA within 90 days on the actions (to be) taken and of the time necessary for their completion and where no action is taken, the reasons therefore. Within 60 days of the receipt of the reply, the SIA shall inform the addressee whether or not it considers the reply adequate and give justification when it disagrees with the decision to take no action.

An analysis of the SRIS database (date March 16, 2017) showed that 49% of all Safety Recommendations are open. For the Safety Recommendations of Union wide relevance or Global relevance, this percentage is 53%. This could suggest that there is a delay in following up Safety Recommendations. The chair of ENCASIS WG6 on Safety Recommendations cautions the "open" and "closed" status usage on SRIS as a whole since there is not a standard for this, nor is there a requirement in the regulation to "close" a recommendation.

The issue regarding the deadlines of the follow-up of the Safety Recommendations has been discussed within WG6. It was concluded that it is not easy to obtain statistics on the follow-up of safety recommendation as each SIA records the status of recommendations differently. However, WG6 has collected some data from the SRIS database. The result should be treated with care because the data and timings may not be accurate. Additionally, it is not clear whether the response date in SRIS refers to the initial response or a possible supplemental response. For instance, there may have been an initial response in the 90 days and then a further response at a later date, which has over written the date response received. Figure A.22 shows the average response time (in days) for the years 2010 to 2016. The trend shows an overall improvement toward the 90 days. However, there are still many recommendations (about 50%) awaiting response (see Figure A.23). This might be either no response received, or the SIA has not recorded the response on SRIS. Also, there are recommendations addressed to organizations outside the EU that are not bound by the EU regulation, although they are supposed to comply with ICAO Annex 13.

Figure A.22: Average time of the addressee to respond (in days) to the safety recommendation for the years 2010 to 2016

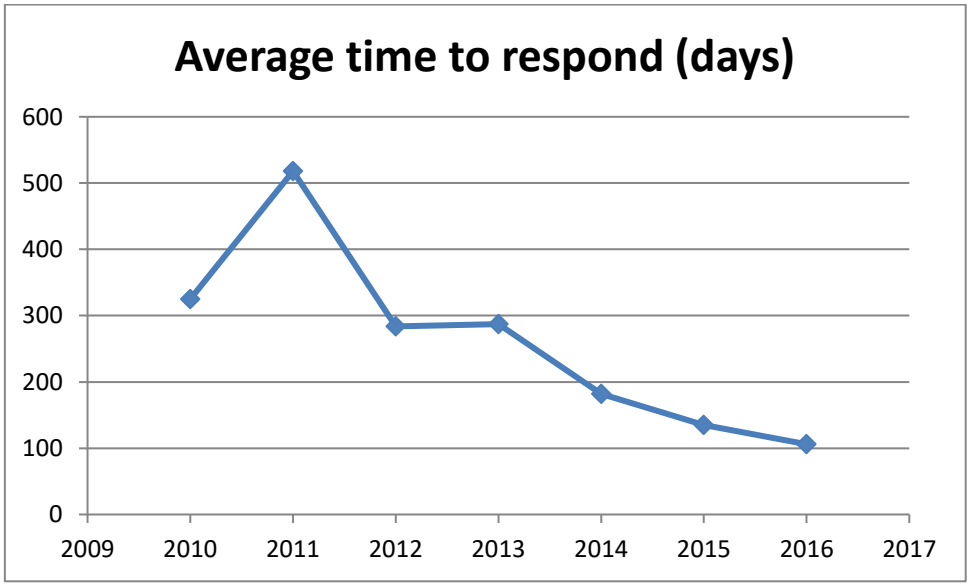
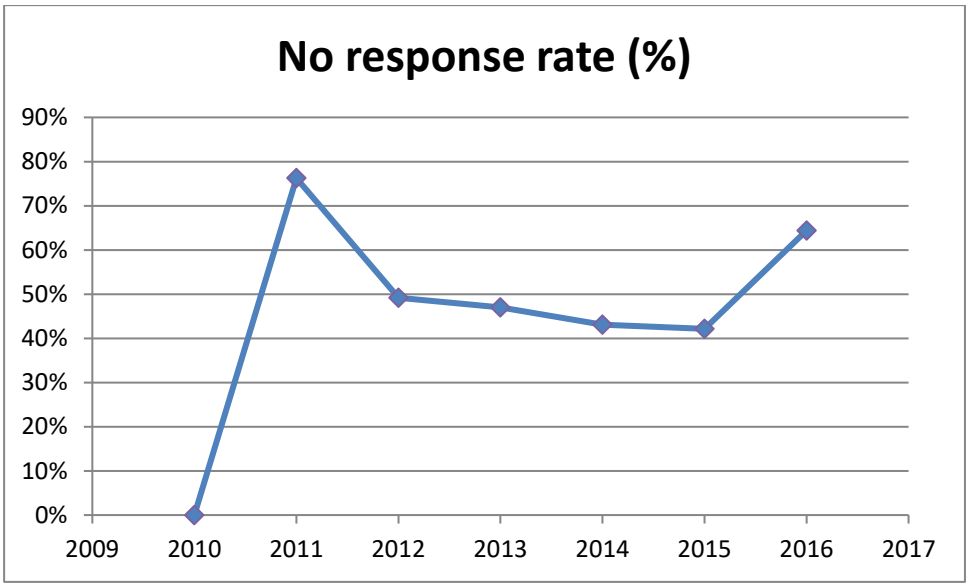


Figure A.23: Fraction of safety recommendations in the SRIS database without a response for the years 2010 to 2016



On the 60 days response time, ENCASIA WG6 has insufficient data to determine to what extent this deadline is being met.

In the Commission Working Document on the implementation of Regulation (EU) No 996/2010 on the investigation and prevention of accidents and incidents in civil aviation (SWD(2016)151) it is concluded that the regulation enacted more stringent constraints than before on the follow-up of safety recommendations, but endeavoured to remain consistent with ICAO Annex 13 which has also introduced revised provisions addressing safety recommendations to include a 90 day time frame for actions to be taken.

Furthermore, it is concluded that EASA, being a frequent addressee of safety recommendations, has found that the time constraints for the follow-up of safety recommendations were quite unpractical. This is especially the case for the 90 day provision set up in Article 18 that could lead to overly optimistic expectations regarding the outcomes of safety recommendations. Most Member States have not encountered such difficulties, but some concur to consider that the time constraints are challenging.

Results from Field Research

Results from interviews

According to the interviewees, formal responses to a safety recommendation are mostly too late (later than the deadline). However, it is felt that the 90 days response time has improved. The database is useful in managing safety recommendations. SRIS shows when safety recommendations are due and allows SIAs to verify if and when conditions are met using appropriate definable queries.

There are some differences in the assessment of the adequacy of responses. Some SIAs close a safety recommendation only if all the actions have been completed while others close a safety recommendation if there is no further response from the addressee to be expected. For instance, when an action plan is agreed, but some actions can still be open because they could take years to complete. The term "response is adequate" is a confusing term for the public. A related question is: should the SIA monitor the implementation of the responses or is this an action of the regulator (CAA) as part of their oversight activities. There is a role of the SIA, namely to scrutinise the response: making sure that their safety recommendation is well understood. The regulator could track the plan. These issues are being discussed within ENCASIA WG6.

According to some interviewees, the quality of the safety recommendation helps to improve the follow-up. The quality of the safety investigations across Europe has improved. The improved quality of the safety investigations has also an impact on the derived safety recommendation. Better safety recommendations resulted in a higher likelihood that the safety recommendations are implemented. This aspect is also raised in Evaluation question 2.2.

ENCASIA had a large influence by introducing a common doctrine, establishing communication

and the introduction of SRIS database. The regulation formalised the follow-up of safety recommendations and also caused a shift in focus for safety recommendations from quantity to quality in selection and justification.

Results from survey
According to the respondents of the survey 71% (31 of 44) agreed that the regulation proved, to be of added value regarding the formulation of safety recommendations and 66% (29 out of 44) agreed that the regulation helped in the follow-up of the safety recommendations.

Results from workshop
According to EASA, the quality and time delivery of the safety investigation reports. It is questioned whether the soft deadline helps to achieve things earlier.

To put more pressure on addressees of safety recommendations, it could help to indicate when a reply is expected and to publish response to safety recommendations when they are received on the SIA website. This is also discussed in ENCASIA meetings.

Safety recommendations are sometimes not formulated in such way that they make practical sense to the recipient. A possible solution is to involve the recipient in the formulation of safety recommendations. This is already covered in Article 17, although 'authorities concerned' may be misinterpreted as not including manufacturers or airlines.

The difficulty of closing long term recommendations was identified as a problem by one of the workshop groups. The group suggested addressing this issue in ENCASIA WG6.

Industry position is that many safety recommendations, which directly target manufacturers, have been formulated without consulting with / liaising with the addressee. This should be done to make sure the safety recommendation addresses the right problem, and to ensure that the addressee is not taken by surprise (benefit in this respect is that they can begin preparing a response, 90-day timeframe). This is not always done. This view is confirmed by UK and Swedish SIAs. The Swedish SIA further highlighted that they have observed a vast improvement - in both the quality of the SR and the adequacy of the response – as a result of involving the addressee in the SR drafting process.

Results from Accident Cases
LOT case 6 years after the accident no final report has been issued. One of the causes is the change in staffing and availability of the air safety investigators. Within a year after the accident safety recommendations were issued, which we not all followed-up. The safety recommendations to Boeing and FAA no response has been received so far.

In the Pilatus case, the four safety recommendations to EASA (SRUR) are still open. The other seven recommendations have been closed.

In the Germanwings case, EASA has provided generally satisfactory responses. One safety recommendation was issued to the EC. The BEA does not consider the answer from the EC to be satisfactory. Another safety recommendation was issued to IATA. The BEA considers that the response is only partially adequate. The BEA did not receive an answer from the World Health Organisation (WHO), which received a similar recommendation as the one to EC, but on a global level.

Answer to the question
The timeliness of safety investigation reports has been analysed in Evaluation question 2.1.1. There it is concluded that the timeliness of reporting is a challenge for SIAs, as they cannot control the number and the complexity of accidents that must be investigated. An analysis of a sample of 104 accidents involving large aircraft (maximum take-off mass more than 5700 kg) in EU Member States between 1 January 2010 and 1 April 2016 shows that for approximately 40% of the sample the safety investigation report is released within 12 months of the date of the accident.

An analysis of the SRIS database over the period 2010 – 2016 shows that average response time is longer than 90 days, but the trend shows an overall improvement towards the 90 days.

However, for almost 50% of the safety recommendations, no response has been provided.

The analysis of the SRIS database shows also that 49% of all safety recommendations are open. This could be an indication that there is a delay in following up safety recommendations. However, the "open" and "closed" status usage on SRIS should be handled with care as there is not a standard for this, nor is there a requirement in the regulation to "close" a recommendation.

During the interviews, the issues were raised regarding when to close a safety recommendation and when is the response considered "adequate". There are some differences in the assessment of the responses. Some SIAs close a safety recommendation only if all the actions have been completed. Others close a safety recommendation if there is no (further) response from the addressee to be expected. This happens for instance when the action plan is agreed, but some actions can still be open because they could take years to complete. Also the term "response is adequate" is a confusing term for the public. Currently, these items are being discussed within ENCASIA WG6.

Within ENCASIA WG6, guidance has been developed on the formulation of safety recommendations. These guidelines in combination with an improved quality of the safety investigation lead to better safety recommendations. In the interviews and the workshop it has been argued that better safety, recommendations result in a higher likelihood that the safety recommendations are implemented.

A majority of the respondents of the survey agreed that the regulation proved to be of added value regarding the formulation of safety recommendations and a majority also agreed that the regulation helped in the follow-up of the safety recommendations. In an interview, it was concluded that also the 90 days response time has improved over the years.

The overall conclusion is that the regulation and the activities of ENCASIA have helped in following up the safety recommendations.

A5.16 Evaluation question 2.6

Evaluation question 2.6:
What improvements have been made with regard to establishing civil aviation accident emergency plans at national level?

Results from Desk Research
According to an analysis by Francesco Rossi Dal Pozzo[89], only Spain and Italy had by 2014 systematically complied with the obligations of Article 21.

On 31 January 2014, the European Commission held a workshop in Brussels that focused on the establishment of civil aviation accident emergency plans at national level. The workshop concluded that a number of Member States have difficulties establishing an emergency plan at national level. The difficulties experienced by the Member States are mainly due to the following factors (in isolation or combination):

- National emergency plans are strongly linked to the administrative structure of Member States. For Member States structured around regions, the coordination of a unique plan or of consistent plans at regional level is very challenging;
- The establishment of the plans requires the involvement of many different actors belonging to various institutions, with sometimes different perspective and objectives;
- Factors such as geographical location and language barrier can become challenges when the authorities should deal with victims and their relatives with various nationalities and backgrounds, in particular in the case of a large commercial air transport accident.

It was concluded that there is a need to develop guidance for the establishment and content of national emergency plans[90].

[89] Dal Pozzo, F.R. (2014). EU legal framework for safeguarding air passenger rights, Springer.

As part of the safety investigation of the crash of flight MH17 on 17 July 2014, the Dutch Safety Board published a separate report on passenger information.[91] This report contains the following conclusion:

"The relatives of the Dutch victims of the crash of flight MH17 had to wait for an unduly long time before they were given clarity regarding the presence of their loved ones on the aeroplane, because:

- *[...]*
- *The Dutch crisis organisation was insufficiently prepared for such a situation; and*
- *There was a* lack of control and coordination in the execution.

According to the report, *"Neither the national nor the regional crisis management plans included a detailed scenario for an aircraft accident abroad with a large number of Dutch victims. There was no indication of a coordination plan with a clear allocation of roles and responsibilities. Nor was there any coordinating institute in place, as was previously recommended by the International Civil Aviation Organization".*

ENCASIA Working Group 7 is specifically dedicated to assistance to victims and their families. This sub-group is composed of France, Germany, Netherlands, the United-Kingdom and the European Commission. In 2017, the working group published a leaflet "A practical guide on safety investigations for Air Accident Victims and their Relatives" via the ENCASIA web site[92]. This leaflet is aimed at air victims and their relatives to facilitate their understanding of the role and the different phases of a safety investigation. This leaflet describes the main milestones of the investigation of accidents to commercial air transport aircraft that occur within Europe.

Results from Field Research

Interview

Some Member States have not yet developed and implemented a national civil accident emergency plan. This is not due to any problem in the formulation of the regulation, but rather an internal governmental matter; specifically, which government body is to be responsible.

Article 21 (civil accident emergency plan at national level) defines a function to be fulfilled by a Member State. This is not a function that is likely to be fulfilled by a SIA, and therefore some interviewees believe that Article 21 is misplaced in Regulation (EU) No 996/2010 and should be placed elsewhere. However, it was also said that while it might seem odd to place assistance to victims in Regulation (EU) No 996/2010, but it has to be put somewhere and there is a link with accident investigation. Others suggested that national emergency plans should be covered in the Basic Regulation.

There has been a lot of progress in resolving the problems and challenges concerning assistance to victims and their relatives, and Regulation (EU) No 996/2010 kick-started this progress. Due to Regulation (EU) No 996/2010 there is a greater focus in the beginning of any investigation on adequately informing victims and their families. The appointment of a national contact person responsible for communication with victims' families is a clear benefit from the regulation. How the national contact persons engage in the process and how victims are supported varies somewhat from Member State to Member State. SIAs find it challenging to provide information to victims and their relatives. One of the problems is that definitions of a victim and a relative are not provided in the regulation. Managing relations with victims and their facilities requires a significant effort to satisfy their need for information while preventing disclosure of safety sensitive information. Requirements from Article 20 (Information on persons and dangerous goods on board) have been fulfilled by the airlines. Improvements are attributable to Regulation (EU) No 996/2010, although operators that fly to the US already had a system for this in place.

