

SAFETY MANAGEMENT SYSTEMS & QUALITY MANAGEMENT SYSTEMS

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SMS

Safety – The State in which risks associated with aviation activities, related to, or in direct support of the operation of aircraft, are reduced and controlled to an acceptable level

- ICAO Doc 9859

SAFETY MANAGEMENT SYSTEM

A systematic approach to managing safety, including the necessary organizational structures, accountability, responsibilities, policies and procedures
– ICAO Doc 9859

- A system is a construct or collection of different elements that together produce results not obtainable by the elements alone

OR

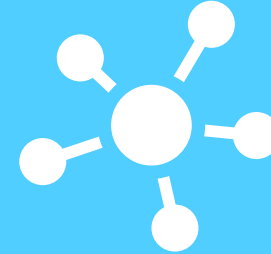
- A system can be seen as an integrated composite of people, products, and processes to achieve a stated need or objective

WHY SAFETY MANAGEMENT IN AVIATION?



Seeks to proactively mitigate safety risks before they result in aviation accidents and incidents

Achieve improved effectiveness of efforts to reduce hazards and mitigate risks



Activities can be managed in a more disciplined, integrative, structured and focused manner

Objectives at global, regional and State levels provides priorities and a way to measure and improve performance



BENEFITS OF SAFETY MANAGEMENT

- Strengthened safety culture
- Documented, process-based approach to assure safety
- Better understanding of safety-related interfaces and relationships
- Enhanced early detection of safety hazards
- Safety data-driven decision-making
- Enhanced communication
- Evidence that safety is a priority
- Possible financial savings, improved efficiencies & cost avoidance

MAIN COMPONENTS OF AN SMS

COMPONENT 1

SAFETY POLICY AND OBJECTIVES



Management Commitment

- **Develop** the safety policy and reporting system, in accordance with national and international standards and organizational priorities
 - **Communicate**, the safety policy to all staff
- **Continuously improve** the level of safety performance
- **Promote and maintain** a positive safety culture within the organization
- **Comply** with all applicable regulatory requirements
- Provide the necessary **resources** to deliver a safe service
- **Ensure safety** is a primary responsibility of all managers

- Hazard identification
- Safety investigations
- Safety risk assessment and mitigation



COMPONENT 2

SAFETY RISK MANAGEMENT

MAIN COMPONENTS OF AN SMS

COMPONENT 3 SAFETY ASSURANCE



Safety Performance monitoring and measurement

- **Internal audits and establishment and monitoring of SPIs** - To verify safety performance and validate the effectiveness of safety risk controls requires:
 - **Safety audits** - The process by which the safety performance of the organization is verified in comparison to the approved safety policies and objectives

- Training
- Safety Communication



COMPONENT 4 SAFETY PROMOTION

SAFETY CULTURE

OUTCOME, NOT A PROCESS

The introduction of safety management concepts lay the foundation upon which to build a safety culture

- Safety culture cannot be “mandated” or “designed”, it evolves
- It is generated “top-down”

Attitude to safety

SAFETY MANAGEMENT INITIATIVES

Reactive



Responds to events that have already taken place

Proactive



Actively identifies hazards and risk through analysis of system processes and activities

Predictive



Uses system performance data based on real time normal operations to predict potential hazards

SAFETY MANAGEMENT INITIATIVES



REACTIVE

Investigation of accidents and serious incidents

- Based upon the notion of waiting until something breaks to fix it
- Most appropriate for situations involving failures in technology, unusual events, and major occurrences
- The contribution of the reactive approach to safety management depends on the extent to which the investigation goes beyond the triggering cause(s), and includes contributory factors and findings as to risks



PROACTIVE

Mandatory and voluntary reporting systems, safety audits and surveys.

- HIRA –Based upon the notion that system failures can be minimized by:
- identifying hazards and safety risks within the system before it fails; and
 - taking the necessary actions to eliminate or reduce such hazards/safety risks of their impact



PREDICTIVE

Confidential reporting systems, flight data analysis, normal operations monitoring

- Based upon the notion that safety management is best accomplished by looking for trouble, not waiting for it.
- Aggressively seek information from a variety of sources which may be indicative of emerging safety risks
- SPI's and resulting targets and objectives.



