

SAFETY MANAGEMENT SYSTEM MANUAL
FOR
CAAP APPROVED MAINTENANCE ORGANIZATION NO. 01-76
PHILIPPINE AEROSPACE DEVELOPMENT CORPORATION
DOMESTIC ROAD, PASAY CITY, METRO MANILA
PHILIPPINES 1300
MANUAL CONTROL NO. 4
ASSIGNMENT: PADC



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1.1

COMPANY CERTIFICATION

This Manual sets forth the procedures, means and methods of **Philippine Aerospace Development Corporation (PADC)** as an **Approved Maintenance Organization (AMO)**, to provide knowledge of **Safety Management Concept and International Civil Aviation Organization (ICAO)**.

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Department of National Defense
PHILIPPINE AEROSPACE DEVELOPMENT CORPORATION
SAFETY MANAGEMENT SYSTEM MANUAL



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1.3 INTRODUCTION

At the Philippine Aerospace Development Corporation (**PADC**), an Approved Maintenance Organization, (**AMO**), the safety and health of each employee come first.

Personnel and Equipment in the aviation industry are often exposed to many hazards. Acknowledging this fact and committed to doing everything possible to eliminate injury and damage in the working environment, the on-going process of **PADC Safety Management System** is ultimately the responsibility of the Company. However, each and every employee shall cooperate with management to ensure implementation of this program.

The Safety committee at **PADC** will continue to be pro active to identify risks that may pose injury to personnel, or damage to equipment. To keep this risk to a minimum, **PADC** will continuously examine the operation within its facilities.

The management team will respond to incidents, conduct audits, communicate and document findings, and constantly train all employees on safety policies.

PADC personnel are actively participating in the Safety Program and shall use safety practices in everyday operation and report any discrepancies to the authority.

The Safety Committee will be held accountable for recommending and monitoring safer steps for the prevention of incidents and accidents.



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1.4 PREFACE

This Manual is a guide for establishing and maintaining safe working conditions and for promoting safe work practices by management and employees. Implementing these safety guidelines will set a good example for all personnel involved in this Company. **PADC** is aware of its responsibility to provide a safe and healthful working environment. This shall include making reasonable efforts to promptly investigate and address health and safety issues, not requiring employees to perform tasks that are dangerous to their health and safety without adequate training and safety equipment as determined by applicable laws, and making information on hazardous materials readily accessible. **Civil Aviation Authority of the Philippines (CAAP)** and **Philippine Aerospace Development Corporation (PADC)** recognized their responsibility to cooperate in maintaining and improving a safe and healthful working environment. **PADC** will adhere to operating practices and procedures designed to prevent illness and injury.

Applying this manual will not provide all conditions necessary to promote safety. **PADC** must continue to develop a philosophy of injury and illness prevention and provide all necessary safety training rather than establish book of rules. Prevention of hazard will always be preferable to protection from hazard, and part of management's safety focus is to eliminate hazard rather than require employee personnel protection.

Implied in each and every section of this manual is the understanding that **PADC**, its management and the employees share the responsibility for establishing and maintaining the safest possible workplace for all. To that end, every effort will be made by **PADC** to provide the training, materials, safety equipment and technical advice necessary to foster a safe workplace.

This manual outlines the procedures and responsibilities regarding the functioning of the **Safety Management System (SMS)**. While the manual focuses on clarifying safety management processes of the organizations within the **CAAP**, this manual is applicable to all **ICAO** organization that promote and approved changes that affect the provision of air traffic control and navigation services.

This manual was developed as the result of our training and seminar which reflects current international best practices. Safety experts and managers from across the **ICAO** contributed to its development. This version of the manual marks an important next step forward to a complete and integrated SMS in **Philippine Aerospace Development Corporation (PADC)**.

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1.5 RECORD OF REVISIONS

This Record of Revision shall remain in this **Safety Management System Manual** (SMSM). It is the responsibility of the registered holder to ensure that this manual is maintained to its current revisions. Upon receipt of a revision the manual holder shall not insert the revision pages in this manual and shall enter the revision sequence number, revision date and initial of person incorporating the revision in appropriate column of the record revision.

Revision No.	Description of Revision	Revision Date	Insertion Date	Signature
00	Changes of Letter Head (from DOTr to DND) All Pages	27 April 2022	27 April 2022	
00	1.1 Company Certification Page 1	27 April 2022	27 April 2022	
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1.6 SUMMARY OF AMENDMENT

The information within the table below indicates a summary of the amendments that has been performed within this document against each revision or re-issue.

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1	00	27 April 2022	Changes of Letter Head (from DOTr to DND) All Pages	
2	00	27 April 2022	1.1 Company Certification Page 1	
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1.7 Management Commitment and Responsibility

1.7.1 Safety Policy

Our commitment as Approved Maintenance Organization (AMO) is to promote safety at all possibilities. We believe we can achieve a safe and efficient operation with set of some rules and regulations in accordance with International Civil Aviation Organization (ICAO) and it's under State.

