

Cooperation to Improve Safety: a Tool to Increase Safety Levels

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Abstract

This article shows how the collaborative network can be a tool to increase transportation safety levels in States, regions and globally, considering that transportation, in any of its modes, is transnational.

Introduction

In this text, we will focus on success aviation stories, specifically in the area of aviation accident investigation. It is essential to emphasize that accident investigation plays a crucial role in the contribution to transportation safety management.

The experiences and results obtained globally through various cooperation mechanisms in the area of aviation safety (accident investigation) indicate that cooperation in addressing and solving different issues in the region can be transferred to other modes of transportation, taking into account the individual characteristics of each.

International Context of Aviation Accident Investigation

The various modes of transportation in the States are based on international legal regulations and bilateral and multilateral agreements. In aviation, it is the International Civil Aviation Organization (ICAO) that, through the Chicago Convention and various documents, has succeeded in internationally harmonizing the rights and obligations of States regarding civil aviation, making this mode of transportation the safest in the world.

The ICAO Council, at the 20th meeting of 12th session, held on April 13, 1951, adopted the following additional resolution:

Considering that Article 26 of the Convention stipulates that any State in which an accident occurs to an aircraft, under the circumstances indicated in the article itself, shall conduct an investigation into the circumstances of the accident, in accordance, so far as its laws permit, with the procedure recommended by the International Civil Aviation Organization; and

Considering that the ICAO Council, at the 18th meeting of 12th session held on April 11, 1951, adopted Annex 13 on aircraft accident investigations;

Therefore, the ICAO Council recommends the Standards and Recommended Practices for aircraft accident investigations included in Annex 13 to the Convention, as procedures to be followed by the Contracting States when conducting accident investigations involving death or serious injury, instituted in accordance with the provisions of Article 26.

This international regulation has a direct impact on the States that have adhered to the 1944 Chicago Convention, as they must comply with the standards established in Annex 13, Annex 19, and related documents such as Doc. 9756, Doc. 9962, etc.

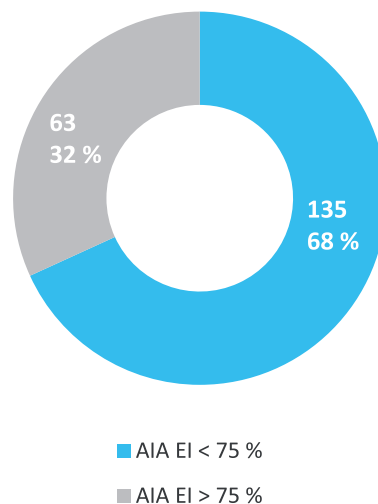
ICAO monitors the level of Effective Implementation (EI) of standards in all areas of aviation through the Universal Safety Oversight Audit Programme (USOAP). This program is based on a set of protocol questions tailored for this purpose and for each area that comprises aviation.

Status of Effective Implementation in Accident Investigation at the International Level

Analyzing the results of USOAP activities in accident investigation worldwide, it can be observed that 68% of States, representing 135 countries, have an Effective Implementation (EI) below 75%, while only 63 States, or 38%, have achieved an Effective Implementation above 75%.

This level of Effective Implementation corresponds to a target set by the ICAO Global Aviation Safety Plan for the year 2022.

Figure 1. Effective implementation. Accident Investigation area



Information obtained from the ICAO OLF (Online Framework).

Note: Eleven accident investigation authorities have not been considered in this analysis since they have not received USOAP activity in this area.

The result only confirms that, within the global aviation system, the area of accident investigation has the lowest percentage of Effective Implementation worldwide, with 54.53%. This situation is a matter of concern for ICAO and has led it to undertake various initiatives to address it.

Identification of the Problem

In USOAP audits, it has been highlighted that many States lack the necessary resources to investigate the full range of aviation accidents and incidents, as well as to conduct a thorough analysis of the data collected on accidents and incidents. For these States, the establishment of an investigation cooperation mechanism would provide qualified investigators, technical resources, training, and education, which could represent the only solution to achieve the implementation of an effective investigation and prevention system.

The information presented indicates that many States lack the necessary capabilities to investigate accidents or non-serious incidents, in accordance with Annex 13 to the ICAO Convention on International Civil Aviation. This discrepancy could result in the investigation process not covering all aspects or guaranteeing its impartiality and independence. This situation negatively impacts the quantitative and qualitative contribution of investigation bodies to the management of safety within the State's aviation system and, by extension, affects the safety of the region due to the transnational nature of this mode of transportation.

