



**JORDAN CIVIL AVIATION REGULATORY COMMISSION**

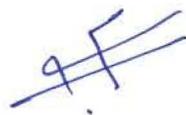
# **SMS-Guidance to Aviation Organizations**

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## APPROVAL SHEET

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## ABBREVIATIONS AND DEFINITIONS

### 1. ABBREVIATIONS

<b>ALARP:</b> As Low as Reasonably Practicable
<b>ALoS:</b> Acceptable Level of Safety
<b>CARC:</b> Civil Aviation Regulatory Commission
<b>ERP:</b> Emergency Response Plan
<b>ESB:</b> Effective Safety Behaviors
<b>HF:</b> Human Factors
<b>ICAO:</b> International Civil Aviation Organization
<b>IRM:</b> Immediately Reportable Matter
<b>IRS:</b> Internal Reporting System
<b>ISO:</b> International Organization for Standardization
<b>MOS:</b> Manual of Standards
<b>QMS:</b> Quality Management System
<b>RRM:</b> Routinely Reportable Matter
<b>SAG:</b> Safety Action Group
<b>SM:</b> Safety Manager
<b>SMM:</b> Safety Management Manual
<b>SMS:</b> Safety Management System
<b>SOP:</b> Standard Operating Procedure
<b>SRB:</b> Safety Review Board

## 2. DEFINITIONS

**Accident:** An occurrence associated with the operation of an aircraft which takes place between the times any person boards the aircraft with intention of flight until such time as all such persons have disembarked, in which:

a person is fatally or seriously injured as a result of:

- Being in the aircraft, or
- Direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or
- Direct exposure to jet blast,

except when the injuries are from natural causes, self-inflicted, or caused by other persons, or when injuries are to stowaways hiding outside the areas normally available to the passengers and crew, or the aircraft sustains damage or structural failure which,

- adversely affects the structural strength, performance or flight characteristics of the aircraft, and
- would normally require major repair or replacement of the affected component,

except for engine failure or damage, when the damage is limited to the engine, its cowlings or accessories; or for damage limited to propellers, wing tips, antennas, tyres, brakes, fairings, small dents or puncture holes in the aircraft skin; or the aircraft is missing or is completely inaccessible.

**ALARP:** As Low As Reasonably Practical, means a risk is low enough that attempting to make it lower, or the cost of assessing the improvement gained in an attempted risk reduction, would actually be more costly than any cost likely to come from the risk itself.

**Assessment:** The process of observing, recording, and interpreting individual knowledge and performance against a required standard.

**Change Management:** is a systematic approach to controlling changes to any aspect of processes, procedures, products or services, both from the perspective of an organization and individuals. It's objective is to ensure that safety risks resulting from change are reduced to as low as reasonably practicable.

**Competency:** A combination of skills, knowledge and attitudes required to perform a task to the prescribed standard.

**Competency standards:** Defined and expressed in outcome terms.

**Competency-based training:** Develops the skills, knowledge and behavior required to meet competency standards.

**Competency assessment:** The process of collecting evidence and making judgments as to whether competence has been achieved.

**Consequence:** Outcome or impact of an event.

**Error:** An action or inaction by an operational person that leads to deviations from organizational or the operational person's intentions or expectations.

**Error management:** The process of detecting and responding to errors with countermeasures that reduce or eliminate the consequences of errors, and diminish the probability of further errors or undesired states.

**Hazard:** A source of potential harm.

**Human Factors (HF):** The minimization of human error and its consequences by optimizing the relationships within systems between people, activities and equipment.

**Incident:** An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.

**Just culture:** An organizational perspective that discourages blaming the individual for an honest mistake that contributes to an accident or incident. Sanctions are only applied when there is evidence of a conscious violation or intentional reckless or negligent behavior.

**Likelihood:** Used as a general description of probability or frequency.

**Note:** *Can be expressed qualitatively or quantitatively.*

**Management:** Management comprises planning, organizing, resourcing, leading or directing, and controlling an organization (a group of one or more people or entities) or effort for the purpose of accomplishing a goal.

**Operational safety-critical personnel:** Persons performing or responsible for safety-related work, including those personnel performing roles that have direct contact with the physical operation of the aircraft or with those that have operational contact with personnel who operate the aircraft.

**Quality Management System (QMS):** A set of policies, processes and procedures required for planning and execution (production/development/service) in the core business area of an organization.

**Risk:** The chance of something happening that will have an impact on objectives.

**Risk Assessment:** The overall process of risk identification, risk analysis and risk evaluation.

**Risk Identification:** The process of determining what, where, when, why and how something could happen.

**Risk Management:** The culture, processes and structures that are directed toward realizing potential opportunities whilst managing adverse effects.

**Safety:** The state in which the probability of harm to persons or of property damage is reduced to, and maintained at, a level which is ALARP through a continuing process of hazard identification and risk management.

**Safety Culture:** An enduring set of beliefs, norms, attitudes, and practices within an organization concerned with minimizing exposure of the workforce and the general public to dangerous or hazardous conditions. In a positive safety culture, a shared concern for, commitment to, and accountability for safety is promoted.

**Safety Management:** May be described as managing the identification and reduction of hazards until they reach the ALARP criteria.

**Safety Manager (SM):** A person responsible for managing all aspects of the operation of the organization's safety management system.

**Safety Management System (SMS):** A systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures.

**Stakeholders:** Those people and organizations who may affect, be affected by, or perceive themselves to be affected by a decision, activity or risk.

**Systemic:** Relating to or affecting an entire system.

**System Safety:** The application of engineering and management principles, criteria and techniques to optimize safety by the identification of safety related risks and eliminating or controlling them by design and/or procedures, based on acceptable system safety precedence.

**Threat:** Events or errors that occur beyond the influence of an operational person, increase operational complexity and shall be managed to maintain the margin of safety.

**Threat and Error Management (TEM):** The process of detecting and responding to threats with countermeasures that reduce or eliminate the consequences of threats, and mitigate the probability of errors or undesired states.

**Training:** The process of bringing a person to an agreed standard of proficiency by practice and instruction.

**Training Needs Analysis (TNA):** The identification of training needs at employee, departmental, or organizational level, in order for the organization to perform effectively.

**Violation:** Intended or deliberate deviations from rules, regulations or operating procedures. A person committing a violation fully intends their actions. Violations can be one of four different types:

- routine – common violations promoted by an indifferent environment, 'we do it this way all the time';
- optimizing – corner-cutting based on the path of least resistance, 'I know a better way of doing this';
- exceptional or situational – one-off breaches of standards/regulations dictated by unusual circumstances that are not covered in procedures, 'we can't do this any other way'; or
- acts of sabotage – acts of harmful intent to life, property of equipment.

## CHAPTER 1- INTRODUCTION

### 1.1 GENERAL

This Civil Aviation Regulatory Commission Guidance Material describes the safety outcomes and the key elements of a Safety Management System (SMS). It is based around the SMS Framework recommended by ICAO. The content of this Guidance Material specifies the components and elements that need to be in place for aviation organizations when developing an organization's SMS, to meet the requirements of JCAR Part 19 for an SMS program. The content of this Guidance Material comes in a form of guidance and safety promotion material in regards to SMS.

A successful SMS provides – amongst other things a systematic, explicit and comprehensive process for identifying hazards and the risks they bring, and for minimizing those hazards. As with all management systems, it involves goal setting, planning, documentation and the measuring of performance goals.

The organizational culture and the way people go about their work will have a significant impact upon the success of the SMS. Indeed, it is unlikely that the SMS will achieve its full potential for mishap prevention without full understanding and application of Human Factors (HF) principles by the entire organization's staff in support of a positive safety culture.

Legislation governing the mandating of SMS will be based upon *ICAO Document 9859 – Safety Management Manual*. Operators are therefore encouraged to use *ICAO Document 9859* as a source of guidance on SMS, in addition to this Guidance Material .

It is important to recognize that Safety Management System (SMS) are top down driven systems, which means that the Accountable Manager of the organization is responsible for the implementation and continuing compliance of the SMS. Without the wholehearted support of the Accountable Manager an SMS will not be effective.

There is no 'one size fits all' model of an SMS that will cater for all types of operators. Complex SMS are likely to be inappropriate for small operators, and such operators should tailor their SMS to suit the size, nature and complexity of the operations in their organization and allocate resources accordingly.

### 1.2 MANAGEMENT SYSTEMS

An SMS goes beyond a traditional Quality Management System (QMS) by focusing on the safety, human and organizational aspects of an operation. Within an SMS,

there is a distinct focus on operational safety and the human element in the system. This underlines the importance of integrating HF through all parts of the SMS.

- ❖ In civil aviation today, there are various control systems existing within an organization. Examples include:
  - International Organization for Standardization (ISO) 9000 system;
  - QMS;
  - Human Factors (HF) and Error Management System;
  - Fatigue Risk Management System (FRMS);
  - Occupational Health and Safety Management System; and
  - Security Management System.

There may be organizational benefits in coordinating some/all of these systems. These include:

- Reducing resource duplication, and therefore, cost;
  - Integration and processing of cross-functional safety related data; and
  - Reducing potentially conflicting objectives and relationships.
- 
- ❖ Although the co-ordination and integration process may be a challenging task for many organizations, and could impact on the ability to successfully implement an SMS program in the short to medium term, an alternative would be to plan for integration once the SMS is established within the organization (a phased approach).

If there is a strategy to integrate some or all of these programs, then the SMS should provide the organizational overview of all the various organizational systems from the operational safety perspective.

The role of the QMS is to monitor compliance with and the adequacy of procedures required to ensure safe operational practices. The QMS and SMS have complementary but independent functions with the QMS monitoring the SMS.