The following are safety policies which need to be followed by the CEO and all the people of the organization. Its purpose is to promote and implement safety in all areas within the organization.

We do things by...

- Promoting safety in all aspects of operation and maintenance in accordance with the prescribed resources and regulatory requirements stated in the ICAO and it's under State.
- Implementing the highest degree of safety at all levels in the organization. No exemption.
- Ensuring that all personnel of the organization are aware of the safety policies and procedures that this organization imposes.
- Performing tasks and duties with safety devices and hazard identification (markings) visible to all personnel, managers, staff and all others involved in performing the tasks.
- Ensuring that the safety policy once violated by one does not affect him or cause him to be in sanction unless one has exceeded the limitations stated in the ICAO and it's under State.
- Ensuring that from CEO to personnel, staff, managers and people involved with the organization are provided with Safety Policy handbook.
- Ensuring that all the personnel performing the tasks are with proper training and are performing the tasks which are appropriate to the skills and ratings which he/she possess.



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1.7.2 Safety Policy Objective

Vision

To promote the highest degree of safety at all levels and to be recognized as a reliable partner in aviation and aerospace development.

Mission

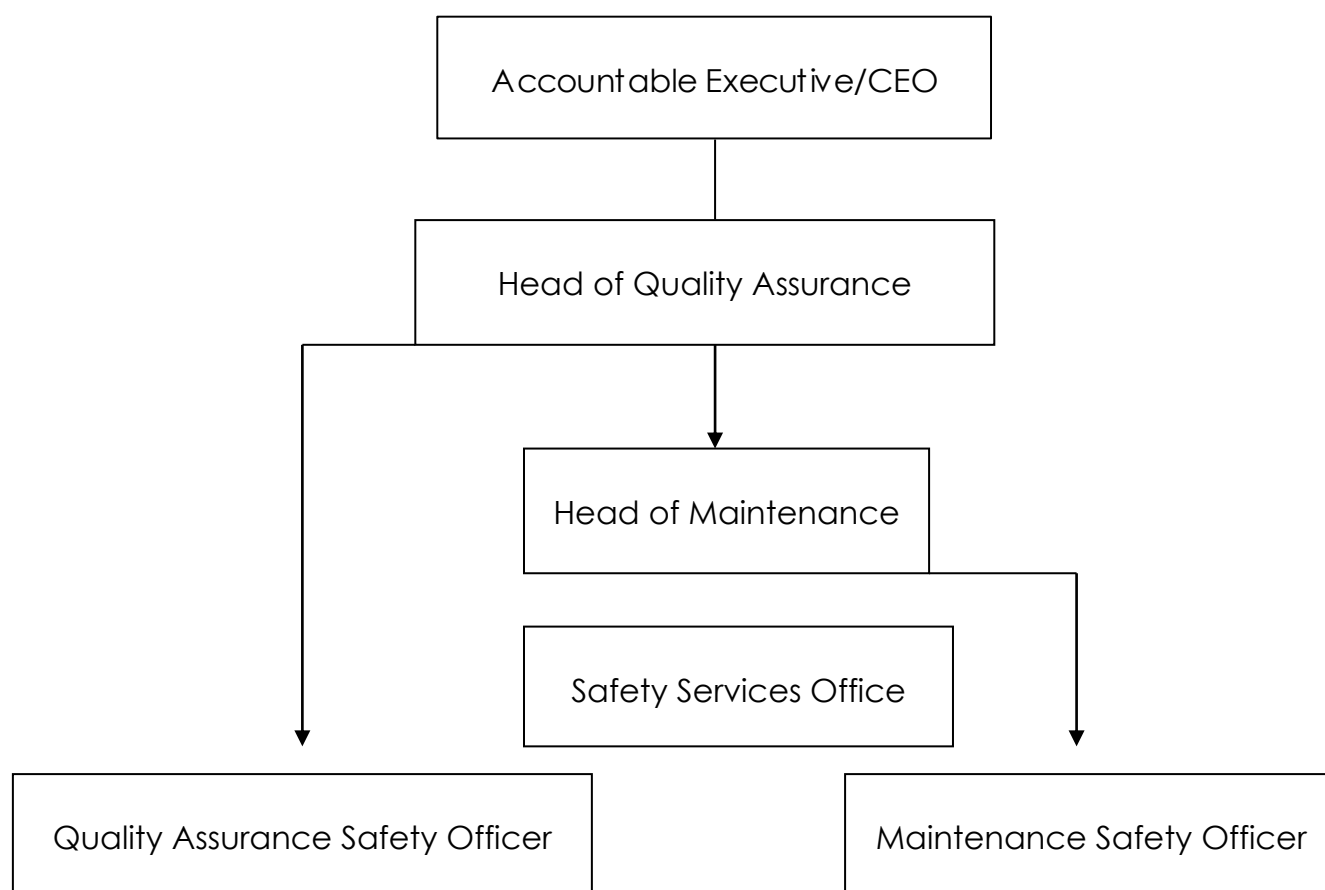
To commence safe operation, business, and development in the aviation and aerospace industry.



