

GHANA CIVIL AVIATION AUTHORITY



SAFETY MANAGEMENT SYSTEMS

GUIDANCE MATERIAL

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GHANA CIVIL AVIATION AUTHORITY

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Safety Management Systems

What's in it for you?

**An introductory guide to aviation
Safety Management Systems suitable for:**

Aerial work operators
Charter Operators
Air Transport operators
Maintenance organization
Aerodromes

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Foreword

Ghana has so far enjoyed better aviation safety record as compared with her neighbours. However as the industry grows and Ghana becomes increasingly a hub for aviation in the sub-region the number of incident and accidents could rise. That is why we all need to examine how to improve aviation safety even further.

The Ghana Civil Aviation Regulation CAR part 6, 11, 14, 16 requires operators involved in Aerial Work, Charters and Air Transport as well as Maintenance Organisations and Aerodrome Operators to develop Safety Management Systems.

This manual contains guidance material developed by the Ghana Civil Aviation Authority as an ICAO requirement to assist operators customize and integrate Safety Management System into their own operations.

A Safety Management System can help the operator classify and manage risk to the safety of its operation, and provides a framework on which to build a sound business.

The benefits become apparent once a Safety Management System is integrated into the operation.

A safety Management System will help the operator:

- Market the Safety Standards of its operations.
- Guard against the direct and indirect costs of incidents and operations.
- Improve communication, morale and productivity.
- Meet the Legal responsibilities to manage safety.

It is a myth that Safety Management Systems are only suitable for large organizations like Airlines, Air Traffic Services and Airport Management Companies.

Smaller organizations actually have an advantage when it comes to incorporating a Safety Management System. This is true whether you are involved in flying, maintenance or aerodrome operations.

The smaller the operation, the easier it is to communicate and implement the changes required to run a successful system manage safety.

A Safety Management System is an investment with high return over the long term.

The use of the following terms in this manual have these meanings.

Definitions

Cost: Activities, both direct and indirect, involving any negative impact including money, time, labour, disruption, goodwill, political and intangible losses.

Hazard: A source of potential harm or a situation with a potential to cause loss.

Likelihood : Used as a qualitative description of probability or frequency,.

Monitor: To check, supervise, observe critically, or record the progress of an activity or system on a regular basis in order to identify change.

Probability: The likelihood of a specific outcome.

Risk: The chance of something happening that will have an impact upon objective. It is measured in terms of consequences and likelihood.

Risk analysis: A systematic use of available information to determine how often specified events may occur and the magnitude of their consequences.

Risk assessment: The overall process of risk analysis and risk evaluation.

Risk evaluation: The process used to determine risk management priorities by comparing the level of risk against predetermine standards, risk levels or other criteria.

Risk identification: The process of determining what can happen , why and how.

Risk level: The level of risk calculated as a function of likelihood and consequence.

Risk management: The culture, processes and structure that are directed towards the effective management of potential opportunities and adverse effects.

CHAPTER 1 GENERAL REVIEW

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1.0 GENERAL REVIEW

1.1 What is an SMS

A Safety Management System is an integrated set of work practices, beliefs and procedures for monitoring and improving the safety and health of all aspects of your operation. It recognises the potential for errors and establishes robust defenses to ensure that errors do not result in incidents or accidents.

Decades of research has shown that accidents and incidents can be traced to some form of human error. Errors can occur at the management level-in the development of policy and procedures-in the same way that errors can occur on the flight deck, the ramp, the hanger or the workshop.

A successful Safety Management Systems provides a systematic, explicit and comprehensive process for managing risks. As with all management systems, it involves goal setting, planning, documentation and the measuring of performance against goals.

Any successful Safety Management System is woven into the fabric of an organisation. It becomes part of the organisation's culture and the way people go about the their work.

Regardless of the size of the operation, all successful Safety Management Systems will include (but are not limited to) four key elements.

- Top-level management is committed to safety
- Systems are in place to ensure hazards are reported in a timely manner.
- Action is taken to management risks.
- The effects of safety actions are evaluated.

These four key elements are described in detail below.

A. Senior Management Commitment.

While safety management requires the involvement of staff at all levels of an organisation, without complete and visible commitment from the highest management levels, operational safety margins are eroded.

Through its attitudes and actions, top-level management influences are attitudes and actions of staff.

In effect, management defines the safety culture of an organisation and sets the safety standards of the operation. If management doesn't care about the safety, it's unlikely that safety will be a priority for staff.

If, on the other hand, management does care about safety, and is seen by staff to take safety matters seriously, the Safety Management System is likely to be successful.

Visible senior management commitment can take a variety of forms, such as:

- The appointment of a safety officer.
- Open communication about safety issues.
- Provision of adequate resources to address safety concerns.

B. Timely reporting Systems

It's been estimated that for each major accident, there are as many as 360 incidents that, properly reported and investigated, might have identified an underlying problem in time to prevent the accident. Identifying the hazard is the first step to analyzing the risk.

Systems to encourage open reporting and communication include:

- Non-punitive, confidential hazard reporting systems
- Formal and informal meetings to discuss safety concerns.
- Feedback from management about action taken as a result of hazard reports or safety meetings.

C. Action taken to manage risks.

Once hazards are identified, a system must be in place to determine logical approaches to counteract the risks to safe operations. Actions may be taken into achieve the following.

Eliminate the hazard completely: This is the most effective defence, but it sometimes not practical.

Change operational procedures to work around the risk: this may require rewriting some of operating procedures.

Communicate to people about risks associated with the hazard: This relies on an effective communication and reporting system within organisation.

The objective is to reduce or eliminate the probability that a particular risk will occur, or reduce the severity of its effects if it does.

D. The effect of Safety actions are evaluated.

The safety actions taken to manage risks impact on your operations. Evaluating the impact allows the operator see and communicate the benefits, or to take further remedial action.

Standard evaluation method includes the following.

Monitor and review: You should look at the short-and long-term impact of safety actions on operations, such as on-time tasks, performance of contracts and every day activities.

Audits and checklist: formal audits can be done internally or by an external provider. Use developed checklists derived from your safety objectives to determine the impact on operations.

Feedback: you should seek informal feedback about work standards and operational Safety from staff and customers.

1.1.1 Can Safety Management systems be used by small Operators?

Safety Management Systems can be implemented in any operations, regardless of size. In fact, there are significant advantages for smaller operators wanting to implement a Safety Management System.

The cost and effect required to set up a Safety Management System is lower in smaller operations. Because they employ fewer people, its much easier to create open lines of communication, a key component in any Safety Management System.

1.1.2 Is Safety Management the same as Quality Management?

Most operators are familiar with quality assurance, or quality management systems. It's reasonable to say that quality and Safety Management Systems have about 70 per cent in common.

They both have to be planned and managed, because neither quality nor safety happens by chance. Both depend upon measurement and monitoring, both involve every function, process and person. Both strive for continuous improvement.

However, there are important differences. Quality management was introduced in the 1960's when understanding of human and organisational psychology was less developed than today.

Safety management differs from quality management by focusing more on human and organisational factors because they dominate risks in all kinds of ways.

Safety management recognizes that human and organisational errors cannot be eliminated. Safety Management Systems set up processes to improve communication about hazards and errors and take actions to minimize risks.

1.1.3 How much does it cost to set up a Safety Management System?

A Safety Management Systems need not be expensive, though it does require the allocation of some resources and time.

If you are a small organisation, it may be possible to allocate the task of setting up and maintaining the Safety Management System to an existing employee. Larger organisation needs to hire a full-time Safety Manager.

They are likely to be small cost in record keeping and safety related literature. Given that the cost of even a minor aircraft accident is high, the cost of maintaining an effective Safety Management System is small.

1.2 BENEFITS OF AN SMS

Apart from the obvious safety benefits, a Safety Management System will help you

- Market the Safety Standards of your operations.
- Guard against the direct and indirect cost of incidents and accidents
- Improve communication, morale and productivity.

