

## **EASA involvement in safety investigations**

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### **Introduction**

In its multiple role of a Regulator as well as Certification and Standardization Authority, the Agency has always recognized the strategic safety value of accident investigations. For this reason, following the entry into force of the Regulation (EU) No 996/2010 of the European Parliament and of the Council “*On the investigation and prevention of accidents and incidents in civil aviation*”, EASA has been continuously increasing its level of engagement in accident investigations in order to actively contribute to them and, at the same time, to have the opportunity to learn lessons from the field to be reverted into timely taken safety actions.

The paper mentions the internal protocols used by the Agency to comply with the access to the information and the confidentiality requirements in the course of an investigation, as well as the resources specifically dedicated to support the safety investigation matters.

Moreover, the paper presents the range of activities that have been recently undertaken by the Agency to strengthen the links with the Safety Investigation Authorities worldwide and to further increase the internal capabilities to provide effective support to their independent investigations.

### **Lecturer short introduction**

EASA Safety Investigation officer since August 2014 and Head of the Safety Investigation and Reporting Section since February 2017.

Former Air Safety Investigator at ANSV (Italian Safety Investigation Authority) where he has been working for 7 years. In that timeframe he was also in charge of the Proactive Prevention Office.

Before joining the ANSV, Mario Colavita has been an Officer of the Italian Air Force since 1993. His military career was entirely performed at the Flight Test Centre that he left with the rank of Lt. Col. and the position of Head of the Structural Materials Department.

From 1990 to 1993 he was a Junior Scientist at the Centro Sviluppo Materiali in Rome, the R&D centre of the main Italian steelmaker company.

After graduating in Chemistry at the University “La Sapienza” of Rome in 1988, he got an MSc in Corrosion Science at the University of Ferrara (Italy) and an MSc in Advanced materials at Cranfield University (UK), as well as the completion of the Aviation Safety Certificate at the University of Southern California (US).



## EASA involvement in safety investigations

### 1 Background

At the European Union (EU) level, the principles governing the investigation of accidents and serious incidents are defined in 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.

Regulation (EU) No 996/2010 implements international standards and recommended practices as described in Annex 13 to the Chicago Convention on International Civil Aviation. It sets down an obligation for each Member State of the EU to establish an independent permanent national civil aviation safety investigation authority, which shall investigate accidents and serious incidents in order to improve aviation safety and to prevent future occurrences without apportioning blame or liability. Investigation reports and the related safety recommendations shall be communicated to the concerned aviation authorities for consideration and for appropriate action, as needed.

In particular, Regulation (EU) No 996/2010 takes into account that EASA carries out on behalf of the Member States (MS) the functions and tasks of the State of Design, Manufacture and Registry when related to design approval, as specified in the Chicago Convention and its Annexes. Therefore, it establishes the right of the Agency to participate in a safety investigation in order to contribute, within the scope of its competence, to its efficiency and to ensure the safety of aircraft design, without affecting the independent status of the investigation.

Article 8 of the abovementioned Regulation is specifically dedicated to the participation of EASA (and national civil aviation authorities of the Member States) in safety investigations. In accordance with that, Safety Investigation Authorities (SIAs) shall invite EASA to appoint a representative to participate:

- (a) as an adviser to the investigator-in-charge in any safety investigation under Article 5(1) and (2), conducted in the territory of a Member State or in the location referred to in Article 5(2) under the control and at the discretion of the investigator-in-charge;
- (b) as an adviser appointed under this Regulation to assist accredited representative(s) of the Member States in any safety investigation conducted in a third country to which a safety investigation authority is invited to designate an accredited representative in accordance with international standards and recommended practices for aircraft accident and incident investigation, under the supervision of the accredited representative.

The same Article details the activities in which the Agency is entitled to participate. Among them:

- receive copies of all pertinent documents and obtain relevant factual information;
- participate in the read-outs of recorded media, except cockpit voice or image recorders;
- participate in off-scene investigative activities such as component examinations, tests and simulations, technical briefings and investigation progress meetings.



