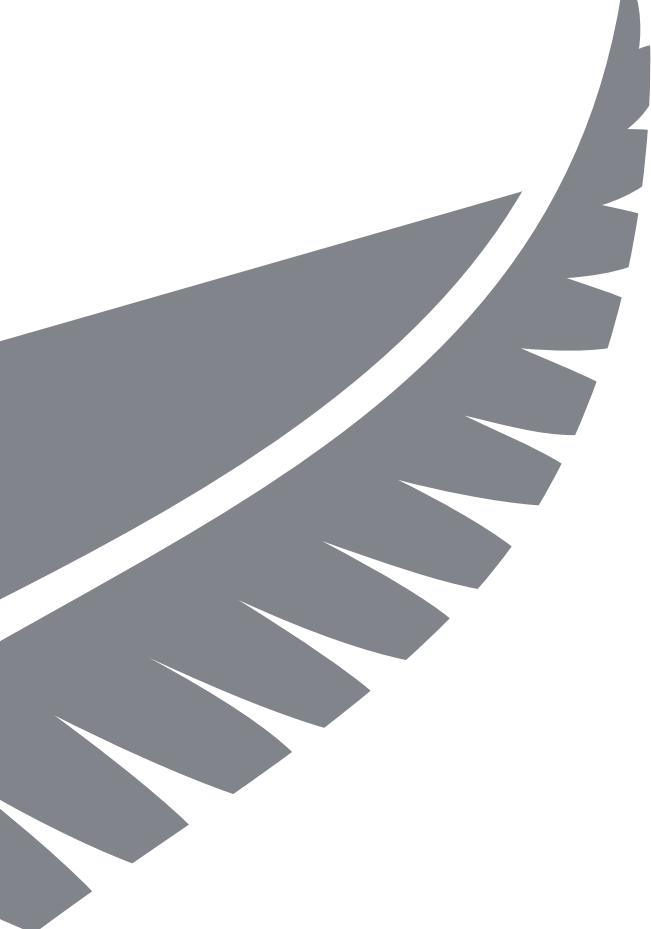


02

FROM QUALITY MANAGEMENT SYSTEMS TO SAFETY MANAGEMENT SYSTEMS AN ENHANCEMENT GUIDE

CIVIL AVIATION AUTHORITY OF NEW ZEALAND
BOOKLET TWO





PREFACE

The Civil Aviation Authority published Advisory Circular AC 00-4 'Safety Management Systems' in December 2012 to provide comprehensive guidance material to support organisations implementing a safety management system (SMS).

This booklet contains practical advice to organisations about how to improve current systems and add additional tools and processes to improve safety outcomes. It explains the steps that can be taken to successfully, systematically and proactively manage safety while complying with regulatory requirements.

This booklet may be read in conjunction with the other CAA Industry Resource Kit booklets:

- **BOOKLET ONE** – Safety Management Systems (SMS): an introduction
- **BOOKLET THREE** – Implementing Safety Management Systems: guidelines for small aviation organisations
- **BOOKLET FOUR** – Aviation Risk Management; an introduction.



AIR SAFARI

ZK-NMC

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DEFINITIONS

CAA AC 00-3 DEFINES A QUALITY MANAGEMENT SYSTEM (QMS) AS:

'The structure, responsibilities, processes and procedures of an organisation that promote and establish an environment and culture of continuing improvement that will enhance the safety of the operations'.

CAA AC 00-4 DEFINES A SAFETY MANAGEMENT SYSTEM (SMS) AS:

'A systematic approach to managing safety, including the necessary organisational structures, accountabilities, policies and procedures'.

OVERVIEW

MANY NEW ZEALAND AVIATION ORGANISATIONS ALREADY HAVE AN ESTABLISHED QMS IN PLACE. WHAT IS THE DIFFERENCE BETWEEN AN SMS AND A QMS?

QMS and SMS have a number of similar processes; both systems depend on measuring and monitoring, both strive for continual improvement and both use a number of the same tools, such as audits.

In short, an **SMS may be thought of as an enhanced and expanded QMS.**

Whereas a QMS focuses on internal quality assurance procedures, an SMS expands on this by advocating a risk-based approach to the structure, responsibilities, processes and procedures of an organisation. A QMS will not ensure that your organisation is identifying, and eliminating where possible, all safety risks.

Moving from a QMS to an SMS will bring increased effectiveness to your organisation and the assurance of high safety performance standards. The systems share some common elements, so an organisation with an established QMS is already part of the way there.

KEY POINTS OF DIFFERENCE

UNLIKE QMS, SMS IS INHERENTLY RISK-BASED

QMS is structured on ISO 9000 Quality Management and quality assurance standards, which are based on identifying and correcting instances of non-conformance or non-compliance, as laid out in CAA AC 00-3 Internal Quality Assurance.

