

ANA - Aeroportos de Portugal, SA

Preventing, reporting, evaluating, and mitigating Airside accidents and incidents at airports.

Introduction

Safety measures undertaken at the airport are grouped in the following way:

- Steps focusing on Airport Safety in Operations;
- Steps focusing on Security against Illicit or Criminal Actions;
- Steps assuring Safety and Health in the Workplace;
- Steps focusing on Environmental Safety Management.

The areas mentioned above have their own distinct regulations, procedures and practices; however, should an inadequacy present itself in activities or situations of one domain, it would certainly affect the others.

The identification of dangers for each area and the evaluation and mitigation of risk for each of the above-stated safety fields can be tracked by using a computer-based Integrated Management System (IMS) whose vision and performance are, at the same time:

- individualised, based on the requirements of each domain;
 - collective, with each domain's respective cross-over effects into other domains.
- This integrated System will compel all sectors in these domains to work together in the task of:
- obtaining immediate response to incidents;
 - controlling the implementation of appropriate corrective measures or actions;
 - facilitating the revising and updating of manuals, procedures and norms in compliance with the requirements of the company's duly certified Quality Management System.

2 - Airport Safety Cabinet (Gabinete de Segurança Aeroportuária - GSA)

In order to tighten the bonds between the Board of Directors of ANA and Airport Directors in matters of airport safety, the Office for Airport Safety was created as part of the Directorate for Technical Services (DSTE).

Among the various services under its charge, Air Services Management (GSA) have participated in the elaboration of company-wide Safety Policy and has endorsed:

- the creation of an Airport Safety Manual;
- the establishment of the Safety Management System – ICAO, Annex 14, Volume I on the corporate level;
- the follow-up to implementation of this System in each of its airports.

All activities, currently in operation or about to be set in motion, focus on the consolidation of a genuine culture and atmosphere that promotes Airport Safety.

3. Safety Policy

The increase in air traffic has meant that new measures must be put in place to assure that the number of accidents per year does not surpass unacceptable levels.

Also, the increase in the number and size of individual aircraft, and their respective movement in airports, has required constant expansion work, which has led to the resizing of infrastructures and even the construction of new buildings.

This increase in air traffic also translates into a greater commitment to support services and assistance to passengers and aircraft, which must be dealt with in terms of Flight Services in airports that are increasingly congested with planes and equipment. All of this requires heightened attentiveness to safety and security.

Therefore, ever mindful of these concerns, we on the corporate level have been developing initiatives to establish the Safety Management System at each of our airports, stressing the domains of safety assuredness already mentioned, with the Board of Directors of ANA stating the Safety Policy thus:

“ANA, SA seeks to formalise Management Systems for Airport Safety, for Security against Illicit or Criminal Actions and for Safety and Health in the Workplace such that they are implemented in each one of our airports and able to perform to the highest degree, with the goal of reducing to the bare minimum the number of accidents and incidents that may occur in these three safety areas.

ANA, SA is committed to providing the structures and means necessary, be it at the central or airport level, which will allow for the efficient management of Safety issues as a fundamental component of the success of the business of airport operations.

ANA, SA is committed to increasing whatever measures are required for the creation, modification and updating of norms and procedures, of the acquisition of equipment and of various initiatives of sensitivity-training and other types of technical training for the bolstering and improvement of the various domains of safety assuredness in order to display the clear image of responsibility that ANA has assumed for all national airports under its charge.

4- Airport Safety

When referring to the term “Airport Safety in Operations”, various aspects immediately must be taken into account, ones of a rather personalised or specific nature.

This concept bears clarifying here, so that all parties may correctly interpret the issues that come into play in regard to Airport Safety.

Namely, it is essential that the basic concepts of hazard and risk be differentiated.

- Hazard is something with potential to cause harm or damage;
 - Risk is the probability, whether high or low, of this potential situation becoming a reality.
- Airport Safety must be based on well-defined procedures that include superior, up-to-the-minute practices.

In order to implement essentially preventive measures, it is necessary to proceed with the identification of hazards with the potential for causing personal harm or material damage to property.

The risk factor links the probability of the occurrence with the gravity (or severity) of the potential for damage.