Furthermore, the Article 9 establishes an obligation to the SIAs of the MS to notify EASA, without delay “of all accidents and serious incidents of which it has been notified.”

## 2 EASA level of engagement on safety investigation

The multiple roles of the Agency in Regulation, Certification and Standardization show the strategic nature of the engagement in safety investigation in order to be timely reactive in case of identification of a safety issue to be addressed, but also to be able to support the investigation by providing information and advice as necessary.

In order to cope with the expected high volume of investigations carried out in 28 MS, the Agency identified since 2009 the need to create an internal Team devoted to safety investigations (SI) and the management of the related safety recommendations (SRs). This Team currently belongs to the “Safety Investigation and Reporting Section”, in conjunction with the Internal Occurrence Reporting Section (IORS) Team that represents the single entry point for all safety related occurrences that are reported to the Agency.

The Section is part of the “Safety Intelligence & Performance Department” that belongs to the “Strategy & Safety Management Directorate”, responsible for developing the Agency Strategy, key Programmes and Plans as well as for International Cooperation, Technical Training, Research and Safety Promotion activities.

The SI Team of the Agency, currently composed of 7 members, acts as a bridge between EASA and the SIAs of the MS that provides an intense exchange of information and data in both ways. The Team consist of a group of experts covering a wide range of nationalities and background. The cross-domain nature of the safety investigations makes the SI Team a core unit of the Agency, highly interconnected with all other departments and in direct contact with the senior management.

Due to the confidential and sensitive nature of the data treated, the Article 15 of the Regulation (EU) 996/2010 also establishes an obligation for the Agency to protect the information received, in accordance with the provisions established for the SIAs. In order to comply with this requirement, the Agency has put in place very strong internal protocols, so that all information always goes through the Safety Investigation Team. The access to the information is always strictly limited to the experts that have to use it and who are informed about the prohibition to further disseminate it.

When the notification of a new opened investigation is received at the functional mailbox [investigation@easa.europa.eu](mailto:investigation@easa.europa.eu), the SI Team provides an acknowledgment of a receipt on behalf of the Agency. With the same response email, the Agency nominates a Technical Adviser (TA) as a point of contact who will be available to assist the IIC (or the AccRep, depending on the circumstances) in the course of the investigation.

The EASA’s TA will always be a member of the SI Team. The standard process requires that the TA will be the Officer of the Team who is “on duty” on a weekly base and in charge of the correspondence received on the functional mailbox. However, on those cases where a specific level of expertise is more easily predictable, or



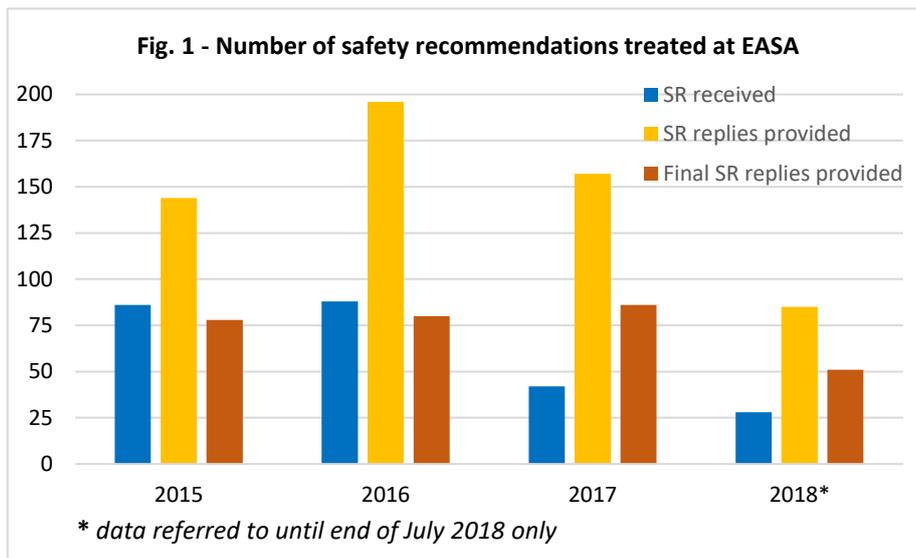
where it is possible to understand a link with previous similar cases already treated in the past, this procedure can be side-stepped and the name of a more focused member with the most appropriate background and expertise is provided.

