

SIA Quality Management System' Manual

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Abstract: *The safety investigation agency is a modern concept introduced in the transportation branch by ICAO, since Annex 13 to the Chicago Convention requires a separate safety investigation to be conducted by a Member State in case of serious occurrences, accidents and incidents, the main purpose being preventing future similar occurrences and increasing the safety level of the air operations. Such a body is subject to various tasks and limitations supporting the achievement of its targets, it is not a manufacturer or service supplier and it is not similar to other kind of governmental agencies. This paper should provide a model to develop guidance on QMS applied to the very specific case of a civil aviation safety investigation agency.*

Key Words: *Quality Management, independent safety investigation, national law, governmental agencies, civil aviation*

1. INTRODUCTION

The Annex 13 to Chicago Convention on International Civil Aviation is supporting the independent safety investigation conducted by member States in case of severe occurrences, such as accidents and serious incidents.

The investigation has to be independent from other type of investigations required by law, such as judicial, police, labor health and safety, security and law enforcement bodies, enabling to determine proper measures to be applied to avoid further occurrence of similar events, measures to be applied by safety oversight agencies and different economic operators involved such as air carriers, aircraft manufacturers, and aerodromes operators [1], [2], [3].

Even if the investigations have to be independent, cooperation between investigation bodies/ agencies/ authorities is encouraged.

Due to different reasons mainly economics and social, some ICAO member States created also regional bodies to facilitate these investigations and/or to enable proper cooperation of different agencies, mainly from different States.

Currently there is a trend for governments to introduce such agencies for further branches of transportation: maritime and shipping, rail and road.

The Romanian Civil Aviation Safety Investigation and Analysis Authority (SIAA)/ Autoritatea de Investigatii si Analiza pentru Siguranta Aviatiei Civile (AIAS) is the national

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body for civil aviation safety investigations in Romania^b. Since Romania is a European Union Member State in addition to the national legislation, the SIAA activity is also governed by European law, mainly the “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”. SIA, an abbreviation for Safety Investigation Agency, is widely used to define SIAA/AIAS similar bodies in Europe and overseas. This paper is intended to provide an overview of SIA quality management since, due to limitations determined by laws and regulations, these organizations need a very specific approach, determined by the fact that these are neither manufacturers, services suppliers, supervisory bodies and very different to from other kind of government agencies. Therefore, the SIAA is deemed to maintain a Quality Manual, even if such document is not more compulsory required by the standards for quality management systems.

We are looking to the quality management based on one of the frequent used standards, from the ISO 9000 standards family, the ISO 9001:2015 “Quality management systems – Requirements” [4], providing an overview of the SIAA *Quality Management System Manual*. Following paper’ sections are, basically, the manual’ sections and are observing the structure of the reference standard^c.

2. SIA PRESENTATION

The SIA has following tasks [3]:

- (1) Organizing, conducting, coordinating and completion of safety investigation in case of civil aviation accidents and incidents, occurred on the national territory or in the airspace or if an aircraft registered in this State is involved in such occurrence outside of national territory or airspace,
- (2) Issuing safety recommendations based on these investigations looking forward to preventing further similar occurrences,
- (3) Development of regulations concerning civil aviation safety,
- (4) Appointing the investigators and accredited representatives and their advisers,
- (5) Notification to the ICAO member States about any civil aviation severe occurrence in the national territory or airspace and facilitating the participation of foreign parts in the investigation according to international regulations,
- (6) Providing ICAO EASA or ECAC, as well as other States information and data necessary for the investigations according applicable international arrangements,
- (7) Cooperation with ICAO, EASA, ECAC and ICAO members concerning safety investigations conducted according to nation and/or international legislation,
- (8) Issuing and distributing reports on the investigations and their results,
- (9) Managing, assessing, analyzing and storing occurrences reports according to international and European regulations,
- (10) Producing studies and analyses on aviation accidents and incidents
- (11) Completion of any other tasks