SMS is structured on ISO 31000-2009 Risk Management – *Principles and Guidelines* and ICAO Doc 9859 Safety Management Systems Manual, which encourage organisations

to identify, assess and control all types of risk that could affect the safety of the operation.

SMS FACILITATES A MORE PROACTIVE APPROACH TO MANAGING SAFETY RISKS

QMS focuses on the delivery of efficient functional processes and is reactive in its approach, whereas an SMS aims to minimise all safety risks using a number of proactive methods. QMS aims at maintaining a good safety record; however while an organisation can have a good safety record; there may be unidentified and untreated risks. In other words, just because you haven't had an accident does not mean you are a low risk or a 'safe' organisation.

SMS takes a holistic approach to safety for all aspects of your organisation and any contracting organisations that you work with.

BENEFITS OF ENHANCING YOUR QMS TO BECOME A SAFETY MANAGEMENT SYSTEM

Implementing an SMS will allow your organisation to take a risk-based approach to managing the:

- Identification of hazards that pose safety risks
- Benefits of an effective reporting system
- Organisational, operational and physical changes to your organisation
- Accident and incident investigative processes
- Emergency response preparedness.

The diagram on the right illustrates the road from QMS to SMS.



QMS TO SMS: A 'FORMULA'

QMS already has established elements of an SMS which include:

- Safety policy
- A document control process
- Processes to monitor and measure compliance-based performance
- A continual improvement process
- An internal compliance audit programme
- A management review process.

To implement your SMS you will need to develop or enhance:

- A risk management process
- An Emergency Response Plan
- A hazard identification process
- A safety investigation process
- A safety training and education programme
- A change management process
- Safety performance measures.

**“SAFETY IS A VERB, AND
AN ACTIVE ONE AT THAT”**

– ALAN J STOLZER

SMS – A JOURNEY NOT A DESTINATION

Establishing an SMS involves creating interconnected systems throughout your organisation. Safety will ideally develop as an integral component of the culture of your staff (and third party employees) and will influence everyone’s daily conduct. ***SMS is a way of doing business that places safety at the core of your organisation’s commercial practices.***

Your QMS processes and practices will continue to assist you to supervise compliance and process competence. It will complement the overall approach to safety that SMS establishes relating to the organisation structures, accountabilities, policies and procedures underpinned by risk management processes.

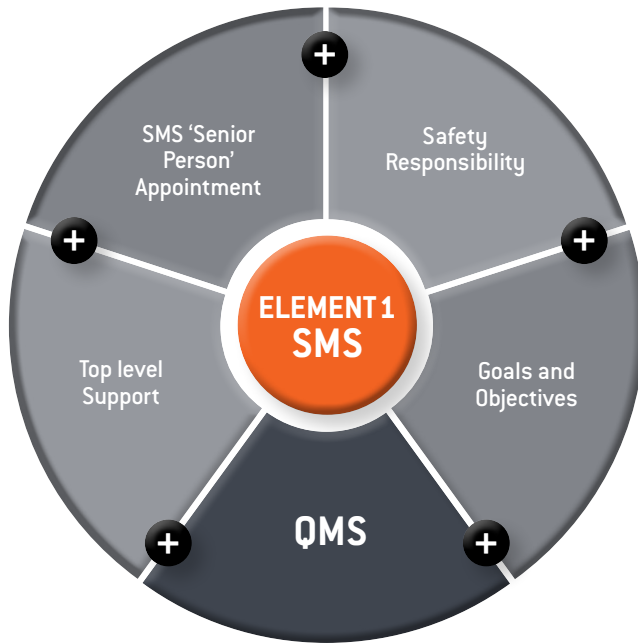
SMS will apply to all the staff in your organisation and importantly to the staff of all the organisations who provide services to your business.

As you plan how to implement the SMS you will need to look at the systems and processes your organisation already has in place.

A gap analysis (discussed in further detail in Booklet THREE) is an ideal tool to identify what practices and processes are already in place in your organisation, and compare them with the 13 elements of an SMS that are required (see CAA AC 00-4 Safety Management Systems). Any gaps identified will determine the actions required to meet the SMS objectives.

ELEMENT 1: SAFETY POLICY AND ACCOUNTABILITY

Commitment to the SMS has to start at the top of your organisation to ensure that safety risks are systematically managed.



ESTABLISH TOP LEVEL SUPPORT FOR SMS

Senior management must champion the SMS and resource it appropriately.

The Chief Executive (CE) is accountable for safety management and this accountability cannot be delegated. The CE must make an unequivocal statement of the organisations' commitment to safety. This statement should be given to all staff.

APPOINT A 'SENIOR PERSON' FOR SAFETY

Meeting the SMS safety policy requirements will require expansion of your existing quality/safety policy and the appointment of a senior person (eg, safety systems manager) to implement and maintain the SMS. This new senior person could be what was previously the QA Manager, or a new selection.