The actual volume of data managed by the Agency is represented in table 1, summarizing the most recent figures in terms of notifications of new investigations opened, interim, draft and final reports received.

**Table 1 - Amount of investigation information processed at EASA**

	Year 2017	Year 2018 (until end of July)
Notifications	825	578
Interim Reports	33	22
Draft Reports	170	92
Final Reports	579	302

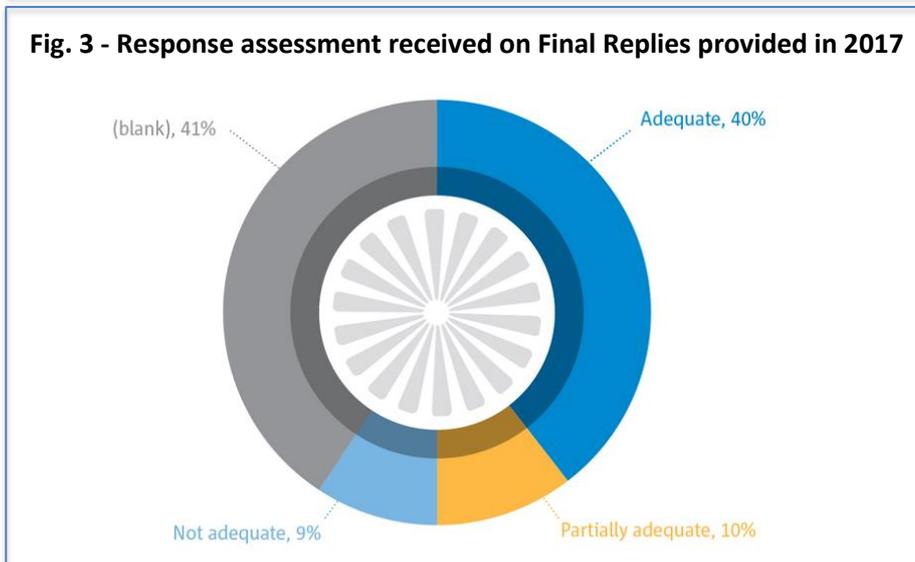
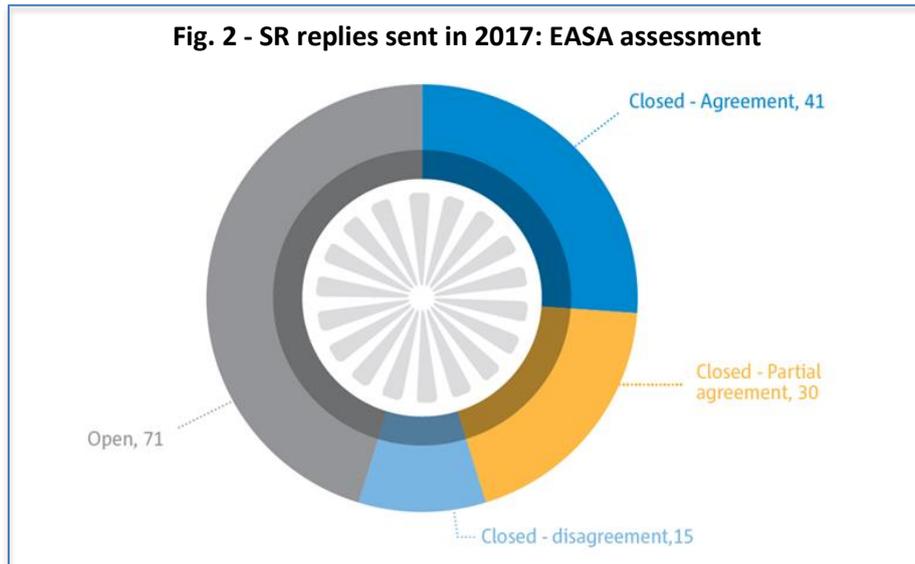
The significant effort behind treating of this massive amount of data is complemented by the additional processing of the SR addressed to EASA, which remains the main single EU addressee of SRs. The volume of data related to SR is summarised in Figure 1:



In accordance with Regulation 996/2010, Article 18 “*Follow-up to safety recommendations and safety recommendations database*”, this aspect is further duly accomplished according to an additional internal process for the assessment of the safety recommendations and the related replies provided.

The data reported in the Annual Safety Recommendation Review 2017<sup>1</sup> make clear reference to this aspect and reflect the high degree of acceptance of the safety recommendations received by the Agency:

- more than 82% of SRs received were “Agreed” or “Partially Agreed” in 2017<sup>2</sup> (Figure 2);
- 85% of the assessments received to the closing replies provided in 2017 by the Agency were “Adequate” (68%) or “Partially Adequate” (18%).



<sup>1</sup> Document published in June 2018 and available on EASA website at <https://www.easa.europa.eu/document-library/general-publications/annual-safety-recommendations-review-2017>

<sup>2</sup> In accordance with internal Agency’s procedures, the SR is only assessed by EASA at provision of the closing reply, it means when no further action is expected by the Agency on the safety issue prompted by the SR.

The excellent level of maturity reached in the internal processes established in this area have been certified during the last ICAO Audit (Nov. 2017), when the applicable Protocol Questions (PQs) in the area of Accident Investigation (AIG) have been assessed at 100% of Effective Implementation (EI).

Previously, the Agency had already supported, specifically on AIG, the Asia Pacific (APAC) Combined Action Team (CAT) programme undertaken by the ICAO Regional Office of Bangkok and aimed at conducting an assessment and gap analysis of Universal Safety Oversight Audit Program (USOAP) PQs in areas of low EI and to assist the States in attaining the most readily achievable improvement. So, between 2016 and 2017, members of the SI Team of the Agency acted as AIG experts during the CAT Programme ICAO missions to assist the SIAs of Bangladesh, Cambodia, Indonesia and Philippines.

In line with this, members of the SI Team have also been recently engaged in the European Common Aviation Area (ECAA) agreement to assess the current status of the expected transposal and implementation on the EU Regulations on AIG into the Serbian National Legislation. Similar commitment is expected to be expanded to the other Western Balkan States involved in the agreement.

### 3 Not only desk work

Since its establishment, the Agency has been steadily increasing its direct participation in safety investigation, always fully respecting the independency of the SIAs. The data below (Table 2) shows the number of requests of assistance/support received by the Agency in the recent past, requiring the identification and involvement of the most competent experts.

**Table 2 – Requests of assistance/support received from SIAs in the course of an investigation**

	Year 2017	Year 2018 (until end of July)
No. of requests	82	53

In a selected number of investigations, however, there is a need for a more in-depth participation. This is the case where on-site attendance to detailed analysis or joint debriefing meetings are organized during the course of the investigation on aspects that seem to have a substantial relevance for the Agency, either in the Airworthiness or in the Operation of an aircraft.

As an example, the following list shows the investigations on events occurred in 2017 that have required the direct participation of the members of the SI Team:

- ACC L410, RA-67047 – in-flight activation of beta reverse mode occurred in Russia on 15.11.2017
- ACC AS332L, JA9672 – in flight separation of tail rotor gearbox (TGB) and tail rotor hub (TRH) occurred on 07.11.2017 in Japan
- ACC A380, F-HPJE – engine 4 fan and inlet separation occurred on 30.9.2017 when overflying Greenland
- SI A340-300, F-GLZU – slow rotation at take-off occurred on 11.03.2017 in Bogota'

- CL-604, D-AMSC – wake turbulence encounter occurred on 07.01.2017 when overflying the Arabian Sea

#### **4 Involvement in investigations promoting safety actions: when and how it happens.**

The current trend, from many SIAs in the world, is to promote safety actions during the course of the investigation to be acknowledged in the final report instead of issuing a safety recommendation in the end.