Safety is thus a state in which the risk of personal harm and material damage is reduced and maintained at or below a level deemed acceptable via a continual process of identification of hazards and risk management. (ICAO Safety Management Manual – Doc. 9859, Dec. 2005)
Therefore, it can be summarised that:

- Safety is the absence of both unacceptable and/or intolerable risks;
 - Safety Management entails the providing of services intended to guarantee that all hazards are identified and all risks evaluated and mitigated;
 - Airport Safety in Operations is the result of a set of measures and procedures applied to airports, be they in their construction and development or in the operation and elaboration of support procedures for aircraft with a view toward reducing to the lowest internationally acceptable level the risk of occurrences in airport operations (regarding aircraft, persons, vehicles, equipment and infrastructures).
- Additionally, it may be said that Safety requires:

- The adequate definition of all the duties and responsibilities for each area of activity and each entity's role in completing tasks;
 - The proper investments throughout the complex chain of systems in the airport.
- In this way, Safety involves not only those dealing with operations issues but all the organisations and entities in the civil aviation field, from the companies that build aircraft to those in charge of management and operations of airport infrastructures and navigation support, to air traffic control management, regulation and inspection of official entities and even to companies that provide handling services and the airlines themselves.

Clearly, no one has a monopoly on Safety – we must all work together, each according to his specific tasks, functions, responsibilities and abilities in order to attain the highest level of success in airport operations.

At all times and in all circumstances, whether routine or less so, Airport Safety efforts must always be maximized by pulling together all means and resources available so that Air Transport Operators and airports themselves may effectively carry out the business of normal operations at airport facilities.

The Scope of Airport Safety

The scope of airport safety is not just limited to the operation of aircraft.

At airports, Airside incidents may take place involving aircraft, people, vehicles (ground traffic), equipment, ground structures and support services.

Special attention must be given to traffic areas at airports, primarily those regarding movement:

- between aircraft,
- between vehicles,
- between aircraft and/or vehicles and/or equipment and/or infrastructures and/or support structures,
- between all the aforementioned and persons,
- between aircraft and/or vehicles and wildlife.

5- The ANA, SA Airport Safety Manual

The strategic framework in place for Airport Safety is described in the Airport Safety Manual.

Approving and determining the content of the manual falls to ANA's Board of Directors, but putting these measures into action requires the efforts of each and every member of the company, most specifically in that which deals with Airport Administration, and most visibly in areas of traffic and movement.

6- Analysing and Investigating Incidents

Safety is an issue whose scope branches out to all levels of the company's organisation. Either more or less directly, it is influenced by multi-layered, interdisciplinary factors that must be permanently present within the Organisational Culture at ANA, SA as well as within Airport Management.

This stance makes sense since, in terms of airport safety, it matters less 'who is right' and matters more that things are done correctly since it is rather unthinkable that anyone would commit an error intentionally.

Therefore, the following contributing factors must be considered in the analysis and investigation of any type of event.

- human factors, bearing in mind the failure of those participants most directly connected to the incident: pilots, air traffic controllers, vehicle drivers or operators of material devices, platforms, or jetways and the maintenance staff (of aircraft, vehicles, equipment, support structures, etc.)
These failures may:

- be individual failures;

- be the result of insufficient coordination and/or interaction between team members and/or various teams and/or services
- systemic or latent failures in internal or external organisation that undermine airport operations that include:
 - latent internal organisational failures
 - in the work environment;
 - in the organisational environment.
 - latent external organisational failures
 - in the physical environment;
 - in the regulatory environment.

Those latent internal organisational failures mentioned above, however, are rather difficult to eradicate since they are so engrained in Human Nature, yet there is the possibility of other system deficiencies related to the management of the airports themselves and those features, procedures and conditions linked to operations in areas of movement and traffic.

More specifically, the scope of airport safety must encompass the evaluation of all Airside support structures, services and equipment in order to be in full compliance with the Standards and Recommended Practices of the ICAO.

7- Bringing together traditional and modern practice

Traditionally, the duty of handling airport safety, both nationally and internationally, was given to a Safety Officer or department, both of which took their orders from and reported to an Operations Manager or Head.

The ability to effectively improve airport safety measures was diminished since it was dependent upon the powers of persuasion of individuals when speaking before their superiors, the department heads.

However, as a result of the great increase in air traffic, new measures must be applied. If not, the number of accidents and incidents annually, in absolute terms, will reach an unsustainable level. The ICAO have ruled that, beginning on 24 November 2005, an Airport Safety Management System (SMS) must be in place, as referred to in Annex 14 of the ICAO, Volume I, Chapter 1, paragraph 1.3.5, in which the Manual on Certification of Aerodrome – Doc. 9774 NA/969 mandates the establishment of said Safety Management System (SMS) in Appendix I, Part 5.

8. The Safety Management System

It is the duty of the Aerodrome Operator to implement a Safety Management System, with a description of its organisational structure and its respective tasks, abilities, attributes and responsibilities. This is to be done in such a way as to guarantee that operations are performed in a visible and controllable way and that the system may be enhanced or improved where and when necessary (management of minimum acceptable risk).