- Meet your legal responsibilities to manage safety.

1.2.1 Economic Benefits

Few organisations can survive the economic consequences of a major accident. Hence, is a strong economic case for pursuing an integrated Safety Management System. There are three of costs associated with an accident or incident: direct indirect and industry/social cost.

A. Direct costs

These are the 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, and aircraft equipment and property damage.

B. Indirect costs

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

Loss of business and damage of reputation of the organisation

Many large organisations will not charter an aircraft from an operator with a questionable safety record or one without a documented Safety Management System in place.

Legal and damage claims

While you can take out insurance for public liability, it is hard to cover the costs of lost time handling legal action and damages claims. You must take action to protect your interests and to do so will cost you time as well as money.

Surplus spares, tools and training

If you have spares inventory and people trained for a non-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.

Increase insurance premiums

An accident will push you into a higher risk category for insurance purposes, and therefore could result in increased premiums. The implementation of a Safety Management System could help you negotiate a lower premium.

Loss of staff productivity.

If people injured in an accident are unable to work, they must still be paid,. They will also need to be replaced in the short term. This again involves 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 has to be met by the operator.

Cost of internal investigation

This is a cost borne by the organisation 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 company owned equipment.

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

1.2.2 Improved Communication, Morale and Productivity

Successful Safety Management Systems are characterised by good communication between management and the rest of the organisation. This enhances safety and can lift morale and, in some cases, productivity.

As communication failures are commonly identified as a source of problems for organisations, having a focus for improving communication can only result in improved performance at all levels.

1.2.3 Marketing Advantages

There are significant marketing advantages in being seen as an organisation with high safety standards. A good safety reputation can contribute to profitability and repeat business.

Increasingly, aviation organisations are required to submit to an external safety audit when bidding for larger charter contracts. Because of improved safety practices operators with Safety Management Systems are more likely to perform well in an audit and be awarded the job.

1.2.4 Legal Responsibilities

Recent inquiries into commercial aviation have stressed the need for management to take responsibility for safety, and the need for the aviation industry and the regulator to do more to identify safety deficiencies and reduce the potential for accidents.

Clearly management can no longer remain legally “aloof” from the action of employees.

One proven way of improving safety and meeting legal requirements is for operators to take a leadership role in building Safety Management Systems designed to manage safety risks.

1.2.5 Regulatory Requirements

The civil Aviation Act requires that, holder of an Air Operator’s Certificate (AOC) must at all times take all reasonable steps to ensure that every activity covered by the AOC, and everything done in connection with such an activity is done with a reasonable degree of care and diligence.

1. If the holder is a body having legal personality, each of its directors must also take the steps specified in subsection (1)
2. It is evidence of a failure by a body and its directors to comply with this section if an act covered by this section is done without a reasonable degree of care and diligence mainly because of:
 - In adequate corporate management, control or supervision of the conduct of any of the body’s directors, servants or agents; or

- Failure to provide adequate systems for communicating relevant information to relevant people in the body.

A Safety Management System is an integrated set of work practice, beliefs and procedures for monitoring and improving the safety and health of all aspects of your organisation.

CHAPTER 2 ESTABLISHING A SAFETY MANAGEMENT SYSTEM

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2.0 ESTABLISHING A SAFETY MANAGEMENT SYSTEM

2.1 Introduction

There are many ways to integrate a Safety Management System into your operation. You may have some elements of a Safety Management System in place already.

You should plan to integrate a Safety Management System into your operation in a way that suits your particular operation.

Regardless of how you incorporate a system for managing safety, you should consider each of the 10 key steps which research has found to be essential to the success of Safety Management System.

The 10 basic steps to establishing a Safety Management System are:

1. Gain senior management commitment.
2. Set safety management policies and objectives.
3. Appoint a safety officer.
4. Set up a safety committee (usually only for large or complex organisation).
5. Establish a process to manage risks.
6. Set up a reporting system to record hazards, risks and actions taken.
7. Train and educate staff.
8. Audit your operation and investigate incidents and accidents.
9. Set up a system to control documentation and data.
10. Evaluate how the system is working.

Each step is briefly described in the following chapters. Putting these elements in place is the first stage in building a Safety Management System. However, they will only be effective if they are integrated seamlessly into your operation and organisation culture.

2.2 SENIOR MANAGEMENT COMMITMENT

2.2.1 Gain senior management commitment

While Safety management requires the involvement of all staff, without commitment from senior management, your Safety Management System will not be effective.

Regardless of size, complexity and type of operation, senior management must:

- Demonstrate commitment to safety and the Safety Management System
- Set the safety standards and policies for the operation.
- Encourage participation in safety management.
- Allocate sufficient resources to the Safety Management System
- Facilitate the flow of safety information.

What resources are required?

Good safety management is a state of mind, not an expensive add-on. It's about the mindset of everyone involved, rather than money.

When planning the implementation of your Safety Management System, you need to look at the resources available and those that you need to provide.

Resources required may include (but are not limited to):

- Time-for meetings, information gathering, planning and communication.
- Safety information.
- Expertise.
- Customized training
- Contingency plans for hazardous situations and events.

Often, time is the largest resource, particularly at the start of the process of implementing a Safety Management System.

Meetings will be required to establish roles and responsibilities. Time must also be taken to communicate the intention of the safety

management system to all employees. The time spend communicating policy and goals to staff will pay dividends in gaining commitment.

You can demonstrate management commitment to safety by providing available resources like safety-related literature, courses, seminars and crew resource management training.

One of the most important resources you need to devote to the operation of your Safety Management System is expertise. You will need to involve people from across your operation with the expertise to address safety related issues. Technical training may be required.

All staff should be training to understand the purpose of your Safety Management System and their role in applying it to the way you do business.

Significant resources-in time and expertise- will be needed to plan contingencies for hazardous situation events.

Once hazards start to be identified, senior management must be prepared to commit resources to address those hazards. If hazards are not properly addressed, enthusiasm for the Safety Management System will quickly wane.

Checklist.

Senior management is involved in-and committed to – the safety Management System.

Senior management has approved the organisations safety policy and operating safety standards.

The safety policy and standards are communicated to all staff, with visible endorsement by senior management.

Senior management has established an appropriate reporting chain for safety issues.

Senior management actively encourages participation in the Safety Management System.

2.3 POLICIES & OBJECTIVES

2.3.1 Set Safety Management Policies & Objectives

2.3.1.1 What are safety policies and objectives?

The purpose of developing safety management policies and objectives is to set out what your organisation is striving to achieve, and how it is to get there. This is communicated in a written document.

Safety policies set out you are trying to achieve through your Safety Management System.

Safety policies outline the methods and processes the organisation will use to achieve desired safety outcomes. They serve as clear indications of “the way we do business around here”. They are a tangible indication that senior management is committed to safety, and high safety performance from staff and managers.

Objectives set operational safety standards. They need to be specific, measurable, realistic and agreed with those who have to deliver them. Both short-and long-term objectives should be set and prioritized against business needs.

Who to write a Safety Policy.

The safety policy can be stand alone document or it can be incorporated in your operations manual. A copy of the policy should be located where it will be seen by staff.

Senior management should consult widely with staff when preparing the safety policy. Consultation ensures that the document is relevant to your ownership of the safety policy.

2.3.1.2 Effective policies are a commitment to action. They must:

- Contain the general intentions of management, the approach and objectives of your organisation.
- Cover the arrangement for implementing the policy.
- Become the criteria upon which the organisation bases its actions.
- Align with other operational policies, and are designed to secure commitment and involvement from all staff.

2.3.1.3 Your policy statement should clearly state:

- Senior management's commitment to the Safety Management System.
- The responsibilities and accountabilities for directors, managers and employees.
- How the organisation will achieve its safety objectives.
- The safety outcomes expected of staff, managers and contractors

It should be signed by the most senior person in your organisation, usually the owner, Chief Executive Officer or Board of Directors or Director-General. The key to effective policy implementation is good business planning.