From the Agency's perspective this is in principle seen as a very welcome step forward. However, it should be recognised that the implications of this approach are very different when considering different addressees (e.g. an Operator or a Regulator).

At EASA, these differences are also considered depending on the different areas of competences that are involved in the safety issue identified by the investigation. As a matter of fact, in many cases the information shared by the SIAs while investigating has identified an unsafe condition that would warrant an Airworthiness Directives (AD) action under EU 748/2012, Part 21.A.3B. This has been then timely transposed into mandatory actions implemented by the Agency in order to ensure, as a temporary or conclusive measures, the Continuing Airworthiness of the Fleet.

This was also the case of some of the investigations listed above (Let 410, AS332L, and A380).

Furthermore, there are a number of circumstances where the Agency is also intervening with a Safety Information Bulletin (SIB), a different tool that is found particularly advantageous to tackle operational concerns. An example of this is the issuance of the SIB drawing attention to the risk of rotating too slowly during departure from runways where performance-limiting factors are present.

In other circumstances, SIBs have also been introduced during the course of investigation as additional operational barriers to reinforce the safety nets when the safety concern is not considered to be an unsafe condition that would warrant an AD action under EU 748/2012, Part 21.A.3B.

This was the case for example of the SIB on severe propeller/engine vibration events investigated by Sweden and France on ATR aircraft during descent when operating close to maximum operating speed (VMO) with power in Flight Idle. The Agency published the SIB 2015-03 (superseded on 19 Jan 2016 by SIB 2015-03R1) to improve crew awareness about this type of vibration event and to allow a better and prompt identification of the issue and the application of conservative measures.

In general terms there is a shift currently ongoing at EASA to address more safety issues through safety promotion activities like collaborative groups or a SIB, rather than a Rulemaking process. When Rulemaking is considered necessary, it implies a different magnitude of time to reach a conclusion that is barely compatible with the completion of a safety action in the timeframe of an investigation.

Similar consideration applies to research activities that may also be prompted by the safety investigation. This is a tool on which the Agency is currently planning to invest more, but from the planning of a research up to its conclusion and possible implementation of the results, the time scale also becomes often impractical to be presented as safety actions already implemented at the release of the final report.



## 5 EASA level of integration with SIAs

EASA has been organizing and hosting since 2005 an annual coordination meeting with the SIA of the MS. The event has now reached a high level of maturity, and since 2016 it has been extended the current format of 1.5 days. The meeting is intended to cover the status of the key enablers for the future development of safety investigation in Europe and offer a great opportunity to encourage an effective sharing of information among the participants of a significant number of relevant topics that have been studied or investigated in the course of the previous year. The meeting is also intended to promote way forwards in the data exchange and analysis processes between the SIAs and the Agency, aimed at identifying and assessing systemic risks.

Since 2018, the Agency has intended to further strengthen the links with the SIAs in Europe and worldwide, promoting a series of bilateral meetings where, face-to-face and through tailored agendas, there is the opportunity to discuss about topics of common interest.

This project has been started with UK AAIB and the Dutch DSB. More meetings are planned in the second part of the year with the French BEA, the Greek HAAIB, the Portuguese GPIAA, and the Spanish CIAIAC. This project will continue in the following years and preliminary contacts have already been taken with the Finnish SIA and the Italian ANSV.

Outside of the EU borders, an Exchange Program has been agreed with the NTSB that will lead soon to have member of the SI Team of EASA staying at NTSB for 4 weeks to cooperate on investigation matters.