The safety systems manager cannot have conflicting responsibilities and must have direct access to the CE.

INTEGRATE SAFETY RESPONSIBILITIES INTO YOUR ORGANISATION

All safety positions should be documented in your organisational chart with clear lines of authority and responsibility.

SET SAFETY GOALS AND OBJECTIVES

Safety goals and objectives must be established.

Auckland International Airport
Check-in and Departures

Flight	Destination	Check-in Counter	Board Gate	Remarks
TL 007				
SB 011	PAPEETE LOS ANGELES	25 41	12:25 02	DEPARTED
MF 190	SOERABAYA	25 30	12:25 04	DEPARTING
284	SINGAPORE	26 64	12:45 04	DEPARTING
BR 652	PARPI	27 05	13:20 04	ARRIVING
NZ 125	PERTH	25 54	13:45 02	AIR CALL
2				
E24	BRISBANE	08 20	13:45	PROCESSED
NZ 740	SFIA	04 04	13:55	PROCESSED
790	BANGKOK	08 20	14 00	PROCESSED
NZ 725	MELBOURNE	21 37	14:35	CHECK-IN
419	SYDNEY	24 24	15 00	CHECK-IN
NZ 105	SYDNEY BANGKOK DUBAI	02 30	15:20	CHECK-IN
SB 134	MELBOURNE	02 30	15:20	CHECK-IN
ME 403	SYDNEY	24 24	15 20	CHECK-IN
NZ 200	BNE SINGAPORE DUBAI	02 30	16:20	
S 800	SANTIAGO	08 20	16:30	

Departures
Arrivals

Bank of New Zealand Currency Exchange

Departure Fee

ENTRY Gates

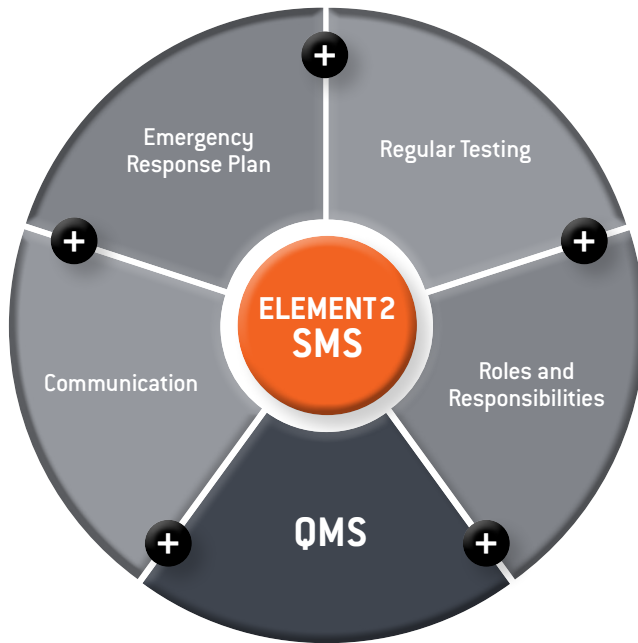
Fee payable at all counters

New Zealand Young Auckland Airport

Photo courtesy of 'Above Ground Level'

ELEMENT 2: COORDINATED EMERGENCY RESPONSE PLANNING

Emergency Response Plans (ERPs) enable your organisation to deal with emergencies.



PREPARE A PLAN

Be prepared for emergencies by developing, integrating and practicing your ERP. Your ERP should be simple and tailored to the size of your organisation. It should cover the basics outlined in the Advisory Circular such as defined responsibilities and actions, a practice plan and a training plan for staff. Third party contractors should be included.

DEFINE ROLES AND RESPONSIBILITIES

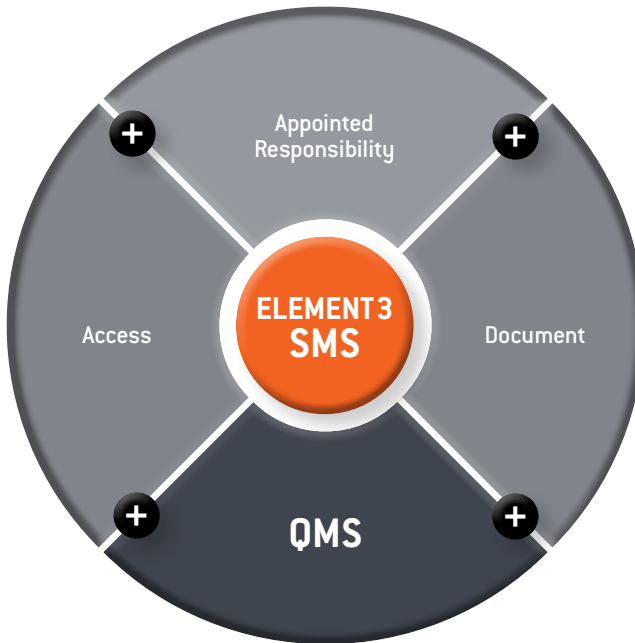
It is important that roles and responsibilities are clearly defined so that all staff understand who has the authority in an emergency and who is responsible for what.