## CHAPTER 2-SAFETY MANAGEMENT SYSTEM

An SMS is an organized approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures.

The complexity of the SMS should match the organization's requirements for managing safety.

At the core of the SMS is a formal Risk Management process that identifies hazard and analyses and mitigates risk.

### 2.1 SAFETY MANAGEMENT SYSTEM IMPLEMENTATION PLAN

The first step, when introducing SMS into an organization, is to develop an implementation plan. This will be a realistic strategy for the implementation of SMS that meets the needs of the organization and defines the approach taken for managing safety. The contents of the plan should include but not be limited to:

- (a) Safety policy;
- (b) Safety planning objectives and goals;
- (c) System description;
- (d) Gap analysis;
- (e) SMS components;
- (f) Safety roles and responsibilities;
- (g) Safety reporting policy;
- (h) Means of employee involvement;
- (i) Safety communication;
- (j) Safety performance measurement;
- (k) Management review of safety performance; and
- (l) Safety training.

### 2.2 THE COMPONENTS OF A SAFETY MANAGEMENT SYSTEM

An SMS shall comprise at least the following four key components and elements:

- 1) Safety Policy, Objectives and planning

- (2) Safety Risk Management
- (3) Safety Assurance; and
- (4) Safety Training and Promotion.

### 2.3 DELIVERING AN EFFECTIVE SMS ORGANIZATIONAL PROGRAM

The aforementioned Key components and elements for delivering an effective SMS are outlined in the CARC SMS Framework shown in Figure 1 below. The SMS framework in this Guidance Material is largely based on the ICAO SMS guidance which consists of the above four major components.

**FIGURE 1: CARC SMS FRAMEWORK**



## CHAPTER 3- SAFETY POLICY, OBJECTIVES AND PLANNING

### 3-1 GENERAL

This chapter covers these elements:

- Management commitment and responsibility;
- Safety accountabilities of managers;
- Appointment of key safety personnel;
- SMS implementation plan;
- Third-party interface – contracted activities;
- Coordination of the emergency response plan; and
- Documentation.

### 3-2 MANAGEMENT COMMITMENT AND RESPONSIBILITY

The Accountable Manager shall have full responsibility for the SMS and shall:

- Recruit a management team appropriate to the size and complexity of the organization;
- Develop and disseminate a safety policy and safety objectives;
- Create and adequately resource the SMS program; and
- Specify roles, responsibilities and accountabilities of the management team in relation to aviation safety.

Senior management in the organization shall develop an organizational structure that has the responsibility, authority and accountability assigned to it to assure the SMS will function as planned. This would include an organization chart that depicts the organization structure, inclusive of the SMS, and that establishes a clear line of communication from the Safety Manager (SM) directly to the Accountable Manager.

### 3-3 SAFETY POLICY

Management commitment to safety needs to be clearly expressed in a statement of the organization's safety policies.

A Safety Policy outlines what the organization will do to achieve the desired safety outcomes. They serve as a reminder as to *'how we do business around here'*.

Safety policy statements may take different forms but will typically include:

- The overall safety objective of the organization;
- The commitment of senior management to the goal of ensuring that all aspects of the operation meet safety performance targets;
- Determination by the organization to provide the resources necessary for the effective safety management;
- The organization's policies concerning responsibility and accountability for safety at all levels of the organization; and
- Management's explicit support of a 'just culture', as part of the overall safety culture of the organization.

A 'just culture' provides clear boundaries about confidentiality, reporting requirements, and individual responsibilities in relation to the SMS as far as management and staff are concerned. However, in a 'just culture' policy, a clear distinction is required between what is acceptable behavior and what is unacceptable, and that people are treated accordingly. 'Just culture' is a necessary evolution from the 'blame free' culture of the past.

### **3-4 SAFETY OBJECTIVES**

- The safety objectives shall state an intended safety outcome. These objectives may be expressed in terms of short, medium and long term safety objectives.
- To be able to measure the effectiveness of operational safety objectives, they shall be Specific, Measurable, Achievable and Realistic; and have a specified Timeframe (SMART) within which they are to be achieved.
- The operator shall have documented plans of action to achieve each specified safety objective, and these shall ideally be included within the implementation plan.

### **3-5 SAFETY ACCOUNTABILITIES OF MANAGERS**

1. The accountable manager is ultimately held responsible for the SMS and shall ensure the provision of resources necessary to implement and maintain the program.
2. The roles, responsibilities and accountabilities of the positions outlined on the organizational chart shall be explicit with respect to the SMS.
3. All management and supervisory positions in addition to the Safety Manager (SM) would be expected to show leadership and have included in their responsibilities/accountabilities a requirement to:

- Actively support and promote the SMS;
- Ensure that they and their staff comply with the SMS processes and procedures;
- Ensure resources are made available to achieve the outcomes of the SMS; and
- Continually monitor their area of responsibility, as outlined in the SMS Manual.

4. Managers shall ensure that sufficient resources are made available to achieve the outcomes of the SMS.

5. Depending on the size and complexity of operations, additional safety accountabilities may be explicitly defined for other senior managers. For example:

- General Manager/Chief Operating Officer;
- Head of Ground Services;
- Head of Cabin Safety;
- Head of Operations; and/or
- Head of ATC Service Provider.
- Head of Airport Ground Operations.
- Head of Fuel Farm Operations

6. As the manager responsible for the SMS, the SM will need to work with the management team to meet the objectives of the SMS. The structure of the organization needs to be documented so that everyone understands their role and responsibilities. The SM is responsible to the Accountable Manager, who is ultimately accountable for the operation of the SMS. When formalizing the organization structure, it is important to remember that the SM needs direct access to the Accountable Manager.

7. To demonstrate their ongoing support for the SMS, program managers shall:

- Ensure due processes and procedures needed for safe operations are in place;
- Ensure sufficient resources are in place to support the SMS; and
- Continually monitor their areas of responsibility, as outlined in the SMS Manual.

### **3-6 APPOINTMENT OF KEY SAFETY PERSONNEL**

**1. Large Organizations** — A large organization may have a dedicated Safety Department, led by a Head of Safety Management. There would be scope within the department to appoint a deputy SM, and additional personnel as required.

**2. Medium Organizations** — A medium sized organization may have a separate SM, possibly with a small number of staff. There would be scope for one of the 'Safety Representatives' to be appointed as deputy when required. The Safety Representative could be a front line staff member.

### **3-7 SM- ROLES, RESPONSIBILITIES**

Depending on the size of the organization, the SM shall possess operational management experience and an adequate technical background to understand the systems that support operations.

Operational skills alone will not be sufficient. The SM shall have a sound understanding of safety management principles, typically acquired through formal training and practical experience.

1. Depending on the size of the organization, senior management shall appoint a SM who, irrespective of other duties, will have responsibilities and authority that includes:

- Ensuring that processes needed for the SMS are established implemented and maintained;
- Reporting to the Accountable Manager on the performance of the SMS and the areas where improvement is required; and
- Ensuring the promotion of awareness of safety requirements throughout the organization.

2. The SM shall be the catalyst to develop and mature the SMS over time, through engagement with the organization's executive; management at all levels; and operational staff.

3. The SM is responsible for accomplishing tasks and functions of the SMS. The role and responsibilities of the SM should be specified in the SMS Manual.

4. The SM reports directly to senior management. The SM may have staff to assist in the role.

5. The SM needs to be 'independent' from operational areas, and have the ability to report directly to the Accountable Manager. Formal reporting lines direct to the

Accountable Manager gives the SM the 'authority' to look across the organization from the safety perspective.

6. Where possible, the SM shall be assisted by safety representatives from each department or functional area.

7. The SM is not the sole person responsible for safety. Specific safety activities and functional or operational safety performance outcomes are the responsibility of the relevant operational or functional managers, and senior management shall not hold the SM accountable for line managers' responsibilities. The SM shall monitor all cross functional or departmental SMS activities to ensure their relevant integration. While the SM may be held accountable for the satisfactory administration and facilitation of the SMS itself, they shall not be held accountable for the safety performance of the organization — the Accountable Manager alone is accountable.

8. The SM responsibilities include, but are not limited to:

- Drafting the SMS Manual;
- Implementing, maintaining, reviewing and revision of the **SMS**;
- Regular evaluation, reviews and fine tuning of the safety program;
- Providing safety advice to management and staff;
- Providing timely advice and assistance on safety matters to managers, staff and contractors at all levels;
- Communicating with Heads of Departments on safety related issues;
- Promoting safety awareness and a positive safety culture;
- Liaison with the Civil Aviation Regulatory Body (CARC) and the National Safety Agencies on safety-related issues;
- Exchange of valuable lessons learned with other operators;
- Researching and sharing safety related information with other key safety personnel in the organization;
- If delegated by the Accountable Manager, chairing the safety committee/Safety Review Board;
- Incident and accident investigations;
- Managing immunity-based reporting systems (confidential reports);

- Monitoring the progress of safety reports and ensuring that hazards are addressed in a timely manner;
- Maintaining an appropriate reporting system to identify hazards, this includes the ongoing identification and management of hazards;
- Overseeing the reduction of hazards to ensure that they are As Low As Reasonably Possible (ALARP);
- Maintaining safety documentation;
- Ensuring SMS induction and recurrent training are conducted in accordance with the SMS Manual;
- Identifying ongoing safety training requirements to support the SMS program objectives;
- Overseeing the internal and external SMS audit programs;
- Emergency response planning; and
- Maintaining the Emergency Response Plan (ERP).