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1.8 Safety Accountabilities

This section describes the accountability of management in implementing safety in all activities of the organization. The following functions, duties and responsibilities of each department are stated in the SMSM (Safety Management Services Manual).



Organization Functional Chart



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1.8 Appointed of Key Personnel

This section describes the personnel who shall be responsible for the operation of the organization. They are appointed to certain position for which they are accountable for.

The following are some of the duties and responsibilities which appointed person perform in each department.

- Manages SMS implementation plan on behalf of the Accountable Executive/CEO.
- Provides safety report on organization's safety performance.
- Organize trainings regarding safety to those involve in the organization.
- Provides safety advice in any occurrence.
- Monitors the SMS implementation plan if it is implemented in each department of the organization.
- Coordinates with ICAO and it's under State regarding concerns in the issue of safety.



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1.10 Coordination of Emergency Response Planning

This section describes the function, purpose and use of Emergency Response Planning (ERP) in emergency.

It includes remedial action once emergency situation occur that would affect the operation until it stabilizes to normal condition.

The contents of Emergency Response Planning (ERP) is in the context of SMSM (Safety Management System Manual)



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1.11 SMS Documentation

This section describes all safety management activities that are documented. It contains all relevant information regarding international and national regulations.

Documentation is essential part of the SMS that all necessary information are given and specified in its content.

SMSM (Safety Management System Manual) is the most important piece of SMS (Safety Management System). It contains the general outline of the SMS and its approach to safety.



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1.12 SMS Implementation Plan

This section describes the management managing safety. It contains the plans which will improve the implementation of safety with the advancement of resources and technology.

SMS plan has timeframe, what actions to be taken and who will take an action. It supports the objectives of SMS in relation to safe and efficient operation.

Contents of SMS Implementation Plan

- Safety policy and objectives;
- SMS components;
- Safety Responsibilities;
- Hazard reporting;
- Safety communication;
- Safety training.



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2.0 Safety Risk management

2.1 Introduction

Hazard as state in the SMM, *is a condition or object with the potential to cause injuries to personnel, damage to equipment or structures, loss of material or reduction of ability to perform a prescribed operation.*

In other words, hazard serves as an early warning device for the possible danger that can occur while operating on given situation or condition.

2.2 Hazard identification

We can identify hazard based on its consequences and the result that it might produce.

2.2.1 Reactive

- It is classified as very serious triggering event.
- Situations involving failure of technology belong in this class.
- Investigations of accident/ serious incident are example of reactive.

2.2.2 Proactive

- It is classified as less-serious triggering event.
- With little or no damaging consequences.
- System failures can be minimized by identifying safety risks within the system.
- Mandatory and Voluntary reporting system, Safety Audits, and Safety Surveys are examples under Proactive.

2.2.3 Predictive

- Safety management is trying to accomplish by trying to find trouble, not just waiting it to show up.

Note: The procedure for Hazard Identification is stated in SMSM (Safety Management Service Manual).



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Another form of identifying hazards can be classified according to certain situation, location as a whole which can contribute to proper identification of hazard.

2.4 Three Generic Families of Hazards

- Natural (e.g. habitat or environment)
- Technical (e.g. energy sources, safety critical functions)
- Economic (e.g. socio-political environment)

2.4.1 Natural Hazard

A type of hazard that is a byproduct of nature and the operation is within this environment.

Some of the examples of Nature's Hazard are:

- Severe weather or climatic event (e.g. drought, thunderstorms, lightning)
- Adverse weather condition (e.g. heavy rain, winds and restriction on visibility)
- Geophysical event (e.g. earthquakes, tsunami, floods)
- Public health events (e.g. *epidemia*)

2.4.2 Technical Hazard

A type of hazard which machineries, equipments can be the source of hazard. It occurs during the operation with human intervention.

Some of the examples of Technical hazard are:

- Aircraft and aircraft components, systems, subsystems and related equipment.
- An organization's facilities, tools, and equipment.
- Facilities and equipments that is external to the organization.

2.4.3 Economic Hazard

A type of hazard which socio-economic status of one's State take place. Delivery of service is affected and its provision.