SAFETY RISK MANAGEMENT

ICAO'S COMPONENT FOR SAFETY RISK MANAGEMENT INCLUDES THE IDENTIFICATION OF HAZARDS AND THEIR CONSEQUENCES (RISKS), THEIR ANALYSIS, ASSESSMENT OF THEIR TOLERABILITY AND THEIR MITIGATION BASED ON MANAGEMENT DECISION MAKING PROCESSES.

HAZARD & RISK

HAZARD



A condition or an object with the potential to cause or contribute to an aircraft incident or accident

The predicted probability and severity of the consequences or outcomes of a hazard



RISK

QMS

Quality – is not so much an outcome as a never-ending process of continually improving the organisation performance measured against its results

DEFINITIONS

- Quality – degree to which a set of inherent characteristics fulfils requirements
- Quality Assurance – part of quality management focused on providing confidence that quality requirements will be fulfilled
- Quality Control – part of quality management focused on fulfilling quality requirements
- Non-conformity – non-fulfilment of requirements
- Auditing – systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which audit criteria are fulfilled

- ISO 9000

QUALITY MANAGEMENT SYSTEM REQUIREMENTS

Customer Requirement



Legal Requirement



Internal Requirement



LEGAL REQUIREMENT

Focus on the regulatory compliance part of the QMS

- **Audit Scope/Programme** – All areas (internal and external) of an organisation that need to be audited to satisfy the senior accountable manager (SAM) and/or operator that you are complying
- **Audit Plan** – is the plan approved by the SAM, when all the areas as identified in the scope/programme will be audited



AUDIT

AN AUDIT IS DEALING WITH THE ORGANISATION, PROCEDURES, AND SYSTEM, NOT WITH A PERSON. AN AUDITEE IS JUST A REPRESENTATIVE OF THAT ORGANISATION

AUDIT CLOSED LOOP CYCLE

- Need for the audit/type of audit
- Audit notification
- Audit preparation:
 - pre audit meetings
 - document reviews
 - Risk analysis (safety incidences, financial reviews, etc...)
 - Applicable forms/checklists
- Conduct the audit
- Audit report
- Corrective action plan (CAP)
- Verification of finding (addressed/evidence)
- Findings closure

CORRECTIVE ACTION PLAN

Root Cause Analysis (RCA)



a technique or process to identify and verify the real cause of a problem in order to prevent it from recurring

Short Term Action Plan



the action taken to fix the finding in the short term

Long Term Action Plan



the action taken that will prevent the situation/finding from re-occurring in the future

ROOT CAUSE VS CONTRIBUTING FACTOR

ROOT CAUSE



A root cause is the main reason for the occurrence of a problem. If we correct this cause, this problem won't occur again. In other words, if correcting the cause of a problem prevents its recurrence, then we can identify this cause as the root cause

A contributing factor is a condition or circumstance that influences the likelihood of an incident. Contributing factors can affect the severity of consequences or increase the effect in time but eliminating contributing factors won't eliminate the effect. Moreover, a contributing factor may not have caused the incident, but when several contributing factors occur simultaneously, the probability of the of the incident also increases



CONTRIBUTING FACTOR

IMPORTANCE OF ROOT CAUSE ANALYSIS

- Helps understand the real problem
- Confirms the understanding of the finding
- Supports fixing and rechecking the real problem (not just symptoms)
- Prevents reoccurrence of the problem