### **3-8 SM- QUALIFICATIONS**

#### **1. The SM's qualifications and attributes may include the following:**

- Operational management experience and have a technical background sufficient to understand the systems that support the organization.
- Sound knowledge of safety management principles and practices;
- Sound knowledge and understanding of HF;
- Good written and verbal communication skills;
- Well-developed interpersonal skills;
- Sound computer literacy;
- The ability to relate to all levels, both inside and outside the organization;
- Organizational ability;
- Capable of working unsupervised;
- Good analytical skills;

- Leadership skills and an authoritative approach;
- Worthy of respect among peers and management;
- Instructional qualifications and experience;
- Knowledge of documentation systems; and
- Good understanding of aviation operations.

## **2. Personal Traits**

Ideally, the SM shall possess qualities such as:

- Fairness;
- Assertiveness;
- Impartiality;
- Trustfulness;
- Integrity;
- Excellent communication skills; and
- Objective thinking.

The SM shall be a person who is approachable, convincing, who remains composed in adverse situations and above all is tenacious. Successful safety culture change related to SMS implementation takes time and ongoing commitment by the program manager.

If the SM lacks credibility, so will the SMS and the behavior and attitude of staff will tend to be negative.

## **3-9 SM-TRAINING**

The person selected as the SM will need to be familiar with most aspects of the organization, its activities and personnel. These requirements may be met in-house or from external courses, however, much of the SM's knowledge will be acquired by self-education.

Areas where SM may require formal training include:

- HF principles;

- Integration of HF into an SMS;
- Understanding the role of human performance in accident prevention and causation;
- Familiarization with different types of operations, routes, etc.;
- Development, implementation, operation and maintenance of an SMS;
- Accident and incident investigation;
- Crisis management and emergency response planning;
- Safety promotion;
- Communication skills;
- Computer skills such as word-processing, spreadsheets and database management; and
- Specialized training or familiarization with regard to the systems that support the organization core operations

### **3-10 Deputizing the SM**

Importantly, operators need to give due consideration to deputizing the SM's role during periods of absence or depending on the size and complexity of the organization.

### **3-11 SAFETY COMMITTEES**

#### **1. Safety Review Board (SRB)**

The Safety Review Board (SRB) is a high level committee which considers strategic safety functions. The board shall be chaired by the Accountable Manager and shall normally include the Senior Management of the organization. If required, directors of the organization shall be included in the SRB.

The SRB ensures that appropriate resources are allocated to achieve the established safety performance and gives strategic direction to the Safety Action Group (SAG).

The SRB monitors:

- (a) Safety performance against the safety policy and objectives;
- (b) Effectiveness of the SMS implementation plan;

- (c) Effectiveness of the safety oversight of sub-contracted organizations;
- (d) That necessary corrective or mitigating actions are being taken in a timely manner; and
- (e) Effectiveness of the auditing of the SMS.

## **2. Safety Action Group (SAG)**

The SAG reports to and takes strategic direction from the SRB. It comprises managers, supervisors and staff from operational areas. The Safety Manager may also be included in the SAG.

The safety action group:

- (a) Oversees operational safety;
- (b) Resolves identified risks;
- (c) Assesses the impact on safety of operational changes;
- (d) Implements corrective action plans; and
- (e) Ensures that corrective action is achieved within agreed timescales.

The safety action group reviews:

- (a) The effectiveness of previous safety recommendations; and
- (b) Safety promotion.

## **3-12 SMS IMPLEMENTATION PLAN**

1. The SMS implementation plan shall detail all aspects of the development and implementation of the SMS. It is expected that the SMS program will mature over time through a process of continuous improvement.

2. The implementation plan shall address all the areas covered in the SMS Manual with particular attention being given to safety strategy, safety objectives, safety management processes and activities, resource implications, training, safety promotion and time lines.

3. A planning group may be established to implement the plan, the planning group may be able to build upon existing strengths by reviewing the organization's current capabilities for safety management (including experience, knowledge, processes, procedures, resources, etc.). Shortcomings in safety management experience shall

be recognized and resources to assist in development and implementation of the SMS identified. Many operational units may already have internal procedures in place for the investigation of incidents, hazard identification, safety monitoring, etc. These shall be reviewed and perhaps modified for integration within the SMS. It is important that the organization re-use as many existing procedures as practicable, as there is no need to replace known and effective procedures and processes. By building on such an experience base, the development of an SMS will be less disruptive.

During this review process, the planning group shall also examine best industry practices for safety management by consulting with other organizations of similar size and mission.

4. An organization shall consider a phased approach to SMS implementation. A suggested approach is outlined in Table 1 below.

The Implementation Plan should start 6 months from effective date of this Guidance Material, or as per an agreed timetable with CARC.

### **3-13 GAP ANALYSIS AND PROJECT PLAN**

1. Organizations would need to conduct a gap analysis of their system(s) to determine which components and elements of a safety management system are currently in place, and which components or elements shall be added or modified to meet SMS as well as regulatory requirements. The review involves comparing the SMS components and elements against the existing systems in the organization.

2. A checklist may be used to account for each component and their respective sub-elements. The checklist can provide for a 'Yes' and 'No' response, in terms of the compliance of the existing system, to the SMS requirements. Remarks for partial compliance or deviations shall be made as well as actions required in order to meet the criteria. There shall be a column for annotating existing organization documentation where the requirement is addressed.

3. Once the gap analysis is complete and fully documented, the items identified as missing or deficient will form the basis of the SMS implementation plan. Organizations may format their implementation plan to suit their individual needs.

**TABLE 1: THE PHASED APPROACH TO SMS IMPLEMENTATION**

ELEMENTS	PHASE 1	PHASE 2	PHASE 3
<b>Safety Policy, Objectives and Planning</b>			
Management commitment and responsibility	x		
Safety accountabilities of managers	x		
Appointment of key safety personnel	x		
SMS implementation plan	x - (including gap analysis)		
Third party interface		x	
Coordination of the Emergency Response Plan		x	
Documentation	x		
<b>Safety Risk Management</b>			
Hazard identification process		Proactive/predictive hazard identification	
Risk assessment and mitigation process	Reactive	Proactive and predictive	
<b>Safety Assurance</b>			
Safety performance monitoring and measurement	Reactive – incident and accident investigation		
Internal safety investigation	x		
The management of change			x
Continuous improvement of the safety system			x
<b>Safety Promotion</b>			
Training and education	Key personnel	All safety critical personnel	All safety critical personnel
Safety communication		x	x

**3-14 THIRD PARTY INTERFACES – CONTRACTED ACTIVITIES**

1. The provision of services supporting organization operations often involves third party interfaces (service providers, contractors, suppliers).
2. Whether a large corporate contractor or small business, the contracting authority (e.g. an airline, an airport....etc) holds overall responsibility for the safety of services provided by the contractor. The contract with the third party should specify the safety standards to be met. The contracting authority then has the responsibility for ensuring that the contractor complies with the safety standards prescribed in the contract.
3. AN SMS shall ensure that the level of safety of an organization is not eroded by the inputs, services and supplies provided by external organizations.

4. The operator shall consider the third party's previous safety record and any regulatory breaches. In addition, the operator shall ensure that the third party understands the operator's SMS and their responsibilities relating to it. These factors shall be given equal weight with other considerations like price, quality and timely delivery.

5. As a general guideline, a third party contract shall include the following as a minimum standard:

- Any agreement for the provision of services shall be supported by a written contract prior to services commencing;
- All third party providers shall hold the appropriate qualifications/credentials or approvals for the work being outsourced;
- All third parties shall understand the operator's SMS, and their own responsibilities within the SMS program. The Operator must have a demonstrable process to assure themselves that the third party is aware of, and meeting these requirements;
- All third party organizations shall be able to demonstrate their ability to provide trained and competent staff.
- All written service level agreements shall contain a schedule of oversight to monitor the third party's performance on a regular basis;
- All agreements shall contain details on how any noted safety hazards and deficiencies will be addressed and the time frame for these actions (risk management process as outlined in this Publication); and
- Where a service being provided is conducted under a license or certificate approved by CARC, the written agreement shall contain a statement requiring the third party to advise the contracting organization of any regulatory action undertaken by CARC that may impact on the third party's ability to provide the required services.

### **3-15 THE EMERGENCY RESPONSE PLAN**

An Emergency Response Plan (ERP) shall be established that provides the actions to be taken by the organization or individuals in an emergency. The ERP shall be integrated into the SMS and reflect the size, nature and complexity of the activities performed by the organization.

The ERP shall ensure:

- (a) An orderly and efficient transition from normal to emergency operations;

- (b) Designation of emergency authority;
- (c) Assignment of emergency responsibilities;
- (d) Authorization by key personnel for actions contained in the plan;
- (e) Coordination of efforts to resolve the emergency; and
- (f) Safe continuation of operations or return to normal operations as soon as practicable.

The ERP shall set out the responsibilities, roles and actions for the various agencies and personnel involved in dealing with emergencies.

The ERP shall set out the responsibilities, roles and actions for the various agencies and personnel involved in dealing with emergencies.

An ERP shall take into account such considerations as:

- (a) Governing policies;
- (b) Organization;
- (c) Notifications;
- (d) Initial response;
- (e) Additional assistance;
- (f) Crisis Management Centre (CMC);
- (g) Records;
- (h) Accident site;
- (i) News media;
- (j) Formal investigations;
- (k) Family assistance;
- (l) Post-critical incident stress counseling; and
- (m) Post-occurrence review.

### **3-16 DOCUMENTATION – SMS MANUAL**

1. The component elements of the SMS manual shall incorporate the requirements covered throughout this Publication. It is an important management function to provide direction and guidance to managers and staff in an organization on how the organization intends to conduct its business based on safety management principles.