A system of this type requires that such a commitment to Airport Safety, and the necessary budgetary backing for same, be integrated into the organisational management structure, thus obliging the Directors and Managers to assume the position of being ultimately responsible for airport safety, as they indeed are for other aspects of the business.

9. Establishment of the SMS

The establishment of the Safety Management System (SMS) focuses on the progressive and systematic integration of those measures and actions in Airport Safety related to all daily Airside operations, including as well, technical and human factors.

Airport norms and procedures shall be clear and precise, and part of the knowledge of all staff using the Airside of the airport.

The SMS, duly structured, will enable the airport operator to guarantee safety in operations, equipment and facilities for all those who work at or use the airport.

9.1 Phases in the System

The SMS is an essential support mechanism for the prevention of events, via adequate preventative measures, and for the investigation and analysis of verified events in order to introduce/update adequate procedures.

An airport SMS can be summarised as having the following five constituent phases:

- Safety Policy

This is defined in a document written by the Board of Directors of ANA, SA, calling for each airport to declare how it will achieve the objectives determined by Company Policy.

- Organisation

Here it must be defined how duties and responsibilities of organisational structures are attributed. It is vital that effective, inter-linked channels be established to communicate when problems occur, to maintain an updated registry of events, and to promote the supervision of those actions taken.

- Task Planning and Execution

Planning must include clear systemising and scheduling of measures and actions to be taken in order to reach pre-determined goals.

Executing this plan well means that airport and terminal safety is assured in terms of a management programme which evaluates risk, identifies hazards and controls the overall

associated risk.

- Performance Assuredness

The system must include elements that allow for the constant overseeing of all activities, norms and procedures that can prevent an event from occurring and which also allow for follow-up in the investigation of accidents, incidents and other events related to airport safety.

- Revision

Bringing together solid information collected from various domains allows for the continual validation and revision of norms and procedures, which in turn results in the SMS itself being the most up-to-date possible.

9.2 Objectives

In compliance with the Airport Safety Policy mentioned above, each airport must take into consideration the following objectives, and as such, pledges:

- To guarantee, to the fullest degree possible, the safety of all persons, including employees, users, passengers and the public, during the normal operation of the airport.
- To take initiatives and/or strengthen corrective measures, preferentially preventative ones, with the goal of reducing eventual damage to aircraft, equipment, vehicles and infrastructures that may result from unsafe actions or conditions occurring during the normal operation of the airport.
- To guarantee the compliance to all National, European and ICAO Airport Safety legislation as well as to assure the proper practice of international standards for the airport industry.
- To minimise delays and problems that affect normal operations at the airport.
- To promote the systematic collection of identified potential risk factors and to develop cost-effective methodologies for the highest level of risk evaluation management.
- To minimise direct and indirect costs of accidents and/or incidents or structural damage and to maximise the benefits of preventive safety measures.
- To guarantee the distribution of adequate resources in terms of time and money for the best control of hazards.
- To implant within the staff and users of the airport a permanent culture of airport safety.
- To perform all airport activities such that their execution always contributes to the good reputation of the airport.

9.3 Organisation

Of all those phases of the Safety Management System mentioned above, it would be of most interest to briefly show the organizational make-up as depicted in the flowchart below.

This organizational structure brings enhancement to the current vision, recommended by the ICAO, in that Airport Safety now extends to:

- all executives and workers in the employ of the Airport, with ultimate responsibility falling at

the level of Airport Administration and most visible in movement and traffic areas;
- all persons who work and/or pass through the areas of movement within the Terminals, or are directly or indirectly linked to planning and logistics of passenger, flight and aircraft-related assistance services.

With this perspective in mind, the establishment of effective inter-linking channels is fundamental for the operations and efficiency of the SMS such that they permit organisational fluidity within and amongst sectors, especially in regard to communicating when problems arise and disseminating and overseeing whatever measures or actions are taken. Portuguese national airports have adapted the framework of the above organisational diagram on the corporate level according to the specific features of each airport facility.

9.4 Airport Safety Offices

The SMS defines the duties and responsibilities of each airport Administration and provides for the creation of Airport Safety Offices within each one's particular hierarchy. Each airport's Airport Safety Office has well-defined features and duties, orientating and coordinating its activities by means of three Safety Committees:

- for Platform Safety (Apron Committee),
- for Runway Safety (Runway Incursions Committee)
- for Emergency situations.

The person who is in charge of this Office is nominated by the Director of each Airport; the heads of the three safety committees report directly to this person.

For Airport Safety to be effective, all persons involved must adhere to the principles set forth in ANA's Safety Policy.

This multi-faceted commitment to accountability is a result of the composition of the Committees and their respective duties and responsibilities and the fact that the person in charge is appointed by the Director of each airport.