2.3.1.4 How to write safety objectives.

Safety management objectives are outcome-based to meet the organisation's safety policies. For example, you may have an objective to reducing incidents in your workshop by 15per cent over the next 12 months. The purpose of communicating safety objectives is to foster a common understanding of what you want to achieve.

2.3.1.5 In writing your objectives consider the following:

- What are your performance standards to targets?
- Who is responsible?
- What are they responsible for?

Your safety policies should be reviewed periodically to ensure that it remains reflective of your safety objectives and relevant to your

operation. You should be able to measure performance against policy, objectives and plans.

Checklist

A safety policy has been developed by management and staff and signed by the Chief Executive Officer or board of Directors or Director-General.

The policies align with other operational policies.

The safety policy has been communicated to all staff.

The safety policy is reviewed periodically.

2.4 SAFETY OFFICER

2.4.1 Appoint a safety officer

The safety officer is the person within the organisation who is responsible for the day-to-day operation of the Safety Management System. Larger organisations may have a director or a safety manager.

Depending on the size of the organisation, the responsibilities of the safety officer may require a full-time appointment, or may be added to existing duties. In large organisations, the safety officer may require the assistance of other people.

The safety officer should have an open line of communication with the Chief Executive Officer. This ensures that safety reports and recommendations are afforded the proper level of attention, and that appropriate solutions are implemented in a timely manner. The safety officer must have the Chief Executive Officer's assurance that any safety issue can be raised without fear or retribution.

The safety officer should be technically competent in one or more of the functional areas of the company's operations. Regardless of technical expertise, the most effective safety officer is the person who is enthusiastic and interested in the task. If the job of safety officer is forced on someone who does not have a keen interest in safety, then it is

unlikely that others within the organisation will be encouraged to “buy in” to the Safety Management System.

2.4.1.1 The safety officer is responsible for:

- The maintenance, review and revision of the safety management program.
- Providing timely advice and assistance on safety matters to managers and staff at all levels.
- Maintaining an appropriate reporting system to identify hazards
- Monitoring the progress of safety reports and ensuring that hazards are addressed in a timely manner.
- Providing feedback about ongoing safety issues.
- Reporting incidents and accidents are required by legislation
- Distributing relevant and up-to-date safety information to staff and management.
- Identifying safety training requirements.

2.4.1.2 Organisational structure

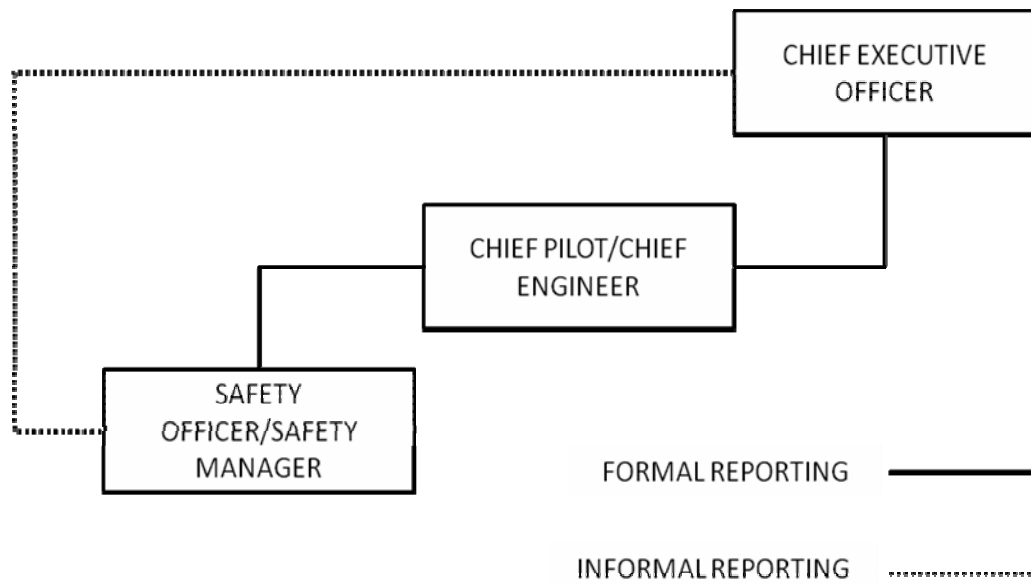
The appointment of a safety officer manager does not relieve the organisation’s key personnel from discharging their legal obligations.

The safety officer is appointed to administer the safety program. The responsibilities include the identification and reporting of safety hazards, but may not include operational authority.

The responsibilities and authority of the safety officer and other post holders must be clearly understood in order to prevent any conflict.

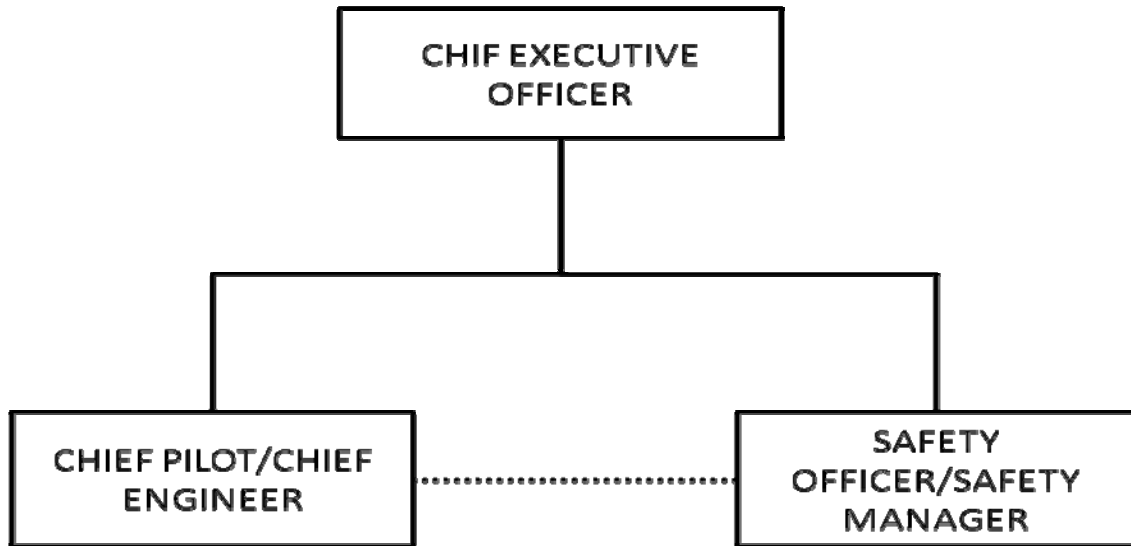
One solution might be to have the safety officer report to the chief pilot or chief engineer (figure 1) with an informal communication line to the Chief Executive Officer. A down side to this structure is the possible of inappropriate filtering of the information reaching the Chief Executive Officer.

Figure 1: Suggested reporting structure.



The preferred option is for the safety officer to report directly to the Chief Executive Officer (figure 2) with a formal communication line to the chief pilot and/or chief engineer. Ensure copies of all safety related information and reports are made available to key staff is required.

Figure 2: Preferred reporting structure.



Checklist

A safety officer has been appointed

The safety officer has an open line of communication with the Chief Executive Officer.

The roles and responsibilities of the safety are clearly defined and documented

Staff and management understand the roles of the safety officer.

2.5 SAFETY COMMITTEE

2.5.1 Set up a Safety committee (if required)

Depending on the size or nature of your operation, the safety officer may be assisted by a safety group or committee.