The establishment of an Investigation Cooperation Mechanism (ICM) could represent a reasonable option, enabling them to establish an effective system for investigating accidents and incidents in order to fulfill their obligations based on cooperation.



According to the regulatory framework established by ICAO through Annex 13 and related documents such as Doc. 9962, Doc. 9756, etc., States have the obligation as the State of Occurrence to conduct an investigation into an accident or incident. However, many States have not yet developed the necessary capabilities to conduct effective accident and incident investigations, as they lack both financial and technical resources. The varying realities of States with unique characteristics in their aviation systems, along with disparities in resources and levels of Effective Implementation in the area of accident investigation within the same region, present a challenge for the States involved.

As mentioned above, investigation agencies play an important role in contributing to the improvement of aviation safety. Therefore, ICAO encourages States that have robust investigation agencies equipped with technical and logistical resources, equipment, training centers, and a team of experienced investigators in various investigation specialties to strengthen cooperation among States through Investigation Cooperation Mechanisms.

***“USOAP audits have highlighted that many States do not have the resources to investigate the full range of aviation accidents and incidents.*”**



In support of this effort, ICAO developed Doc. 9946 titled “Manual on Regional Accident and Incident Investigation Organizations,” which provides guidance on the establishment and management of a regional accident and incident investigation organization and Investigation Cooperation Mechanisms (ICM) that enable economies of scale by allowing necessary resources to be shared. Furthermore, by working together, the Contracting States of a region or subregion can exert their influence more effectively in the global context and contribute to creating more favorable conditions aimed at achieving an operationally safe international air transportation system.

Cooperation as a Mechanism for Safety Improvement

Based on ICAO's active policy of promoting cooperation among States within a region and between regions, it is necessary for States with investigations organizations that have achieved capabilities in investigation, experience, and resources to make themselves available to other States that, for various reasons, have not established an investigation organization capable of conducting investigations in accordance with the

standards recommended by ICAO. This has become the driving force for the creation of various cooperation mechanisms.

States with the capacity to cooperate with other States understand that improving safety in the latter will inevitably lead to enhancements in the aviation safety in the region.

Currently, at the global level, there are four established cooperation mechanisms:

- European Network of Safety Investigation Authorities (ENCASIA): composed of all investigation authorities within the European community..
- Banjul Agreement Group Accident Investigation Agency (BAGAIA): composed of seven investigation authorities from West Africa.
- Regional Aviation Accident Investigation Management (GRIAA): includes the six accident investigation authorities from the Central American region.
- AIG Regional Cooperation Mechanism (ARCM): composed of the thirteen investigation authorities from the South American region.

Objectives of an Investigation Cooperation Mechanism (ICM)

The main objective of establishing an investigation cooperation mechanism is to enable States to fulfill their international obligations in the most effective and efficient manner.

The establishment of these mechanisms would allow for:

- a. Achieving economies of scale.
- b. Sharing investigators, knowledge, and technology.
- c. Making administrative savings without sacrificing effectiveness.

To achieve economies of scale, numerous factors must be considered. The implementation of a regional technical assistance system for member States, among others, is important in order to:

- a. Share objectives, strategies, and activities to address deficiencies in the performance of accident and incident investigation functions at both national and regional levels.

- b. Call upon, jointly utilize, and maintain highly qualified investigators for multinational and multifunctional investigation teams that assist member States in fulfilling their obligations in terms of accident and incident investigation.

- c. Develop and implement common regulations, policies, procedures, and guidance texts to be applied at regional level, benefiting all accident and incident investigation activities in the region and contributing to global harmonization.

Experience of Cooperation in the South American Region

Following ICAO's initiative to promote the creation of Regional Accident and Incident Investigation Organizations (RAIO) or Investigation Cooperation Mechanisms (ICM), in 2016, the thirteen States of the South American region agreed to establish the AIG Regional Cooperation Mechanism (ARCM).

Objectives of the AIG Regional Cooperation Mechanism (ARCM)

The main objective of this mechanism is to facilitate multinational technical cooperation in the field of aviation accident and incident investigation, which will include technical assistance with investigators in the investigation of serious aviation events, training for investigation personnel, and testing of materials and primarily equipment. This assistance will be made effective whenever an AIG authority of a member State requests it and another investigation authority from a different member State wishes to cooperate.