Some of the examples of Economic hazard are:

- Growth
- Recession
- Cost



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2.5 As much as possible, most hazards in the system's operational environment are identified. Some techniques might include:

- Checklist
- Group review

2.5.1 Checklist

It includes review experience and data from similar systems. It can be use to locate in what particular area the cause of hazard.

2.5.2 Group Review

It may be use to review the hazard check lists, to brainstorm hazard and conduct more detailed scenario analysis. In-depth discussion is allowed for further investigation.



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2.6 Hazard assessment should take into consideration from all possibilities, from least to worst. To simplify hazard assessment, there are two boundaries that will justify based on hazard assessment.

2.6.1 Worst case

The most unfavorable condition (e.g. extreme typhoon)

2.6.2 Credible case

The acceptable level of condition where extreme condition can possibly happens.



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2.7 Hazard Identification Process

The following are list of area or general aspect to be considered to “assure” safety.

2.7.1 Responsibility

He/she who takes into account for something is now responsible for whatever results it may be. Being a responsible has a corresponding responsibility which is capable of handling things and certain matter.

Responsibility talks about who can be liable in planning, organizing, directing and controlling, operational activities and its ultimate accomplishment.

2.7.2 Authority

He/she must submit into authority as far as the rules and regulation is concern. People having authority to rule, to lead has a greater chance to implement or change the current policy, procedures and any other rules.

When it comes to assurance of safety; authority defines the person who can *direct, control, or change* the procedures as well as who cannot and make key decision. (I.e. safety risk acceptance decision)

2.7.3 Procedures

To get things done, procedures is followed. As we define procedure, it the specified ways to carry out operational activities from “what” (objective) into “how” (practical activities.)

2.7.4 Controls

To keep operational activities on track, controls provided. Controls composed of hardware, software, special procedures or procedural steps.

SHEL MODEL

S - Software

H - Hardware

E - Environment

L - Live ware



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3.0 RISK ASSESSMENT AND MITIGATION

3.1 SAFETY RISK ASSESSMENT

Safety risk assessment is the analysis of the safety risk of the consequences of the hazards that have been determined as threatening to the organization. It serves as a reference for decision making in determining the acceptable limits for risks and its consequences. Safety risk assessment is breakdown into two:

- The probability of occurrence of a damaging event of condition;
- The severity of event

3.2 SECOND FUNDAMENTAL – SAFETY RISK PROBABILITY

Safety risk probability is defined as the likelihood that an unsafe event or condition might occur. The process of bringing the safety risks of the consequences of hazards under organizational charts. The definition of the likelihood of a probability can be aided by questions such as:

- Is there a history of similar occurrence to the one consideration, or is this an isolated occurrence?
- What other equipment or components of the same type might have similar defects?
- How many personnel are following, or subject to, the procedures in question?
- What percentage of time is the suspect equipment or the questionable procedure in use procedure in use?



Safety Risk Probability Table

	Meaning	Value
Frequent	Likely to occur many times (has occurred frequently)	5
Occasional	Likely to occur sometimes (has occurred infrequently)	4
Remote	Unlikely to occur, but possible (has occurred rarely)	3
Improbable	Very unlikely to occur (not known to have occurred)	2
Extremely improbable	Almost inconceivable that the event will occur.	1

3.3 THIRD FUNDAMENTAL – SAFETY RISK SEVERITY

Safety risk severity is the process in which the consequences of hazards under organizational control is the assessment of the severity of hazard if its damaging potential materializes during operations aimed at delivery of services.

Safety risk severity is defined as the possible consequences of an unsafe event or condition, taking as reference the worst foreseeable situation. The assessment of the severity of the consequences if its damaging potential materializes during operation aimed at delivery of services can be assisted by questions such as;

- How many lives may be lost (employees, bystanders, and the general public).
- What is the likely extent or property of financial damages (direct property loss to the operator, damage to aviation infrastructure, third-party collateral damage, financial and economic impact for the State).
- What is the likelihood of environmental impact (spillage of fuel of other hazardous products, and physical disruption of the natural habitat).
- What are the likely political implications and/or media interest.



Safety risk severity contains five categories to denote the level of severity of the occurrence of an unsafe event or condition, the meaning of category, and the assigned value to each category.

Safety Risk Probability Tab

Severity of occurrence	Meaning	Value
Catastrophic	<ul style="list-style-type: none">- Equipment destroyed- Multiple deaths	A
Hazardous	<ul style="list-style-type: none">- 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.- Serious injury- Major equipment damage	B
Major	<ul style="list-style-type: none">- A significant reduction in safety margins, a reduction in the ability of the operating conditions as a result of increase in workload, or as a result of conditions impairing their efficiency.- Serious incident- Injury to persons	C
Minor	<ul style="list-style-type: none">- Nuisance- Operating limitations- Use of emergency procedures- Minor incident	D
Negligible	<ul style="list-style-type: none">- Little consequence	E



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3.4 FOURTH FUNDAMENTAL – SAFETY RISK TOLERABILITY

Safety risk tolerability is the process in of bringing the safety risks of the consequences of the unsafe events or condition under organizational control. The assessment of the consequences of hazard if its damaging potential materializes during operations, aimed at delivery of services.