The safety committee can:

- Act as a source of expertise and advice.
- Review the progress of incidents/accidents, and the actions taken
- Review the status of hazard/risk reports and review the actions taken
- Make safety recommendations to address hazards
- Review internal audit reports
- Review and approve audit response and actions taken
- Encourage lateral thinking and creative solutions
- Help identify hazards and defenses
- Prepare and submit reports to the Chief Executive Officer for review.

2.5.1.1 Who should be on the safety committee?

The size of your operation will determine the make-up and number of members in your safety committee.

The committee must include:

- The safety officer
- A representative from senior management who has the authority to approve safety recommendations

It should also include at least one representative from each functional area.

For example:

- Flying operations
- Maintenance
- Ramp
- Cabin crew
- Check-in

2.5.1.2 Who should chair the safety committee?

The safety officer, a senior manager, or any other committee member may chair the meetings. The role of chairperson can be rotated.

Minutes of agenda.

Minutes: The minutes of all meetings should be recorded by a committee member, or someone dedicated to this task. The minutes should be provided to each member of the committee as soon as possible after the meeting. Copies of the minutes should be displayed, or made available by other means for the information of employees.

Agenda: A member of the committee, usually the safety officer, should be made responsible for drawing up the agenda. Adequate notice of items to be discussed should be given to the safety officer. The agenda should be distributed one week before the meeting.

A typical agenda might include some or all of the following items:

- Review outstanding issues from previous meetings
- Review safety action plans
- Review accident investigation reports
- Review the effectiveness of previous safety recommendations
- Notify members of committee activities
- Assess and resolve identified hazards
- Review safety audits and actions plans
- Monitor and promote safety involvement
- Carry out risk assessment on any new equipment, routes or procedures
- Plan and organise staff training
- Plan for the impact on safety of operational changes.

2.5.1.3 How often should the safety committee meet?

The frequency of committee meetings will be determined by the size of your organisation and the volume and severity of identified hazards.

Some safety committees will meet on a weekly basis, while others may only need to meet once every two months. Meetings should take place at least every three months.

An extraordinary meeting of the safety committee should be called if a serious safety issue requires urgent resolution. Alternatively, the safety officer may advise management of time critical problems and solutions.

2.5.1.4 Do you need a safety committee?

Depending on the size and complexity of your organisation you may not need a safety committee.

Small general aviation organisation: Smaller organisations with less than 20 staff may prefer to discuss and resolve safety matters in a more informal way. As long as there is good communication, and staff and management are willing to provide advice and assistance to the safety office, the Safety Management System should function without a formal safety committee.

Another option for smaller organisations is to pool resources with other operators in their region to form a combined safety committee. The sharing of safety information and expertise can benefit all concerned and need not be commercial sensitive.

2.5.1.5 Regular public transport and larger organisations:

In larger organisations (20 or more staff) or organisations with several operational centres, communications are often “filtered”. In these organisations, safety committees are vital to the operation of the Safety Management System.

Checklist

A safety committee has been established (if required)

The roles and responsibilities of the safety committee are clearly defined and documented.

Staff and management understand the roles of the safety committee.

The safety committee includes representation from across the organisation.

Minutes of the safety meetings are made available to all employees.

2.6 HAZARDS 7 RISK MANAGEMENT

2.6.1 Identify hazards and manage risks to your operation

2.6.1.1 What is a hazard?

A hazard is an event or situation that could result in damage or injury. The purpose of hazard identification is to allow organisations to assess their risk and determine effective approaches to reduce or eliminate them.

When identifying hazards, management and staff should consider all facets of the operation and identify any areas or situations that may compromise safety.

Hazard identification systems should be non-punitive, confidential simple and easy to use. You can use paper reporting forms, minutes from meetings, or a computer database to record hazards.

What is risk?

Risk is the chance that a hazard will result in damage or harm. It is measured in terms of consequences and likelihood.

There will always be risks involved in aviation operations. Some risks can be accepted, some can be eliminated, and others can be reduced to the point where they are acceptable.

Risk management is a decision making tool that allows you to continually improve safety performance.

2.6.1.2 Risk Management

2.6.1.3 The risk management process follows a logical sequence:

Establish the context.

Identify the hazards

Analyze the risk.

Evaluate the risk

Apply the defenses

Monitor and review defenses.

1. Establish the context

Establishing the risk management context is about defining the extent and depth of the project or activity you are going to examine.

It requires you to be familiar with all the elements of the project or activity and to decide what criteria you are evaluating the risk against. For example: operational needs, customer requirements or technical, financial or legal issues.

Establishing the context allows you to limit your process to something that is manageable, such as an activity or task.

2. Identify hazards

There are many ways to identify hazards. You could use:

Checklist

- Judgement based on previous experience
- Records and trend analysis.
- Brainstorming meetings with staff or customers
- Flow charts
- Systems analysis, which looks at gaps in how your system are working together
- Scenario analysis, which imagines possibilities for hazard and error.

Some of the methods of identifying hazards may need lateral thinking by people who are unencumbered by past ideas and experiences.

3. Analyze the risks

Risk analysis is the process of estimating the probability and consequences of each hazard to ensure the risk is understood and prioritised. Critically analyse the hazards and rank them, as far as possible, in order to their risk potential. A priority list will ensure that your resources are focused on the most threatening risks.

In analysing risk you must determine:

The probability of the hazard occurring

The consequences of the hazard occurring

Any risks with severe consequences and medium-to-high likelihood will obviously assume the highest priority.

4. Evaluate the risk

Once a hazard is identified and approximately ranked, evaluate the risk level. Your safety policy determines the responses to the levels of risk. You may decide to fix “low”

risks when possible, but those that rank 'likely' or above need immediate action.

How will you evaluate the risk?

Group discussions that include representatives with relevant expertise.

Research by the safety officer.

Information from other sources (staff, consultants, aircraft or engine manufacturers, safety publications, etc).

5. Apply the defenses

Each hazard and its defenses need to be critically examined to determine whether the risk is appropriately managed or controlled. Having identified the risk that may need to be resolved, there needs to be a strategy to:

- Eliminate the risk
- Reduce the level of risk, or the consequences or likelihood of that risk
- Avoid the risk.

If the risk can be resolved, the activity or task may continue. If not, then steps should be taken to improve the defenses or to remove or avoid the hazard. Assess the suitability of your existing defenses associated with each of the identified hazards. How effective are they? Do they minimize the likelihood or the consequences? And to what extent?

To establish the effectiveness of defenses, you should ask:

- Are staff aware of the defenses?
- Are they trained to use the defenses?
- Are there tools or equipment suitable for the anticipated risks?
- Do staff need authorisation to use the defense in an emergency?

In some instances, a range of solutions to hazard may be available.

For example:

- Re-designing solutions
- Changing standard operating procedures.
- Ongoing reviews of the activity or task.
- Recurrent training.
- Improved supervision.
- Contingency planning.
- Limit exposure to the risk.

6. Monitor and review defenses.

When any change is made, further risk management must be carried out to ensure the hazard is effectively controlled and the defence has not, in itself, created any new hazards.

Checklist

- Criteria are established for evaluating risk.
- A system is in place to identify hazards
- Relevant staff are involved in critically analyzing and ranking identified risks
- Defenses are set up to reduce, eliminate or avoid risks.
- Staffs are aware of the defenses, and have received training, where appropriate.
- Checks are in place to find out whether defenses are working.

Table1: Qualitative measures of consequences and likelihood.

Consequence Level	Descriptor	Description
1	Insignificant	No injuries, low financial loss
2	Minor	First aid treatment required, on site release immediately contained, medium financial loss.
3	Moderate	Medical treatment required, on site release contained with outside assistance, high financial loss.
4.	Major	Extensive injuries, loss of production capability, off release with no detrimental effect, major financial loss
5	Catastrophic	Death, toxic release off-site with detrimental effect, huge financial loss

Note: Measures used should reflect the needs and nature of the organisation and activity.