The ARCM, through management and coordination, provides the resources made available by the States to the requesting State. The resources offered through the mechanism include:

- a. Investigators or other AIG specialists, for example, specialists in the Accident/Incident Data Reporting (ADREP) system or the European Coordination Centre for Accident and Incident Reporting Systems (ECCAIRS).
- b. Technical facilities.
- c. Equipment related to the investigation of serious accidents and incidents.
- d. Training, including opportunities for practical on-the-job training (OJT), whether as an observer or by participating in an investigation, and the availability of instructors and/or training materials.

- e. Readings of flight data recorders and cockpit voice recorders, excluding the analysis of recovered data and sounds, for the purposes of investigating accidents and serious incidents, unless the requesting State specifically requires it.
- f. Testing of materials and fluids.
- g. Preparation of documents and other publications, such as reports of completed work, bulletins, manuals, provisional statements, and other public documents.
- h. The provision of the material means and specialized human resources for the implementation, strengthening, and adaptation of the database of each Accident Investigation Authority (AIA), ensuring compatibility with the Safety Data Collection and Processing System (SDCPS) of the SAM region (South America Office), to facilitate, through the risk management process, the effective analysis of information collected on incidents, serious incidents, accidents, and latent conditions that allow for risk mitigation and the establishment of performance indicators, objectives, and corresponding alerts in the SAM region.
- i. To promote the participation of AIG specialists of the ARCM member States in working groups, ad hoc groups, in order to cooperate with the ICAO regional office and in regional groups to achieve the established goals.
- j. To promote the input and update of the ARCM Safety Data Collection and Processing System (SDCPS) through the individual repositories of each AIA, and the exploitation of SDCPS data at the State and regional level to contribute to safety studies.

Specific Results of Cooperation in the South American Region through the ARCM

Based on the ARCM, an assessment of the strengths and weaknesses of each member State, and depending on the results, a roadmap was established with specific actions to address the various deficiencies.

As a result of the coordinated actions managed by the ARCM under the cooperation of the member States, the following achievements were reached:

- a. AIG Organizational Area
 - Improved communication among AIG organizations.

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- Enhanced information management.
 - Coordination with other organizations and regions.
 - Participation with specialists in providing technical assistance to investigation agencies in preparation for audits or in requested issues.
- b. Policy and Procedures Area
- The following documents were harmonized:
- Accident investigation regulations.
 - Accident and incident investigation procedures.
 - Training programs.
- c. Technical-Operational Area
- The availability of training at the regional level increased with a team of multinational instructors.
 - Several States provided investigators and experts to States that requested.
 - Some States made their laboratories available for testing or reading black boxes (Flight Data Recorder - FDR) and Cockpit Voice Recorders (CVR), etc.
 - The first regional recommendation was made regarding Runway Excursion.
- d. AIG/SAM Database Area
- A regional database (SDCPS SAM) was created, encompassing all segments of aviation.
 - Mandatory reporting processes were improved in accordance with Annex 13 of the Convention, achieving a reporting rate of over 90% in the commercial aviation segment.

- Various ad hoc working groups were created to analyze accident and incident data across all segments of aviation.

All these achievements mean improved investigation processes, contribute to the safety of each State, and, in turn, benefit the operational context of the region for safer aviation.

CONCLUSION

All States have different modes of transportation that have enabled connectivity between States and regions. Each of them strives to develop transportation in the safest operational context possible by implementing international standards recommended by international organizations and in accordance with national regulations. However, reality shows us that not all States within the same region, or globally, have achieved the same level of transportation safety.

The inherent characteristic of transportation to provide high connectivity between States leads us to reflect that it is not logical to think of a safe operational safety

context in isolation. As a State, there are carriers and/or operators arriving from other States and departing to others, transporting national passengers and cargo, just as another State transports to ours.

States must approach the issue of safety with a regional perspective and work with other States to achieve a safe operational context for transportation. This challenge has already been addressed, along with various proposed solutions, such as cooperation between States, which, as presented in this article, has already yielded satisfactory results in different regions.

Finally, we can say that, based on experience in the area of aviation accident investigation, cooperation mechanisms are a valid tool to contribute to the improvement of safety at the regional level.

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