In safety risk tolerability, it is necessary to obtain overall assessment of safety risk. This is achieved by combining the safety risk probability and safety risk severity table into a safety risk assessment matrix.

E.g. Safety risk probability assessment: Occasional (4)

Safety risk severity assessment: Hazardous (B)

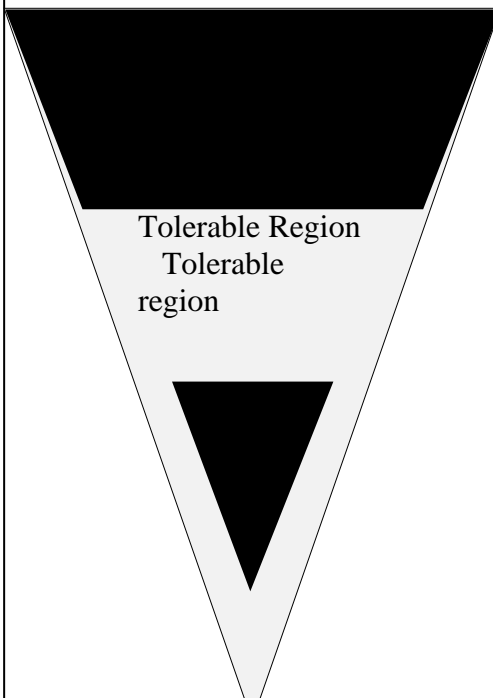
The composite of probability and severity (4B) is the safety risk of the consequences of the hazard under consideration.

In this example, the safety risk is just a number or alphanumeric combination and not a visible or tangible component. The color coding in the matrix figure reflects the tolerability regions in inverted triangle.



Risk Severity					
Frequent 5	5A	5B	5C	5D	5E
Occasional 4	4A	4B	4C	4D	4E
Remote 3	3A	3B	3C	3D	3E
Improbable 2	2A	2B	2C	2D	2E
Extremely improbable 1	1A	1B	1C	1D	1E

**Safety Risk
assessment mat**

Suggested Criteria	Assessment risk index	Suggested Criteria
	5A, 5B, 5C, 4A, 4B, 4C	Unacceptable under the existing circumstances.
	5D, 5E, 4C, 4D, 4E, 3B, 3C, 3D, 2A, 2B, 2C	Acceptable based on risk mitigation. It may require management decision.
	3E, 2D, 2E, 1A, 1B, 1C, 1D, 1E	Acceptable

Safety Risk Tolerability Table



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3.5 FIFTH FUNDAMENTAL – SAFETY RISK CONTROL/MITIGATION

The final step in the process of bringing safety risks of the consequences of an unsafe event or condition under organizational control. *Control* and *mitigation* are terms that can be used interchangeably. Both are meant to designate measures to address the hazard and bring under organizational control in the safety risk probability and severity of the consequences of the hazard.

3.5.1 Three generic strategies for safety risk control/mitigation:

- **Avoidance**

The operation or activity is cancelled because safety risks exceed the benefits of continuing the operation or activity.

- **Reduction**

The rate of operation or activity is reduced the extent of consequences of the accepted risks.

- **Segregation of Exposure**

Action is taken to isolate the effects of the consequences of the hazard or build in redundancy to protect against them.

3.5.2 Safety defenses

Defenses in the aviation system were discussed in the Chapter 2 (ICAO Safety Management Manual. Chapter 2, Basic Safety Contents) and can be grouped under three general categories;

- Technology;
- Training;
- Regulations.



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4.0 SAFETY ASSURANCE

4.1. Safety performance monitoring and measurement

Safety Performance monitoring and measurement is the process by which the safety performance of the organization is verified in comparison with the safety policy and approved safety objectives.

4.1.1 Hazard Reporting

Hazard reporting are essential elements in hazard identification. Below are the three types of reporting in terms of hazard reporting:

- Mandatory reporting system;
- Voluntary reporting system;
- Confidential reporting system.

4.1.1.1 Mandatory reporting system

People are required to report certain types of hazards. It detailed the regulations on who shall report and what shall be reported. It deals mainly on "hardware matter" than the hazard itself.

4.1.1.2 Voluntary reporting system

Hazard information is voluntarily submitted to the authority without any consent. In this system, the regulatory agencies may give incentives to those who reported. The report shall not be used against the reporter instead, encourage him/her to report such information.

4.1.1.3 Confidential reporting system

It is aimed to protect the reporter and his/her statement to be confidential. This system acquires more information that could lead to broader understanding of hazard report.