Likelihood Level	Descriptor	Description
A	Certain	Is expected to occur in most circumstances
B	Likely	Will probably occur at some time
C	Possible	Might could occur at some time

D Unlikely Could occur at some time

E Rare May occur only in exceptional circumstances.

Table 2: Matrix of consequence and likelihood

	Insignificant	Minor	Moderate	Major	Catastrophic
Likelihood	1	2	3	4	5
A (certain)	H	H	E	E	E
B (likely)	M	H	H	E	E
C (moderate)	L	M	H	E	E
D (unlikely)	L	L	M	H	E
E (rare)	L	L	M	H	H

Key

E: Extreme risk, immediate action required

H: High risk; senior management responsibility must be specified

M: Moderate risk; management responsibility must be specified.

L: Low risk; manage by routine procedures.

2.7 REPORTING SYSTEM

2.7.1 Set up a reporting system to record hazards, risks and action taken.

2.7.1.1 What is a reporting system?

A reporting system is a formal means of collecting, recording, acting on and providing feedback to staff about hazards and risks to your operation.

Reported risks are those that have been identified and can be managed. Unreported hazards and risks are difficult to identify and therefore to fix. In setting up your reporting system, consider Reason's illustration: "Breach of Safety Defenses" (see introduction)

Unreported hazards and risks, or employees choosing not to follow policy, or mistakes may not be independently significant. However, the frequency with which they occur could indicate whether there are gaps in your safety defenses.

When there are gaps in all of your safety system defenses, then there is a good chance accidents or incidents will occur. This is more likely when management and organisational weaknesses coincide with poor working conditions, poor communication and a poor safety culture.

It has been estimated that for each major accident, there are up to 360 incidents that, if reported and investigated, might have identified underlying problems in time to prevent the accident.

A systematic process for identifying hazards relies on an effective reporting system. Define how the reporting system will function, who will be involved in the system and what resources will be required.

For example:

Anyone from your organisation can submit a report. It will then be considered and the need for a solution will be decided in a timely manner.

2.7.1.2 What are the features of a good reporting system?

They key features of a good reporting system are:

- Identifying what is relevant
- Collecting current and applicable information
- A procedure for receiving and actioning reports
- A reliable method of accurately recording, storing, retrieving and maintaining safety reports.
- A procedure for distributing relevant or appropriate information to staff (and possibly contractors)
- Able to be audited.

Who should report hazards?

Hazards can be reported by staff, management customers or passengers and external contractors.

What hazards should be reported?

Any hazard which has the potential to cause damage or injury or which threatens business viability, should be reported.

For example:

- High workload during passenger boarding
- Poor communication with Air traffic Services
- Flight crew stress
- Failure to follow standard procedures
- Information overload from NOTAMs.
- In-flight ground traffic movement.
- Failure of passengers to listen to and follow instructions.
- Lack of LAME retraining.
- Poor communication within the maintenance department/contractor.
- Unreasonable time pressure on maintenance staff to complete safety critical tasks.
- Poor work continuity.
- Lack of up-to-date maintenance manuals
- Poor cross-checking.
- Lack of emergency equipment, procedures and training.
- Poor communication between operational areas.

- Flight crew rushing flight checks/inadequate checklist

2.7.1.3 How are the reports made?

Methods of uncovering hazards can range from informal interviews with staff about safety, to computer-base hazard and incident reporting systems.

Staff should feel willing to use the hazard reporting system and trained to access the forms. The forms may be paper or electronic. They may be kept in a file with a summary sheet, or entered onto a database or other tracking system.

All information should be accepted with the aim of fixing problems-not punishing people.

2.7.1.4 Hazard reporting methods.

Both formal and informal processes can be used to gather information from staff about hazards in your organisation including:

- Confidential hazard reporting
- Confidential surveys or questionnaires of staff.
- Informal communication
- Observations of work practice and work flow.

2.7.1.5 Confidential hazard report forms.

Confidential hazard report forms allow staff to report hazards without fear of retribution. A sample reporting form is included at Appendix B. In small operations, it may be difficult to conceal the identify of the person who submits the report. In this case it is vital that staff understand that any safety issue can be discussed without fear of reprisals.

Everyone in your organisation should be familiar with the reporting system that you have in place.

2.7.1.6 Confidential surveys or questionnaires

Confidential surveys or questionnaires can be used to get feedback from staff about specific areas of your operation.

The confidential survey or questionnaires encourages input or feedback about the way you do business. It may be used for many purposes, such as identifying hazards or risks before changes are made, introducing new procedures, or gauging the success of recent changes.

2.7.1.7 Informal Communication

One of the simplest, and most effective, ways of identifying hazards is to talk to staff. Informal communication can be established by having an “open door” policy which invites staff to express their concerns directly to managers. It can be a chat over a cup of coffee away from work tasks.

These may be initiated when the safety officer or a senior manager walks around the workplace and ask people if they are having any problems.

Your interest in the safety issues of staff demonstrates concern about safety. It sometimes elicits more honest and accurate information than formal channels

Observation of work practices and work flow

A critical review of specific work practices used in your operation can identify areas of hazard and risk that have been generally overlooked or taken for granted.

Standing back and making an overall observation of how well the work flow occurs in your operation is a process that can be used to identify bottlenecks and potential risks to your business. You should ensure that the right people in your organisation are involved in providing the solutions to the identified risks.

Often an independent person can give a new perspective on a reoccurring issue.

Other reporting methods

There are other methods you can use to identify safety deficiencies.

- For example:
- Small groups meet to identify hazards.
- A formal review of standards, procedures and systems.
- Internal and external safety audits/ assessments.
- Suggestion box.

It is important to be self critical, and honestly appraise all areas of your operation. Establishing discussion groups with staff and the managers is a good way to identify hazards. The purpose of group discussions is to identify those hazards that are most likely to cause injury, damage or loss. The number of participants will depend on the size of the organisation, however, participants should be considered the minimum.

Group discussions encourage staff to become actively involved in safety. Staff should be made aware that their contribution to the safety system is essential and that no staff member will be penalized for raising a safety issue.

Discussion groups have several main advantages. They can:

- Provide a current assessment of the organisation's safety performance
- Encourage staff to report safety problems or concerns.
- Encourage staff to participate in safety management.
- Reaffirm the organisation's commitment to safety.
- Make staff more aware of the safety implication in their job and the effect their actions have on others

Checklist

- All reports are recorded and investigated.
- A combination of formal and informal reporting processes is in place.
- Staff are aware they will not be penalized for submitting a report
- Confidentiality is protected.

- Staff who report hazard are given feedback
- After investigations, recommendations are made available to all staff.
- A system is in place to allow the safety officer to monitor the status of each identified hazard.

2.8 TRAINING & EDUCATION

2.8.1 Train and educate staff.

The commitment to provide both induction and ongoing refresher training and checking to all staff is an essential element of any Safety Management System.

Induction training should be conducted by the safety officer and customized to suit staff member's areas of specialty. It should include information about the Safety Management System, the safety officer, participate in the Safety Management System. Records of participating should be maintained.

Existing employees and new staff must be trained in the operation of the Safety Management System, and encouraged to adopt the safety practices of your organisation. Customizing training allows you to impress your operational practice of safe behaviour, risk management decision making quality control processes on all staff.

When you introduce new technology or equipment, or make changes to your operations, training should be provided. There are also regulatory requirements for specific training and checks, and ongoing technical training for your employees.

Evaluation of the training effectiveness can include review of staff abilities, knowledge of processes and practices used in the work place and any specific competencies that are required in your operation.

Keeping staff informed and educated about current safety issues through providing relevant, safety related literature, sending them to safety

related courses and seminars improves the safety health of your organisation.

Checklist

Staffs understand how the Safety Management System operates.

Staff are aware of the role they play in the Safety Management System is to improve safety-not to attribute blame.

All personnel attend induction and ongoing safety related training.