2. The primary function of the safety management documentation is to provide management with the ability to effectively communicate the organization's approach to safety to the whole organization. The following components and elements need to be documented:

- Safety policy, objectives and planning:
  - Management commitment and responsibility;
  - Safety accountabilities of managers;
  - Appointment of key safety personnel;
  - SMS implementation plan;
  - Third-party interfaces – contracted activities;
  - Coordination of the emergency response plan; and
  - Documentation.
- Safety risk management:
  - Hazard identification processes; and
  - Risk assessment and mitigation processes.
- Safety assurance:
  - Safety performance monitoring and measurement;
  - Internal safety investigations;
  - The management of change; and
  - Continuous improvement of the safety system.
- Safety training and promotion:
  - Training and education; and

- Safety promotion.

**3.** The documentation shall be written so that it reflects the intent and processes of the SMS. Thus, a change to the SMS will require an update of the SMS Manual.

**4.** To facilitate easy comprehension and application, the content of the SMS Manual shall be concisely written.

**5.** Any information that changes regularly shall be put into annexes/appendices. This includes, for example, names of personnel assigned specific safety responsibilities.

**6.** The amendment and distribution of SMS documentation needs to be controlled.

## CHAPTER 4- SAFETY RISK MANAGEMENT

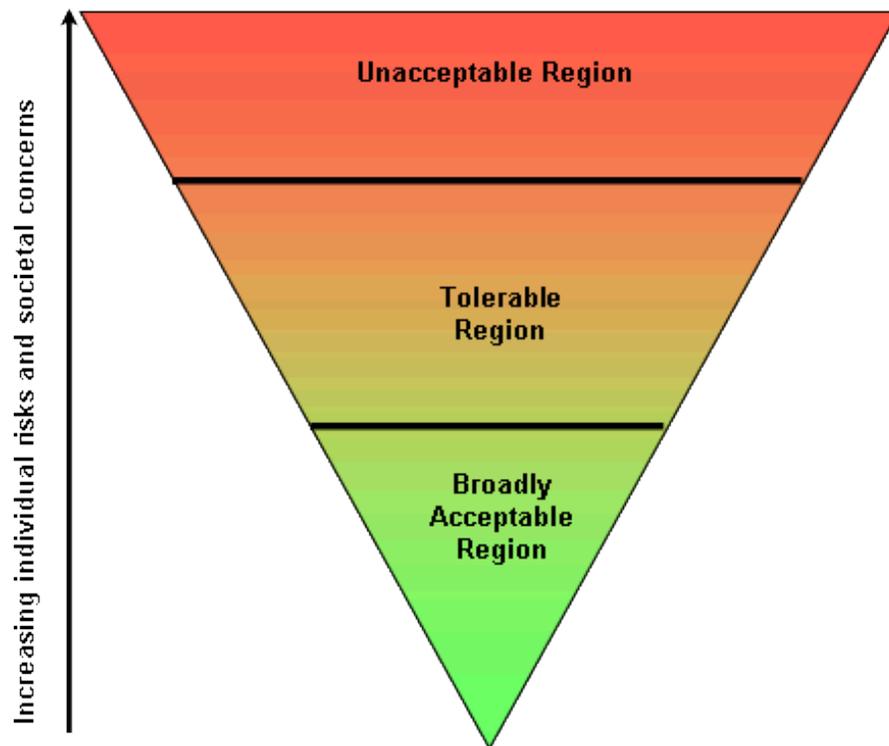
1. The Risk Management is defined as *'The culture, processes and structures that are directed toward realizing potential opportunities whilst managing adverse effects'*
2. The process of risk management involves establishing an appropriate infrastructure and culture and applying a logical and systematic method of establishing the context, identifying, analyzing, evaluating, treating, monitoring and communicating risks associated with any activity, function or process in a way that will enable organizations to minimize losses and maximize gains.
3. Risk management can be applied at many levels in an organization. It can be applied at the strategic level and operational levels.
4. In very broad terms, the objective of risk management is to eliminate risk where practical or reduce the risk (probability/consequence) to acceptable levels, and to manage the remaining risk so as to avoid or mitigate any possible undesirable outcome of the particular activity. It is therefore integral to the development and application of an effective SMS.
5. Organizations pursuing a pro-active strategy for safety risk management believe that the risk of accidents or incidents can be minimized by identifying vulnerabilities and by taking the necessary actions to reduce the risk of adverse consequences arising from them.
6. The specific design, integration and implementation of the safety risk management system will be influenced by, and dependent on, the requirements of the individual operator, its processes, policies, practices and SMS.

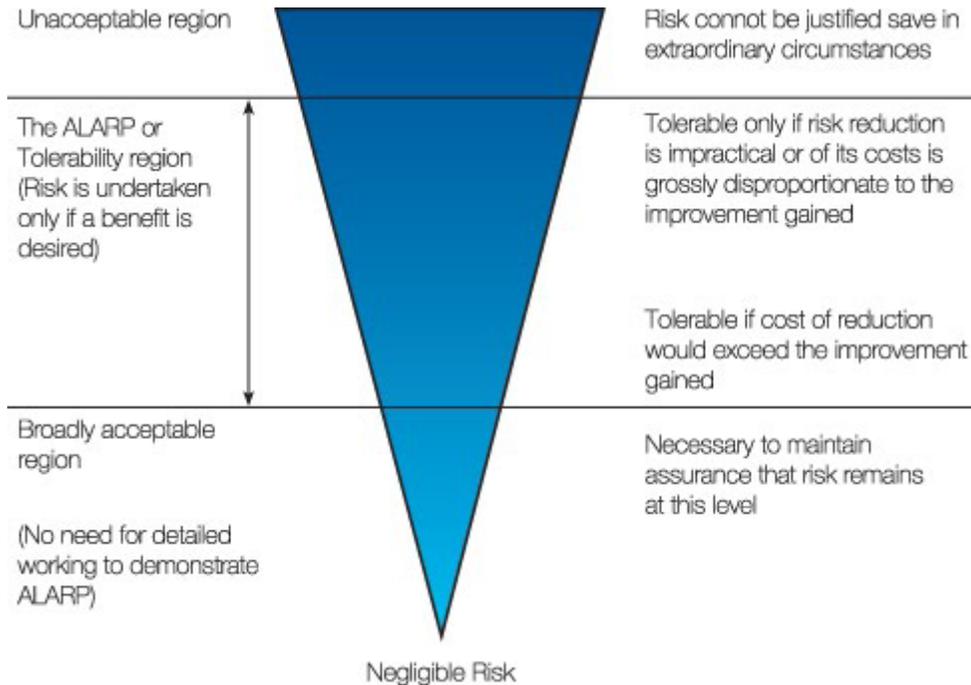
### 4.1 RISK CRITERIA AND THE CONCEPT OF 'ALARP'

1. Where risk is concerned, there is no such thing as absolute safety. Risk management systems are often premised on the concept of As Low As Reasonably Possible (ALARP). In doing so, there is an acceptance that not all risk can or shall be eliminated. There are practicable limits to which the aviation industry is able to go and the extent to which the industry and the community will pay to reduce adverse risks.
2. The principle of managing risk to a level that is ALARP is as follows:
  - There is an upper level of risk that is deemed to be intolerable. If a risk is found to be intolerable, risk reduction measures are essential, regardless of cost;

- There is a lower level of risk that is deemed to be broadly acceptable. At this risk level (and below), maintain current systems and monitor and review the risk. Further risk reduction may be made, but only if the cost is insignificant; and
  - The ALARP region lies between the upper and lower levels of risk. If risk falls into this region, it shall be reduced as much as is reasonably practicable.
3. In the ALARP region, risk reduction measures shall be identified and evaluated in terms of cost and possible risk benefit. Any risk falling within the ALARP range shall be assessed and reduced unless the cost of reducing the risk is grossly disproportionate to the benefit gained. This comparison may be a quantitative one, or based on qualitative arguments. Figure 2 and 3 illustrates “The ALARP principle “.

**FIGURE 2: THE ALARP PRINCIPLE**



**FIGURE 3: DETAILS OF ALARP PRINCIPLE**

4. The risk can only be said to be ALARP when it can be demonstrated that all justifiable risk reduction measures have been considered and the remaining mitigation strategies cannot be justified.

5. The ALARP principle operates in an environment of continuous improvement. Both the risks and the methods of control change and evolve over time and consequently require a continual reassessment as to which risk, and their respective treatments, are reasonable to sustain and which are not.

#### **4.2 HAZARD IDENTIFICATION PROCESSES**

1. Hazards can combine in unforeseeable ways, so that even apparently slight hazards can result in undesirable outcomes which may have catastrophic results.

2. Consequently the starting point for the whole safety risk management process shall be establishment of the context and hazard identification. A systematic and comprehensive hazard identification process is critical, because hazards not identified at this stage may be excluded from further risk analysis and treatment.

3. Hazards can be identified from a range of sources including, but not limited to:

- Brain-storming using experienced operational personnel;
- Development of risk scenarios;

- Trend analysis;
  - Feedback from training;
  - Flight data analysis programs;
  - Safety surveys and operational oversight safety audits;
  - Monitoring of normal operations;
  - State investigation of accidents and serious incidents; and
  - Information exchange systems (similar operators, regulators, etc.).
4. Over time, the 'database' of reported hazards enables the organization to:
- Identify 'hot spots' that need particular attention; and
  - Conduct trend analysis which can provide the basis for improvement of hazard identification.

#### **4-3 HAZARD AND OCCURRENCE REPORTING**

1. Every event is an opportunity to learn valuable safety lessons. The lessons will only be understood, however, if the event is analyzed so that all employees, including management, understand not only what happened, but also why it happened.

This involves looking beyond the event and investigating the contributing factors, the organization and HF within the organization that played a role in the event.

2. To enable analysis and organizational learning, the organization shall maintain procedures for the internal and external reporting and recording of incidents, hazards and other safety-related issues. The collection of timely, appropriate and accurate data will allow the organization to react to information received and apply the necessary corrective action to prevent a recurrence of the event.