^b Established in 2009 by the following acts: “Ordonanța nr. 26/2009 privind înființarea, organizarea și funcționarea Centrului de Investigații și Analiză pentru Siguranța Aviației Civile” [2] and “Ordonanța nr. 17/2018 pentru modificarea și completarea Ordonanței Guvernului nr. 26/2009 privind înființarea, organizarea și funcționarea Centrului de Investigații și Analiză pentru Siguranța Aviației Civile și pentru abrogarea Ordonanței Guvernului nr. 51/1999 privind investigația tehnică a accidentelor și incidentelor din aviația civilă” [3]

^c The content of the SIAA Quality Manual is presented in a reduced format enabling proper guidance on how the ISO 9001 requirements are applied in case of a civil aviation SIA

Chapter 1. Purpose of quality management system manual

The purpose of the manual is to document the organizational quality policy, describing the applicable quality management system (QMS), the duties, responsibilities and connections of the personnel in charge for quality, as well as the operation of the organization by observing the reference standard. Even that according to the ISO 9001 clauses the Quality Management System Manual (QMS Manual) is not compulsory, it is required to keep this document updated to adjust it to the specific activities, i.e. aviation safety investigation and analysis in case of accidents and incidents. The manual is an application guide for the clauses of the reference standard.

Chapter 2. Normative references

It includes reference to all standards related to the implementation and operation of quality management within the SIA. According to circumstances national and international legal references can be added.

Chapter 3. Terms, definitions and abbreviations

According to the applicable, standards and legislation, as well to facilitate the understanding of the content there are included proper explanations of the terms as used in the quality management documents and internal organization's documents.

Chapter 4. The context of the organization

In the case of a SIA, as resulting from the clauses of ICAO Annex 13, requirements of Regulation (EU) No. 996/2010 [3] as well from Aviation Code [6], the context includes certain particularities:

- The safety investigation processes are targeting the determination of the causes of the severe occurrence. These processes include legal and regulatory and input generated by the on-site investigation, as well data acquired from external sources, such as design data for the aircraft or its power the plants, data provided by on-board equipment and systems, aerodromes' data, meteorological information, ATM-ATS, personnel training information, etc.
- In certain cases, the investigation process might require expertise or research provided by other organizations or experts outside the investigation body.
- Managing, updating and analysis of the civil aviation safety database of the country is including tasks determined by international agreements and arrangements involving the specific country, as well as national regulatory requirements. An important issue is also the exchange of information with similar bodies of the States and information exchange with international databases.

The chapter included a review of all kinds of factors defining the context of the organization, i.e. external factors such as political, economic, social-cultural and technological factors, internal factors. The review shall include strongholds and weaknesses on hand and opportunities and threats on the other. There shall be included information supporting the understanding of needs and expectation of the involved parts, especially in this very specific environment of a SIA, an organization which misses direct clients but has a lot of interested parts involved. Table 1 includes an example, i.e. an overview of the requirements of the interested parties for the SIAA. It is also very important to determine the QMS application domain. For an SIA the QMS application domain is organizing, coordinating, control and provision of civil aviation safety investigations, acquisition and analysis of civil aviation safety data and issuing of aviation safety recommendations.

Chapter 5. Leadership

These issues are similar to all organizations. For a SIA here are certain specific issues:

- A. The top management is providing leadership and full involvement concerning the QMS, looking forward to ensure to provide the involvement of the personnel to achieve the quality objectives:
 - a. Taking whole responsibility on QMS efficiency and the managerial control legal requirements (in Romania this is OSGG 600/2018, in fact the SCIM Commission);
 - b. Ensuring that policies and quality objectives are consistent with the organizational context and strategic line;
 - c. Ensuring that QMS requirements are integrated in the organizational processes;
 - d. Promoting process approach and risk based thinking;
 - e. Ensuring availability of resources for QMS;
 - f. Communicating significance of efficient management and QMS requirements.