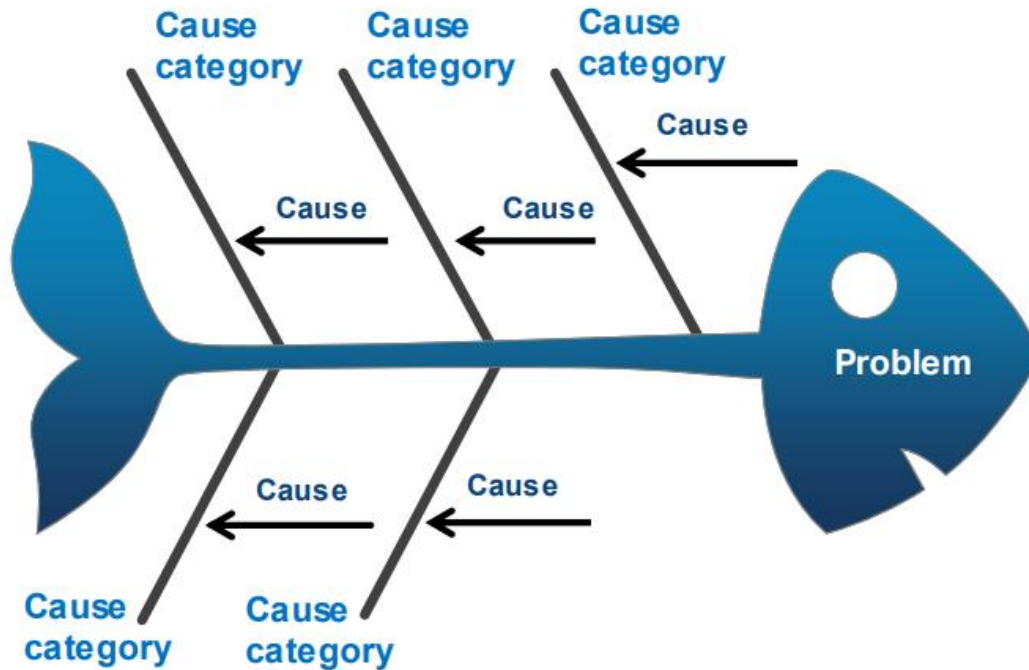
EXAMPLES OF RCA TOOLS

- Five why's

Objective of the 5 why's is to get through to the deeper causal factors and not accept a symptom

- Cause and effect diagram (fishbone diagram)

To be focused on the problem, create a snapshot of the collective knowledge of the team, create consensus of the problem causes, build support for the possible solutions, discover the probable causes for further analysis





ELIMINATING THE EFFECT

The main difference between root cause and contributing factor is that eliminating the root cause would eliminate the effect of a problem and prevent it from reoccurring but eliminating a contributing factor would not eliminate the effect altogether

CORRECTIVE ACTION PROCEDURE



CHANGE SHOULD BE MANAGED

“We have always done it this way” – Dangerous statement

“Growth is achieved when we move outside our comfort zone”

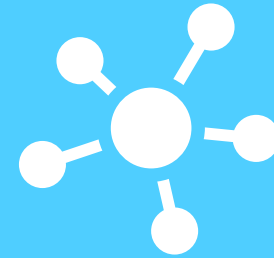
CHANGE PROCESS

Any change associated with management and organisation development needs to be managed



Change management
requires an adequate
culture

Change must be led
from the top of the
organisation



Change shall involve
Process and People

Change shall be
continuous if you want
to deliver quality
services to your
customers



INTEGRATED SMS AND QMS

Benefits of integrating SMS and QMS data management

- Reduced potentially prohibitive implementation cost for Safety and Quality management automation
- Boost SMS and QMS efficiency with a single platform solution
- Simplifies Safety and Quality tracking, reporting and record keeping
- Enhanced data analysis capabilities
- Improve Safety and Quality compliance and conformance
- Enhanced risk management and hazard identification



QUALITY AND SAFETY

Quality and Safety management systems are managerial tools with proactive and reactive elements embedded in performance-oriented processes

Safety is an attribute of Quality as long as it describes the ability of the system to function without harm or damage to people, assets or environment

Quality is essential to Safety to ensure that safety assurance is managed and continuous improvement achieved

Safety is a state in which the risk of harm or damage is limited to an acceptable level

Safety is the main goal in service delivery in the aviation system or any aviation activity

In any Quality system, Safety is a primary requirement or purpose, and in any Safety system, Quality is essential!



QUESTIONS?



THANK YOU

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