#### **4-4 STATUTORY REPORTING REQUIREMENTS**

1. Organizations are required to meet statutory reporting requirements under the relevant Jordan Civil Aviation Regulations (JCARs) requirements. Reportable matters are categorized as Immediately Reportable Matters (IRM) and Routine Reportable Matters (RRM).

2. IRM and RRM are required to be reported to CARC. IRM and RRM are events relating to an organization's operations, and therefore need to be included in the organization's internal reporting system.

3. Reportable Matters can be entered into the organization's Internal Reporting System (IRS) database along with any other matters reported through the company's IRS (for example, hazards).

#### **4-5 KEY ELEMENTS – INTERNAL REPORTING SYSTEM**

1. An Internal Reporting System (IRS) is a method of gathering valuable safety information from the people who are probably aware of a range of hazards in an organization – the staff.

2. An organization's IRS shall encompass the following fundamental elements:

- Procedures for reporting occurrences (including IRM and RRM), hazards, or safety concerns;
- Methods for the collection, storage and distribution of data (hazard register or log);
- Procedures for analyzing data, safety reports and any other safety related information;
- Documentation of corrective action and risk reduction strategies;
- Determination of the effectiveness of corrective action; and
- Ongoing monitoring and review.

4. The IRS shall be accessible by all operational safety critical personnel and be user-friendly.

#### **4-6 Safety Surveys**

1. Safety surveys provide managers and staff the opportunity to respond to questions about various safety related matters. The results of such surveys can be analyzed to provide cost effective identification of hazards and safety concerns. Surveys may be conducted using electronic or paper-based checklists, questionnaires or interviews.

2. A Safety survey can be used to establish an organizational benchmark and then be re-used as a way of measuring improvement over a period of time.

3. When conducting safety surveys, the following points shall be considered:

- Affected managers and staff shall be told before the survey starts;
- Affected managers and staff shall receive an assurance of confidentiality regarding the information volunteered through the survey;
- Any perception of bias shall be avoided;
- Surveys shall not be used too often or they may start to be ignored;
- When conducting a survey interview, avoid criticism of the person being interviewed; and
- Hearsay and rumor need to be substantiated before being accepted.

#### **4-7 RISK MANAGEMENT AND MITIGATION PROCESS**

1. Safety Risk Management is a formal process that is used to:

- Identify hazards associated with an organization's operations;
- Analyze and assess the risks associated with those hazards;
- Implement controls, to prevent future accidents, incidents or occurrences.

The main elements of the risk management process, as illustrated in Figure 4, are as follows:

##### **(a) Communicate and consult**

Communicate and consult with internal and external stakeholders as appropriate at each stage of the risk management process and concerning the process as a whole.

##### **(b) Establish the context**

Establish the external, internal and risk management context in which the rest of the process will take place. Criteria against which risk will be evaluated shall be established and the structure of the analysis defined.

##### **(c) Identify risks**

Identify where, when, why and how events could prevent, degrade, and/or delay the achievement of safety objectives. Sometimes referred to as a Hazard Identification process, this encompasses a number of methodologies in identifying potential threats and past failures in order to determine the extent of the risks associated. Part of this process may include the establishment of a hazard log/register to ensure that

hazards are tracked and treated as part of a formal process of prioritization, documentation and assessment.

**(d) Analyze risks**

Determine consequences and likelihood of the event and therefore the level of risk. Identify and evaluate existing controls (measures in place that control the hazard or reduce the likelihood of occurrence or consequence). This analysis shall consider the range of potential consequences (both commercial and operational) and how these could occur. The determination may be the result of employing either qualitative, quantitative analysis techniques, or a combination of the two (semi-quantitative).

**(e) Evaluate risks**

Compare estimated levels of risk against the pre-established criteria of acceptability and consider the balance between potential benefits and adverse outcomes. This enables decisions to be made about the extent and nature of treatments required and about priorities.

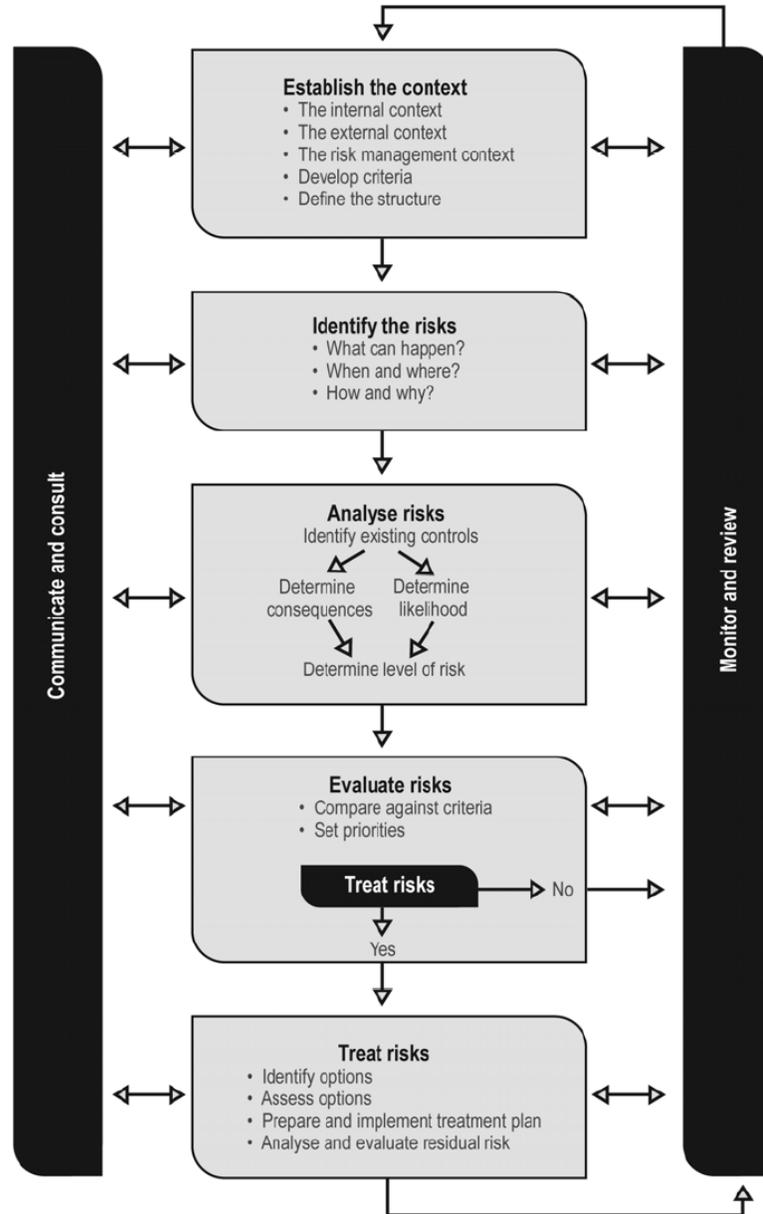
**(f) Treat/Mitigate risks**

Develop and implement specific cost-effective strategies and action plans for increasing potential benefits and reducing potential costs and losses.

**(g) Monitor and review**

It is necessary to monitor the effectiveness of all steps of the risk management process. This is important for continuous improvement. Risks and the effectiveness of treatment measures need to be monitored to ensure changing circumstances do not alter priorities.

2. A formal record of each stage of the risk management process shall be initiated and kept. Assumptions, methods, data sources, analyses, results and reasons for decisions shall all be documented.

**FIGURE 4: RISK MANAGEMENT PROCESS – OVERVIEW****4-8 HAZARD ANALYSIS AND RISK ASSESSMENT PROCESS**

Following the identification of a hazard a form of analysis is required to assess its potential for harm or damage. This involves three considerations;

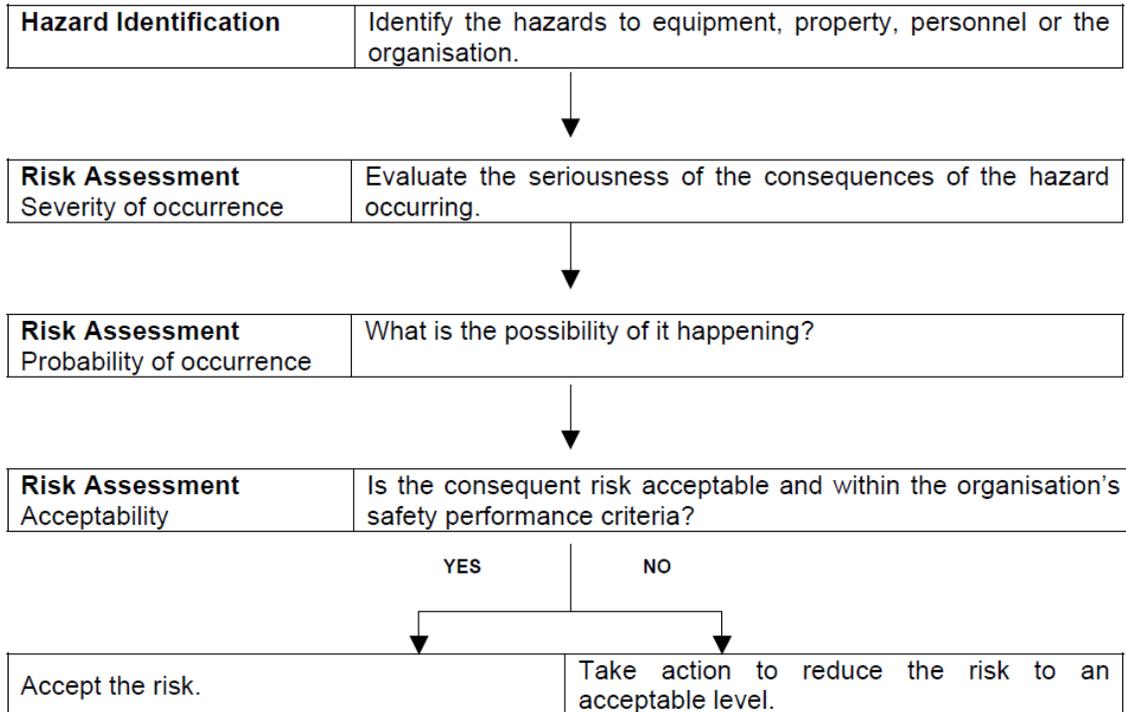
(a) Probability: The probability of the hazard causing adverse consequences.