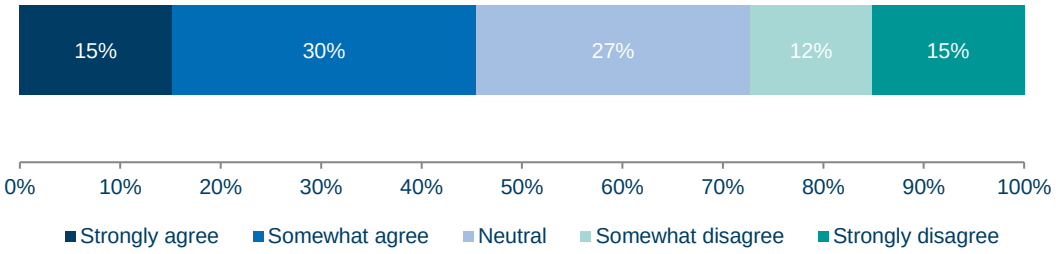
The speed of communication that is established when the emergency plans are executed is much slower than that of social media. Speculation emerges quickly on social media. Victims and their relatives may therefore have the perception that emergency plans do not work. These evolving communication landscapes are something to consider in the future.

[90] European Commission. (2014) Civil aviation accident emergency plan at national level; summary of discussions and workshop conclusions.
[91] Dutch Safety Board. (2015). MH17 Passenger Information.
[92] https://ec.europa.eu/transport/sites/transport/files/leaflet-air-accident-victims-safety-investigations-guide_en.pdf.

Survey

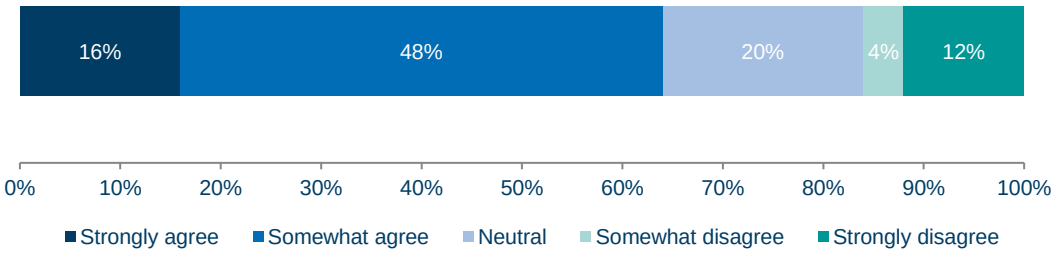
In the targeted survey, respondents were asked whether or not the national civil accident emergency plans have been sufficiently developed and implemented. From the 46 respondents, 13 did not provide an answer. From the 33 respondents that provided an answer, 45% (15) agreed, while 27% (9) disagreed, see Figure A.24.

Figure A.24: National civil accident emergency plans have been sufficiently developed and implemented (N=33)



Respondents were asked whether or not sufficient assistance to victims and their relatives is provided in their country. From the 43 respondents, 18 (42%) did not provide an answer. From the 25 respondents that provided an answer, 65% (16) agreed, while 16% (4) disagreed, see Figure A.25.

Figure A.25: Sufficient assistance to victims and their relatives is provided in my country (N=25)



Workshop

During the workshop it was concluded that the SIAs have a role in sharing information the victims and their relatives. The leaflet 'A practical guide on safety investigations for air accident victims and their relatives', developed by ENCASIA, illustrates that the SIA is one of several organisations involved in communication with victims and their families. A balance needs to be found between providing victims and their families with sufficient information and ensuring the protection of safety sensitive information.

Results from Accident Cases

Germanwings Airbus A320, 24 March 2015.

A national point of contact of the German government, in coordination with Lufthansa, was able to put together a list of victims and families. The formal contact in Germany was the BFU. The Ministry of Transportation and Digital Infrastructure (BMVI) is the office responsible for dealing with victim assistance. Lufthansa's internal post-emergency organisation (PEO) was in charge of working with BMVI and supporting the victims' families. The Lufthansa investigation team, together with the BMVI team, acted as the liaison between the investigator in charge (IIC) of BEA and Lufthansa's PEO regarding the information that could be disclosed (Note: the IIC was responsible for deciding the information that could be disclosed). Meetings were held between BEA and PEO before the press conference; the PEO organised the flight of victims' families,

translations, making sure special assistance teams were present at the press conference. The whole process is said to have worked well with the Lufthansa PEO, which received positive comments from the relatives' victims as well.

Answer to the question

On 31 January 2014, the European Commission held a workshop on the establishment of civil aviation accident emergency plans at national level. The workshop concluded that a number of Member States have difficulties establishing an emergency plan at national level. The difficulties experienced by the Member States are mainly due to the following factors (in isolation or combination):

- National emergency plans are strongly linked to the administrative structure of Member States. For Member States structured around regions, the coordination of a unique plan or of consistent plans at regional level is very challenging;
- The establishment of the plans requires the involvement of many different actors belonging to various institutions, with sometimes different perspective and objectives;
- Factors such as geographical location and language barrier can become challenges when the authorities should deal with victims and their relatives with various nationalities and backgrounds, in particular in the case of a large commercial air transport accident.

It was concluded that there is a need to develop guidance for the establishment and content of national emergency plans, but so far such guidance material has not been established. Results for the survey indicate that 27% of the respondents (9) are of the opinion that national civil accident emergency response plans have not been sufficiently developed and implemented.

The speed of communication that is established when the emergency plans are executed is much slower than that of social media. Speculation emerges quickly on social media. Victims and their relatives may therefore have the perception that emergency plans do not work. These evolving communication landscapes are something to consider in the future.

There has been a lot of progress in resolving the problems and challenges concerning assistance to victims and their relatives, and Regulation (EU) No 996/2010 kick-started this progress. Due to Regulation (EU) No 996/2010, there is a greater focus in the beginning of any investigation on adequately informing victims and their families. The appointment of a national contact person responsible for communication with victims' families is a clear benefit from the regulation. How the national contact persons engage in the process and how victims are supported varies somewhat from Member State to Member State.

A5.17 Evaluation question 2.6.1

Evaluation question 2.6.1:
Are there any difficulties in the process of establishing the list of passengers and then comparing it to the list of victims?

Results from Desk Research

In 2015, the Dutch Safety Board wrote a separate report on the passenger information involving the accident of flight MH17[93]. In this report the following conclusion is drawn: "The investigation has shown that the passenger information that was available after the crash of flight MH17 was not sufficient to conform to the relatives that their loved ones were on the flight. Malaysia Airlines has done what could be expected of an airline based on the aviation regulations. The airline issued a list of passengers' names, which afterwards turned out to be almost entirely correct, and handed this list to the Dutch authorities as soon as possible. Additional information about the passengers, such as their nationality and dates of birth, had to be extracted from secondary registration systems; as a result, it took some time before the data were available. For 75% of the passengers, this was possible on the evening of the crash; for the rest of the passengers, up to two days were required to collect additional information. Not being able to establish who was on board the flight at the push of the button is not an exceptional situation. This is a known and generally accepted fact in the aviation sector." (p12-13)

[93] Dutch Safety Board. (2015). MH17 Passenger Information.

The Dutch Safety Board recommends that the nationalities of the passengers should be available on the passenger list: "It is the Board's opinion, in future the nationalities of the passengers should be available on the passenger list that is drawn up by the airline. "(p.14) "In the opinion of the Board, a passenger list that includes the nationality of all passengers and a smoothly functioning crisis organisation, would provide sufficient guidance after an aircraft accident to retrieve information about the victims and their families more quickly." (p.14)

In their report, the Dutch Safety Board also describes that the bottlenecks in the collection and verification of passenger information were not new and were described previously in relation to a crash of a Turkish Airlines aircraft near Amsterdam in 2009.[94]

In the Staff Working Document on the implementation of Regulation (EU) No 996/2010[95] the same issue is addressed:

Article 20 requires airlines to make available immediately after an accident happens, a list of all the flight passengers and dangerous goods on board. During their national emergency exercises, the Finnish authorities discovered that Article 20 does not require the list of passengers to include information on the nationality of the passengers for flights within the Union. This lack of information could contribute to making the identification of victims difficult in a crisis situation. It was therefore suggested that the Commission should present further guidance. These pieces of information are already partly covered by the draft rules related to Passenger Name Records (PNR) proposed by the Commission.[96]

Results from Field Research

Interviews

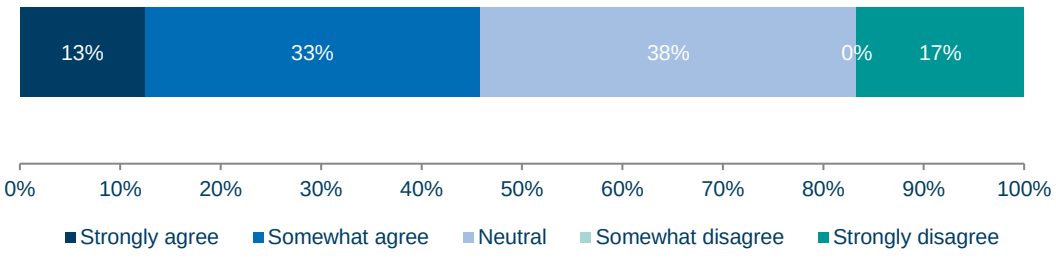
It has been highlighted in the interviews that the regulation emphasised the need to provide better passenger information. However, this has not been fully implemented. One interviewee stated that the national emergency plan is not very detailed regarding obtaining a list of passengers.

Survey

On the question if the national emergency plans sufficiently describe the requirements on obtaining passenger lists and comparing it to the list of victims, 22 out of the 46 respondents (48%) could not answer the question.

11 of the 24 respondents (46%) of the survey agreed and 4 (17%) respondents (strongly) disagreed. One respondent elaborated that this issue is not in the national emergency plan.

Figure A.26: The national emergency plans sufficiently describe the requirements on obtaining passenger lists and comparing it to the list of victims (N=24)

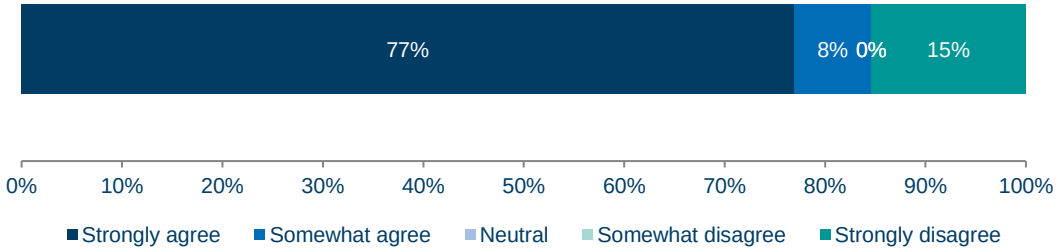


Next, SIA and Member State participants to the survey were asked if there have been safety investigations in which establishing the list of passengers and comparing it to the list of victims led to "unusual" difficulties in the process. Of the 30 respondents, 17 (57%) replied that they could not answer the question. Most of these respondents added that there were no accidents in

[94] Dutch Safety Board. (2010). Emergency assistance after Turkish Airlines incident, Haarlemmermeer, 25 February 2009.
[95] SWD(2016)151.
[96] COM(2011)32.

the period in which this was an issue. 13 respondents provided an answer of which 10 (77%) agreed and 2 (15%) (strongly) disagreed, see Figure A.27. One of the two respondents that disagreed referred to the MH17 report on passenger information.

Figure A.27: The national emergency plans sufficiently describe the requirements on obtaining passenger lists and comparing it to the list of victims (N=24)



Workshop

During the plenary discussion of the workshop, it was stated that it is important that SIAs know the nationality of the victims – this should be included in the passenger lists (Article 21), to facilitate the mobilization of the relevant Member States' representatives, etc. This point was addressed in the Staff Working Document SWD(2016)151 on the implementation of Regulation (EU) No 996/2010.

Results from Accident Cases

Not applicable.

Answer to the question

On the question if the national emergency plans sufficiently describe the requirements on obtaining passenger lists and comparing it to the list of victims, half of the survey respondents could not answer the question. Of the respondents that could answer it 11 (46%) agreed and 4 (17%) disagreed. However, a majority could not answer the question if this has led to any problems or stated that there have been no major investigations in which obtaining the list of passengers was an issue.

The accident of Malaysian Airlines Flight MH17 made it clear that the passenger list that was available immediately after the crash of flight MH17 was not sufficient to establish who was on board the aircraft[97]. To this end, Malaysia Airlines first had to retrieve additional information about the passengers, such as their nationality and date of birth, from the underlying registration systems. Since the related information had not been entered for all passengers, this took some time to obtain. In their report, the Dutch Safety Board also describes that the bottlenecks in the collection and verification of passenger information were not new and were described previously in relation to a crash of a Turkish Airlines aircraft near Amsterdam in 2009.[98] According to the Dutch Safety Board, this situation could be improved if the airlines were to record the nationalities of all passengers in the system that provide passenger information in the event of an aircraft accident.

A5.18 Evaluation question 2.7

Evaluation question 2.7:
What are the National practices and legal constraints for handling confidential safety information (e.g. CVR, witness statements, medical data)?

Results from Desk Research

The answer to this question is also addressed in Evaluation question 2.1.3.

[97] Dutch Safety Board (2015). MH17 Passenger Information.
[98] Dutch Safety Board. (2010). Emergency assistance after Turkish Airlines incident, Haarlemmermeer, 25 February 2009.

Analysis of the advance arrangements makes it clear that there are countries which:

- appear to give priority to the public prosecutor rather than to the SIA when it comes to the preservation of sensitive information, that is, Belgium, subject to specified conditions, Latvia, Luxembourg and Spain;
- appear to give priority to the SIA in this respect (Greece);
- aim to follow a balanced approach between the two without ranking the parties in terms of the preservation of sensitive information, as exemplified by Austria, France and Malta;
- leave it to courts whether or not such information can be disclosed and/or has to be transmitted by the SIA to the public prosecutor, as to which see Denmark and the UK.

Results from Field Research

Interviews

In some interviews, it is stated that Regulation (EU) No 996/2010 lacks detail on items to protect in the context of Article 14. Therefore, guidance is needed.