Table 1. Overview of the Requirements of the Interested Parts for the SIAA

No.	Interested parts	Requirements/ needs/ expectations	Conformation to
INTERNAL			
1.	Management	Observing QMC requirements	Legal requirements specific for public authorities and institutions.
2.	Personnel	Provision of necessary resources – financing, infrastructure, training and documented information – enabling proper activity conditions	
		Proper working environment	
3.	Process owners or responsible	Clear and available input from other processes (Leaders of the investigation commissions or heads of the involved compartments, as appropriate)	
EXTERNE			
4.	Authorities in the branch	Observing legal and regulatory terms and responsibilities applicable.	ICAO Annex 13, Regulations (EU) No. 996/2010 and No. 376/2014, RACR – REAC, (approved by OMT 598/20.07.2016)
		Completeness and correctitude of supplied documents and records.	
5.	Suppliers	Providing clear and complete orders	SIA shall assure that external suppliers fulfill requirements similarly to the authorities.
		Observing contract/ order clauses (In line with ISO 9001, for QMS, direct suppliers are organization providing expertise required by AIAS)	
		Communication	
6.	Civil aviation organizations	Reporting civil aviation occurrences	Regulation (EU) No. 376/2014,

7.	People	Voluntary reporting of civil aviation occurrences	RACR – REAC, (approved by OMT 598/20.07.2016)
8.	Aviation safety supervisory and regulatory authorities	Direct consultation with SIAA on implementing the safety recommendations issued by SIAA.	ICAO Annex 13, Regulations (EU) No. 996/2010 and No. 376/2014, RACR – REAC, (approved by OMT 598/20.07.2016)
		Involvement and consultation concerning the debate of legal requirements / modifications	
		Efficient cooperation in maintaining and updating databases concerning civil aviation occurrences, including the provision of specific information available, due to fulfilling the tasks allocated to these institutions.	
9.	Competent authorities	Observing legislation (Laws, Acts, Decisions, Orders, etc.), applicable standards and regulations	Applicable legislation

- g. Ensuring that the QMS provides intended results;
- h. Involving, leading and supporting staff contribute;
- i. Promoting continuous improvement;
- j. Supporting other relevant tasks to demonstrate leadership as applied in the specific responsibility areas.

B. SIA is not a service supplier as normally understood by quality management standards. In this care clients/beneficiaries are, finally, all those taking benefit from aviation safety, passengers and aeronautical staff. Beneficiaries are also the authorities using further the SIA work results, the safety investigation and analysis reports and the safety recommendations, organizations which are as well interested parties/stakeholders. Processes concluded by reports are providing these documents for both authorities and public, thus clients and interested parties are in fact the same.

Chapter 6. Planning

The planning required to enable SIA activities is looking towards the same aspects as any other organization.

In the particular case of the SIAA the internal managerial control (under the SCIM Commission) provides complete risk management by updating the risk register records and continuous risk assessment [5].

Chapter 7. Support

The SIA operations support is similar to any other organizations, of course taking into account the specific activities and equipment.

It's important to note that the SIA personnel are relatively difficult to recruit, especially for investigators, since this type of staff requires a high professional standard / licensing as a prerequisite. External communication has to observe specific requirements shown by international standards, regulations correlated with national legal requirements. The final result of the SIA work is a consisting of public documents. The documents have to provide proper information but shall not to involve blame and, responsibilities. The use of the SIA documents for other purposes that improving aviation safety.

Chapter 8. Operation

Operation planning and control

For a SIA specific planning is applied as such:

- Investigation planning is possible only for each investigation separately; a prioritization being possible only according to applicable regulations and legal requirements and, in specific circumstances, in correlation with other authorities.
- For safety analysis and database management planning has to observe legal and regulatory provisions and, if possible, requirements of other bodies with which the SIA cooperates.
- For the training and professional improvement of the personnel involved in safety investigation and analysis it is necessary to ensure the personnel availability for each occurrence.
- All other SIA activities are planned similarly to any public authorities.