- (b) Severity: The severity of the potential adverse consequences.
- (c) Exposure: The rate of exposure to the hazard.

Risk Assessment and Mitigation Processes analyze and eliminate or mitigate to an acceptable level risks that could threaten the capabilities of an organization

The hazard analysis and risk assessment process is shown in Figure 5 below:

**FIGURE 5: HAZARD ANALYSIS AND RISK ASSESSMENT PROCES**



A system shall be developed for assessing and analyzing the data collected or derived from the actions outlined above. Information provided by analysis shall be distributed to those with a responsibility for operational safety in the organization.

Confidential reporting systems shall be based on established human factors principles including an effective feedback process.

## Risk

Risk is the assessed potential for adverse consequences resulting from hazard if its potential to cause harm is realized. A hazard has the potential to cause harm, while risk is the likelihood of that harm being realized within a specific time-scale.

## Risk Assessment

Risk Assessment involves taking into account the probability and severity of any adverse consequences resulting from an identified hazard. Mathematical models may give credible results but typically these analyses are supplemented qualitatively by subjective critical and logical analysis of the inter-related facts. A Risk Matrix as shown in Figure 6 is useful for assessing hazard. While the severity of the consequences can be defined, the probability of occurrence may be more subjective, based on the maturity of the organization's operational activities. The assessment process shall be recorded at each stage to form a substantive record.

**FIGURE 6: RISK MATRIX**

**(Matrix A)**

**Risk probability**

<b>Probability of occurrences</b>		
<b>Qualitative definition</b>	<b>Meaning</b>	<b>Value</b>
Frequent	Likely to occur many times (Has occurred frequently)	<b>5</b>
Occasional	Likely to occur some times (Has occurred infrequently)	<b>4</b>
Remote	Unlikely, but possible to occur (Has occurred rarely)	<b>3</b>
Improbable	Very unlikely to occur (Not known has occurred)	<b>2</b>
Extremely improbable	Almost inconceivable that the event will occur	<b>1</b>

**(Matrix B)****Risk severity**

<b>Severity of occurrences</b>		
<b>Aviation definition</b>	<b>Meaning</b>	<b>Value</b>
Catastrophic	<ul style="list-style-type: none"> <li>• Equipment destroyed</li> <li>• Multiple deaths</li> </ul>	<b>A</b>
Hazardous	<ul style="list-style-type: none"> <li>• A large reduction in safety margins, physical distress or a workload such that the operators cannot be relied upon to perform their tasks accurately or completely</li> <li>• Serious injury or death to a number of people</li> <li>• Major equipment damage</li> </ul>	<b>B</b>
Major	<ul style="list-style-type: none"> <li>• A significant reduction in safety margins, a reduction in the ability of the operators to cope with adverse operating conditions as a result of increase in workload, or as a result of conditions impairing their efficiency</li> <li>• Serious incident</li> <li>• Injury to persons</li> </ul>	<b>C</b>
Minor	<ul style="list-style-type: none"> <li>• Nuisance</li> <li>• Operating limitations</li> <li>• Use of emergency procedures</li> <li>• Minor incident</li> </ul>	<b>D</b>
Negligible	<ul style="list-style-type: none"> <li>• Little consequences</li> </ul>	<b>E</b>

**(Matrix C)****Level of risk**

Risk probability	Risk severity				
	Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
5 – Frequent	5A	5B	5C	5D	5E
4 – Occasional	4A	4B	4C	4D	4E
3 – Remote	3A	3B	3C	3D	3E
2 – Improbable	2A	2B	2C	2D	2E
1 – Extremely improbable	1A	1B	1C	1D	1E

**(Matrix D) Level of risk tolerability**

Assessment risk index	Suggested criteria
5A,5B,5C,4A,4B,4C,3A	Unacceptable under the existing circumstances
5D,5E,4D,3B,3C,2A,2B	Risk control/mitigation requires management decision
4E,3D,2C,1A,1B	Acceptable after Review of the operation
3E,2D,2E,1C,1D,1E	Acceptable

## CHAPTER 5- SAFETY ASSURANCE

### 5-1 GENERAL

Safety assurance within the organization shall be monitored and reviewed by a range of formal safety review processes, initiated through senior management and the Safety Department/Safety Manager. This oversight can be used to confirm the effective functioning of the SMS as documented.

### 5-2 SYSTEMS TO ACHIEVE SAFETY OVERSIGHT

The following elements are desirable:

- A system for analyzing flight recorder data for the purpose of monitoring organization operations and for detecting unreported safety events;
- An organization-wide system for the capture of written safety event/issue reports;
- A planned and comprehensive safety audit review system which has the flexibility to focus on specific safety concerns as they arise;
- A published system for the conduct of internal safety investigations, the implementation of remedial actions, and the communication of such information;
- Systems for effective use of safety data for performance analysis and for monitoring organizational change as part of the risk management process;
- Arrangements for ongoing safety promotion based on the measured internal safety performance and assimilation of experience of other operations;
- Periodic review of the continued effectiveness of the safety management system by an internal, independent body; and
- Line managers monitoring work in progress in all safety critical activities to confirm compliance with all regulatory requirements, organizational standards and local procedures.

### 5-3 SAFETY PERFORMANCE MONITORING AND MEASUREMENT

1. Safety management requires feedback on safety performance to complete the safety management cycle. Through feedback, system performance can be evaluated and any necessary changes effected. In addition, all stakeholders require an

indication of the level of safety within an organization for various reasons, for example:

- Staff may need confidence in their organization's ability to provide a safe working environment;
- Line management requires feedback on safety performance to assist in the allocation of resources between the often-conflicting goals of production and safety;
- Passengers are concerned with their own personal safety;
- Senior management seeks to protect the corporate image (and market share); and
- Shareholders wish to protect their investment.

2. The size and complexity of the organization will determine the best methods for establishing and maintaining an effective safety performance monitoring program. Organizations providing adequate safety oversight employ some or all of the following methods:

- By establishing an effective hazard and occurrence reporting system
- Their front-line supervisors maintain vigilance (from a safety perspective) by monitoring day-to-day activities;
- They regularly conduct inspections (formal or informal) of day-to-day activities in all safety-critical areas;
- They sample employees' views on safety (from both a general and a specific point of view) through safety surveys;
- They systematically review and follow up on all reports of identified safety issues;
- They systematically capture data which reflect actual day-to-day performance;
- They conduct macro-analyses of safety performance (safety studies);
- They follow a regular operational audit program (including both internally and externally conducted safety audits); and
- They communicate safety results to all affected personnel.

#### **5-4 INTERNAL SAFETY INVESTIGATION**

1. For every accident or serious incident, there will likely be hundreds of minor events or near-misses, many of which have the potential to become an accident. It is

important that all reported events/hazards be reviewed and a decision taken on which ones shall be investigated, and how thoroughly.

2. The Organizational Safety Policy/SMS Protocols would need to state that the purpose of internal investigations is to find systemic causes and implement corrective actions, **NOT** to apportion blame to individuals. Where a 'Just Culture' policy is in place, the Policy and Protocols for internal investigations shall clearly reference such policy.

### **5-5 INVESTIGATION MANAGEMENT**

1. Where the CARC conducts an investigation into an organization event, the SM, or delegate, would act as the organization's point of contact/coordinator for the investigation. This way the SM will be kept informed as the investigation progresses.

2. Resources are normally limited, thus the effort expended shall be proportional to the perceived benefit in terms of potential for identifying systemic hazards and risks to the organization

3. The accountability for the management of internal safety investigations shall be documented in the organization's SMS specifically to determine:

- The scope of the investigation;
- The composition of the investigation team including specialist assistance if required;
- That the investigation outcomes are recorded for follow-up trend analysis; and
- That there is a timeframe for completion.

4. The accountable person in charge of the investigation shall have the authority to:

- Interview any manager or staff member; and
- Access any company information source.

### **5-6 SCOPE OF SAFETY INVESTIGATIONS**

1. The extent of the investigation will depend on the actual and potential consequences of the event or hazard. This can be determined through an initial risk assessment. Reports that demonstrate a high potential shall be investigated in greater depth than those with low potential.

2. The investigative process shall be comprehensive and shall attempt to address the factors that contributed to the event, rather than simply focusing on the event

itself – the active failure. Active failures are the actions that took place immediately prior to the event and have a direct impact on the safety of the system because of the immediacy of their adverse effects. They are not, however, the root causes of the event; applying corrective actions to these issues may not address the real cause of the problem. A more detailed analysis is required to establish the organizational factors that contributed to the event.