Survey

Figure A.28: Does your national constitution require public records including the records of the safety investigation bureau to be publicly available? (N=46)

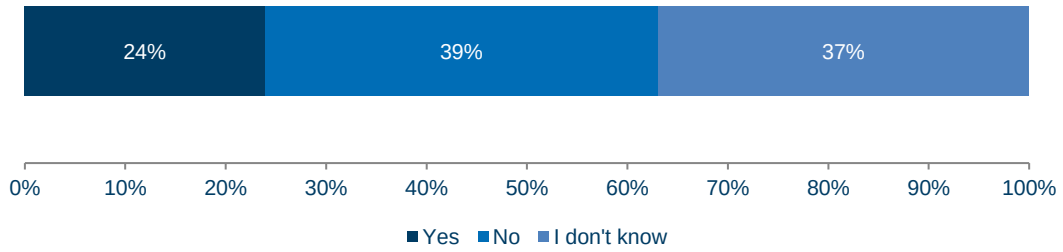


Figure A.29: Have national courts or administrative bodies or institutions in your country made decisions on the protection of sensitive safety information and persons? (N=46)

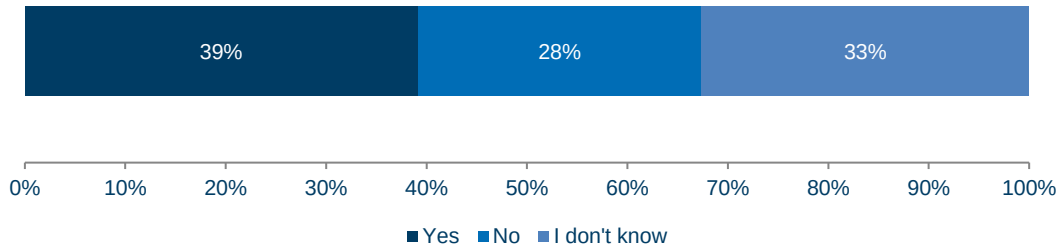
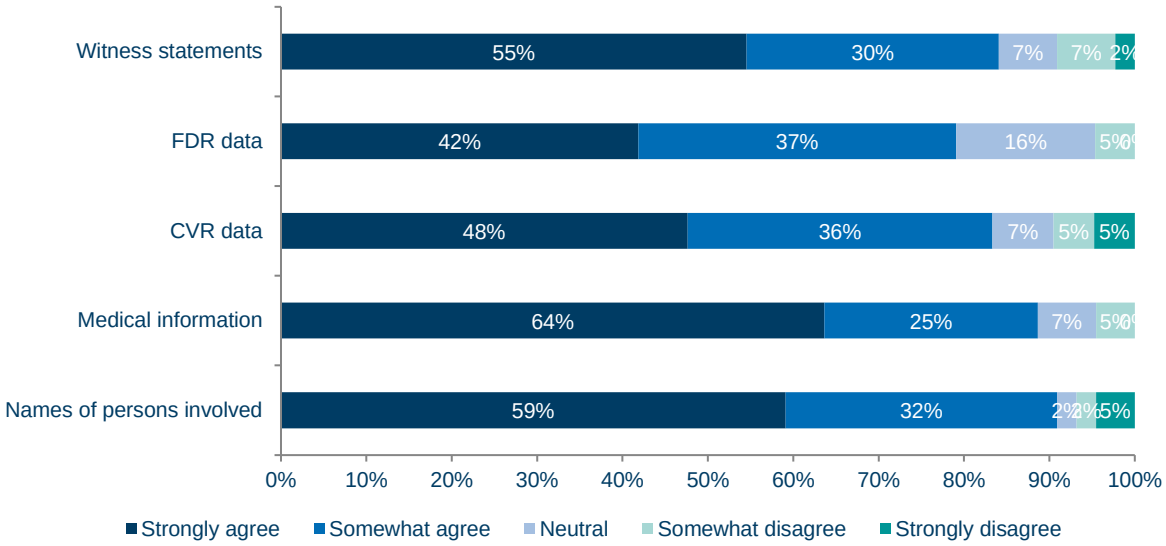


Figure A.30 below depicts the distribution of respondents whether or not they believed that the evidence from safety investigations is sufficiently protected in their country for the different types of evidence. From the 48 respondents, 4 could not answer the question for names of persons involved; 4 could not answer the question for medical information; 6 could not answer the question for CVR data; 5 could not answer the question for FDR data; and 4 could not answer the question for witness statements.

Figure A.30: The evidence that is sufficiently protected in their country (N=48)



Workshop

There are differences across Europe regarding the use of safety investigation reports in judicial investigations. It was suggested that the EC could make budget available to conduct a comparative study on the practices in different Member States concerning the use of safety investigation reports in judicial investigations.

Results from Accident Cases

UK practices and legal constraints for handling confidential safety information are described in detail in the UK court cases in Annex 4.

Answer to the question

In some Member States the public prosecutor has custody of sensitive safety information (and the SIA can have access), while in other Member States the SIA has custody of sensitive safety information over the data and the public prosecutor can have access. According to the interviewees, this did not lead to any problems. The majority of survey respondents are of the opinion that confidential safety information is sufficiently protected in their country see Table A.5 below.

Table A.5: Percentage of respondents to the survey agreeing that the information is sufficiently protected differentiated per type of information

Type of information	Percentage of respondents agreeing that data is sufficiently protected
Names of persons involved	91% (40 of 44)
Medical information	89% (39 of 44)
Witness statements	84% (37 of 44)
CVR data	83% (35 of 42)
FDR data	79% (34 of 43)

There are differences across Europe regarding the use of safety investigation reports in judicial investigations. The difference between the different Member States and the implications thereof are understood insufficiently.

A5.19 Evaluation question 3

Evaluation question 3:
Have resources and costs incurred been proportional to the results achieved?

This question is answered through Evaluation questions 3.1, 3.2 and 4. To appreciate whether resources and costs have been proportional, these need to be assessed against the baseline (the counterfactual scenario) which is presented in Annex 3.

Results from Desk Research

Benefits of Regulation (EU) No 996/2010

The primary aim of Regulation (EU) No 996/2010 is '*to improve aviation safety by ensuring a high level of efficiency, expediency, and quality of European civil aviation safety investigations*' (italics added).

In Chapter 3, the overall aviation safety improvement in Europe is presented. In this chapter, the annual number of (fatal) aviation accidents and fatalities in Europe before and after the introduction of the regulation are presented. Table 2 shows the average annual number of aviation fatalities in Europe before and after the introduction of Regulation (EU) No 996/2010. This table shows that the average annual number of aviation fatalities in Europe has reduced since the introduction of the regulation. Although a safety improvement is demonstrated and a link between safety improvement and high quality safety investigations (the aim of Regulation (EU) No 996/2010) exists, it is not possible to determine which fraction of the improvement can be attributed to Regulation (EU) No 996/2010.

The monetary benefit of improved aviation safety can be expressed as the value (costs) of accidents that have been prevented. The costs of aircraft accidents are a combination of various factors such as cost of repair/replacement of the aircraft, loss of use of the aircraft, site contamination and clearance, cost of accident investigation, etc., and the costs associated with fatalities and injuries. Estimating costs associated with fatalities can be difficult and controversial. A person's life is beyond price. It is, therefore, usually accepted that money cannot compensate for the loss of life itself. However, a price may be put on the material impact on others of a person's death e.g. compensation (indemnity) for loss of support etc., and, separately, on society's assumed desire to reduce the risk of a statistical fatality. Costs associated with fatalities are usually expressed as a Value of a Statistical Life (VOSL) where this 'value' generally includes an element of indemnity together with society's 'willingness to pay' to avoid a statistical fatality. In a study in 2014 for DG MOVE[99], this value was estimated to be € 1.8 million according to 2010 prices. Corrected to 2016 princes, this value becomes € 2.1 million. For the purpose of this rough analysis, only benefits associated with the prevention of fatalities will be considered. Other factors of accident cost are on average considered to be relatively small compared to fatality costs, especially in general aviation[100].

An estimate of the monetary benefit of Regulation (EU) No 996/2010 can be obtained by comparing the annual number of (fatal) aviation accidents and fatalities in Europe before and after the introduction of the regulation as presented in table 2 and multiply them by the costs of an accident.

Based on the data in table 2 and using a VOSL of €2.1 million, the monetary benefit of fatalities prevented in Europe since 2010 due to improved aviation safety amounts to €143 million per year for commercial air transport, €59 million per year for general aviation and €202 million for commercial air transport and general aviation combined.

The costs for Regulation (EU) No 996/2010 were estimated at € 6.3 – 7.7 million for the period 2011-2017 (see Table A.6), i.e. an average of € 1.1 million per year. This means that the benefit/cost ratio on annual basis of the Regulation is greater than 1 if more than 0.55% of all prevented fatalities due to improved aviation safety can be attributed to the regulation.

Answer to the question

The answer to this question is based on the answers to Evaluation questions 3.1, 3.2 and 4 and an analysis of monetary benefit due to an increased safety.

[99] See Table 10 in https://ec.europa.eu/transport/sites/transport/files/themes/sustainable/studies/doc/2014-handbook-external-costs-transport.pdf.

[100] See for example Ecorys, NLR et al, Aviation Safety Improvement using Cost Benefit Analysis (ASICBA). Research study, FP6 project No 12242, and for an estimation of the costs of aviation accidents in the US http://www.sciencedirect.com/science/article/pii/S0965856412001577.

The benefits of the regulation are the result of a decrease in the risk of aviation accidents due to improved safety recommendations. Assuming a Value of a Statistical Life (VOSL) of € 2.1 million, the monetary benefit of fatalities prevented in Europe since 2010 due to improved aviation safety amounts to €143 million per year for commercial air transport, €59 million per year for general aviation and €202 million for commercial air transport and general aviation combined.

The costs for Regulation (EU) No 996/2010 were estimated at € 6.3 – 7.7 million for the period 2011-2017 as summarised in Table A.6, i.e. an average of € 1.1 million per year. This means that the benefit/cost ratio on annual basis of the Regulation is greater than 1 if more than 0.55% of all prevented fatalities due to improved aviation safety can be attributed to the regulation.

The consulted SIAs during this evaluation study indicate that the benefits indeed outweigh the costs, and expect that this will remain the case in the future.

Table A.6: Summary of costs per stakeholder category for the period 2011-2017

Stakeholder category	Costs (€)
European Commission	1.9 million
Member States	1.4 million
SIAs	3.2 million – 4.7 million
Airlines	Negligible[101]
Total	**6.3 – 7.7 million**

A5.20 Evaluation question 3.1

Evaluation question 3.1:
Are the means provided by the Commission sufficient to support MS cooperation?

To answer this question, the means provided by the Commission are estimated. Costs that are incurred by other stakeholders are discussed under Evaluation question 4.

Results from Desk Research

Table A.7 below gives an overview of Commission assistance to ENCASIA that can be quantified:[102] direct grants, technical support, reimbursement of travel costs for ENCASIA meetings (plenary meetings and working groups), as well as Commission attendance to ENCASIA meetings, including provision of working group leaders. The total costs for these activities add up to € 743,483 for the period 2011 - 2017.

Table A.7: Overview of financial support to ENCASIA Network, 2011-2017

Grant	Period	Goal		Amount (€)	Total 2011-2017
ENCASIA-1	2013 (12 months)	Training		99,540	99,540
ENCASIA-2	2014-2015 (18 months)	Peer Review Programme Safety Training		99,933	99,933
ENCASIA-3	2015-2016 (18 months)	Peer Review Programme Safety Training		79,948	79,948
ENCASIA-4 & -5	2017-2018	Peer Review Programme Safety Training		159 942	159,942
Technical	**Period**	**Type**	**Partner**	**Amount**	**Total**

[101] Airlines representatives have indicated in a separate interview that the main 'cost category' for them – providing information to victims and families – was already an obligation under the ICAO guidelines and thus does not represent an additional cost as such.
[102] Data gathered through teleconference with DG MOVE and received ENCASIA Network grant application overviews.

				(€)	2011-2017
Development costs of ENCASIA website	2014-2015	Framework contract creation of Drupal site	TIPIK/All Starks	20,000	20,000
Hosting and maintenance costs	2016-ongoing	Internal contract	DG DIGIT	5,000 annual	10,000
Development of SRIS database		Internal contract	JRC		*No information from JRC*[103]
ENCASIA meetings*	**N° meetings (annual)**	**N° Participants**	**Costs (€)**	**Annual (€)**	**Total 2011-2017**
Plenary meetings	2	25 per plenary meeting	490 p.p.	24,500	171,500
Working groups (7)	2	8 per working group	490 p.p.	7,800	54,600
Head of working group	2	2011: 4 working groups 2012: 5 working groups 2013-2016: 6 working groups 2017: 7 working groups	980 per working group	6,860	48,020
				Total**	**€ 743,483**

Source: ENCASIA Annual Reports, Commission grant requests and data.
* Concerns Commission remuneration of travel costs to meetings and remuneration for the head of the working group.

** Total includes costs for 2 years of hosting and maintenance support (2016-2017), for 7 years of ENCASIA meetings (from 2011 to and including 2017), and 80 Working Groups meetings (2 meetings per year).

Details of Commission grants

- ENCASIA-1: Grant for € 99,540 for two training courses. Ran for 12 months, 2013, covered 100% of the costs:
  - 15-17 May 2013 at AAIB, Farnborough, UK. Objective: provide investigators with a harmonized and ENCASIA-developed risk assessment framework. Covered the management of site hazards and personnel safety required during investigation activities and the recovery of flight data for investigators. 22 attendees from 22 MS;
  - 21-23 October 2013 at BEA, Le Bourget, France. Focus on harmonisation of response for a major safety investigation and dealing with technical issues such as coordination for examination of aircraft parts or systems, as well as different types of computation that can be performed using available recording data. 28 attendees representing 25 MS. 8 SIAs and EASA participated as lecturers.
- ENCASIA-2: Grant for € 99,933 for training on ATM and airports (50%) and peer review programme (50%). Ran for 18 months, 2014-mid 2015, covered 100% of the costs:
  - 15-17 September 2014 at AAIB, Farnborough, UK;
  - 1-3 December 2014 at BFU, Braunschweig, Germany.
- ENCASIA-3: Grant for € 79,948 for expansion of Peer Review Programme and training for European air safety investigators (one per MS). Ran for 18 months, mid 2015-2016, covered 95% of the costs;
- ENCASIA-4 and ENCASIA-5: Request for € 159,942 for Safety Training and Peer Review Programme. The programme runs for 18 months, 2017-mid 2018, covers 95% of the costs.

Additionally, the Commission supported in non-financial terms, as detailed in the table below.

[103] No information has been provided by the JRC on the costs involved for this cost item.

Table A.8: Non-financial support (costs in terms of time spent by Commission), per year

Type	Activities	FTE (estimate)	Costs (€)[104]
Secretarial support	Planning and organisation	2	100,000[105]
Participation in plenary meetings	Various, including debriefing on relevant EU legal developments, making notes	0.25	23,750
Participation in working groups	Various, including debriefing on relevant EU legal developments, providing expertise (dependent on participant), making notes	0.5	47,500
Operational management of ENCASIA public website	Uploading documents / leaflets Support to victims and relatives Translation of documents in 23 EU languages Placing updates regarding changes at SIAs	Included in secretarial support	
Monitoring of SIAs	Updating status and composition of SIAs if necessary	0.25	23,750
ENCASIA trainings	Provision of trainer/instructor as needed	Included in participation in working groups	
Translations	Translation of leaflets and national agreements SIAs and other organisations	Included in secretarial support	
	Total	**3 FTE**	**195,000**
	Total	**2011-2017**	**1,170,000**

Source: Ecorys estimates based on inputs European Commission regarding FTEs.

The total of 3 full-time equivalents in non-financial support can be quantified at € 95,000 per policy-officer FTE and around € 50,000 per FTE for secretarial support,[106] which amounts to € 195,000 annually, or (6 * 195,000) = € 1,170,000 over the 2011-2017 period.

This means that total support provided by the Commission, financial or otherwise, adds up to an amount of € 1.9 million over the 2011-2017 period:

Table A.9: Total support provided by the Commission, financial or otherwise over the 2011-2017 period

Support	Budget
Financial support	€ 743,483
Non-financial support	€ 1,170,000
Total	**€ 1,913,483**

Results from Field Research

Overall, Commission support for the ENCASIAs activities was found to be sufficient by a majority of survey respondents as well as the interviewees who registered a response. This relates to the following ENCASIA tasks:

[104] Based on Ecorys, 2015, Study on the resources deployed in the area of European aviation safety before and after the creation of EASA. See https://ec.europa.eu/transport/sites/transport/files/2015-04-23-study-on-resources-deployed-in-eur-aviation-safety-before-and-after-creation-easa.pdf.
[105] Secretarial support costs have been estimated at 50% of the policy officer costs.
[106] Based on Ecorys, 2015, Study on the resources deployed in the area of European aviation safety before and after the creation of EASA.

1. Organisation of peer reviews;
2. Promotion of information sharing;
3. Advising EU institutions;
4. Promoting best safety investigation practices;
5. Developing Union-wide safety recommendations (This activity is done by SIAs, not ENCASIA);
6. Managing a resource sharing framework;
7. Organising training and skill development activities.

Also, the Commission's grant is deemed sufficient to prepare for the ENCASIA meetings as well as preparing the ENCASIA Annual Reports.