COMMUNICATE INTERNALLY AND EXTERNALLY

Once the ERP is documented, consider how you will communicate it. Train your staff and practice the plan. There may be external stakeholders (in addition to contractors) that you can consult during this process. For example, many airports have their own ERPs and it would be useful to coordinate with your local airport.

ELEMENT 3: DEVELOPMENT, CONTROL AND MAINTENANCE OF SAFETY MANAGEMENT DOCUMENTATION

Robust safety documentation is integral to the SMS.



DOCUMENT YOUR PROCESSES AND PRACTICES

Ensure all steps of the implementation and maintenance of the SMS are documented in your existing policies and procedures. These should be done in practical and actionable terms, including newer elements such as:

- Hazard identification and risk management
- ERP
- Change management
- Any SMS specific references within existing documentation.

ESTABLISH CONTROL AND ACCESSIBILITY

To manage SMS documentation it is vital to appoint one person to control versions and updates.

Ensure safety documentation is easily accessible and staff know where information can be located.

Encourage your staff to take part in the development of the documents that describe the safety activities they conduct.

ELEMENT 4: HAZARD IDENTIFICATION

A hazard is defined as ‘an object or condition with the potential to cause injuries to personnel, damage to equipment or structures, loss of material, or reduction of ability to perform a prescribed function’. Report, collect, record, analyse, treat and communicate hazards identified in operational activities.



ESTABLISH A RISK-FOCUSED REPORTING SYSTEM

Establishing an effective reporting system will allow not only hazards to be managed but also risks, incidents and accidents.

HAZARD IDENTIFICATION TRAINING

Ensure that your staff and those of third party organisations are trained to identify hazards and are willing to report them as well as all occurrences. This willingness is a cultural component that requires vigorous encouragement.

ESTABLISH A NON-PUNITIVE REPORTING POLICY

This will provide positive results by protecting occurrence reporters from disciplinary action (except in cases of reports outlining reckless, criminal or negligent actions). In turn, this allows for a positive reporting culture to develop.

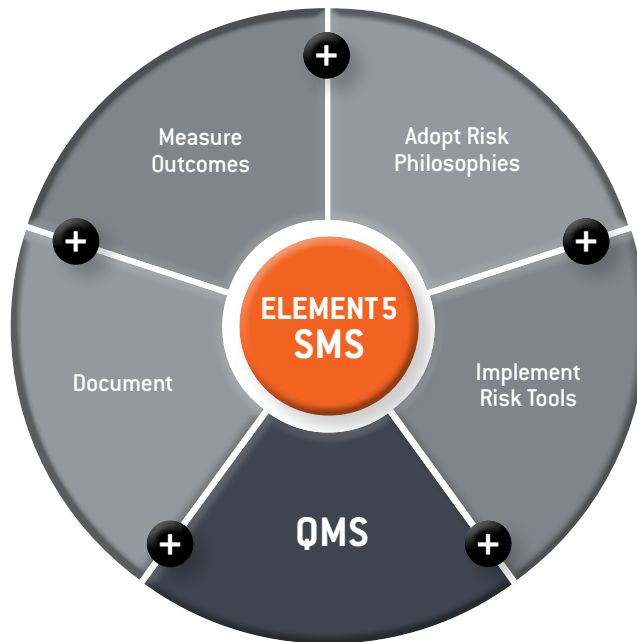
MAKE REPORTING AS EASY AS POSSIBLE

Simple forms and methods for reporting are very important. Encourage your third party contractors to follow your lead.

You will already be collecting quality-related information which can be fed into your formal reporting system, as well as other reliable sources of hazard information such as surveys, your existing audit programme, discussion groups, 'brainstorming' and safety meetings.

ELEMENT 5: RISK MANAGEMENT

The CAA defines risk as ‘*the effect of uncertainty on objectives*’ and risk management as ‘*ensuring that risk remains at an acceptable level through consistent and proactive framework*’.



The identification of safety risks (and other risks to your business) will enable you to **proactively control the potential outcome** of these risks.

ADOPT RISK STANDARD PHILOSOPHIES

ISO 31000:2009 outlines risk management principles that provide guidance on how to develop a risk management process.

IMPLEMENT RISK ACTIVITIES AND TOOLS

Risk assessments need to be conducted as part of change-based projects. Regular ways to assess risk in operational activities are also required (consider ‘Operational Risk Profiles’).