## **5-7 THE MANAGEMENT OF CHANGE**

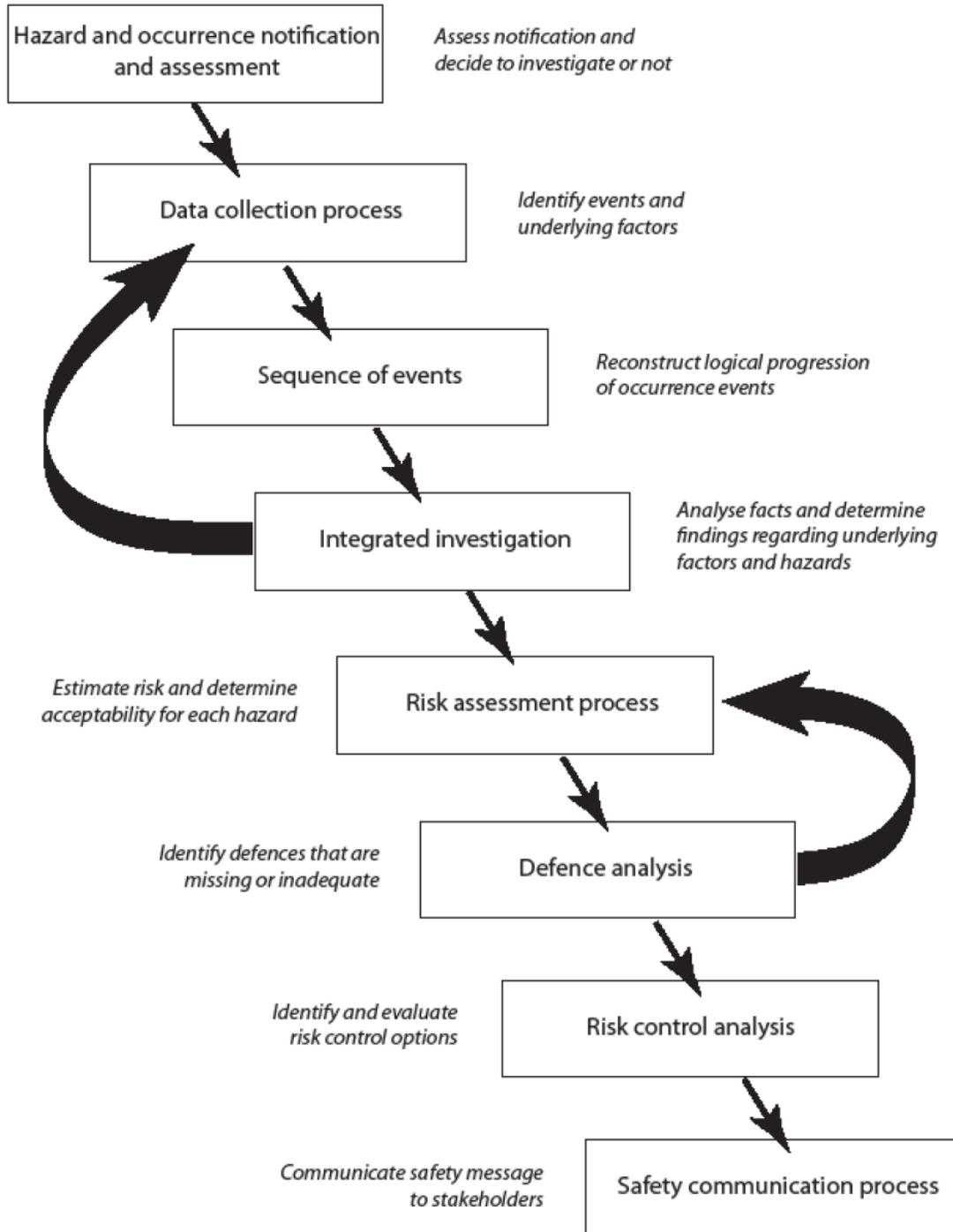
1. Changes within an organization can result in the creation of hazards which can impact on safety. In the main, changes are made to meet business demands, and organizations need the flexibility to meet those requirements. However, whilst the changes need to be made effectively and efficiently, the main focus needs to be on implementing the changes safely.

2. The organization shall identify the changes likely to occur in the business which would have a noticeable impact on:

- Resources – material and human;
- Management direction – processes, procedures, training; and
- Management control.

**FIGURE 7: INTEGRATED SAFETY INVESTIGATION METHODOLOGY**

***Internal Safety Investigation Process***



3. Change may create the potential for adverse safety outcomes. Typical areas that would require the application of change management procedures include:

- New schedule(s);
- New port(s);
- New type(s) of operation;
- Addition of a new equipment type;
- Addition of extra equipment of the same or similar type;
- Introduction of new equipment and/or operational procedures;
- Change in key personnel; and
- Restructure of operational department(s).

4. The operator's SMS documentation shall identify those changes that necessitate formal risk management processes, including HF issues.

### **5-8 CONTINUOUS IMPROVEMENT OF THE SAFETY SYSTEM**

1. Continuous improvement of the safety system requires management of two major components:

- Maintenance – the objective of which is to maintain current technological, managerial, and operating standards, and
- Improvement – This is aimed at improving current standards.

2. Under the maintenance function, the SM shall first establish a SMS that includes policies, rules, directives and standard operating procedures (SOPs) and then work towards ensuring that everybody follows SOPs. To achieve this, a combination of discipline and human resource development measures need to be employed.

3. Under the improvement function, management will be required to work continuously towards revising the current processes, in response to changing needs, operational environment or standards.

### **5-9 MANAGEMENT REVIEW**

1. Formal management reviews of the SMS shall occur on a regular basis. Ideally, there would be a quarterly high level review process via the Safety Committee/CARC to ensure:

- That the SMS continues to meet its core safety objectives;
- Safety performance is monitored against objectives; and
- Identified hazards are addressed in a timely and appropriate manner.

**2.** Following the formal management review, there shall be a periodic SAG review process at line management level to include, for example:

- Monitoring and reporting on safety management activities by SAG/Safety Committee;
- Measuring and reporting on safety management performance;
- Reporting on change management issues;
- Reporting on resource issues; and
- Reporting on safety training performance.

*Note: For less complex organizations, this could be combined into a single process.*

**3.** A safety review validates the SMS, confirming not only that people were doing what they were supposed to be doing, but also that their collective efforts have achieved the organization's safety objectives. Through regular review and evaluation, management can pursue continuous improvements in safety management and ensure that the SMS remains effective and relevant to the organization's operation.

**4.** Based on the SMS review, recommendations could include:

- Changed SMS objectives;
- Changed safety goals/targets;
- Improved SMS processes/procedures; and/or
- An implementation plan for improvement changes.

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## CHAPTER 6- SAFETY TRAINING AND PROMOTION

### 6-1 TRAINING AND EDUCATION

1. The key function of safety management training is to create awareness of the objectives of the SMS of the organization and the importance of developing a positive safety culture.
2. The SMS training shall focus on both the identification and reduction of hazards in the system, and the importance of the human component in achieving this.

### 6-2 TRAINING REQUIREMENTS

1. As part of the implementation of training in SMS, a Training Needs Analysis (TNA) shall be undertaken for all operational safety critical personnel in the organization.
2. Depending on the nature of the task, the complexity of safety management training required will vary from:
  - Safety management awareness training for all staff;
  - Training aimed at management's safety responsibilities;
  - Specific training for operational staff depending on organization's core business; and
  - Detailed training for safety specialists (such as the Safety Manager, Safety Representatives).

### 6-3 TRAINING DOCUMENTATION

1. Documentation shall be developed to support the SMS training plan, which includes:
  - A listing of the personnel (staff and third party personnel) who require SMS training;
  - A means of determining when each staff member is due to undergo a specific safety training course;
  - A method of determining the training provided to each member of staff;
  - Safety induction course/s for staff who have not previously been exposed to an SMS;
  - Recurrent safety course/s for all operational safety critical personnel; and

- A means of determining the effectiveness of the safety training provided. e.g. feedback questionnaire.

2. An SMS training register which incorporates individual training records shall be established and maintained. This may be incorporated in a centralized training record system.

#### **6-4 INITIAL SAFETY TRAINING – ALL STAFF**

1. All staff shall receive an appropriate induction course covering, for example:

- HF elements supporting SMS;
- Basic principles of safety management;
- Corporate safety philosophy, safety policies and safety standards (including corporate approach to disciplinary action versus safety issues, integrated nature of safety management, risk management decision-making, safety culture, expected behaviors etc.);
- Importance of complying with the safety policy and with the procedures that form part of the SMS;
- Organization, roles and responsibilities of staff in relation to safety;
- Corporate safety record, including areas of systemic weakness;
- Corporate safety goals and objectives;
- Corporate safety management programs (e.g. IRS, Internal Audit Program, LOSA, etc);
- Requirement for ongoing internal assessment of organizational safety performance (e.g. employee surveys, safety audits and assessments);
- Reporting reportable matters, hazardous events and potential hazards;
- Lines of communication for safety matters;
- Feedback and communication methods for the dissemination of safety information;
- Safety awards programs (if applicable); and
- Safety promotion and information dissemination.

#### **6-5 SAFETY TRAINING FOR MANAGEMENT**

It is essential that the management team understand the principles on which the SMS is based. Training shall ensure that managers and supervisors are familiar with:

- The principles of the SMS;
- Risk management process;
- Their responsibilities and accountabilities for safety; and
- Their legal liabilities.

### **6-6 SPECIALIST SAFETY TRAINING**

1. A number of safety-related tasks require specially trained personnel. These tasks include:

- Investigating safety events;
- Monitoring safety performance;
- Conducting risk assessments;
- Managing safety databases; and
- Performing safety audits.

2. It is important that staff performing these tasks receive adequate training in the special methods and techniques involved. Depending on the depth of training required and the level of existing expertise in safety management within the organization, it may be necessary to obtain assistance from external specialists in order to provide this training.

### **6-7 TRAINING FOR THE SAFETY MANAGER**

1. The person selected as the SM needs to be familiar with most aspects of the organization, its activities, its management and staff.