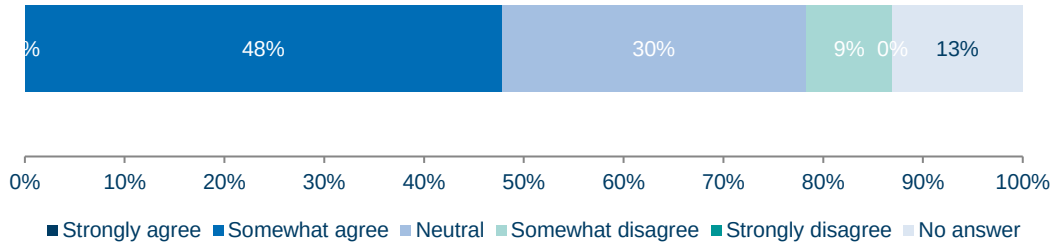
At the same time there is no clear agreement among stakeholders on whether the Commission annual grant is sufficient to support the breadth of ENCASIA activities, and a number of possible improvements are mentioned.

These issues are elaborated on below.

Resources for ENCASIA work programme

Respondents were asked whether they found sufficient resources are available for the ENCASIA work programme (see Figure A.31 below). Out of 23 respondents, 48% (11) agreed somewhat, while 30% (7) neither disagreed nor agreed and 13% (3) recorded 'no answer'. 9% (2) indicated they somewhat disagreed. No respondents agreed strongly and no respondents disagreed strongly.

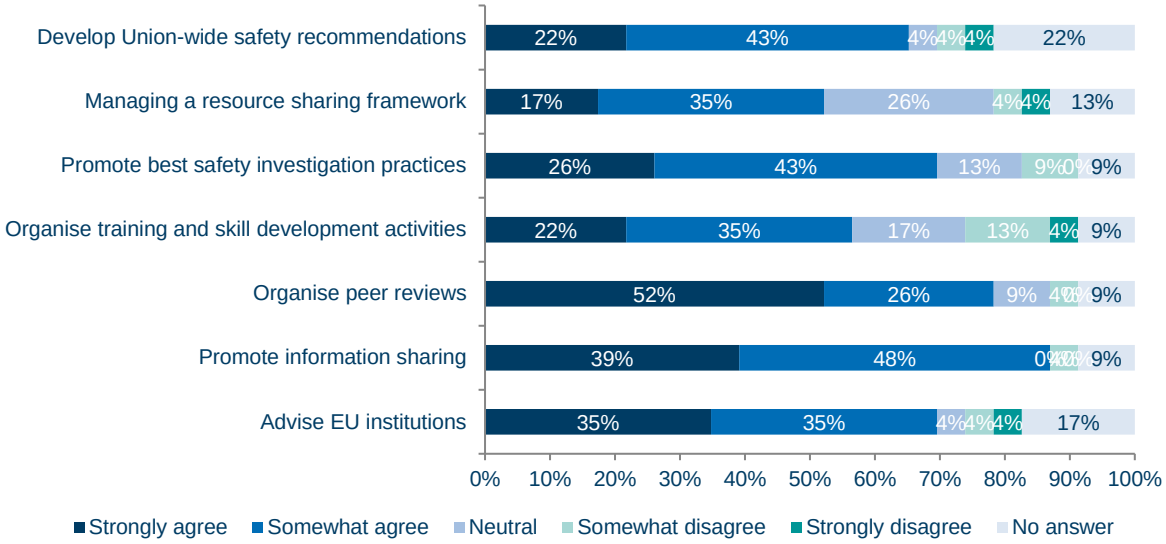
Figure A.31: There are sufficient resources available for the ENCASIA work programme (N=23)



In the elaboration of their answers, two survey respondents indicated that the ENCASIA work programmes are adjusted to fit the available resources. Another respondent indicated that the Network is largely driven by large and medium-sized SIAs, and that the representatives from smaller SIAs, who sometimes do not speak English very well, are generally less active. One respondent indicated the budget should be increased for more training.

SIA respondents were also asked whether ENCASIA is sufficiently resourced to perform a number of specifically identified tasks, which are elaborated on below and depicted in Figure A.32. Table A.10 show the percentage of respondents that agreed, disagreed or provided no answer. The number of respondents is also provided between brackets. The overall conclusion is that a majority of SIA respondents agreed that ENCASIA is sufficiently resourced to perform its tasks.

Figure A.32: ENCASIA is sufficiently resourced to perform the following tasks (N=23)



In the elaboration to these questions, one SIA indicated it has proposed the establishment of an office with permanent staff based in Brussels with at least one air safety investigator to assist the ENCASIA Chairman and the day to day communication with the SIAs. It was further highlighted that even if the ENCASIA Network is sufficiently resourced, SIAs themselves still need to deploy sufficient resources and these are not necessarily available in each case, especially for smaller SIAs.

Table A.10: Percentage of respondents that agrees, disagrees and provided no answer to the question if ENCASIA is sufficiently resourced to perform the following tasks (N=23). The number of respondents is provided between brackets

ENCASIA Task	Agree	Disagree	No answer
Advise EU institutions	70% (16)	9% (2)	17% (4)
Promote information sharing	87% (20)	4% (1)	9% (2)
Organise peer reviews	78% (18)	4% (1)	9% (2)
Organise training and skill development activities	57% (13)	17% (4)	9% (2)
Promote best safety investigation practices	70% (16)	9% (2)	9% (2)
Managing a resource sharing framework	52% (12)	9% (2)	13% (3)
Develop Union-wide safety recommendations	65% (15)	9% (2)	22% (5)

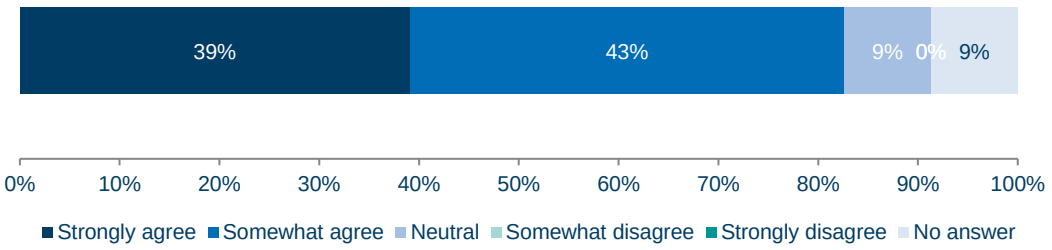
Resources for ENCASIA activities

SIAs were also asked whether they considered the Commission support to ENCASIA to perform its activities is sufficient. This was split over two activities, as elaborated below. Overall, Commission support was considered sufficient by a large majority of respondents.

Preparation and organisation of meetings

Overall, respondents indicated that sufficient Commission support was available for the preparation and organisation of meetings. As shown in Figure A.33 of a total of 23 respondents, 82% (19) indicated they either somewhat (10) agreed or strongly (9) agreed. Nobody disagreed with the statement that Commission support was sufficient, and some 18% (4) respondents indicated they neither disagreed nor agreed (2) or provided no answer (2).

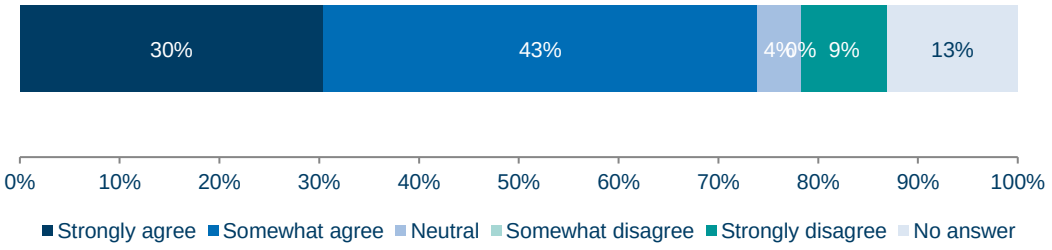
Figure A.33: Commission support sufficient for preparation and organisation of ENCASIA meetings (N=23)



The preparation of the ENCASIA annual report

Overall, respondents indicated that sufficient Commission support was available for the preparation of the ENCASIA annual report. As shown in Figure A.34, of a total of 23 respondents, 74% (17) indicated they either somewhat (10) agreed or strongly (7) agreed. 9% (2) of respondents strongly disagreed with the statement that Commission support was sufficient for the annual report preparation, while some 17% (4) respondents indicated they neither disagreed nor agreed (1) or provided no answer (3).

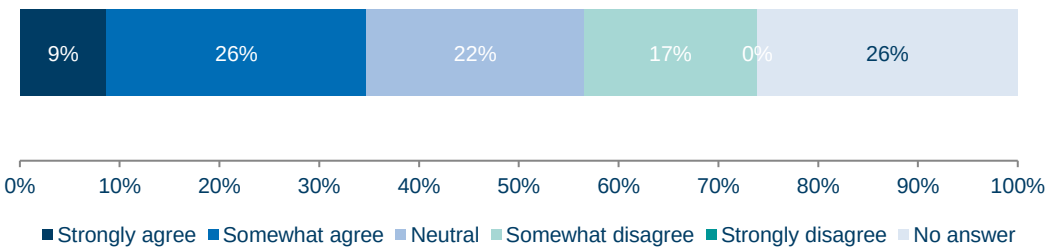
Figure A.34: Commission support sufficient for preparation of the ENCASIA annual report (N=23)



Annual Grant provided by the Commission

SIAs were asked whether the annual grant provided by the European Commission is adequate to support ENCASIA activities. As shown in Figure A.35, no clear picture emerges either way, as respondents seem divided on the issue. No respondent strongly disagreed and 17% (4) somewhat disagreed. About 35% (7) agreed either somewhat (6) or strongly (2) that the annual grant was adequate, while 48% (11) either neither disagreed nor agreed (5) or provided no answer (6).

Figure A.35: Commission annual grant sufficient for support ENCASIA activities (N=23)



In their elaboration, one respondent indicated that the annual grant provides for 'only' one investigator training from each SIA per year. Another respondent added that the grant could be

increased to provide more training, and a third added that the timeline is a bit short for organising training sessions.

A fourth respondent indicated that if the European Commission would provide ENCASIA with a larger grant, this might be used to help the smaller SIAs.

SIAs, the aviation community and Member States (CAAs, Ministries) were asked to indicate the main reasons for SIAs not to participate in ENCASIA meetings – and what could motivate them to participate more in ENCASIA's activities. 16 responses were recorded.

Reasons for non-participation can be grouped into the following items:

- Lack of financial resources (budget restraints);
- Lack of human resources;
- National political constraints / political reorganizations of SIAs / lack of understanding of the importance of participation at national level;
- Occurrence of a major accident in the days before a meeting.

The following motivators to increase participation in ENCASIA's activities were mentioned:

- Providing grants to SIAs;
- 'It has to matter whether you participate or not' (this might be interpreted as a call for introducing incentives - sanctions or rewards – but is rather unclear).

Participants in the stakeholder workshop[107] indicated that the current way of financing ENCASIA with grants is not suitable for sustained support.

Results from Accident Cases

Not applicable.

Answer to the question

The Commission has provided support aimed at supporting member state cooperation in the field of aviation accident investigation, mostly focusing on the ENCASIA Network. This support has taken various forms, such as grants, secretarial support, translations as well as provision of trainings, assistance during ENCASIA meetings, and the development and maintenance of a dedicated ENCASIA website and SRIS database. In total, quantifiable Commission support for Member State cooperation amounted to € 1.9 million in the period 2010 – 2017.

A majority of SIAs, the main beneficiaries of this support, indicate this is sufficient to support ENCASIA's various activities and to facilitate Member State cooperation; there were 2 SIAs (9%) hat indicated the Commission support was insufficient for the preparation of the annual report. At the same time, when focusing solely on the Commission's grants specifically, no conclusion can be drawn on their sufficiency: a large segment indicates the grants were sufficient, whereas there is also a large segment arguing the opposite (although it is noted those who disagreed indicated they 'somewhat' disagreed, while none strongly disagreed that grants were sufficient).

It should be kept in mind that cooperation between Member States has indeed increased significantly and that substantial benefits have been derived from it.

A5.21 Evaluation question 3.2

Evaluation question 3.2:
Could other means of support deliver better support?

This question is related to the previous question (Evaluation question 3.1) on sufficiency of Commission support.

[107] Held on 1st of June 2017, with participation from SIAs, EASA, representatives from airlines and manufacturers, as well as policy officers from the Commission.

Results from Desk Research

On the basis of arrangements in place for other areas, possible alternatives to support given to ENCASIA by the Commission could be to:[108]

1. Publicly tender the support activities (e.g. like this has been done for NSA Coordination Platform (NCP) Working Group Support Function);
2. Setting up a (permanent) Secretariat.

Although not directly related to the question whether alternative means could deliver better support, it is noted that with an eye on the future, the long-term sustainability of the current form may be questioned, specifically the provision of Commission grants for the ENCASIA Network. Indeed, it is recognised that more co-financing and less (sole) dependency on EU funds are a priority.[109] This means that the 'financial model' of Commission support may need to be rethought.

Results from Field Research

In the survey, SIAs, the aviation community and Member States (CAAs, Ministries) were asked what other ways the Commission could support cooperation. 3 out of the 11 responses indicated that no change in the support from the Commission in necessary.

Some respondents suggested increasing the existing types of support (i.e. larger grants), whereas others pointed to alternative means of support.

Below, the proposed alternative types of support to be given by the Commission are recorded in the survey:

- Paying for accommodation as well as daily allowances for ENCASIA meetings attendance, and facilitating the meetings of the ENCASIA Network;
- Facilitating further integration of ENCASIA by creating a board, with SIA board members who could lay out the strategy and combine the effort and resources from all the SIAs. Existing SIAs could be turned into regional offices handling minor investigations, and the integrated ENCASIA and regional SIA offices could function as a support organisation when a major investigation occurs. ENCASIA could define roles and types of investigators (regional, IICs for major investigations, and experts) and train everybody according to the same standards;
- Funding the establishment of an ENCASIA office with permanent staff based in Brussels with at least one air safety investigator to assist the ENCASIA Chairman and the day to day communication with the SIAs.

Another option was mentioned in the survey that goes beyond supporting Member State (SIA) cooperation: the creation of a contingency fund, upon which small SIAs could draw in case of major emergencies. This would be accompanied by an agreement on how this can be paid back.

Results from Accident Cases

Not applicable.

Answer to the question

As indicated in the answer to the previous Evaluation question 3.1, current support is deemed to be sufficient by a majority of the stakeholders. Most suggestions for improvement in Commission support relate not to alternative means of support, but amount to an extension of the current means of support. For example reimbursing travel to ENCASIA meetings for more than one SIA representative, and reimbursing accommodation costs and daily allowances.

At the same time, some suggestions have been made for alternative means of support. Further integration and formalisation of the ENCASIA Network could be considered as a way to economise resources, where an ENCASIA board composed of SIA members could lay out the ENCASIA strategy and act as a support organisation for various national (or potentially regional)

[108] Alternative options to those discovered through field research were established in internal team brainstorm.

[109] For some general background see e.g. REGULATION (EU) No 1303/2013, which lays down a number of provisions for co-financing under various funds: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R1303&from=EN.

SIAs. Such board could be a formal organisation structure with statutes, structural budget and staff (which may be seconded from SIAs). In the same vein, a permanent ENCASIA Network office in Brussels could be created as a way to further institute and formalise the ENCASIA Network.

Although these suggestions would merit further consideration, it should be noted that this study has not found an express wish either in favour or against these ideas.

On the basis of the evidence collected, it is considered that alternative means of support would not deliver better support, but that alternative means of support could be considered to complement them. Alternatives could in any case be considered keeping in mind that long-term sustainability of depending on large Commission grants for support is questionable.