A risk register is a fundamental tool for documenting all current and emergent risks, and the treatments being applied.

DOCUMENT YOUR RISK MANAGEMENT PROCESSES

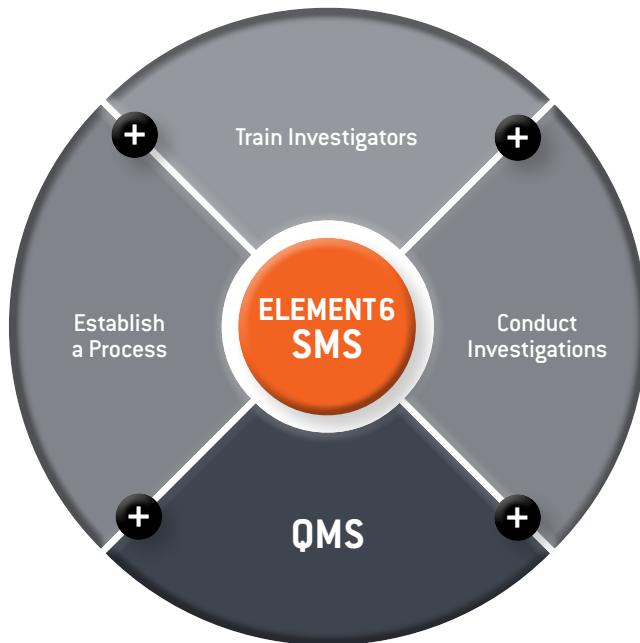
A documented risk management process provides a structured basis to risk management. Without a documented process, different people will use different methods resulting in inconsistent results.

MEASURE POSITIVE OUTCOMES

Risks properly managed and minimised will improve safety performance and can lead to better profits and often positive outcomes overall.

ELEMENT 6: SAFETY INVESTIGATION

Safety investigations provide invaluable details about the factors contributing to incidents or accidents. Analysis will provide your organisation with valuable learning's and outcomes.



TRAIN YOUR INVESTIGATORS

Investigations must be carried out by an independent qualified investigator in a fair and equitable manner to promote an atmosphere of trust and bolster your safety culture.

OUTLINE WHEN (AND WHY) TO INVESTIGATE

Interweave the risk assessment process into the safety investigation process; it will help to have a set of risk-based criteria (or trigger points). Carry out a risk assessment on incident occurrence reports. For example, an incident rated by the matrix as moderate or high level may automatically trigger an investigation and the requirement to escalate the matter to management.

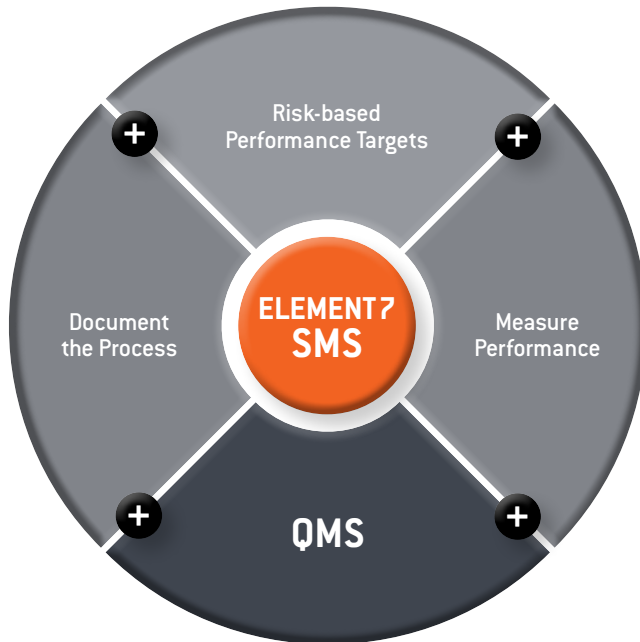
ESTABLISH AND DOCUMENT A PROCESS

The process should be underpinned by a non-punitive approach and in accordance with regulatory investigation requirements. The aim of an investigation is to seek the causes and system failures that may have contributed to the accident or incident in order to improve operations.



ELEMENT 7: MONITORING AND MEASURING PERFORMANCE

Monitoring all safety related systems and performance will allow your organisation to continuously improve upon them.



SET RISK-BASED SAFETY PERFORMANCE TARGETS AND INDICATORS

Set risk-based safety performance targets that define the level of safety performance of your organisation. For example, you may wish to reduce serious incidents within the next 12 months by 10 per cent. You can determine if this has been achieved by using safety performance indicators.

It is important to ensure that targets aren't set that actually damage your safety culture. For example, aiming for a reducing volume of reports could lead to a negative reporting culture where staff hide hazards or occurrences rather than report them.