Products and service supply requirements, client communication, design and development of product and service supply, control of external supplied products, manufacturing and control, and other issues are basically inapplicable for a SIA. Of course, there is a specific process to enable checking the quality of the supplied reports and observing of national and international legal and regulatory requirements.

Chapter 9. Performance evaluation

9.1. Monitoring, measurement, analysis and evaluation

The main quality objectives and targets for SIA are those stated by applicable national and international legal and regulatory provisions.

Observing these requirements is also related to improving efficacy and efficiency, i.e. reducing costs of investigation and analysis without affecting, in any way, the content, quality and thoroughness of investigations or analysis. For the SIA, a performance evaluation is represented by analyzing the feedback received from interested parties and authorities.

As for any organization, the results of the feedback analysis are inputs for the management analysis.

9.2 Internal audit

Basically, the internal audit is similar to any other organization, but certain specific issues have to be observed when applying the reference standard's clauses.

The internal audit of the quality management system is conducted according to a plan approved by the director general of the SIA, and shall refer to each compartment, usually once each year. A proper system procedure shall be in-place to enable internal auditing to be conducted appropriately.

Not all activities conducted within the SIA are included in the certification, but the departments involved in activities not included in the certification, still need to be audited.

In case of audits targeting similar issues as quality management, such audits conducted according to legal provisions (e.g. in Romania, for an authority, the internal public auditing is compulsory) or based on international agreements (e.g. standardization audits conducted by EASA on behalf the European Commission (EC) referring to the civil aviation safety oversight and regulatory system of a country), can be used as an auditory reference and can replace internal QMS audits for certain sections or departments within the SIA.

9.3 Management review

The SIA top management shall conduct QMS reviews on regular base, planning at least a yearly review. The input for such a review is similar to any other organization, of course, being provided by the internal QMS audits. Some remarks:

1. For SIA the auditing will involve those departments or sections directly involved in the investigations. The sections within the SIA of a EU Member State, dealing with the international safety and accidents databases there will be available the results of audits conducted under the EC/EASA. If legally required audits targeting the proper of each section or department are conducted, the results of those audits can also be used to replace internal auditing of compartments not directly involved in safety investigation and analysis (e.g. internal public audits under Romanian law).
2. If there are in-power legal provisions requiring the implementation of operational procedures, there will be avoided double procedures, meaning that the QMS procedures are operated also as procedures required for additional management purposes. E.g. in SIAA, the QMS procedures are as well SCIM procedures.
3. Written documents such as QMS procedures, registers, manuals can be also maintained, upgraded and managed also as electronic documents using intranet facilities.

Chapter 10. Improvement

SIA shall be continuously observing the efficiency and efficacy improvements of its QMS. The SIA management analysis/reviews shall determine and implement any measures which could determine improvement in accomplishing national and international legal and regulatory requirements.

All clauses of the reference standard referring to improvement are to be applied, perhaps with minor adjustments determined by the specific type of activity.

SIA specific provisions that shall be included in the QMS Manual

Taking into account the specific of the quality documents of SIA, especially the applicable procedures, there shall be considered certain specific updating measures:

1. QMS procedures shall be updated always when changes within applicable legal provisions, either national or international. If updating is not immediately possible the procedures need to be applied by observing the updated version of the legal reference, while the people coordinating each investigation will be in-charge to apply proper measures enabling the investigation or analysis to be conducted according to applicable law.
2. SIA QMS procedures shall be updated when updated ICAO reference documents are entering into force, mainly ICAO Annex 13 and ICAO Doc 9756 'Manual on accident investigation'. If updating is not immediately possible the procedures need to be applied by observing the updated English version of the documents, while the people coordinating each investigation will be in-charge to apply proper measures enabling the investigation or analysis to be properly conducted.
3. If specific legal or regulatory requirement has to apply for a certain analysis, the operational procedures will be completed with additional working instructions referring to those requirements.
4. If according to other procedures and standards applied within the management system, there are required additional elements in the procedures or QMS documents, the QMS

responsible department within the SIA will be cooperating with departments' in-charge for those specific requirements enabling proper implementation and evidence of the procedures, including updating editions and revisions.