4.1.2 Actual reporting system may vary among States and the organization. Typical qualities of successful safety reporting system

- Reports are easy to make;
- No disciplinary actions as a result of the report;
- The reports are confidential;
- Feedback is rapid, accessible and informative.



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4.2 The Management of Change

- An organization may experience permanent change due to expansion, adding or subtracting of equipments, changes in policies in procedures which may affect the entire organization. Hazards are introduced due to these changes that may affect the existing safety risk mitigation controls.
- Changes in organization can happen internally or externally. Example of internal change is change in management, new equipments and change in policies and procedures. Example of external change is change in regulatory requirements where the organization comply its standard procedures.
- The management of change should take into account the three considerations;

4.2.1. Criticality of systems and activities

Criticality relates to the potential consequences of equipment being improperly operated or an activity being incorrectly executed. It is where the possible danger might occur while performing the activity if the proper procedure is not followed. It is relevant to the situation where it identifies what are the possible risks might happen or occur so that corrective actions will be taken.


4.2.2. Stability of system and operational environment

Changes can be classified into programmed changes and operational changes. In programmed change, it is the changed directly control under the organization (e.g. new location, changed in labor hours). In operational changes, it the changed where it involves the operation of the organization (e.g. economic or financial status, labor unrest, change in policy and regulations)

4.2.3. Past performance

Past performance is the basis for the future performance. The previous investigation, evaluation and audit is use to find deficiencies, irregularities in the existing safety program. This information can be used for planning in the future activities in the situation of change. Correct information should be used for corrective actions to be taken.

- The management of change should identify the changes within the organization. It should be visible in all areas within the organization so that adjustments to the newly acquire management schemes will be initiate.

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4.3 Continuous improvement of SMS

4.3.1 Internal Evaluation

Internal evaluation must be conducted by the persons of organizations that are functionally independent of the technical process being evaluated.

Internal evaluation shall audit and evaluate the functions of safety management, policymaking, safety risk management, safety assurance and safety promotion.

Note: Management officials shall perform the audit and evaluation prior to continuous improvement of SMS.

4.3.2 Internal Audit

Internal Audit is an important tool for managers in making decisions and keeping operational activities on track. The primary responsibility of safety management rests with those who "own" the organization's technical activities supporting the delivery of services.

Internal Audit serves as a "grading" system for organization's activities. It aids the managers who are in charge of the activities supporting the delivery of services.

Once the safety risk control has been implemented, they continue to perform and are effective in maintaining continuing safety operation.

4.3.3 External Audit

External Audit is conducted by the State who's the organization is under its regulatory compliance prior to the international standards prescribed by the ICAO.

E.g.

PADC (Organization) ← CAAP (State) ← ICAO (International State)

Note: PADC undergo external audit performed by CAAP once a year.



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5.0 SAFETY PROMOTION

Safety promotion is the process in which both individual and organization provides the sense to support the safety effort. Organization must make every effort to communicate their objectives, as well as current status of the organization's activities and significant events.

5.1 TRAINING AND EDUCATION

Safety promotion includes:

- Training and education; including safety competency; and
- Safety communication

The Safety managers shall provide current information and training with relevance to safety issues. It shall be provided to all staff regardless of their level in the organization. It is the management commitment for the effective SMS. Safety training shall include:

- Documented process to identify training equipment;
- A validation process that measures the effectiveness of training;
- Initial (general safety) job-specific training;
- Indoctrination/initial incorporating SMS, including Human Factors and organizational factors;
- Recurrent safety training.

Training requirements and activities should be documented for each area of activity within the organization. A training file should be developed for each employee, including management, to assists in identifying and tracking employee training requirements and verifying that the personnel have received the planned training.

Safety training within the organization must ensure that the personnel are trained and competent to perform their safety management issues.

The SMS Manual shall specify initial and recurrent safety training standards for operational personnel, managers, supervisors, senior managers, and Accountable Executive.



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Safety training should follow a building-block approach. Safety training for personnel should address safety responsibilities including:

- Following all operating and safety procedure;
- Recognizing and reporting hazard.

The training objectives should include:

- Organization's safety policy;
- SMS fundamental and overview

The contents should include:

- Definitions of hazard;
- Consequences and risks;
- Safety risk management process;
- Roles and responsibilities;
- Safety reporting;
- Organization's safety reporting system.

Safety training for managers and supervisors should deal with;

- Safety responsibilities;
- SMS Promotion;
- Hazard reporting of operating personnel.

The training objectives for managers and supervisors should include:

- Detailed knowledge of the safety processes;
- Hazard identification;
- Safety risk assessment and mitigation;
- Change management;
- Safety data analysis

Safety training for senior managers should include:

- Safety responsibilities;
- Compliance with national and organizational safety requirement;
- Allocation of resources;
- Effectiveness of inter-departmental safety communication;
- Active promotion of the SMS.