A5.22 Evaluation question 4

Evaluation question 4:
Have the attributable costs to different stakeholders been proportionate?

Results from Desk Research
To address this question, the costs and the benefits of the regulation need to be taken into account and assessed against the counterfactual scenario in which there would not have been Regulation (EU) No 996/2010 (see Annex 4).

Costs for the European Commission have been elaborated under Evaluation question 3.1. To reiterate, total costs for the Commission amounted to € 1.9 million. These are considered to be all additional costs compared to the counterfactual.

Costs for other stakeholders have been elaborated based on field research.

Results from Field Research
Below, the benefits and costs are described and where possible quantified. This is followed by an assessment of the costs versus the benefits.

Benefits
A qualitative description of the benefits is provided in the answers to the questions on effectiveness (Section 4.3). However, in terms of quantified results of the regulation not much data are available. Nevertheless, the underlying logic of the regulation is to increase aviation safety in the European Union by increasing the quality of investigations, which should lead to better safety recommendations that, when implemented, improve the level of safety. Due to the regulation, in theory there should be benefits in the form of better safety investigations, as a result of:

- More efficient coordination of safety investigations between national SIAs in case of large international accidents;
- More exchange of knowledge between national SIAs through ENCASIA Network meetings and joint trainings;
- Less time spent on coordination with judicial authorities, through establishment of advance arrangements.

The following additional benefits were identified in the interviews and from the survey:

- Better protection of sensitive safety information;
- Clearer division of responsibilities / role with CAAs;
- Clearer division of responsibilities / role with judicial authorities (though suboptimal);
- Clearer division of responsibilities / role of EASA;
- Better assistance to victims and families;
- Better cooperation between European SIAs;
- Better quality of safety investigations due to joint trainings;
- Achieving and maintaining independence of safety investigations by highlighting functional independence of SIAs.

On the basis of the benefits identified by the stakeholders involved, it is reasonable to assume that aviation safety has increased and that the risks for an aviation accident have been

decreased.

Costs

The costs from the Commission in support of ENCASIA are provided in the answer of Evaluation question 3.1. Additional costs to those borne by the Commission relate to costs for individual SIAs and Member States (see also Evaluation question 5 on additional administrative tasks):

- Set-up of independent SIA (where relevant);
- Establishing advance arrangements (where relevant);
- Time spent for preparing and attending ENCASIA meetings (including working groups and trainings);
- Costs related to attending ENCASIA meetings (daily allowances, accommodation);
- Recording as well as implementing safety recommendations;
- Developing emergency plans;
- Developing plans related to assisting victims and families.

When asked how many resources are involved in complying with the regulation, in the survey stakeholders indicated a range from 0 up to 4 additional FTEs. One respondent mentioned 10 additional FTEs, the most extreme case.

As a result of an in-depth session on cost categories performed with a SIA, these costs can be estimated and quantified in further detail. The costs can be split into one-off costs for Member States (adapting national legislation to be in line with the regulation, including establishment of emergency plans) and structural costs for SIAs recurring yearly.[110]

One-off costs have been divided in two groups: costs to those Member States who had to implement few changes to national legislation, because the regulation did not introduce significant new elements; and costs to those Member States who had to implement substantial changes in their national law.

The tables below show the overview per type of costs and quantified in euros. The workload is provided in FTE. To translate FTE in annual costs, the annual salary of an NSA employee has been used (in the case of SIAs as a proxy), at € 55 000.[111]

In this overview, a distinction has been made between states who needed to implement few changes to legislation and those that had to implement many changes. For the purposes of estimation and to compensate for a lack of sufficient concrete inputs, a simplified distribution of 80%-20% has been made between states with few and many changes. This is justified by the fact that no transposition of a Directive into national legislation is required, so that substantial national law changes were in the majority of cases not required.

Table A.11: Overview one-off costs: transposition Regulation (including emergency plan), borne by Member States

Activity / cost item	Workload in FTE	Workload in FTE
	Few changes (~80% or 22 states)	Many changes (~20% or 6 states)
Providing inputs to lawmakers	5 days p.p., 8 persons 40 days total ~0.2 FTE per MS	~0.4 FTE per MS
Coordinating and drafting national law	40 days p.p., 2 persons 80 days total ~0.4 FTE per MS	~0.8 FTE per MS
Subtotal	**13.2 FTE**	**7.2 FTE**
	Total	**20.4 FTE**

[110] Airlines representatives have indicated in a separate interview that the main 'cost category' for them – providing information to victims and families – was already an obligation under the ICAO guidelines and thus does not represent an additional cost as such.

[111] Based on Ecorys, 2015, Study on the resources deployed in the area of European aviation safety before and after the creation of EASA. See https://ec.europa.eu/transport/sites/transport/files/2015-04-23-study-on-resources-deployed-in-eur-aviation-safety-before-and-after-creation-easa.pdf.

Activity / cost item	Workload in FTE	Workload in FTE
	Total costs (€)	**1,122,000**

Table A.12: Overview of structural cost categories, borne by SIAs

Activity / cost item	Workload in FTE (annual basis)	Quantified costs (€)
Updating and using SRIS	0.1-0.2 FTE per SIA, **2.8-5.6 FTE for 28 SIAs**	154,000 – 308,000
Chairing ENCASIA working group	0.5 FTE per group, **3 FTE for ENCASIA total**	165,000
ENCASIA plenary	Plenary: 2 meetings per year, 2 days, 28 SIAs 112 mandays **~0.5 FTE for ENCASIA total**	27,500
ENCASIA working group participation	Working groups (~6 groups): 2 meetings per year, 1-2 days, 28 SIAs 56 – 112 days per working group 336 – 672 mandays **~1.6 – 3.2 FTE ENCASIA total**	88,000 – 176,000
Conducting peer review	3 mandays per review p.p. = 6-9 mandays per review (2-3 persons); 24-36 mandays total (4 peer reviews) **~0.15 FTE for ENCASIA total**	8,250
Receiving peer review	20 mandays of preparation + 9 mandays for participation = 29 mandays total per review; 116 mandays total 4 peer reviews) **~0.6 FTE for ENCASIA total**	33,000
	Total per year	**475,750 – 717,750**
	Total 2011-2017	**2,854,500 – 4,306,500**

Table A.13: Overview of ENCASIA attendance costs: hotel and daily subsistence allowance

Miscellaneous[112]	Rates	Persons & Meetings	Costs (€)
ENCASIA meetings: accommodation Brussels	Hotel rate for Brussels, Belgium € 140 per night	25 people at plenary, 2 days, 2 a year = 100 hotel nights 8 people per working group, 6 working groups, 2 days, 2 a year = 192 hotel nights **Total = 292 nights**	40,880
ENCASIA meetings: Daily subsistence allowance (DSA)	DSA for Brussels, Belgium, € 92	1 DSA per hotel night **Total = 292 DSAs**	26,864
	Total per year		67,744
	Total 2011 – 2017		**406,464**

Table A.14: Overview of costs for SIAs, 2011-2017

Cost category	Costs (€)
Structural costs	2,854,500 – 4,306,500
ENCASIA attendance costs	406,464
Total	**3,260,964 – 4,712,964**

Table A.15: Overview of costs per stakeholder category

Stakeholder category	Costs (€)
European Commission	1,913,483
Member States	1,386,000
SIAs	3,260,964 – 4,712,964
Airlines	Negligible[113]
Total (€)	6,296,447 – 7,748,447 **€ 6.3 – 7.7 million**

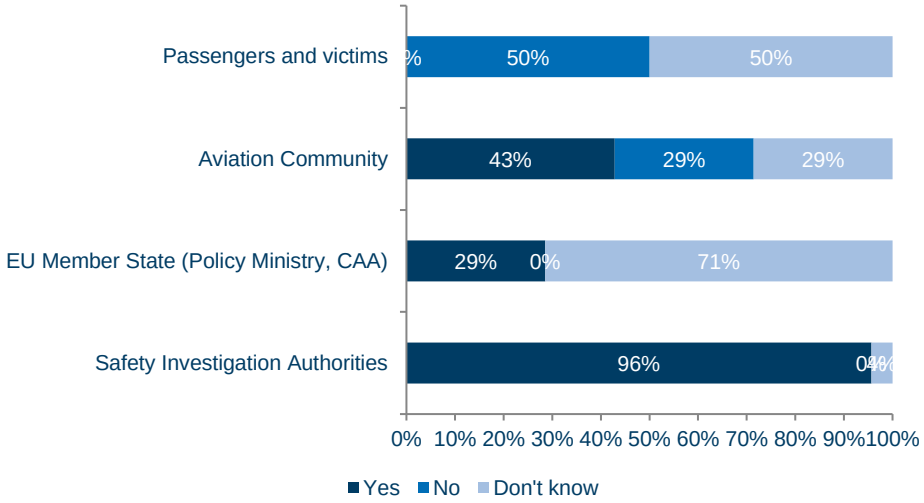
Costs versus benefits

A majority of 65% (30 of the 46 respondents) of the survey indicated that the benefits outweigh the costs. 11% (5) indicated that costs outweigh the benefits and 24% indicated they did not know. The results recorded per stakeholder group are shown in Figure A.36.

[112] See for an overview of DSA and hotel costs http://ec.europa.eu/dgs/education_culture/calls/222013/eac-22-2013-annex5c_en.doc.

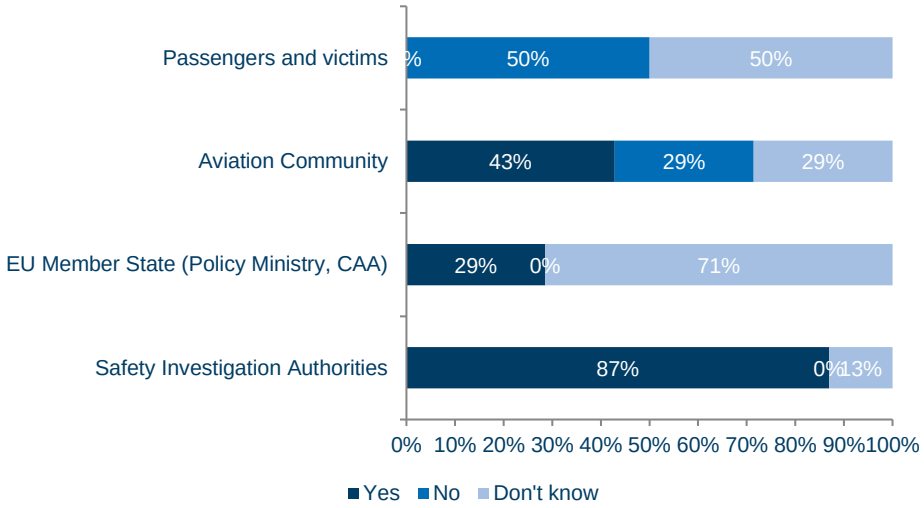
[113] Airlines representatives have indicated in a separate interview that the main 'cost category' for them – providing information to victims and families – was already an obligation under the ICAO guidelines and thus does not represent an additional cost as such.

Figure A.36: Benefits of the regulation currently outweigh the costs (N=46)



Stakeholders expected this judgement to remain the same in five years' time, as can be seen from Figure A.37 below.

Figure A.37: Benefits of the regulation will outweigh the costs in five years' time (N=46)



It is noted that the costs of the regulation have been relatively larger for smaller SIAs than for larger SIAs, who had been performing many of the tasks before the introduction of the regulation. (See also answer to Evaluation question 5 below).

Total costs for all stakeholder categories have been estimated at a range of € 6.3 – 7.7 million in total for the period 2011-2017. It is reasonable to assume that aviation safety has improved as a result of the regulation, hence the likelihood of aviation accidents is assumed to be decreased, and it is known from earlier research by Ecorys and NLR that the costs of a single aviation accident with a commercial airliner can easily amount to a few hundred million euros in case of many fatalities,[114] while it is known from US research that general aviation accidents can cost more than $ 1 billion on a yearly basis.[115]

[114] Ecorys, NLR et al, Aviation Safety Improvement using Cost Benefit Analysis (ASICBA) research study, FP6 project No 12242.
[115] See for an estimation of the costs of aviation accidents in the US http://www.sciencedirect.com/science/article/pii/S0965856412001577.

Results from Accident Cases
Not applicable.

Answer to the question
To answer this question of proportionality, the total costs and benefits need to be taken into account. Total costs for all stakeholder categories have been estimated at a range of € 6.3 – 7.7 million in total for the period 2011-2017, including the costs for additional administrative tasks (see Evaluation question 5 below). The benefits of the regulation are the result of a decrease in the likelihood of aviation accidents due to improved safety recommendations. It is known that a single aviation accident with a commercial airliner can easily amount to a few hundred million euros in case of many fatalities.[116] Overall the conclusion is that the benefits of Regulation (EU) No 996/2010 have outweighed the costs.

From the analysis it becomes clear that the benefits of improved safety largely accrue to passengers, airlines and society as a whole, while the costs are borne by the European Commission and Member States. These are stakeholders who together represent European societies and whose mission it is to provide goods for the public interest.

Therefore, it can be concluded that the costs have indeed been distributed proportionally to the benefits incurred across stakeholders.

A5.23 Evaluation question 5

Evaluation question 5:
Which additional administrative tasks have been generated by the Regulation?

Results from Desk Research
An analysis of the regulation shows it mandates different types of administrative tasks as indicated in Table A.16.

Table A.16: The regulation imposed additional administrative tasks

Item	For whom
Preparing advance arrangements	SIAs, judicial authorities
Developing procedures of recording responses to safety recommendations and implementing these	SIAs
Developing plans for assistance to victims and families	SIAs, airlines, (appointing) national coordinator victim assistance
Recording safety recommendations and responses in ECCAIRS/SRIS	SIAs
Preparing ENCASIA meetings, organising travel	SIAs, European Commission
Peer reviews	SIAs
Plans and programmes for training, which have to be accepted by the Civil Aviation authority	SIAs, CAA

Results from Field Research
Survey respondents were asked whether the regulation had introduced additional administrative tasks to their organisation. Table A.17 shows, percentage-wise, the division per stakeholder group with the absolute numbers in parentheses.

Table A.17: The regulation imposed additional administrative tasks (N=44)

	Strongly disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Strongly agree	No answer

[116] See Ecorys, NLR et al, Aviation Safety Improvement using Cost Benefit Analysis (ASICBA) research study, FP6 project No 12242, and for an estimation of the costs of aviation accidents in the US http://www.sciencedirect.com/science/article/pii/S0965856412001577.

	Strongly disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Strongly agree	No answer
SIAs	4% (1)	4% (1)	22% (5)	52% (12)	17% (4)	0% (0)
EU Member State (Policy Ministry, CAA etc.)	29% (2)	0% (0)	14% (1)	43% (3)	0% (0)	14% (1)
Aviation Community	14% (2)	36% (5)	7% (1)	36% (5)	7% (1)	0% (0)

From this, the following observations can be made:

- A majority of 69% (16) of SIA respondents stated additional administrative tasks have been imposed, with 8% disagreeing;
- Member States respondents are divided about the effect on their organisation, as 29% (2) stated that no additional administrative tasks have been imposed, while 43% (3) stated they somewhat agree additional tasks have been imposed;
- Half (7) of Aviation Community respondents stated no additional administrative tasks have been imposed on their organisation, while 43% (6) state additional tasks have been imposed.

Therefore, it seems the SIAs as a stakeholder group were most affected by additional administrative tasks.

In addition, the majority of SIAs indicated in the survey and the interviews that they are (strongly) affected, although a few larger SIAs also indicated that they were already implementing all of the tasks as a regular activity, due to either their adherence to the ICAO Annex 13 guidelines and/or because they implement best practices.

One respondent also noted that there are only slight impacts to his/her organisation and another noted that the regulation did not impose anything they would not or should not be doing anyway as best practice dictates.