5. Internal QMS auditing planning will take into account any other types of auditing targeting similar objectives to avoid dubbing of the activities and enable proper operation within the section or department not affecting its daily work. Any useful results provided by other type of auditing, legally required or based on international arrangements (e.g. as previously mentioned, internal public auditing or EC/ EASA standardization audits).
6. QMS documents and, as well, all other management systems documents, shall be available on the intranet of the SIA organization, enabling proper access and observing for all staff and, if necessary, other cooperating parts. Of-course, staff outside the SIA shall be granted limited access, only to those parts of the documents they need to deal with.
7. SIA QMS auditing documents shall subject to all national and international, legal and regulatory security requirements applicable for safety related documents as well as for other investigation documents.

Annexes or Appendices to the QMS Manual

To enable the guidance purposes of the QMS manual certain annexes/appendices shall be considered to be added:

- Quality management policy statement, usually issued by the SIA top management;
- SIA organizational chart;
- A processes and interaction chart for the SIA activities;
- Explanatory information on the relation between the QMS procedures / documents and procedures / documents issued due implementation of other management systems, mainly if those systems have been implemented according to legal requirements;
- Lists of controlled reference documents such as legal and regulatory applicable documents;
- Lists of documents associated with quality, mainly the list of applicable documents, their updates, and entry-into-force dates, mainly the QMS system and operational procedures and related instructions;
- Reference reports on the SIA operation, such as annual reports, or other documents defining the organization's targets and objectives and their achievement possibilities, as well as performance indexes;
- Documents on the allocation of specific duties and responsibilities related to QMS;
- References on planning the QMS audits, internal and external, and, if possible the cases when results of other audits are included in the SIA QMS auditing.

To facilitate the use of the QMS Manual as guidance and/or reference, it can be an advantage to provide links to on-line documents rather than hardware annexes.

3. CONCLUSIONS

This paper was intended to provide specific guidance for the staff in-charge to develop, implement and manage quality management for a safety investigation agency operating in aviation and, if necessary, in other domains of transportation.

It was also intended to enable colleagues and partners to understand the specific SIA and SIAA working environment and future cooperation.

SIA in all branches of transportation and connected areas will soon extend. Certain States consider operating separate safety investigation agencies for air, maritime, railways and/or road transportation (e.g. UK, Germany) while other States prefer a common safety agency (e.g. US or Canada) or a mixed agencies system (e.g. the Netherlands), even a regional civil aviation investigation agency (such IAC for Russia and CIS). In any of these cases the problems are very similar for all branches of transport, even that certain regulatory or legal provisions, including international arrangements, could be different. Private safety investigation bodies should also observe similar rules, maybe fewer legal constraints.

The QMS of the SIA has to enable a balance between legal and regulatory requirements and the real life possibilities, without avoiding thorough observing of the requirements.

According to the national legislation of certain States the (civil aviation) SIA shall have additional duties to safety investigation and analysis. Such duties could include dealing with the accident survivors or the family of victims, organizing recovery, transportation and storage of wracks, as well as many other tasks. In such cases special QMS procedures and regulations shall be applied according to the specific situation.

It is important to take into account that for the SIA certification and auditing of management systems based on legal provisions is a useful tool in the relation with the other State's authorities, for any reason. But QMS certification and auditing is a significant asset in relation with all any other partners abroad, as well as for an eventual partnership with other organizations, if legally accepted.

DISCLAIMER

This paper is not a translation or copy of a SIA QMS Manual, but only an overview of SIA specific QMS issues, looking forward to providing aid to someone interested in developing a QMS for a safety investigation agency, in civil aviation or similar to those in civil aviation.

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