2.9 AUDIT & ASSESSMENT

2.9.1 Audit your operation and investigate incidents and accidents

2.9.1.1 What is an audit?

An audit is a methodological, planning review of your routine operational functions. Internal safety audits should be carried out as a routine part of your safety programme. Every part of the working system is critically examined to identify strengths, objectives and operating procedures with actual work practices.

All audit procedures should be well documented so that any deficiencies can be easily identified. The audit records and results need to be accurate, complete, reliable and accessible for comparison or trend analysis.

Any safety audit should include the activities of external contractors that influence the safety of your operation (e.g. Maintenance contractors, operators).

2.9.1.2 Who carries out an audit/ assessment?

Internal safety audits can be carried out by staff from within the area being looked at. Using staff from other areas of your operation is beneficial, it may yield different results as they are

less familiar with the intricacies of the daily tasks or working environment.

Larger organisations use a team approach, rather than individuals. Similar operators benefits by having the safety officer or staff member from another area do the audit.

The most likely people to conduct the audits are:

- Safety officer
- Representative of the safety group.
- An external safety consultant
- Quality/inspection department

2.9.1.3 How should the audit/assessment be carried out?

Depending on the nature and size of your organisation, audits may be carried out at regular intervals (bi-monthly) or prior to and following any changes to the operation. They should occur at least twice a year and should be part of the annual assessment plan for all functional areas. The audit may involve interviews with key staff, correlation of policies and work practices and observation of the working environment.

When conducting the audit consider:

- The timing of the audit
- The preparation required to conduct the audit
- Checklist are used and adhered to
- There is a comments section for items not included in the checklist.
- Confirmation of the findings.
- Reports are sent to appropriate line managers and the CEO.
- There is appropriate follow up.
- Staffs are advised of the results / findings.

Operation areas that may be audited included (but are not limited to):

- Maintenance arrangements.

- Physical work environment.
- Equipment safety
- Safe systems of work
- Emergency procedures

One trap when auditing is to limit the audit to the contents of your checklist. This can be avoided if audit documents are regularly updated and revised.

Staff doing the audit should be competent and familiar with the areas they are auditing.

A report of the audit finding is generally written and should be given to the Chief Executive Officer and key managers for actions.

Recommended actions may be phased according to the degree of risk that they pose and the relative cost of eliminating or controlling the hazards.

Small Organisation

It is necessary to continually update your knowledge of your operations and check to see if your operation is meeting its own safety standards. Are staff reporting hazards? If not, why? A safety assessment should be conducted at least annually.

Larger Organisation

The safety officer and the quality/inspection department (if applicable) are responsible for planning and conducting regular safety audits/assessment.

2.9.1.4 Each functional area should be audited at least annually.

What is an investigation and why do it?

An investigation is a detailed study of the circumstances surrounding an event.

When staffs submit an incident or accident report, the safety officer may investigate the situation leading up to the event, the causes of the event and the event itself.

The safety officer is also responsible for reporting any short term or long term effects the event may have on the safety of your business operations.

An investigation is usually completed following any incident or accident and may be conducted by a team of experts as well as those involved in your routine operations.

The safety officer may require specific training in how to conduct an investigation and prepare report for submission to the Chief Executive officer or external agencies.

The recommendations from the investigation may allow you to improve the safety system defenses of your operation and prevent the accident or incident occurring again.

Aspects of your operation that may be investigated includes (but are not limited to):

- Management and supervision procedures.
- Physical working conditions.
- Accident prevention strategies
- Safety information dissemination.
- Training for staff and contractors.
- Safety performance.
- Organisation safety standards and practices.
- Safety incident investigation and corrective actions.

Checklist

A system exists to audit whether the company is meeting regulatory requirements and its own safety standards.

Staffs are encouraged to submit hazard and share safety concerns.

Feedback is provided to those audited.

Investigations are carried out for hazard reports, accident and incidents.

2.10 DOCUMENTATION

2.10.1 Set up a system to control documentation and data.

Your Safety Management System should be documented. It should be tailored to the needs of your operation and the staff who will use it. The range and extent of the documentation depends on the complexity of the operation, the skills, training, competence and expertise of staff.

2.10.1.1 Documentation may be located in policy and procedures manuals and include:

- A policy statement by the Chief Executive Officer.
- The reporting chain and responsibility of the safety officer and safety committee.
- The organisation's hazards identification and risk management system.
- The safety communication pathways.
- The safety training program.
- Emergency and contingency planning
- Risk management methods.
- Audit schedules and investigation criteria
- Safety Management System evaluation procedures.
- Any other activities of the Safety Management System

Documentation needs to be accessible to those who need to use it, and may include online material, posters and videos.

A record should be kept of:

- All activities involving the identification and assessment of hazards and their defenses and any incidents that have occurred.
- Any reports issued or received.
- Any safety recommendations.
- Any management action.

The document control procedures need to be tailored to the needs of the organisation:

They need to cover:

- The location of current dated versions of documents
- The review period and who is authorised to change them
- What to do with obsolete documents
- The identification and storage of significant documents

Small Organisations

Smaller organisation may want to document their safety program as a dedicated manual or document.

Data control

Collecting information about the health of your business operations through flight and maintenance reports, safety reports, audits, checks and evaluation of your staff and your work practices generates a lot of data. This can be stored on paper or electronically.

Analysis of the data allows you to measure your progress towards your objectives and to make informed decisions about safety issues.

The management and control of this data may influence the quality of the analysis done on it. There are commercial available computer systems for processing and tracking data. The one you select should allow you to protect and back-up your data.

Ensure that you collect relevant data, rather than lots of interesting, but unrelated information.

Checklist

Your Safety Management System is documented.

Documents are accessible to those who must use them

Relevant safety data is kept.

2.11 EVALUATE HOW THE SYSTEM IS WORKING

The Chief Executive Officer/Director-General should ensure that the Safety Management System is properly reviewed and evaluated at regular intervals.

Both the chief Executive Officer/Director-General and the safety officer must ensure that the operation of the Safety Management System continues to improve.

The Chief Executive Officer/Director-General needs to ensure that the program is adequately resourced, supported by managers and continues to be effective in meeting the safety performance.

Staff should be given the opportunity to make recommendations.

Evaluate the safety, quality and risk management systems for:

- Passenger handling within terminals.
- Apron operations.
- Aircraft refueling
- Airside engineering.

Safety Management System begin with enthusiasm, however, once the initial interest has worn off, the system may begin to wind down

As components of the system are established, the emphasis shifts to maintaining and developing the system to ensure there are no gaps and to consolidate the safety culture.

If the number of safety reports reduces, it may not mean that you've reduced your hazards. It may be that there is something wrong with your system.

Talk to staff to find out why they aren't submitting reports.

Checklist

There is a plan to review the Safety Management System

Adequate resources have been allocated to the evaluation process.

Staff are involved in the evaluation of your Safety Management System.

CHAPTER 3 EVALUATING AN SMS

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- 3.5.10 Evaluation.

3.6 CHOOSING THE RIGHT PERSON

3.6.1 Internal evaluators

3.6.2 External evaluators.

3.7 AN INTEGRATED APPROACH

3.8 CONCLUSION

3.0 EVALUATING AN SMS

3.1 Introduction

This chapter outlines why you should evaluate , what evaluation is, when to perform it and provides guidance on tools to use. Evaluation is a set of techniques for monitoring and reviewing the adequacy of your safety management system. It helps you make decisions about safety controls in your organisation.

3.1 WHY EVALUATE

3.1.1 Direct Benefits:

Evaluation helps your determine.

- The cause factors leading to accidents or incidents.
- The sources of deficiencies in the SMS
- Areas that need improvement
- The effectiveness and applicability of procedures
- Areas of non-compliance with organisational operating procedures
- Areas of non-compliance with legal requirements
- Corrective action needed.