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The training objectives for senior managers should include:

- Safety assurance;
- Safety promotion;
- Safety roles;
- Safety responsibilities;
- Acceptable levels of safety.

Safety special training for Account Executive (it can be CEO, President) should be reasonably brief (it should not exceed one-half day); it should provide the Account Executive (it can be CEO, President) with general awareness of the organization's SMS including:

- SMS roles;
- SMS responsibilities;
- Safety policy;
- Safety objectives;
- Safety risk management;
- Safety assurance.

5.2 SAFETY PROMOTION – SAFETY COMMUNICATION

The safety manager should communicate the performance of SMS program through bulletins and briefings. Communication should flow between the safety manager and the operational personnel throughout the organization.

Safety performance will be more efficient if operational personnel are actively encouraged to identify and report hazards. Safety communications aims to:

- Ensure that all staff is fully aware of SMS;
- Convey safety-critical information;
- Explain why particular actions are taken;
- Explain why safety procedures are introduced or changed;
- Convey nice-to-know information.



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5.2 SAFETY PROMOTION – SAFETY COMMUNICATION (CONTINUATION)

Example of organizational communication including:

- Safety management system manual (SMSM);
- Safety processes and procedures;
- Safety regulations;
- Safety newsletters, notices and bulletins;
- Websites or mail.

Training and education – Building block

Operational personnel

- a) Organization's safety policy.
- b) SMS fundamentals and overview



Managers and Supervisors

- a) The safety processes
- b) Hazard identification and risk management
- c) The management of change



Senior managers

- a) Organizational safety standard and national regulations
- b) Safety assurance

Safety Training



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5.3 Consequence

Consequence defined from SMM as *the potential outcome (or outcomes) of a hazard*.

In other words, consequence is the result of hazard that could result from possible danger.

Consequence can be categorized based on its level:

- Less-then extreme/Lower operational consequences;
- Operational terms;
- Extreme terms.

Note: All of the details when it regards to levels of consequence will be discuss in the preceding paragraph.

5.3.1 Hazard Identification

In the previous paragraphs, we classified hazard according to their scope. Here, hazard is identified by scope and processes that should be looked into. Some of the hazard identification including:

- Design factors (equipment and task design)
- Procedures and operating practices (documentation and checklist)
- Communications (terms and vocabulary)
- Work environment factors (Ambient noise and vibration, temperature, lighting, PPE)
- Regulatory oversight factors (certification of equipments, personnel and procedures.)
- Human performance (medical and physical limitation)

5.3.2 Variety source of hazard

These sources of hazard are available internally or externally in the organization.

- Internal (e.g. Safety Audit, Investigation and Follow-Up of incidents.)
- External (e.g. Accident reports)



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5.3.3 Hazard Log

5.3.3.1 Introduction

In order to identify hazard and its consequences, hazard log is provided. Hazard Log contains the necessary information on the description, consequences, severity and required safety controls and mitigation measure for the assessment of hazard.

5.3.3.2 Scope of Hazard

- Description of each hazard and consequences.
- Assessed likely and severity of the safety risks of the consequences.
- Required safety risks controls, mitigation measures.

Three generic families of Hazards

- Natural (e.g. habitat or environment)
- Technical (e.g. energy sources, safety critical functions)
- Economic (e.g. socio-political environment)

5.3.4 Hazard Identification by Scope and Processes

- Design factors (equipment and task design)
- Procedures and operating practices (documentation and checklist)
- Communications (terms and vocabulary)
- Work environment factors (Ambient noise and vibration, temperature, lighting, PPE)
- Regulatory oversight factors (certification of equipments, personnel and procedures.)
- Human performance (medical and physical condition)

5.3.4.1 Design Factors (Equipment and Task Design)

Due to advancement of technology, some of the tools and equipment that were using nowadays will not be suitable to the latest trend. Hazard can be identified due to its complexity and design. Being familiar with this trend are essential as the technology keep on changing.

5.3.4.2 Procedures and operating practices (documentation and checklist)

To avoid confusion and relying on owns understanding, checklist and documentation are provided. Sometimes, it is the cause of hazard; misleading information is use and wrong procedure is performed. Therefore, it is important to be keen in details and follow exactly what is stated in the procedure or checklist.



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5.3.4.3 Communications (Terms and Vocabulary)

In aviation, there's what we called "technical terms" to ease the statement and make it clearer. But the problem is that, not all aviation personnel are familiar with technical terms. There are times these terms are use in vocabulary or conversation to make it clear. Hazard is identified by using this terms that could lead to confusion and misunderstanding. Therefore, it is important to be familiar with these terms and use it in appropriate way.