The Agency has also been granted access, as an observer, to the meetings of the European Network of the Civil Aviation Safety Investigation Authorities (ENCASIA), whose activities are aimed at further improving the quality of investigations conducted by the SIAs and strengthening their independence. The ENCASIA context is in effect a great opportunity for EASA to strengthen the cooperation with the SIAs of the MS, since it gives the opportunity to actively contribute to some of the Working Groups (WG) that are generated by this Network. In particular, the work done by the WG6, a voluntary partnership between some SIAs, JRC and DG MOVE, established to address the subject on Safety Recommendations (SR) with a view to work towards consistency and common procedures among the MS, and with the objective:

- to provide assistance to ENCASIA in order to achieve an effective management of SRIS, to ensure compliance with the current EU Regulation framework;
- to provide guidance on best practice for the development and processing of safety recommendations, and
- to provide the views and opinions of ENCASIA on developments in occurrence reporting which directly relate to accident and serious incident investigation under EU 996/2010.



Recently, the Agency has also been invited, by some of the States hosting the activity, to take part to the exercises that have been organized in the frame of the ENCASIA Mutual Support System (EMSS) Project. This activity is intended to help EU States that are less capable and/or experienced in conducting a major, or complex, civil aircraft safety investigation, identifying their capability gaps in order to develop contingency plans and establish prior arrangements with other States. The final objective is to enhance the competence and confidence of the SIA in leading a major safety investigation and maintain public confidence in aviation. In June 2018, the Agency has participated to the EMSS exercises organized in Iceland and Slovenia, respectively through a desk and a direct attendance. The outcome of the exercise was considered very positively by the Agency that was actively involved injecting a number of emails and phone calls to ask for preliminary information about the event, stimulate the prompt release of an official notification and offering cooperation. The opportunity to see on site how a SIA with limited resource would react to a major occurrence is undoubtedly very advantageous in terms of preparation for a future unfortunate similar scenario. It is also important to fully appreciate the relevance of the effort currently put by ENCASIA in promoting a structured support provided by more experienced investigation Authorities.

## 6 The safety investigation in the frame of EASA's Safety Risk Management process

As previously presented in the ISASI Seminar 2016, the introduction of EASA's Safety Risk Management (SRM) process is based on the establishment of the *Safety Risk Portfolios* (SRPs) that provide, for the different operational domains, the data-driven input to the decision-making process that supports the European Plan for Aviation Safety (EPAS)<sup>3</sup>.

The systemic list of "Safety Issues" collected in the SRPs specifically identified per each aviation domain are the areas of concern covering one or more identified safety deficiencies that may lead to an accident.

The involvement of the Agency in safety investigations is a powerful enabler to timely update the information available in the occurrence data that is one of the main pillars of the SRM, whose objectives are to allow:

- an adequate internal and external coordination on the identification and assessment of safety issues, as well as the programming of the safety actions, and
- the prioritization of safety actions which are most efficient in reducing risk levels.

## 7 Conclusions

The level of the involvement of EASA in safety investigations has been growing during the years in full respect of the international standards and the complete independence of the Safety Investigation Authorities.

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<sup>3</sup> The European Plan for Aviation Safety is the document that identifies, on a five-year period, the safety priorities addressed by specific actions in the Agency's rulemaking or safety promotion programmes, specific actions in the State Safety Programmes (SSPs) or through focused oversight activities performed either by the Agency or the MS.

Regulation (EU) 996/2010 has a key role in clearly identifying the role and the responsibilities of the Agency in the frame of the investigation. Since its introduction, however, significant improvements have been achieved, mostly driven by the mutual trust that was built between the Agency and the SIAs of the MS.

The strategic importance of a fair and timely sharing of information between EASA and the SIAs fully justifies the investment in the resources that the Agency is currently devoting in this matter. The plans and the actions currently in place are aimed at further strengthening the cooperation with the SIAs and enhancing the ability of the Agency to provide the assistance requested for successful investigations.