Represented in the Platform Safety Committee are:

- those involved in the operations and maintenance of Airports;
- those entities that provide passenger, flight and aircraft-related assistance Support Services and Platform Support Services;
- those other related groups, as deemed applicable.

Represented in the Runway Safety Committee are:

- airport operations personnel;

- pilots;
- air traffic controllers;
- drivers of vehicles that circulate on or near runways.

Represented in the Emergency Committee are:

- members of the Emergency Operations Centre (COE)
- the Aerodrome Emergency Committee (CEA).

In order to assure the highest measure of uniformity of action in all airports, this system shall describe the Methodology underlying each Committee's functioning in terms of Decision-making procedures, the scheduling of meetings and administrative rules (agendas, minutes, disclosure of information, etc.).

Also described are the remaining phases of the System (Planning and Task-Execution, Performance Assuredness, Revising) from the standpoint of a System of Continual Improvements based on the Deming Wheel tenets of PDCA: Plan – Do – Check – Act.

An effective and harmonious system cannot function without credible internal and external auditing, or without the keeping of a rigorous and continuously updated Document Registry (dealing with norms, procedures and reports, etc.) that respect certain Norms of Quality Assurance.

The keeping of a Document Registry, as well as its respective analysis, is fundamental and indispensable. It allows:

- Safety Committees to update databases, to explain statistics, to analyse the investigations of accidents and incidents, to revise norms and procedures, and to define the needs of training courses, refresher courses and dynamic initiatives and campaigns, etc.
- Auditors to verify the correct application of procedures and corrective actions of registered reports.

Whenever accident and incident reports (or those of other occurrences) have been filed, the Document Registry must be quite clear. This allows the event to be followed with the greatest ease, beginning with the initial Report and proceeding to the conclusion in a full informational cycle or loop, which will contribute to those future pertinent revisions that may be made for the reinforcement of Airport Security.

The final part of Airport Safety deals with Risk Evaluation Management.

10. Risk Evaluation Management

Air Terminal Platforms, especially those in large airports, are confusing, traffic-filled workspaces. Both people and aircraft are exposed to potential hazards resulting from the movement and operation of commercial aircraft, vehicles and equipment.

Even the slightest miscalculation in eliminating or controlling hazards can lead to accidents and incidents which can damage aircraft, vehicles, equipment and infrastructures and/or cause injury to people.

The operation of aircraft, equipment and vehicles, including the rotation of aircraft in increasingly short spans of time and runway incursions, must always strive to emulate the ultimate in safety practices for each task according to established procedures.

Airport Management requires that the organisation verify and evaluate all aspects of operations and alterations deemed necessary, with the goal being Airport Safety.

The evaluation of Airport Safety must be conducted such that it can guarantee that the management of any hazard is commensurate with the risk involved and is in compliance with pre-defined safety objectives.

Even after all precautions are taken and preventative measures are in place, there may still be slight or residual risk present, which may be considered acceptable or which may need additional preventative measures.

The Process of Evaluating Risk – the Risk Matrix

In general, the evaluation of risk is performed in the following way:

- By systematically identifying possible dangers;
- By evaluating the seriousness of the damage;
- By considering the frequency (probability) of the occurrences;
- By determining if the consequent risk is acceptable in terms of a tolerance level (with the Matrix being drawn graphically on the axis of seriousness versus probability);
- By taking decisions and implementing corrective actions (risk management) in order to lessen risk to an acceptable level.

Qualifying and quantifying these aspects in terms of time periods, damage and injuries will be established in accordance with determined corporate levels but will be open to adaptation as operations and business conditions at each airport indicate.

Risk Matrix

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Risk Management

The situations indicated in the table, duly analysed in quantity and quality, may demand that

certain decisions or corrective actions be taken via the Airport Security Office in order to reduce the probability of occurrence and/or seriousness of hazard (risk management)

The acceptability of many identified hazards can be mitigated with the application of regulations, procedures, proper practices and norms in force.

In other cases, it might be necessary to alter such norms and procedures to minimise such occurrences.

Conclusion :

Errors can occur in all types of organisations; they are a fact of life.

However, in terms of Airport Safety, when an error occurs, the consequences for personal injury or material damage are on a much higher scale than in many other organisations or companies.

For this reason, it is of the utmost importance that:

- all norms, procedures and proper practices be respected by all persons who work Airside and/or are involved in the management of airports.

- all due decisions and opportune actions be taken, stressing pro-active solutions over reactive ones, in order to mitigate all possible negative event occurrences.

Airport Safety must not be compromised.

Risk Evaluation Management is fundamental to the continual strengthening of Airport Safety.