MEASURE PERFORMANCE THROUGH SAFETY DATA

The safety performance of an organisation can be measured against its safety goals through:

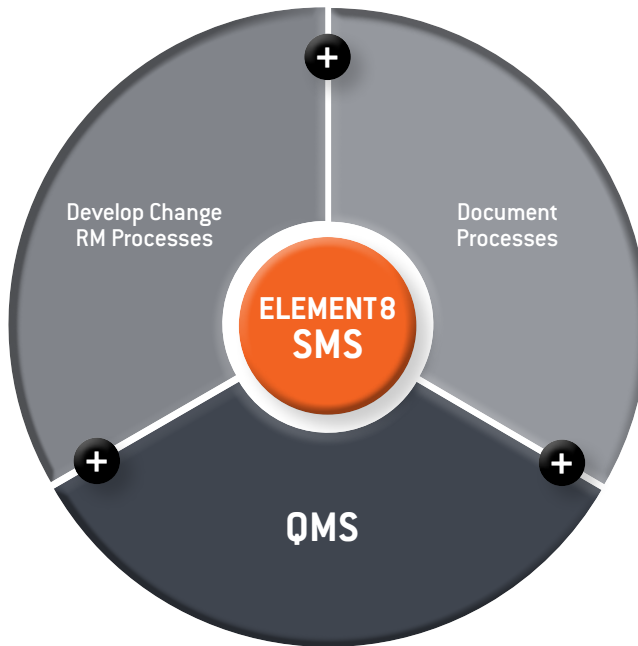
- Hazard and occurrence reports
- Reporting rates
- Information extracted from investigations
- Audit reports
- Risk registers
- Safety meeting minutes
- Surveys and reviews.

ESTABLISH A DOCUMENTED PROCESS

It is important that SMS monitoring and measurement occurs in a consistent manner, hence the need to document your methods.

ELEMENT 8: MANAGEMENT OF CHANGE

Changes that affect your organisation can introduce many potential risks to the operation. Formal change management (or venture risk management) helps to identify, assess and control change-based risks.



By developing and managing risk-management plans, and tracking them until completion, your organisation will gain operational strength.

DEVELOP 'CHANGE RISK MANAGEMENT' PROCESSES

Typical changes in an aviation environment include:

- Organisational change (eg a new executive, a company restructure)
- Operational change (eg, a new fleet, new contract, new systems)
- Physical change (eg, a new base, moving office).

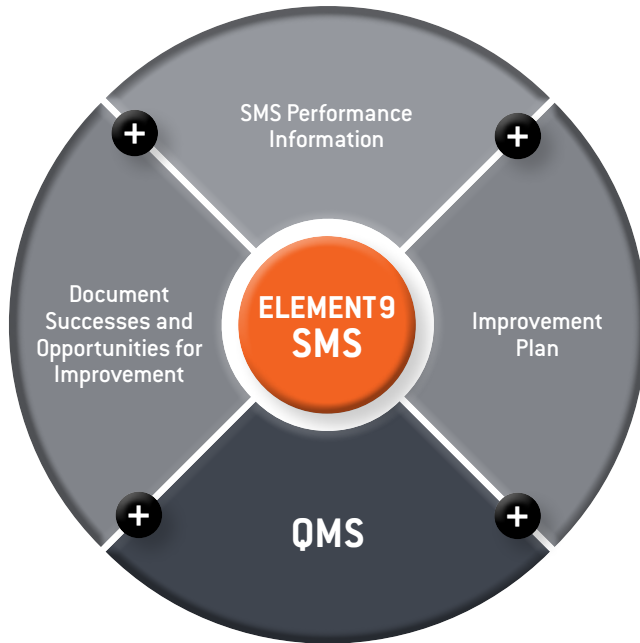
DOCUMENT YOUR ACTIVITIES AND OUTCOMES

Document how your organisation recognises and manages current and upcoming changes, taking into account the:

- Identified risks
- Importance of systems and activities
- Stability of the operational environments
- Past performance and historical information
- Residual risk.

ELEMENT 9: CONTINUAL IMPROVEMENT OF THE SMS

Continuous improvement is just as important to SMS as it is to QMS. The processes of management review, performance monitoring and internal audits undertaken within your quality system are also relevant and integral to SMS. However, they will require expansion to accommodate the new processes required by SMS.



USE SMS PERFORMANCE INFORMATION

Internal and external audit, and management review, will reveal how your SMS is performing and whether you are reaching your organisation's safety objectives. Processes that will facilitate continual improvement include:

- Review of safety performance targets and indicators
- Safety culture surveys to staff
- Ensuring that all effective practices are documented, and then communicated as the new standard expected.