Results from Accident Cases

Not applicable.

Answer to the question

Based on a review of the regulation and on inputs from the survey and interviews, the additional administrative tasks have been identified:

- Preparing advance arrangements;
- Developing procedures of recording responses to safety recommendations and implementing these;
- Developing plans to provide assistance to victims and families;
- Recording safety recommendations and responses in SRIS database;
- Preparing ENCASIA meetings, organising travel;
- Peer reviews;
- Plans and programmes for training, which have to be accepted by the national civil aviation authorities.

The tasks "Developing procedures of recording responses to safety recommendations and implementing these" (second item) and "Recording safety recommendations and responses in SRIS database" (forth item) are considered administrative burden as per the definition in the Better Regulation Guidelines[117]:

These tasks have mostly incurred additional work for SIAs. The total costs incurred by SIAs amounts to €3.3-4.7 million for the 2011-2017 period.

[117] Administrative costs are defined as the costs incurred by enterprises, the voluntary sector, public authorities and citizens in meeting legal obligations to provide information. The administrative burdens stem from the part of the process, which is done solely because of a legal obligation.

A5.24 Evaluation question 6

Evaluation question 6:
To what extent is the intervention coherent with the EU Aviation safety policy and Regulations? Are there any gaps, overlaps or inconsistencies?

Answer to the question
A comparison of the study team of Regulation (EU) No 996/2010 with Aviation Safety Policy and the relevant EU regulations as listed in Annex A did not identify any incoherence. Additionally, a large majority of the respondents to the survey agreed that Regulation (EU) No 996/2010 is coherent with the Aviation Safety Policy and EU regulations. Only Regulation (EU) No 376/2014 led to a lack of harmonisation. This question will be further answered by answering the sub-questions 6.1 through 6.5.

A5.25 Evaluation question 6.1

Evaluation question 6.1:
To what extent is the intervention coherent with EU Aviation Safety policy, and in particular to Regulation 216/2008?

Results from Desk Research
A comparison between the EU Aviation Safety policy and Regulation (EU) No 996/2010 reveal no incoherencies.

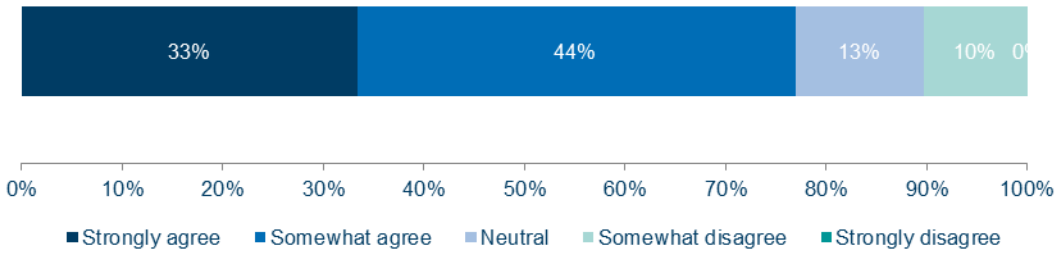
In principle, Regulation (EU) No 996/2010 is coherent with Regulation (EC) No 216/2008 (the Basic Regulation), although the latest revisions have raised a concern. Article 5 of Regulation (EU) No 996/2010 mandates the investigation of every accident or serious incident involving aircraft other than specified in Annex II of the Basic Regulation. The latest revision would also mandate the investigation of accidents and serious incidents of drones. ENCASIA has formulated an opinion in 2015 to allow flexibility in the investigation of drones (and manned aircraft with a MTOW of less than 2250kg). Although this is not incoherence per se, but it is questioned the implication is in line with the intentions behind Regulation (EU) No 996/2010. Currently, the alternative text formulated in the ENCASIA opinion has been incorporated in the revision of Basic Regulation. The revision of the Basic Regulation has not been completed.

Results from Field Research

Interviews
In the interviews no incoherence of Regulation (EU) No 996/2010 with the EU Aviation Safety policy or the Basic Regulation were brought forward.

Survey
In the survey, respondents were asked if Regulation (EU) No 996/2010 is coherent with the Aviation Safety policy and other regulations including the Basic Regulation. Of the 44 respondents, 5 could not provide an answer. Of the remaining 33 respondents, 30 (77%) agreed, while 4 (10%) (somewhat) disagreed, as depicted in Figure A.38.

Figure A.38: Coherence between Regulation (EU) No 996/2010 and the Aviation Safety Policy and other regulations including the Basic Regulation (N=33)



Results from Accident Cases
Not applicable.

Answer to the question
The evaluation did not identify incoherence with the EU Aviation Safety policy.

In principle, Regulation (EU) No 996/2010 is coherent with Regulation (EC) No 216/2008 (the Basic Regulation), although the latest revisions have raised a concern. Article 5 of Regulation (EU) No 996/2010 mandates the investigation of every accident or serious incident involving aircraft other than specified in Annex II of the Basic Regulation. The latest revision would also mandate the investigation of accidents and serious incidents of drones. ENCASIA has formulated an opinion in 2015 to allow flexibility in the investigation of drones (and manned aircraft with a MTOW of less than 2250kg). Although this is not incoherence per se, it is questioned whether the implication is in line with the intentions behind Regulation (EU) No 996/2010. Currently, the alternative text formulated in the ENCASIA opinion has been incorporated in the revision of the ***Basic Regulation. The revision of the Basic Regulation has not been completed.***

A5.26 Evaluation question 6.2

Evaluation question 6.2:
To what extent is the intervention coherent with other EU instruments?

Results from Desk Research
Besides the regulations mentioned in the other questions on coherence, the following regulatory texts have an interaction with Regulation (EU) No 996/2010:

- Commission Decision 2012/780/EU on access rights to the European Central Repository of Safety Recommendations and their responses (and its successors);
- Regulation (EU) No 376/2014 on the reporting, analysis and follow-up of occurrences in civil aviation;
- Decision of the European Parliament and of the Council on a Union Civil Protection Mechanism – 1313/2013/EU in relation to civil aviation accident emergency plans;
- Commission Implementing Decision No 2014/762/EU laying down rules for the implementation of Decision No 1313/2013 of the European Parliament and of the Council on a Union Civil Protection Mechanism;
- Council Regulation (EC) No 2027/97 as amended by Regulation (EC) No 889/2002 on air carrier liability in the event of accidents;
- Regulation (EC) No 785/2004 of the European Parliament and of the Council of 21 April 2004 on insurance requirements for air carriers and aircraft operators for the support of air accident victims and their relatives;
- Regulation (EU) No 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data.

A comparison with these regulations and Regulation (EU) No 996/2010 did not identify any incoherence.

Results from Field Research
<u>Interviews</u>
There is a duplication and/or lack of harmonisation in terms of reporting requirements in Regulation (EU) No 376/2014 and Regulation (EU) No 996/2010 according to some interviewees. There are different channels through which to report an incident depending on whether it is categorised as an incident or a serious incident. There is a fine line between an incident and a serious incident, and there is no definitive list of serious incidents. It is therefore difficult for the reporting organisation to determine whether an incident is serious or not. In some cases, it may not be considered serious at the initial assessment, but data may later reveal the incident to be serious.

The SIAs do not want that all incidents are reported to them as that would create too much additional work and because they want to remain an 'outsider 'to the aviation system. Occurrence reporting according to Regulation (EU) No 376/2014 is seen as part of the internal information feedback loop of the aviation system. In 99 out of 100 cases, it is clear for the

reporter if an incident is serious or not and hence who to report to, but the 1 % is problematic.

The incoherence between Regulation (EU) No 376/2014 and Regulation (EU) No 996/2010 is small and can be resolved by a uniform risk classification scheme.

One interviewee questioned whether the coherence between Regulation (EU) No 996/2010 and the rest of the European safety environment that also mandates SMS is fully optimal.

Survey

In the survey, respondents were asked if Regulation (EU) No 996/2010 is coherent with the Aviation Safety Policy and other regulations including the Basic Regulation. Of the 44 respondents, 5 could not provide an answer. Of the remaining 33 respondents, 30 (77%) agreed, while 4 (10%) (somewhat) disagreed, as depicted in Figure A.38 above.

Workshop

According to Regulation (EU) No 376/2014, reporting must be done within 72 hours, but for accident investigation, a time delay of 72 hours is too long. In practice, this is not an issue for accidents (these are reported promptly) but it can be a problem for serious incidents. This was a problem already before Regulation (EU) No 996/2010.

For reporters of an incident, it may not be obvious whom to report to, as they might not be able to determine whether an incident is serious or not. There may be different views on whether an occurrence is an incident or a serious incident. There is also an administrative burden of two reporting systems.

Safety related cyber security might also be a problem, as there is also a requirement to report cyber security events (Article 19 of Regulation (EU) No 910/2014).

Possible solution: Education and better coordination between NAA, EASA and SIA, including coordination of the flow of information; using a single point of contact for occurrences should be encouraged.

A possible solution is that the NAA only classifies up to "potentially serious incident", avoid the use of the pre-defined "serious incident" and let the SIA decide if it is a serious incident. For further clarification, a database could be set up that captures the justification of classification as serious incidents.

Results from Accident Cases

Not applicable.

Answer to the question

No incoherence with other regulations was identified, except for a perceived lack of harmonisation between Regulation (EU) No 376/2014 and Regulation (EU) No 996/2010.

Accidents and serious incidents, as defined within Regulation (EU) No 996/2010, are to be reported under Regulation (EU) No 376/2014 (Article 2(7)). It means a double reporting could be required in a situation where a person is subject to mandatory reporting obligations in accordance with Regulation (EU) No 376/2014. The SIAs perceive a lack of harmonisation between Regulation (EU) No 376/2014 and Regulation (EU) No 996/2010.

There are several aspects here:

- For the reporter – Regulation (EU) No 376/2014 contains the occurrences (including accidents and serious incidents) that shall be reported through the mandatory reporting systems[118] to the competent authority established by Regulation (EU) No 376/2014. In the majority of the cases, the SIA is not that competent authority. In addition, if the reporter considers that the occurrence is a serious incident or an accident, the reporter must report to the SIA as well under Regulation (EU) No 996/2010 article 9. Moreover, for reporters of an incident, it may not be obvious whom to report to as they might not be able to determine whether an incident is serious or not;

[118] Not all occurrences are to be reported and not everybody is subject to the mandatory occurrence reporting system. This information can be found in Regulation (EU) No 376/2014.

- For the SIAs – The SIAs have concerns that if occurrences are classified as representing a significant risk to aviation safety by the competent authority under Regulation (EU) No 376/2014, this would mean that there are considered as 'serious incidents', hence the SIA's obligation to investigate would be subject to a classification by another competent authority. Strictly speaking, this concern is not justified, as the safety risk classification of occurrence reports in Regulation (EU) No 376/2014 does not define what is a serious incident or accident. Another issue for the SIAs is that serious incidents and/or accidents could be reported only to the competent authority under Regulation (EU) No 376/2014 and not to the SIAs.

Hence, people should be aware of the different reporting channels. Member States are responsible for an appropriate set up of the national reporting systems to allow the authorities to be aware of the information and to cope with their respective duties. Effective coordination between the competent authority under Regulation (EU) No 376/2014 and the SIAs is deemed necessary.

A5.27 Evaluation question 6.3

Evaluation question 6.3:
In how far was the Regulation coherent with other rules on protecting data and human rights?

Answer to the question
The first question that must be addressed in this context is whether the provisions of the regulation must comply with human rights and data protection as the subject of the regulation is a very specific one, allowing for divergences from the general rules, because of reasons of protecting public order and aviation safety. The regulation focuses on aviation safety, but leaves it to the laws of Member States to set a balance between the two objectives, as to which see in particular Article 14(3) of the regulation on the disclosure of safety sensitive information.

For instance, Sweden knows a Freedom of Information legislation, which comes under constitutional provisions of that country. Thus, judicial authorities may obtain evidence from investigation and data laid down in the SIA reports. In practice, the final report of the SIA can be used for the prosecution of crimes. Sweden is a country in which the issue of matching the 'safety culture' with the protection of human rights and data is illustrated in the most articulated fashion.

In 2016, the EU has adopted the General Data Protection Regulation, and the Passenger Name Record (PNR) directive, integrating the privacy legislation in these instruments. The objective of this new set of rules is to give citizens back control over their personal data, and to simplify the regulatory environment for business. This point is, among others, the subject of Opinion (1/15) of the CJEU requested by the European Parliament concerning the compatibility of the preservation of with EU treaties and the EU Charter of Fundamental Rights, especially Articles 7 and 8 on the right to privacy and data protection. The decision of the European Court is expected to be given on 26 July 2017[119].

Up to now, there have been no incoherencies found with other rules on protecting data and human rights.

A5.28 Evaluation question 6.4

Evaluation question 6.4:
In how far do the provisions of the "solidarity clause" (Art.222 TFEU) address the authorities cooperation, in particular with regard to civil protection?

Results from Desk Research

1. Approach

This section aims at analysing whether the solidarity clause laid down in Article 222 of the Treaty on the Functioning of the EU (TFEU) can help to stimulate or perhaps even force, in case

[119] http://curia.europa.eu/juris/document/document.jsf?docid=193216&doclang=EN.

there is a legal obligation for the SIAs of EU Members States flowing form this provision, to provide assistance in case of accident and incident investigation. This question will be addressed under:

- the terms of Article 222 TFEU, as implemented in Council Decision 2014/415/EU of 24 June 2014 on the arrangements for the implementation by the Union of the solidarity clause;
- general principles of EU law;
- international law, including international air law;
- the provisions of Regulation (EU) No 996/2010;
- case law, if available;
- Comments made by authors.

This section concludes that the solidarity clause has a limited value for strengthening the duty of SIAs to cooperate in the context of accident investigation. The special provisions of Regulation (EU) No 996/2010, combined with the rather generally formulated rules of the solidarity clause as explained in Council Decision 2014/415/EU, appear to justify this conclusion.

2. Legal analysis

2.1 The terms of Article 222 TFEU

Article 222 TFEU deals with three situations, to wit:

a) Terrorist attacks;
b) Natural disasters such as storms, floods, earthquakes and volcanic eruptions;
c) Man-made disasters.

If at all, accidents in aviation are mostly qualified as 'man-made disasters', Council Decision 2014/415/EU which is discussed in the next section defines the term 'disaster.'

The formulation of this provision is rather vague which has created a number of practical questions, which have in part been resolved by the Council Decision 2014/415/EU as to which see, for instance, the definition of the term 'disaster' and the scope of the obligations of the EU and the Member States. For the present purposes, Article 222 does not lay down a 'best effort' obligation on the Member States to cooperate or to take measures when a disaster occurs. The 'softness' of this provision when it comes to deal with inter-Member States relations is articulated by the addition of Declaration No 37 which reads as follows:

"Without prejudice to the measures adopted by the Union to comply with its solidarity obligation towards a member State which is the object of a terrorist attack or the victim of a man-made disaster, *none of the provisions of Article 222 is intended to affect the right of another Member State to choose the most appropriate means to comply with its own solidarity obligations towards that Member State.*" (italics added)

Hence it would seem that EU States may choose to act, and when they act, it is up to them to choose how to act: by the provision of financial or human resources, or yet otherwise. However, some level or sort of solidarity must be shown; if not, Article 222 TFEU would not make sense.

However, the first 'stakeholder' in terms of solidarity appears to be the Union itself as it is supposed to express its solidarity in a more extensive way than the Union. That said, the EU and the Member States must 'act jointly in spirit of solidarity.'[120]

Another question pertains to enforcement. Can a Member State be obligated to provide assistance to another State, that is, can the EU Commission force a Member State to take measures for the other Member State? We believe that in practice, also based on the above analysis, this would not be an easy task. Article 222 TFEU does not specify obligations, which may serve as a defence for them.