2. Areas where the SM may require formal training include:

- Familiarization with different types of operations in the organization.;
- Understanding the role of human performance in accident causation and prevention;
- Operation of the SMS;

- Investigation of reportable matters and hazardous events;
- Crisis management and emergency response planning;
- Safety promotion;
- Communication skills;
- Computer skills such as word-processing, spreadsheets and database management; and
- Specialized training or familiarization as required in specific fields based on organization core business and its operation.

### **6-8 SAFETY TRAINING FOR OPERATIONAL SAFETY CRITICAL PERSONNEL**

In addition to the corporate induction training outlined above, staff engaged directly in operations require more specific safety training in relation to:

- Procedures for reporting reportable matters;
- Procedures for hazard reporting;
- Specific safety initiatives;
- Seasonal safety hazards and procedures (weather-related operations, etc.); and
- Emergency procedures.

### **6-9 DELIVERY METHODS**

1. The SM, in consultation with the training manager shall determine the best method of delivery that fits the training requirements considering the size and complexity of the organization.

2. Supporting education material could be delivered via:

- An intranet system;
- An internal document circulation system;
- A safety library (centrally located);
- Summaries (probably by the SM) notifying staff of the receipt of such information; and/or
- A range of available safety posters strategically situated in workplace areas.

**6-10 SAFETY PROMOTION AND COMMUNICATION**

An ongoing program of safety promotion and communication shall ensure that the organization's staff benefit from safety lessons learned and continue to understand the organization's SMS. Safety promotion is linked closely with safety training and the dissemination of safety information. It refers to those activities which the organization carries out in order to ensure that their staff understands:

- Why SMS procedures are in place;
- What safety management means; and
- Why particular safety actions are taken, etc.

**6-11 SAFETY PROMOTION AND SAFETY CULTURE**

1. Safety promotion provides a mechanism through which lessons learned from safety event investigations and other safety related activities are made available to all affected staff. It also provides a means of encouraging the development of a positive safety culture and ensuring that, once established, the safety culture is maintained.

2. While it is important that personnel are kept well informed, they shall see evidence of the commitment of management to safety. The attitudes and actions of management will therefore be a significant factor in the promotion of safe work practices and the development of a positive safety culture.

3. Safety promotion activities are the primary means by which safety issues are communicated within the organization. These issues may be addressed through staff training programs or less formal mechanisms.

4. In order to propose solutions to actual or potential operational safety issues, staff shall be aware of the existing hazards identified and the corrective actions that have already been implemented. The safety promotion activities and training programs shall therefore:

- Address the rationale behind the introduction of new procedures; and
- Ensure the main focus is on 'what is going on within the organization'.

5. If a safety message is to be learned and retained, the recipient first has to be positively motivated. Unless this is achieved, much well-intended effort will be wasted. Propaganda which merely tells people to avoid making errors, to take more care, etc. is largely ineffective as it does not provide anything substantial to which

individuals can relate. This approach has sometimes been described as the 'bumper sticker' approach to safety.

**6.** Safety topics shall be selected for promotional campaigns based on their potential to control and reduce losses. Selection shall therefore be based on:

- The experience of past events or near misses;
- Hazards/potential hazards identified by hazard analysis; and
- Observations from routine internal safety audits.

**7.** The SM/Department Managers/Safety Representatives shall be involved in encouraging staff to submit suggestions for promotional campaigns.

## **6-12 METHODS OF DISSEMINATION**

**1.** The target audience, (employees) tend to be a 'critical audience', therefore the dissemination of information needs to be done well otherwise it will not be effective. All methods of dissemination – the spoken and written word, posters, videos, slide presentations, etc., require talent, skill and experience to be effective.

**2.** Once a decision has been made to disseminate safety information, a number of important factors shall be considered, including:

**The audience:** The message needs to be expressed in terms and vernacular that reflect the knowledge and culture of the audience.

**The response:** What is expected to be accomplished?

**Media:** Consider which media is the most effective. For example, print, web, multimedia, etc.

**The style of presentation:** This may involve the use of humor, graphics, photography and other attention-getting techniques.

**3.** The organizational safety promotion program shall be based on several different communication methods for reasons of flexibility and cost. Typical methods available are:

**Spoken word:** Perhaps the most effective method, especially if supplemented with a visual presentation. However, it is also the most expensive method, consuming time and effort to assemble the audience, aids and equipment.

**Written word:** The most popular method because of speed and economy, the printed safety promotion material also competes for attention with considerable amounts of other printed material.

**Videos:** Videos while offering advantages of dynamic imagery and sound to reinforce particular safety messages efficiently, also have two main limitations: expense of production and the need for special equipment for viewing..

**Electronic media:** Use of the Internet offers significant potential for improvement in the promotion of safety, as even small companies can establish and maintain a website to disseminate safety information. This may also include an electronic newsletter (eNewsletter) or podcasting to distribute key safety messages in a timely manner. This medium may be particularly effective in communicating with younger generations.

### **6-13 THE ESSENCE OF SAFETY MANAGEMENT**

1. Safety should be actively managed from the very top of an organization. Safety management shall be seen as an integral strategic aspect of normal business management, recognizing the high priority attached by the organization to safety.

2. An organization's commitment to safety management is typically evidenced by the following:

- A demonstrable Board/CEO level of commitment to an effective formal Safety Management System shall exist;
- The safety contributions of staff shall be encouraged;
- Companies establishing an SMS need to take a pragmatic approach, building where possible on existing procedures and practices;
- A fully-fledged SMS is a formalized, organization-wide system. Established at the corporate level, the SMS then devolves out into the individual departments of the Organization. Flight Operations, Engineering and Maintenance, Ground Operations and all other departments whose activities contribute to the operator's safety performance will have their own processes and procedures under the umbrella of the corporate SMS;
- Where safety sensitive functions of the operator are outsourced (e.g. maintenance, ground handling), contractual agreements shall identify the need for an equivalent, auditable SMS in the supplier.

## **APPENDICES**

## APPENDIX 1- BENEFITS OF A SAFETY MANAGEMENT SYSTEM

### THE BENEFITS OF AN SMS

To improve on existing levels of aviation safety in the light of the continuing growth of the industry, additional measures are needed. One such measure is to encourage operators to develop and implement their own SMS that fits the size and complexity of their operation.

An SMS is as important to business survival of the organization as financial management. The implementation of an SMS shall lead to achievement of one of civil aviation's key goals; enhanced safety performance through the identification of hazards and reducing these hazards until they are ALARP. An effective SMS may produce the following benefits:

- Reduction in incidents and accidents (occurrences);
- Reduced direct and indirect costs;
- Safety recognition by the travelling public;
- Reduced insurance premiums; and
- Proof of diligence in the event of legal or regulatory safety investigations.

### SMS MAKE ECONOMIC SENSE

Few organizations can survive the economic consequences of a major accident. Hence, there is a strong economic and safety case for developing and implementing an SMS. There are typically three types of costs associated with an accident or incident: direct, indirect and industry/social costs.

#### DIRECT COSTS

There are obvious on-the-spot costs that are easily measured. They mostly relate to physical damage, and include things like rectifying, replacing or compensating for injuries, aircraft equipment and property damage.

#### INDIRECT COSTS

Indirect costs are usually higher than direct costs, but are sometimes not as obvious and are often delayed. Even a minor incident will incur a range of indirect costs.

Indirect costs include:

**Loss of business and damage to the reputation of the organization:** Many large organizations will not charter an aircraft from an operator with a questionable safety record or one without a documented SMS in place.

**Legal and damage claims:** While organizations can take out insurance for public liability, it is hard to cover the costs of lost time handling legal actions and damage claims.

An organization shall take action to protect its interests, and to do so will cost both time and money.

**Surplus spares, tools and training:** If organizations have a spares inventory and people trained for a one-of-a-kind aircraft that is involved in an accident, the spares and training become surplus overnight. In many cases, the sale value of the spares is below the purchase cost.

**Increased insurance premiums:** An accident may push organizations into a higher risk category for insurance purposes, and therefore could result in increased premiums. The implementation of an SMS could help an operator negotiate a lower premium.

**Loss of staff productivity:** If people injured in an accident at work are unable to perform their normal duties, under Australian law they shall still be paid. They will also need to be replaced in the short term – again a substantial cost in terms of wages (and possibly training) as well as management time.

**Aircraft recovery and clean-up:** This is often an uninsured cost and is usually met by the operator.

**Cost of internal investigations:** This is a cost borne by the operator and is uninsurable.

**Loss of use of equipment:** Loss of an aircraft that is not replaced immediately means that the operator will lose business or jeopardize existing contracts.

**Cost of short-term replacement equipment:** Short-term hire is usually far above the cost of operating organization-owned equipment.

Consider the potential savings by reducing these typically uninsured costs. The simplest way is not to have an occurrence in the first place.

## **UNDERSTANDING A SAFETY MANAGEMENT SYSTEM**

A SMS can be compared with a financial management system as a method of systematically managing a vital business function.

The features of a financial management system are well recognized:

- Financial targets are set;
- Budgets are prepared; and
- Levels of authority are established, etc.

The formalities associated with a financial management system include:

- ‘checks and balances’; and
- The whole system includes a monitoring element so that corrections can be made if performance falls short of set targets.

Financial management is central to an organization’s continued success and viability. The outputs from a financial management system are usually felt across the organization. Financial risks are still taken but financial control procedures shall ensure that there are no ‘business surprises’. If there are, it can be disastrous for a small organization. For the larger organization, unwelcome media attention usually follows an unexpected loss.

An aircraft accident is also ‘an unexpected loss’ and not one that any organization in the aviation industry wishes to suffer. It shall be apparent that the management of safety shall attract at least the same focus as that of finance. The adoption of an effective SMS will provide this focus.

**APPENDIX 2- THE MANAGEMENT SYSTEM**