DOCUMENT SUCCESSES AND AREAS OF WEAKNESS

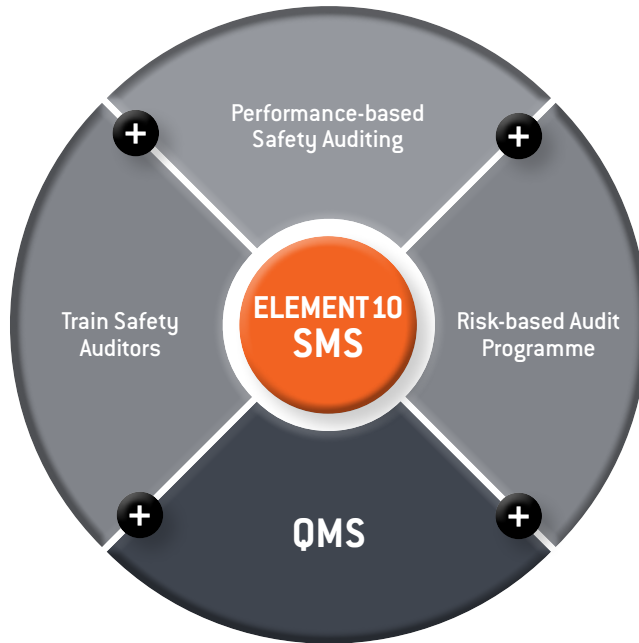
Ensure that the process of continuous improvement is documented also, for the purposes of maintaining 'corporate memory'.

FORMULATE IMPROVEMENT PLAN

If improvement of any part of the SMS is required, use an action plan to formalise the task.

ELEMENT 10: INTERNAL AUDIT PROGRAMME

Your QMS already contains an audit programme. As the SMS is implemented the approach needs to change. Safety auditing examines not only compliance and conformance but also system effectiveness. Safety audits must also encompass any third party contractors.



DEVELOP PERFORMANCE-BASED SAFETY AUDIT PRACTICES

The Advisory Circular provides a standard against which the SMS can be audited in order to measure effectiveness. Audit findings should still be disseminated to the personnel responsible for the activity so that preventive or corrective actions can be taken and tracked.

DEVELOP A RISK-BASED AUDIT PROGRAMME

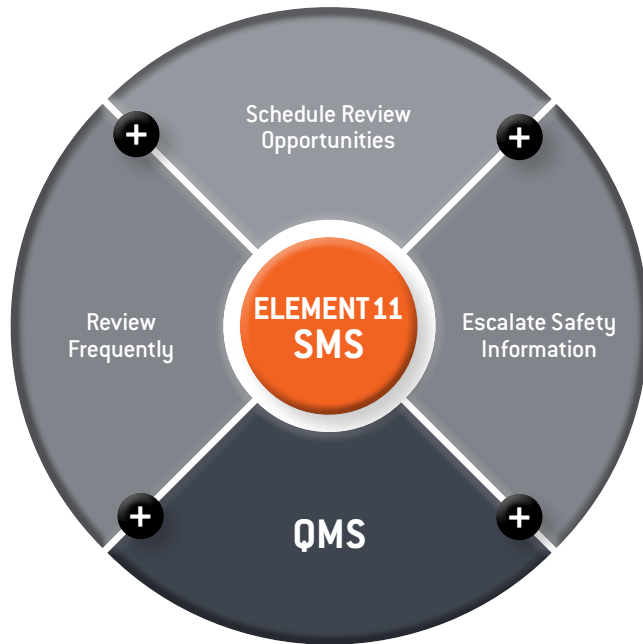
SMS auditing needs to be integrated into your current audit programme. The frequency and scope of audits can be determined by using a risk-based audit programme.

ENSURE SAFETY AUDITORS ARE TRAINED

SMS audits must be conducted by auditors who are both trained and independent of the personnel being audited. It may make sense to engage a third party for this function.

ELEMENT 11: MANAGEMENT REVIEW

This step is about the management review of the SMS, rather than referring to routine management activities. For management to make and resource safety-critical decisions, they must have up-to-date information on the current state of safety management processes.



You may have a management review process, this will require enhancement to encompass all of your safety systems.

SCHEDULE MANAGEMENT REVIEW OPPORTUNITIES

You may already hold monthly review meetings which have a set agenda. Expand any existing regular meetings by introducing a safety and risk-based approach. Ensure that relevant decision makers are present and records are kept.

ESCALATE SAFETY INFORMATION

Consider how to provide management with information about how the SMS is faring. The monitor and review process will assist in giving management a more complete view of safety risks and processes.