[120] See, Peter Hilpold, Filling a Buzzword with Life: The implementation of the Solidarity Clause in Article 222 TFEU, 42(3) Legal issues of Economic Integration 209-232 (2015) at 218.

2.2 Implementation in Council Decision 2014/415/EU

Again, Council Decision 2014/415/EU appears to focus on action *by the Union*. It is based on the assumption that resources are available on the EU level to take action in the context of the principle of solidarity. Here too, the solidarity clause has been interpreted in a somewhat restricted fashion. This is evidenced by the 'Explanatory Memorandum' attached to the Joined Proposal of 2012, which states the following:

"Implementation arrangements for the Solidarity Clause do not replace any existing instruments or policies and the specific procedures for their activation. They provide an umbrella framework for situations of extraordinary threat or damage that overwhelm the response capacities of the affected Member State(s)."

A commentator concluded that Council Decision 2014/415/EU "tried to limit as far as possible the financial implications of the solidarity clause." Thus, next to the rather vaguely formulated obligations of Article 222 TFEU, Council Decision 2014/415/EU "takes a clear – and rather pronouncedly restrictive – stance." [121]

Importantly, Council Decision 2014/415/EU also defines the term 'disaster', which is a prerequisite for the application of the solidarity clause. A disaster is:

> "any situation which has or may have a severe impact on people, the environment or property, including cultural heritage." [122]

The Reference can also be made to Regulation (EU) No 2012/2002 introducing a Solidarity Fund for cases of principally natural disasters such as floods and earthquakes but it does not exclude man-made disasters as explained above. However, its focus lies on 'major' disasters which term is described as:

> "any disaster resulting, in at least one of the States concerned, in damage estimated either at EUR 3 billion in prices, or more than 0.6 % of its GNI."

Also, the major disaster must yield:

> "serious repercussions on living conditions, the natural environment or the economy in one or more regions or one of more countries occurs on the territory of that State."

It would seem doubtful that an aviation accident complies with these criteria.

For the present purposes, a most relevant provision concerns the entitlement of a Member State to "invoke the solidarity clause" if "it considers that the crisis clearly overwhelms the response capabilities valuable to it."[123] A crisis is "a disaster or terrorist attack of such a wide-ranging impact or political significance that it requires policy coordination and response at Union political level."[124] In case of aviation, this rather heave condition may be fulfilled if a European variant of '9/11' occurs, but not in a 'regular' aviation accident. Response arrangements at Union level are central in this Council Decision of 2014; they are drawn up in Article 5.

2.3 General principles of EU law

Solidarity is of course a basic concept for cooperation in the EU. To begin with, the Preamble of the Treaty of Rome of 1957 mentioned it as a binding factor in Europe. However, the term is nowhere defined, and must be interpreted pursuant to the context in which it is used.

According to Article 5(3) of the Treaty on the European Union (TEU), the promotion of solidarity is one of the principle objectives of the EU. This objective is elaborated in Article 21(1) of the TEU, which outlines the EU's development and enlargement.

[121] See, Peter Hilpold, Filling a Buzzword with Life: The implementation of the Solidarity Clause in Article 222 TFEU, 42(3) Legal issues of Economic Integration 209-232 (2015) at 223-224.
[122] See, Art. 3(a).
[123] See, Art. 4.
[124] See, Art. 3(c).

Solidarity must also be observed in relation to immigration policies, border control and the management of the financial crisis. In this respect, Advocate General Kokott explained in her opinion in a case before the Court of the EU that there are limits to this principle.[125]

Next and this point may be related to the foregoing point, the limits of the application of the general principle of solidarity must, in our view, be seen in light of the adagium *lex speciali derogate legi speciali*: the special law prevails over the general law. This holds also true for air transport, which is covered by the special rules of Article 100 of the TFEU, whereas the transport services generally are regulated by the Title VI on Transport rather than by the general title on the provision of services (Title IV, Chapter 3). Thus, the next section will briefly look at Regulation (EU) No 996/2010, which includes the special rules on cooperation between Member States in relation to accident investigation.

Those rules are known, and laid down in Article 6.[126] This provision is also formulated in rather noncommittal terms because a Member State may request assistance from the SIA of another Member State or Member States. A SIA may delegate the investigation task to the SIA of another Member State, but there is no obligation to do so.

The question is therefore whether these rules are reinforced by, the general provisions of the TFEU, in particular the solidarity clause, as to which see the conclusions below.

3. Conclusions

It would seem that the solidarity clause only marginally affects the provisions on cooperation between SIAs of different Member States. Article 222 TFEU concerns the duties of the EU rather than those of the Member States. It would seem that Member States do not even have to undertake their 'best efforts' to help each other when a disaster arises.

The next question is whether an aviation accident can be qualified as a disaster as meant in Article 222 TFEU. This could be the case in specified but not all instances.

Furthermore, Council Decision 2014/415/EU employs a relatively restrictive language when it comes to the duties of the Member States in respect of demonstrating solidarity. Thus, the solidarity clause as interpreted and elaborated in Council Decision 2014/415/EU has basically a complementary nature – supplementing the existing special provisions, such as those of Article 6 of Regulation (EU) No 996/2010.

This is not to say that the solidarity clause has no added value at all, that is, added to the commitments which EU States have undertaken in Article 6 of Regulation (EU) No 996/2010. Hence, it could be relied on because of its "inspirational value" as it makes clear that basic security challenges can only be overcome by showing solidarity. This conclusion is also

[125] Solidarity of the Member States:

142. "Further, a broad interpretation of Article 125 TFEU would be incompatible with the concept of solidarity, as laid down at various points in the Treaties. For example the parties to the EU Treaty are, in accordance with the preamble to that Treaty, pursuing the desire 'to deepen the solidarity between their peoples'. Under the third subparagraph of Article 3(3) TEU, the Union is to promote 'economic, social and territorial cohesion, and solidarity among Member States'. In the chapter on economic policy, Article 122(1) TFEU refers explicitly to solidarity between Member States;
143. Admittedly, it cannot be inferred from the concept of solidarity that there exists a duty to provide financial assistance of the kind that is to be provided by the ESM. None the less, a broad teleological interpretation of Article 125 TFEU would also indeed prohibit the Member States, in a case of emergency, for example, to prevent the serious economic and social effects associated with a State bankruptcy, from voluntarily providing mutual assistance. Emergency assistance to any third State would be permitted, while emergency assistance within the Union would be banned. Such a prohibition, it appears to me, would call into question the very purpose and objective of a Union."
144. Basic fundamental principles of the Treaties therefore militate against a broad interpretation of Article 125 TFEU.

[126] *Article 6 - Cooperation between safety investigation authorities:*

1. A safety investigation authority from one Member State may request the assistance of safety investigation authorities from other Member States. When, following a request, a safety investigation authority agrees to provide assistance, such assistance shall, as far as possible, be provided free of charge;
2. A safety investigation authority may delegate the task of conducting an investigation into an accident or serious incident to another safety investigation authority subject to mutual agreement and shall facilitate the investigation process by that other authority.

supported by the obligation of 'loyal cooperation' drawn up in Article 4.3 TEU, underpinning intra-EU solidarity.

Results from Field Research
Not applicable.

Results from Accident Cases
Not applicable.

Answer to the question
The solidarity clause only marginally affects the provisions on cooperation between SIAs of different Member States. Article 222 TFEU concerns the duties of the EU rather than those of the Member States. It would seem that Member States do not even have to undertake their 'best efforts' to provide mutual assistance when a disaster arises.

The next question is whether an aviation accident can be qualified as a disaster as meant in Article 222 TFEU. This could be the case in specified but not all instances.

Furthermore, Council Decision 2014/415/EU on the arrangements for implementation by the Union of the solidarity clause employs a relatively restrictive language when it comes to the duties of the Member States in respect of demonstrating solidarity. Thus, the solidarity clause as interpreted and elaborated in the Council Decision 2014/415/EU has basically a complementary nature – supplementing the existing special provisions, such as those of Article 6 of Regulation (EU) No 996/2010.

This is not to say that the solidarity clause has no added value at all, that is, added to the commitments which EU States have undertaken in Article 6 of Regulation (EU) No 996/2010. Hence, it could be relied on because of its "inspirational value" as it makes clear that the challenges can only be overcome by showing solidarity. This conclusion is also supported by the obligation of mutual assistance drawn up in Article 4(3) of the Treaty on the European Union, underpinning intra-EU solidarity.

A5.29 Evaluation question 6.5

Evaluation question 6.5:
To what extent is the intervention coherent with other EU instruments with regard to safety and security possible overlaps?

Answer to the question
Interviewees have been asked if they are aware of any EU instruments with regard to safety and security possible overlaps with which Regulation (EU) No 996/2010 is not coherent. No indications were received on any incoherencies with other EU instruments with regard to safety and security possible overlaps.

A5.30 Evaluation question 7

Evaluation question 7:
What does the Regulation add to the work on accident investigation being done by the Member States either individually and within the context of Member States' obligations under ICAO?

Regulation (EU) No 996/2010 added to the work on accident investigations being done by the Member States, either individually or within the context of the previously existing Regulatory framework (i.e. Directive 94/56/EC and ICAO Annex 13 obligations), in three main ways: (1) through the introduction of additional or new requirements in the regulation, (2) through the provision of additional clarification on requirements or roles in the existing Community legislation, and (3) by embedding ICAO SARPs in EU legislation. An assessment of these changes in comparison with the counterfactual scenario as outlined in Section 4.1 is summarised below for each of the five initial needs.

Results from Desk Research

Lack of uniform investigation capability

A key objective of the regulation was to strengthen the independence of the national SIAs in line with ICAO Annex 13. As discussed in Evaluation question 2.1.2, independence of the SIAs is achieved in the majority of Member States but the independence had already been established under the repealed Directive 94/56/EC. However, as indicated in the survey results the regulation has helped to strengthen the independence. A study by the commission[127] indicates that the regulation has contributed to change the perception of some organisations who consider the SIAs more independent than before the regulation.

In the counterfactual scenario, ESASI, ISASI and ECAC-ACC exist for information sharing, albeit on less frequent basis than ENCASIA, and with a wider scope (beyond EU). No such networks provided opportunities for training courses, peer review or other development programmes like in ENCASIA. Although the majority of SIAs have not experienced any change to their national investigation capacity since entry into force of the regulation[128], it is largely due to external factors, most notably the economic crisis that began in 2008. Thus, the added value of the regulation in terms of harmonising and enhancing investigation resources at national level was offset by the effects of the economic crisis.[129]

Tensions between safety investigations and other proceedings

The requirement to establish advance arrangements between the national SIAs and other investigatory bodies, most notably the judicial authorities, strongly contributed to clarifying the respective roles in the investigatory process, thus mitigating potential tensions arising between the various proceedings. In the counterfactual scenario, while a small number of Member States had established such arrangements, these were not required at the Community level or by ICAO Annex 13. The advance arrangements are therefore an important step to ensure the organisation of the coexistence of the safety investigations and the judicial investigations.

From a legal perspective, the added value of Article 12(3) is that it implements Recommendation 5.4.4 of Annex 13 of ICAO, which recommends that States should ensure cooperation between its accident investigation authority and judicial authorities so that an investigation is not impeded by administrative or judicial proceedings. In other words, the EU has enhanced the legal status of ICAO provisions by the implementation of Article 12(3) in the regulation.

Article 14 has helped to clarify obligations concerning the protection of sensitive safety information from disclosure or use for purposes other than safety investigations. However, in several Member States, the regulation has had "no or limited legal effect in restricting the powers of judges defined in the national codes of criminal procedure."[130] Related to this is the use of final reports as evidence in judicial proceedings, which is not covered by the regulation.

From a legal perspective, the protection offered is not absolute, but since the latest amendment 15 of Annex 13, the safeguards for safety information are strongly enhanced. States shall not make records available for purposes other than accident and incident investigation, unless "the competent authority designated by that State determines, in accordance with national laws and subject to Appendix 2 and 5.12.5, that their disclosure or use outweighs the likely adverse domestic and international impact such action may have on that or any future investigation." [131] The implementation of respective ICAO Standard in Regulation (EU) No 996/2010 and its impact on the national laws of the EU States has been discussed under Evaluation question 2.1.5. Courts are starting their own investigations in order to create transparency in the causes of the accident and to assist the victims in finding the appropriate remedies. For instance, in the Überlingen cases courts "went beyond the Accident Investigation Report's analysis of the technology."[132] It remains to be seen whether this is a tendency and, if so, which effects it will have. Therefore, the conclusion on this aspect is that the EU added value has not fully materialised as anticipated, as the protection is not uniformly applied across the States.

[127] SWD(2016) 151.
[128] Ibid, p. 3; NLR / Ecorys targeted survey results.
[129] Ibid, p. 3.
[130] SWD(2016) 151 final, Annex, p. 8.
[131] Standard 5.12 of Annex 13.
[132] *See*, Dr. Hanna Schebesta, *Risk Regulation through Liability Allocation: Transnational Product Liability and the Role of Certification*, 42(2) Air & Space Law (2017), section 3.

Unclear role of the Community (EASA) in safety investigations
The role of EASA is analysed in the answer to Question 8 below. In that section, it is concluded that there has been EU added value by clarifying the role of EASA.

Weakness in implementation of safety recommendations
The regulation gives a specific and formal role to SIAs in issuing safety recommendations (SRs), when necessary. Regarding follow-up of safety recommendations, the regulation enacted more stringent requirements than before while also ensuring that the requirements remain consistent with the recent edition of Annex 13 (10th edition, November 2010), which had introduced a 90-day timeframe for actions to be taken following the issuance of a safety recommendation. This provision contributes clarity as well as accountability to the safety recommendation procedure and monitoring processes that was already established in the counterfactual scenario by ICAO Annex 13. From a legal perspective, the regulation (EU) No 996/2010 enhances the legal status of the Annex 13 SARPs regarding implementation of safety standards.

The regulation also laid the basis for the SRIS database, which has added value for monitoring safety issues of EU relevance. The SRIS database does not exist in the counterfactual scenario, nor is there an instrument for identifying whether safety recommendations are relevant to the EU level or local level. There is also no EU-level overview of the deadlines for issuing safety reports or logging safety recommendation responses. The full potential of this tool has yet to be realised, due to access limitations and inconsistent implementation across Member States.

Insufficient assistance to the victims of air accidents
The EU added value of the assistance provided to victims of accidents, and their relatives, after such accidents stems from the fact that the ICAO regime does not deal with this. This issue was not addressed in the Community context prior to Regulation (EU) No 996/2010, though they were addressed at a general level through ICAO policy documents, guidance material and recommended practices outlined in the Chicago Convention. In this sense, the inclusion of specific provisions in the current regulation created new areas of potential benefit to be realised by relevant stakeholders compared to what would have been achieved in the counterfactual scenario.

Additional requirements
The regulation introduces the obligation to establish penalties for non-compliance with the regulation's provisions, an obligation that was absent in the repealed Directive 94/56/EC. Moreover, given that ICAO does not have enforcement tools at its disposal, the added value of such a provision for ensuring compliance with the regulation is clear from an accountability and enforcement standpoint. However, its application in practice depends on the extent to which such penalties are actively imposed and whether they are sufficient to influence non-compliant States' behaviour.

Results from Field Research
A large majority of respondents to the survey consider that the regulation is of added value, with 78% indicating that the regulation improves Member States' work in the area of accident investigation compared to what could have been achieved by Member States either individually or within the context of Member State obligations under ICAO. Just 8% of respondents do not view the regulation to add value to the work on accident investigations. This view is held by aviation community respondents representing air traffic controllers, manufacturing industry and ANSPs.