5.3.4.4 Work Environment Factors (Ambient Noise and Vibration, Temperature, Lighting, PPE)

In the workplace noise, climate, moving equipments, conversation of personnel is some of the work environment factors. Sometimes we ignore this may be because we want to focus on our work rather than to think of it. Hazard is identified that could lead to higher chance of error and miscalculations. So, it is important to work in a workplace that is balance in all forms of tasks.

5.3.4.5 Regulatory Oversight Factors (Certification of Equipments, Personnel and Procedures.)

To have an efficient and safe operation, there must be licensed personnel, certified equipments and procedures. With this, the risk of human error and failure is lessened. Prior to strict compliance of regulatory, all of the requirements must be met.

Failure to meet this will result in sanction given by the law or cancelation of certification. Hazard is identified by not complying with regulatory standards that will result to substandard practices. Therefore, comply with the regulatory standards and follow the rules and regulations.

5.3.4.6 Human Performance (Medical and Physical Condition)

According to study, about 70% of aircraft accident is because of human error. Human performance and limitation are one of the reasons why we commit mistake. We can deny the fact that we ignore sometimes the error then suddenly when something happens, we come to think of it.

Each of us has capacity and limitation whether in medical and physical condition. Hazard is identified with these two because this hazard is seen to everyone.

To prevent human error, each of us must know his/her capacities and limitations so that he/she might adapt himself/herself on any situation.

5.3.4.7 Variety source of Hazard

- Internal (e.g., Safety Audit, Investigation and Follow-Up of incidents.)
- External (e.g., Accident reports, State mandatory occurrence reporting system, State voluntary reporting system)

5.4 THIRD FUNDAMENTAL - HAZARD ANALYSIS

Hazard analysis is the first step in developing safety information.

Three-step process in Hazard Analysis

- Identify the generic hazard.
- Break down the generic hazard into specific hazard.
- Link specific hazards to potentially specific consequences. (e.g., specific event or outcome)

Sample of Three-step hazard analysis

Generic Hazard	Specific Hazard	Specific Consequences
Airport Construction	Construction equipment Closed taxi runway, etc	Aircraft colliding with construction equipment. Aircraft taking off into the wrong taxiways (closed taxiways), etc
Poor lighting	Darkened working area	Collision with stationary, moving equipments.
Poor ventilation	Minimum ventilation in the working area.	Suffocation
Faulty wiring	Damaged electrical wiring	Possible formulation of fire.



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5.5 FOURTH FUNDAMENTAL – DOCUMENTATION OF HAZARD

5.5.1 SAFETY LIBRARY

Safety Library is the compilation of continuous hazard-related knowledge of an organization. Below are the standards to build the “safety library”

- Definition of terms used.
- Reporting (i.e. what the organization expects)
- Measurement of safety information collected.
- Management of safety information collected.
- Management of safety information collected.

5.5.2 RISK ASSESSMENT AND MITIGATION

A safety risk assessment is the analysis of safety risk of the consequences of the hazards that have been threatening the capabilities of organization.



6.0 SAFETY PERFORMANCE MONITORING AND MEASUREMENT

Safety Performance monitoring and measurement is the process by which the safety performance of the organization is verified in comparison with the safety policy and approved safety objectives.

6.1 Hazard Reporting

Hazard reporting are essential elements in hazard identification. Below are the three types of reporting in terms of hazard reporting?

- Mandatory reporting system;
- Voluntary reporting system;
- Confidential reporting system;

6.1.1 Mandatory Reporting System

People are required to report certain types of hazards. It detailed the regulations on who shall report and what shall be reported. It deals mainly on "hardware matter" than the hazard itself.

6.1.2 Voluntary Reporting System

Hazard information is voluntarily submitted to the authority without any consent. In this system, the regulatory agencies may give incentives to those who reported. The report shall not be used against the reporter instead, encourage him/her to report such information.

6.1.3 Confidential Reporting System

It is aimed to protect the reporter and his/her statement to be confidential. This system acquires more information that could lead to broader understanding of hazard report.

6.2 Actual Reporting System may vary among States and the Organization

Typical qualities of successful safety reporting system

- Reports are easy to make;
- No disciplinary actions as a result of the report;
- The reports are confidential;
- Feedback is rapid, accessible and informative.



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6.3 Audits

Audit focuses mainly on the organization's SMS. It assesses and defines on how the management implemented effectively the safety in terms of operations and performing services. Audits not just focuses on the organization's SMS rather it assesses also the department's staffing, performance, level of competency, training and certification of operating equipment, facilities, and maintaining the required level safety performance.

6.3.1 Two Types of Audits Performed:

- Internal audit - it is within the organization.
- External audit - in which the provision of services is included. (i.e. CAAP conducts audit once a year.)