Evaluation answers the following questions:

- What are the outcomes of the safety management system?
- Are the objectives being achieved?
- Are there any shortcomings in the SMS?
- Is the SMS being implemented correctly?
- Have there been any positive or negative spin-offs?

3.1.2 Indirect Benefits

The indirect benefits of evaluation include the following:

Workplace relations

Positive safety evaluation results can enhance relations with staff by demonstrating that the organisation is acting to ensure their safety.

Marketing and public relations

You can use your evaluation results as a positive marketing and public relations tool to show customers you are working to prevent accidents and incidents.

Winning contracts

The demonstration of a successful safety management system could be the difference between winning and losing a business contract.

Insurance

A demonstrated reduction in accidents and incidents may deliver lower insurance premiums.

Industry Leadership

A good safety record will enhance your standing in the aviation industry, and encourage competitors to improve their standards to meet or exceed yours.

Freeing up funds for expansion

Accidents and incidents cost money, so reducing them release funds for business expansion.

3.2 WHAT TO EVALUATE

3.2.1 Evaluating Activities

Evaluation activities need to be built into an organisation's management practices, not added on. You must be clear on what information you need before you start evaluation.

Evaluation should cover the 10 steps of your safety management systems as they apply to each area of your operations including:

- Flying operations
- Maintenance
- Equipment
- Passenger handling
- Facilities, buildings
- Employee training
- Employee qualifications

- Manuals
- Defect reporting
- Record keeping

Evaluation should consider your product, people processes, services and contractors. These are integral to quality management. For example scheduling problems could turn into safety problems.

3.2.2 Product/Service:

- Did you run the correct number of scheduled flights?
- Were they flights on time?
- Did the flights meet the prescribed weight limits?
- Was maintenance performed on time?

3.2.3 People:

How did your staff perform in:

- Check in?
- Baggage handling?
- Cockpit or cabin?
- Maintenance?

3.2.4 Processes:

- Do your processes achieve the planned results?
- Is the correct number of steps in place?
- Is the process applicable?
- Is there any redundancy?

3.2.5 Services:

- Do your services live up to your planned objectives?
- Are they needed?
- Are they efficient and profitable?

3.2.6 Contractors:

External contractors may include maintenance organisations, persons accepting cargo on behalf of the operator and aerodrome operator personnel

Before employing a contractor, you need answers to the following questions:

- Does the contractor have a safety management system?
- Are you required to inspect the contractor's work premises? If so, how will you evaluate them?
- Are the contractors able to provide the services?

3.3 WHEN TO EVALUATE

3.3.1 Choosing the time

Evaluation of your business should take place regularly. It is an ongoing process and can be reviewed either at fixed intervals or as required. Audits and evaluation may take place annually, in sync with financial year. Safety audits may take place more frequently. Evaluation can be planned or performed as required.

Planned evaluation, or proactive evaluation, is performed before a task is undertaken, or in the planning phase of the task. It establishes the baseline data for future measurements, and can pinpoint gaps in your system. However, you can perform it more frequently, daily (through talks with staff), weekly (at staff meetings.), or monthly (at safety committee or management meetings.). You can also perform it before or after you make a change or at the end of a specific task.

Proactive evaluation measures:

- Changes in passenger loads on particular routes.
- Changes in the number of safety reports being submitted.
- The number of staff undertaking scheduled training
- Communication strategies.

Interactive evaluation draws information from staff to verify that corrective action were reviewed and effective. It should be carried out daily, often through informal talks with staff.

Reactive evaluation is performed after an event to identify shortcomings in your safety management system. It can be driven by external concerns, identified safety trends, or airworthiness directives from the regulatory authority.

3.4 HOW TO EVALUATE

3.4.1 Planning your evaluation program, consider what information you need and the resources available. The drivers for evaluation may be ongoing complaints, unmet needs to clients or customers, changes in regulations, or a need to check that your safety goals are being achieved.

a. when designing an evaluation program, consider:

- Purpose.
- Who the intended audience is.
- The kind of information you need.
- What sources you will use.
- How you will collect the information
- When the information is needed.
- The resources available to collect the information.

Hint: Draw a flow chat to reflect the purpose of evaluation, who will be involved and the expected costs and time scales.

b. Collecting the data

The methods you use to measure and assess your safety management system must be valid. They must produce results that are repeated and consistent with results obtained using other tools.

Ways of getting the information you need include:

- Observation
- Surveys and questionnaires
- Interviews Focus groups
- Complaint form or suggestion boxes
- Audits.

c. Observation

Observation, including informal site inspections, may highlight safety problems missed by other means of investigation.

Advantages:

Quick to perform

Can prompt fast follow up action.

Disadvantages:

Difficulty interpreting behaviour.

Difficulty in categorizing observations.

Observation can influence the behaviour of those being observed.

d. Surveys and Questionnaires.

Safety surveys or questionnaires provide an in-depth analysis of an activity.

They can be conducted on or distributed to:

- All staff
- Specific staff
- Customers

Advantages:

- Can be completed anonymously
- Cheap to administer
- Generates results that are easy to compare
- Can generate a large amount of data
- Can utilize proforma surveys and questionnaires

Disadvantages:

- May not draw considered feedback
- Wording can bias answers
- Are impersonal
- May require statistical sampling expertise.

- Responses may not give the full story.

e. Interviews

Formal and informal interviews are conducted one-to-one and are an important way of getting information. Interviews can be held with:

- Clients
- Staff
- Other service providers

The interviews can be structured, with all respondents asked the same questions, or tailored to the individual.

Advantages:

- Draws a full range and depth of information.
- Develop a relationship with respondents.
- Flexibility.

Disadvantages:

- Time consuming
- Difficult to analyse and compare
- Costly
- Interviewer can bias responses.

f. Focus groups

Focus groups bring six to eight workers together to discuss their workplace. Normally, an outside facilitator leads the discussion. This elicits candid comment, which goes to the evaluator in transcript in transcript for analysis.

Advantages:

- Quick and reliable pointer to common impressions
- Produces a wide range and depth of information.
- Convey key information about the organisation.

Disadvantages:

- Difficulties in analysing

- Requires a good facilitator
- Difficulties in getting six to eight people together at once.
- Pressure to answer questions without much time for thought.

g. Compliant forms or suggestion boxes

Suggestion boxes for workers or customers can be a useful source of information about the environment services or people within your organisation.

Advantages:

- Anonymous.
- Suggestions are often more honest
- Easy to administer.

Disadvantages:

- Open to abuse
- Contents must be monitored constantly.

h. Audits

An audit is a “microscopic” examination of every component of a total system.

Advantages:

- Provides clear direction.
- May be more objective
- Form part of a planned process.

Disadvantages:

- Consider requirements of standards only
- Limited perspective.

3.4.2 Data Presentation, Interpretation and Reporting

Electronic databases enable you to process data to analyse trends. They point to ways to eliminate or counter problems.

The easier ways to interpret your evaluation results is to represent them graphically as:

- Flow Chart.
- Pie charts
- Bar graphs
- Scatter diagrams
- Checklists

How you report your evaluation data depends on why you collect it, and your audience.

For example, was the evaluation done to upgrade your safety management system, to investigate an incident, or to demonstrate compliance with regulations?

In most cases, the data will be compiled and analysed in a report. Staff will then have the opportunity to review the information.

We suggest you present the report in the following format.

1. Title page.
2. Table of contents
3. Executive summary
4. Purpose of the report
5. Organisational background and what is being evaluated
 - a) Previous safety records (12 months)
 - b) Program description
 - i. Statement of the problem
 - ii. Overall goal.
 - iii. Outcomes
 - iv. Staffing
6. Overall evaluation goals.
7. Methodology
8. Interpretation and conclusion

9. Recommendations
10. Appendices

Action

If the evaluation data turn up a recurring operational problem, you will be able to use this information as a basis for change. Discuss the problem and recommended action with relevant staff and communicate decisions to everyone involved.