The prevalent view is that the regulation provides much needed guidance and clarification vis-à-vis cooperation and collaboration on safety investigations, a view espoused in particular by small Member States' SIAs, and the establishment of ENCASIA has been an essential contribution to these ends. One CAA replied that the main shortcoming preventing the full realization of benefits is that implementation is not sufficiently monitored and there are not standardization activities through EU Member States in this domain. On the issue of cooperation, although the advance arrangements are not yet uniformly implemented across Member States, in a number of States, the internal status of SIAs is said to have been strengthened as a result of the arrangements according to the respondents of the survey. For example, in Member States where the judicial authority is entitled to seize evidence in relation to an accident, the regulation ensures that rights are granted to SIAs, particularly regarding their immediate and unlimited access to and use of such evidence.

When asked to reflect on added value of individual provisions, the top three

provisions considered to add value (i.e. responses 'somewhat agree' and 'strongly agree' that the provision adds value) were:

- Article 17: Safety recommendations (71%);
- Article 7: ENCASIA (70%);
- Article 9: Obligation to notify accidents and serious incidents (69%).

The bottom three ranked provisions (i.e. responses 'somewhat agree' and 'strongly agree' that the provision adds value) were:

- Article 8: Participation by EASA and national CAAs in safety investigations (38%);
- Article 21: Assistance to victims of air accidents and their families (45%);
- Article 20: Information on persons and dangerous goods on board (52%).

By way of contrast, the most frequently cited provision by respondents as not having added value (i.e. responses 'somewhat disagree' and 'strongly disagree' that the provision adds value) is Article 5 on the obligation to investigate, which was cited by 19% of respondents as having added no value, followed by Article 11 on the status of air safety investigators (16% disagree).

Results from Accident Cases

The most important added value of the regulation that emerged from the examination of the cases pertains to the provisions on the coordination of investigations. In the Pilatus case, as discussed above, an advance arrangement was not set up at the time the accident occurred. The absence of this agreement created clear problems between the prosecutors and air safety investigators; while the investigation was on-going, an advance arrangement was developed and agreed, which was instrumental for solving the issues on roles and responsibilities that had plagued the investigation to that point. The final report was published without incident. Similarly, initial tensions between investigations in the Germanwings case were effectively addressed once the advance arrangement was fully applied and adhere to by the relevant authorities.

Additionally, the involvement of EASA proved beneficial in the cases to which it was associated, while the SRIS has enabled to the recording of recommendations of Union-wide relevance (SRUR).

Answer to the question

Regulation (EU) No 996/2010 has positively added to the work that was being done by Member States on accident investigations, either individually or within the context of their obligations under ICAO Annex 13 and/or the existing regulatory framework at EU level (i.e. Directive 94/56/EC). The European added value of Regulation (EU) No 996/2010 is generated in three main ways: (1) through the introduction of additional or new requirements in the regulation, (2) through the provision of additional clarification on requirements or roles in the existing Community legislation, and (3) by giving legal force to certain Standards and Recommended Practices of ICAO (SARPs). On the latter point, while States must implement the ICAO SARPs in their national laws in order to give them legal force, ICAO does not have enforcement powers. The EU regulation fulfils a very useful role in this respect, as certain SARPs are now embedded in the regulation, and have thus received legal force in the EU Member States as Regulation (EU) No 996/2010 is directly applicable in the Member States and can be enforced by the European Commission in case of non-compliance. In this respect, the EU regulation is designed to achieve harmonisation of the SARPS on the EU level.

The European added value results from a combination of factors, namely: enhanced legal certainty on the status of certain ICAO provisions as well as the role of the different actors in the event of an accident or serious incident, in particular the EU Commission, EASA and judicial authorities; gains from coordinated knowledge sharing and pooling of resources; and greater effectiveness of the safety investigation actors, procedures and outputs (i.e. safety recommendations). The positive effects of the various mechanisms are generally larger for Member States that did not have such well-established cooperation procedures, investigation processes and/or which did not have a sufficiently independent accident investigation bureau in place prior to Regulation (EU) No 996/2010.

The main benefits of European value, which would not have materialised under a counterfactual scenario, are summarised below for each of the five problem areas:

Investigation capabilities
ENCASIA reinforces the coordination role of SIAs in a European context by building on the previously existing cooperation between such authorities, and their available resources, through peer reviews, training activities and knowledge sharing. No such networks with a European focus existed in the counterfactual scenario. These activities, which are supported by the European Commission, will generate long term added value in the form of higher investigation capacities throughout the Union.

Tensions with other proceedings
The provision obligating States to establish advance arrangements implements Recommendation 5.4.4 of Annex 13 of ICAO, which recommends that States should ensure cooperation between its accident investigation authority and judicial authorities so that an investigation is not impeded by administrative or judicial proceedings. The EU has therefore enhanced the legal status of the respective ICAO provision with the implementation of Article 12(3) in the regulation. The same applies to the implementation of Standard 5.12 of ICAO Annex 13 in Regulation (EU) No 996/2010 concerning the protection of sensitive safety information. The safeguard is not absolute, however, and questions remain as to the scope and application of Article 14 in practice (see Evaluation question 2.1.5).

Unclear role of the Community in safety investigations
EASA certify and approve products and organisations and provide oversight for certain fields in aviation. Therefore, they foresaw a role for themselves within safety investigations. Article 8 of the regulation provides clarity as to the role of EASA as well as CAAs in safety investigations. The ICAO regime is addressed to States without legal articulation as to the contributions from international organisations such as the EU and its bodies. Therefore, the provision establishes and clarifies the role of the Community in safety investigations and it works in practise according to the consulted stakeholders.

Weak implementation of safety recommendations
The regulation enacts more stringent requirements on the follow-up of safety recommendations, while also ensuring that the requirements are consistent with the latest edition of ICAO Annex 13 at the time the regulation was adopted. The provision offers greater clarity and accountability regarding the safety recommendation process than existed previously. In addition to the added clarity, the added value of Article 18 stems from the fact that ICAO has no enforcement powers, therefore the provision(s) gives legal force to the ICAO norms.

The regulation also established the SRIS database (Article 18(5)), which is the instrument for identify safety recommendations with Union-wide relevance. Despite divergent level of implementation and access restrictions, the Union dimension of the instrument creates European added value compared to what is achieved in the counterfactual scenario.

Victims assistance
The assistance provided to victims of accidents and their relatives after such accidents is not dealt with under the ICAO regime and it was not previously addressed at the Community level. The inclusion of specific provisions in the current regulation created new areas of potential benefit to be realised by relevant stakeholders compared to what would have been achieved in the counterfactual scenario.

Another important added value of the regulation is more future-oriented: the functional separation of accident investigations is no longer in dispute or under discussion. That is, it is openly agreed that different government bodies have different investigation objectives and issues to investigate. In the long-term, the regulation makes clear the position and role of safety investigations vis-à-vis other proceedings, and thus making the very question a non-issue.

A5.31 Evaluation question 8

Evaluation question 8:
What is the relevance of this Regulation for the EU safety environment, in particular as regards to the role of EASA and the aviation industry?

Results from Desk Research

Overall, the most important change introduced by the regulation with direct relevance to non-SIA safety investigation stakeholders is the clarification provided on the role and involvement of EASA in accident investigations, given that its predecessor (Directive 94/56/EC) was conceived prior to EASA's existence and the ICAO system extends only to States. Regulation (EU) No 996/2010 bridges the "state-centric" focus of ICAO to meet the European reality within which EASA operates. Article 8 enables EASA to participate in investigations and to advise the IIC and/or accredited representatives. Article 8 further specifies the role and rights of national CAAs to participate to investigations, a provision that was absent in the repealed Directive 94/56/EC.

From a legal perspective, there is a clear added value to Article 8 due to the fact that the ICAO regime is addressed to States, without legal articulation of contributions from international organisations such as the EU and its bodies. The regulation therefore clarified the previously unarticulated role of the European Commission, and in particular, EASA. At the same time, the regulation has not led to any significant change in the role of other regulatory authorities, in particular national civil aviation authorities (CAAs), because it was generally established prior to the regulation.

As with CAAs, the role of aviation industry stakeholders has been largely unchanged since the regulation entered into force compared to ICAO or the repealed Directive 94/56/EC. The only provision that directly mentions industry stakeholders is the requirement that airlines and airports establish accident emergency plans – a requirement that was already established in certain Member States –, which are to be audited by the Member States. There is no evidence that the provision is of European added value in terms of any impact to the EU safety environment.

The one area, which has afforded greater clarity from the perspective of many CAAs, is the procedure for processing safety recommendations, which is specified in much greater detail (i.e. timeframe, requirement to respond, etc.) under Regulation (EU) No 996/2010 compared to its predecessor. While a number of Member States already had such procedures in place prior to the regulation, in line with ICAO Annex 13, the regulation brings clarity for the EU level and aligns EU legislation to ICAO Annex 13.

Results from Field Research

In terms of functioning, stakeholders interviewed across all groups agree that the regulation has added clarity to the role of EASA in accident investigations through Article 8, and few see any negative impacts to the EU safety environment. According to one SIA interviewee, the response by EASA to safety recommendations has improved in the years since the regulation came into force, and their internal processes are considered to be significantly improved. The actual level of EASA involvement, however, is said to remain relatively low, thus calling into question the effectiveness, and thus added value of the provision on this issue.

A majority of both CAAs and SIAs consulted agree that the regulation did not contribute to any practical change in cooperation between SIAs and CAAs, because these roles were already largely defined in Member States' national legislation.[133] For example, in Latvia, the CAA has concluded an inter-institutional agreement with the national accident investigation bureau (AIB), which addresses all questions and areas of concern related to the interactions between the two bodies. The basis of the agreement cover the exchange of information on occurrence and information sharing in the event that the CAA identifies risks from the occurrences or simple incidents that should be investigated by the AIB. This agreement is perceived to function effectively by the stakeholders interviewed.[134]

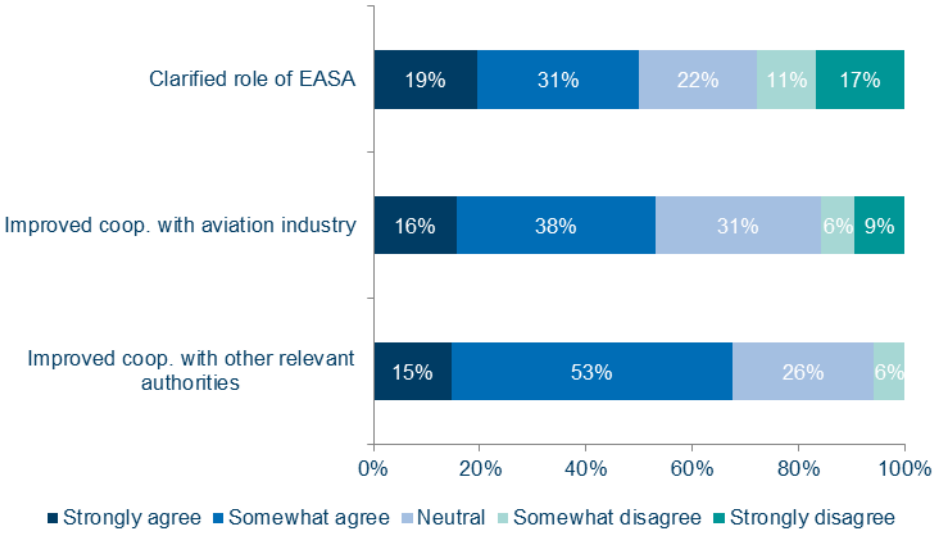
According to stakeholders interviewed, cooperation with industry stakeholders was already clear prior to Regulation (EU) No 996/2010.

Respondents to the targeted survey were requested to indicate their views on the EU added value of the regulation in relation to improved cooperation with, and clarification of roles among different stakeholders involved in the prevention and investigation of accidents and incidents in civil aviation. Figure A.39 shows the distribution of views vis-à-vis cooperation between SIAs and other authorities, aviation industry and EASA. Comments accompanying these responses are summarised below.

[133] Based on interview consultations with CAAs and SIAs and the NLR / Ecorys targeted survey results.
[134] Based on interview consultations with Latvian CAA.

Overall, respondents most agree that the regulation has had a positive impact on the cooperation with other relevant authorities – namely national civil aviation authorities – which is assessed positively by more than two-thirds of respondents (68%) and negatively by only 6%. By way of contrast, while exactly half of respondents agree that the regulation has clarified the role of EASA, slightly more than a quarter of respondents indicate that the regulation has not clarified the role of EASA (28%). This finding stands in contrast to those arising from the interview consultations, which generally identified the clarification of EASA's role in the investigations as a clear and important benefit of the regulation.

Figure A.39: EU Added Value vis-à-vis cooperation among different stakeholders (N=42)



The following observations and comments were made in responses to the survey:

- The regulation does provide for the improvement of cooperation insofar as other entities are aware of the regulation and/or are aware of cooperative efforts;
- The regulation provides structure and clarifies the relationship between the SIA, EASA and NAAs. For small SIAs, for instance, the regulation provides for cooperation without requiring the establishment of individual MoU / MoU;
- The regulation helps to form a common understanding between relevant actors, and generally provides a better understanding of the investigative process and the obligations of States to investigate;
- The regulation has provided SIAs the opportunity to liaise with other authorities involved in the prevention and investigation of accidents and incidents in civil aviation, and discus if something should be changed when following both the regulation and ICAO Annex 13.

Some industry respondents also indicated that cooperation was fine before and at no point has the regulation been quoted or used to improve it. According to ATCO representatives, the availability of email is far more impactful to cooperation than any regulation. It was suggested that maintaining a database of safety contacts, or even requiring all relevant actors to have a central e-mail address (e.g. safety@...), would be far more effective than implementing a new regulation.

Other positive impacts to the safety environment are identified as follows:

- Increased efficiency in investigatory processes due to clearer understandings of obligations and roles;
- More rapid and competent identification of safety issues and hazards;
- Protection of information has improved;
- The cooperation with the aviation industry and other aviation authorities has improved in positive way.

Results from Accident Cases

The regulation articulates a clear role for EASA in the investigation of accidents and serious

incidents, which is evidenced by the fact that EASA has not faced any difficulties or challenges to its participation in the accident case studies. For example, the BEA associated EASA as a technical advisor to the investigation of the Germanwings accident, and the role of EASA was reportedly clear throughout the investigation process. The Pilatus PC-6 investigation team was also supported by EASA, with no reported difficulties. EASA did not support the Polish SCAAI investigation team in the investigation of the Boeing 767 accident at Warsaw airport, though this was not reported to be an issue.

The regulation's provisions concerning the involvement of aviation industry stakeholders as advisors to the accredited representatives enabled a strong, positive collaboration throughout the investigation of the Germanwings accident case.

Answer to the question

The regulation appropriately clarified the role of EASA in accident investigations, enabling EASA to participate in the safety investigations and to advise the investigator-in-charge and/or the accredited representatives. This is widely considered a positive development compared to the previous situation. Aviation community representatives (manufacturing, airlines) have suggested that EASA's involvement could be further strengthened to make the investigation process, including the resulting safety recommendations, more efficient and effective (respectively).

Regarding CAAs, a majority of States consider that the regulation did not lead to any change in the role of CAAs, which was already well defined in the national regulatory frameworks. Consequently, the regulation generally had no impact on the nature of cooperation between CAAs and SIAs. The same finding applies to aviation community representatives, whose role was already considered to be clearly defined in national legislations.

Stakeholder feedback, combined with evidence from the case studies, shows that the involvement of the State of Design and Manufacture (as required by Article 10), along with their technical advisor(s), throughout the entire investigation process has a strong positive impact on the quality of the investigation and its outcomes. Specifically, the expertise of these actors leads to more complete descriptions and understanding of aircraft system behaviour, and consequently, contribute to more accurate and effective recommendations. It can be concluded that the involvement of EASA, as well as industry representatives acting as technical advisors (albeit, the latter already well-established in many States prior to the regulation) positively impacts the EU safety environment.

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