REVIEW FREQUENTLY

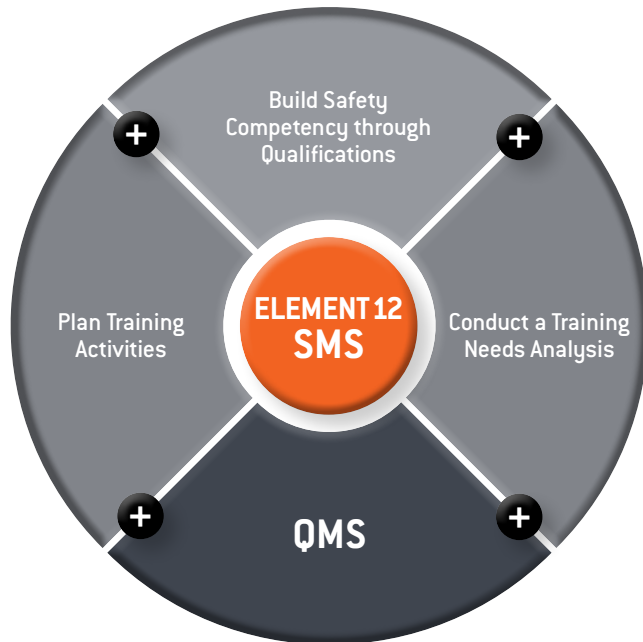
A formal management review should be conducted at least once a year.

Additionally, any significant event requiring rapid safety-critical decisions should trigger a management review.



ELEMENT 12: SAFETY TRAINING AND EDUCATION PROGRAMME

It is important that staff are provided with the knowledge and skills to develop safety competency.



Education will create awareness of the SMS objectives and the importance of developing a positive safety culture. Third party contractors must be considered in SMS training and education plans.

BUILD SAFETY COMPETENCY THROUGH QUALIFICATIONS

New competencies will be required by staff in key safety related areas such as:

- Risk management
- Safety investigation
- Safety evaluations and auditing
- Safety performance review.

CONDUCT A TRAINING NEEDS ANALYSIS

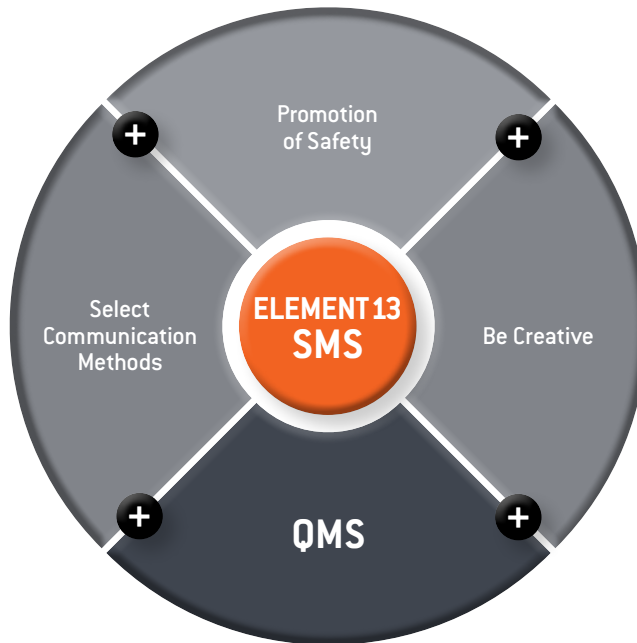
It could be useful to conduct a training needs analysis to determine who needs to be trained and to which level. For example, it is essential that your CE is trained in SMS and risk management, whereas general operational staff will require a different level of understanding.

PLAN TRAINING ACTIVITIES

Competency is critical to enable the consistent application of these new skills. Timeframes for this training need to be established and recurrent training may be required.

ELEMENT 13: COMMUNICATION OF SAFETY CRITICAL INFORMATION

The proactive communication of safety-critical information is crucial to an effective SMS. The continuous and free flow of safety communications keeps senior management and staff up to date with safety issues and information.



SELECT EFFECTIVE COMMUNICATION METHODS

Your organisation needs to promote active communication methods as well as passive ones. For example:

- Regular safety meetings
- Safety updates, memos and emails
- Safety newsletters or magazines
- Safety posters or noticeboards
- Safety outcomes of investigations.

PROMOTE, PROMOTE, PROMOTE!

Find ways to communicate safety information to your workforce. Encourage them to reciprocate by conveying safety information in return.

ENSURE CREATIVITY IS USED

Use all possible platforms (written, spoken and electronic) to promote and communicate safety information. Provide external information sources to staff. Lessons learned by others provide valuable safety insights.

CONCLUSION

Expanding your QMS into an SMS will be an economically sound and logical endeavour. SMS is not a substitute for compliance, however compliance is an integral component of an SMS. Once you have implemented an SMS, the safety performance of your organisation will be greatly enhanced.

**“SAFETY IS A DYNAMIC
NON-EVENT, WE HAVE
TO WORK VERY HARD
SO THAT NOTHING
WILL HAPPEN”**

– PROFESSOR JAMES REASON

This booklet is based upon CAA Advisory Circular AC 00-4,
Safety Management Systems, Version 1.0, 19 December 2012.

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