3.5 EVALUATING THE SMS 10 STEPS

3.5.1 Establish senior management commitment

Step1:

While safety management encourages the involvement of all staff, without commitment from senior management your safety system will not be effective. Management commitment is hard to measure, but evidence of it includes:

- Allocation of time to safety management
- Allocation of time for staff training
- Participating in staff training
- Provision of information and advice.
- Provision of adequate safety management resources
- Written safety policy objectives.
- Determination of Oh&S objectives and strategy
- Communication with staff on safety issues.
- Action to ensure staff know their responsibilities

Check:

Is management committed to the safety management programme?

3.5.2 Set Safety management policies and objectives.

Step 2:

The purpose of developing safety management policies and objectives is to set out what your organisation is striving to achieve and how it is going to get there.

Checklist:

Are there written aviation safety policies, signed by the CEO?

Are the policies and objectives workable, knowable and measurable?

3.5.3 Appoint a safety officer (if applicable)

Step 3

The safety officer's outcomes can be measured against the responsibilities of the job laid out in the organisation operations manual.

For example, one responsibility of the safety officer is to monitor the progress of safety reports and ensure that hazards are eliminated or minimized promptly.

Hint: To check that this has been done, you could track safety reports and follow-up action.

Evaluation should identify reasons why any report was not resolved, and point to ways of averting the problem. Reason could range from time constraints to a lack of resources.

Checklist:

Are safety reports being prepared promptly?

Are hazards being eliminated or reduced promptly?

Is the safety officer receiving enough support from the organisation?

Is the safety officer credible?

Is there a mechanism by which the safety officer can report to the CEO and make recommendations for change or action?

3.5.4 Set up a safety committee(if applicable)

Step 4:

The work of the safety committee should be evaluated against the functions and responsibilities set out in the organisation operations manual.

The percentage of reports actioned and the number of hazards identified or eliminated are examples of statistics you can use to evaluate the committee's performance.

Checklist:

Are hazards being eliminated or reduced?

Is there a mechanism by which the safety committee can report to the CEO and make recommendations for change or action?

3.5.5 Establish a process to manage risks

Step 5

Risk management focuses on identifying hazards, analysing the risks, ranking them according to their probability and likelihood, and setting priorities for action.

Checklist:

Is there an effective ongoing hazard identification program?

Is there a system to rank hazards by their risk potential and prioritise them for action?

Are the defenses against the hazards identified?

3.5.6 Set up a reporting system to record hazards, risks and actions taken.

Step 6

The reporting system is the easiest part of the safety management system to evaluate. You can sort your reports by type and compare them with the previous year's results to find out whether incident frequencies have changed.

Hint: If you use an electronic database to record and track your safety information and reports, it is easy to extract specific information and produce a graph or report for discussion.

Checklist:

Is there a reporting system for hazards and risks?

Does the reporting system cover contractors?

3.5.7 Train and educate staff

Step 7:

Training can be evaluated in several ways.

Keep records of staff annual training requirements, such as renewal of ratings, to ensure they are equipped with the latest information relevant to their tasks.

Hint: It is more efficient to resolve training inadequacies immediately, as they could compromise safety.

Keep records of

The type of training

The application of training to the workplace.

Monitor the skill level of staff required to undertake annual refresher courses

Checklist:

Is there a formal system to ensure all staff meet the minimum regulatory requirements for their job?

Is staff training, including annual renewal ratings, up to date?

3.5.8 Audit your organisation and investigate incidents and accidents

Step 8

Audits, often performed by outside agencies, are critical to evaluation. You need them to manage your business finance, and you will extract quality safety information from them. They follow a set format and are measured against specific rules or regulatory requirements.

Checklist:

Do your audit criteria match your operating procedures?

Have all incidents and accidents been investigated adequately?

3.5.9 Set up a system to control documentation and data

Step 9

Documentation is an auditable trail of action to minimize risk. It can provide evidence if you need to defend your actions.

Keep records of:

Hazard assessments

Safety report issued or received

Safety recommendations

Remedial actions.

Hint: measure the control of documentation against the document requirements laid out in your operations manual. Check documentation against the requirements within the safety management system. If evaluation prompts you to change the reporting or documentation systems, let your staff know.

Checklist:

Are files maintained and kept for the prescribed length of time?

Are records of meetings and safety accident report easily retrieved?

Do staff know how to use the reporting system?

3.5.10 Evaluation

Step 10

The evaluation process itself can be reviewed and improved upon where necessary.

Checklist:

Is your evaluation process giving you the answers you need?

Is your evaluation system identifying gaps in your safety management system?

3.6 CHOOSING THE RIGHT PERSON

The evaluator can either be a staff member or an external expert. If staff resources are limited, you could get an outside agency to design the evaluation and use a staff member to conduct the evaluation.

The evaluator should:

- Be qualified to the highest appropriate standards in the area
- Explore the strengths and weaknesses of your organisation
- Communicate clearly their intentions before the evaluation
- Demonstrate honesty and integrity
- Respect the opinions and actions of others
- Communicate findings effectively.

Both internal and external evaluations may be advantages and disadvantages, some examples of which are shown in the table below.

	Advantages	Disadvantages
Internal	<ul style="list-style-type: none"> • Familiar with the business • Greater understanding of the issues and background • More committed to the result 	<ul style="list-style-type: none"> • Too close to the action • Judgement may be distorted by past experience in the organisation • Costs less • Distraction from primary duties • Pressure to deliver report rather than have accurate

		content.
External	<ul style="list-style-type: none"> • More detached and critical • Fresh perspective • May have higher knowledge / skill base 	<ul style="list-style-type: none"> • May cost more • May be misled about the purpose of the evaluation • Little understanding of industry procedures.

Ensure that your evaluator is aware of:

- The purpose of the evaluation
- Expectations of the organisation
- Timeline for conduct of the evaluation and for submission findings.
- Who to report to and where to get support and information.

3.6.1 Internal evaluators

The safety officer may be responsible for the daily operating of your SMS and could be the most appropriate person to act as evaluator.

Other internal evaluators may include :

- A senior administrative officer
- The chief maintenance engineer.

3.6.2 External evaluators.

External evaluators must be qualified in the relevant subject matter to the highest standard possible. They may include:

Compliance auditors

Financial auditors

OH&S/ work cover inspectors

Check:

Is your evaluator qualified?

3.7 AS INTEGRATED APPROACH

There has been an increasing trend for the aviation industry to adopt an integrated approach to managing various organisational systems. Specifically, the trend is to integrate quality, safety and risk management systems.

There are benefits and limitations to integrating these management systems. However, recent feedback from the aviation industry has shown that the benefits outweigh the limitations.

The problems with a stand-alone Safety Management System run separately to other management systems is that hazards and errors can be overlooked. Hazards and error can occur at all levels of an organisation, from the cockpit or the shop floor right through to the boardroom. Seemingly minor errors or hazards in one area can combine with others to result in an incident or accident.

Because error and hazard can occur at all levels of an operation, your Safety Management system works best if it becomes an integral part of your organisational culture, or “the way you do business”.

You should customize your Safety Management System in a way that best integrates it into your operation.

3.8 CONCLUSION

Integrated Safety Management System can benefit your operations.

The application of the system depends on the size and nature of your operation. By customizing your Safety Management System to the way you do business can ensure ownership of the process.

Management commitment, effective two-way communication and a positive safety culture are the foundations for success.

Effective safety management system contributes to successful business performance by involving people at all levels to:

- Set objectives, policy and procedures for safety operation.
- Set responsibilities accountabilities and authorities for safety action.
- Report safety concerns
- Identify and minimize hazards and risk within the work place.
- Maintain document control
- Participate in and improve standards of safety performance
- Monitor and evaluate the safety health of your operation

Integrating safety, quality and risk management systems provides a cost effective approach to protecting the resources of your operation.