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Advisory Circular

AC 145-1(0)

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SAFETY MANAGEMENT SYSTEMS FOR APPROVED MAINTENANCE ORGANISATIONS

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1. REFERENCES

- Civil Aviation Act 1988
- Civil Aviation Safety Regulations 1998
- Risk Management Standard AS/NZS ISO 31000:2009
- International Civil Aviation Organization (ICAO), Doc 9859 – *Safety Management Manual*, 2nd Edition dated 2008
- Civil Aviation Authority of Singapore (CAAS) Advisory Circular 1-3 (0) — *Safety Management Systems*
- United Kingdom Civil Aviation Authority Civil Aviation Publication 712 — *Safety Management Systems for Commercial Air Transport Operations*
- Transport Canada Advisory Circular 107-001 — *Guidance on Safety Management System Development*

Advisory Circulars are intended to provide advice and guidance to illustrate a means, but not necessarily the only means, of complying with the Regulations, or to explain certain regulatory requirements by providing informative, interpretative and explanatory material.

Where an AC is referred to in a ‘Note’ below the regulation, the AC remains as guidance material.

ACs should always be read in conjunction with the referenced regulations.

This AC has been approved for release by the Executive Manager Standards Development and Future Technology Division.

2. PURPOSE

2.1 This Advisory Circular (AC) provides guidance on the practical application of the regulations pertaining to Safety Management Systems (SMS) and provides examples of SMS processes suitable for organisations operating under Part 145 of the *Civil Aviation Safety Regulations 1998* (CASR 1998). An aircraft maintenance provider seeking to become an Approved Maintenance Organisation (AMO) under Part 145 of the CASR 1998, can utilise the guidance provided by this AC in developing their SMS.

2.2 This AC is intended to be read in conjunction with Part 145 of CASR 1998 and its Manual of Standards (MOS) and replaces the coverage on the subject previously published in the Part of 145 Acceptable Means of Compliance (AMC)/Guidance Material (GM) document.

3. STATUS OF THIS ADVISORY CIRCULAR (AC)

3.1 This is the first AC to be issued on this subject and supersedes previous Civil Aviation Safety Authority (CASA) guidance and safety promotion material in regards to SMS in an AMO.

4. ACRONYMS

AC	Advisory Circular
AMC	Acceptable Means of Compliance
AMO	Approved Maintenance Organisation.
AOC	Air Operator's Certificate
AS/NZS	Australian/New Zealand Standard
ATSB	Australian Transport Safety Bureau (Australia)
CASA	Civil Aviation Safety Authority
CASR	Civil Aviation Safety Regulations 1998
ERP	Emergency Response Plan
FAA	Federal Aviation Administration (United States)
HF	Human Factors
ICAO	International Civil Aviation Organization
IRM	Immediately Reportable Matter
IRS	Internal Reporting System
ISO	International Organization for Standardization
LAME	Licensed Aircraft Maintenance Engineer
MOS	Manual of Standards
SAG	Safety Action Group
SLA	Service Level Agreement
SMM	Safety Management Manual
SOP	Standard Operating Procedure
SPI	Safety Performance Indicator
SRB	Safety Review Board

5. DEFINITIONS

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

- a person is fatally or seriously injured as a result of being in the aircraft; direct contact with any part of the aircraft, including parts which have become detached from the aircraft; or direct exposure to jet blast; except when the injuries are from natural causes, self-inflicted, or caused by other persons, or when injuries are to stowaways hiding outside the areas normally available to the passengers and crew;
- the aircraft sustains damage or structural failure which:
 - adversely affects the structural strength, performance or flight characteristics of the aircraft; and
 - would normally require major repair or replacement of the affected component; except for engine failure or damage, when the damage is limited to the engine, its cowlings or accessories; or for damage limited to propellers, wing tips, antennas, tyres, brakes, fairings, small dents or puncture holes in the aircraft skin.

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

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

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

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

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

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

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

human factors principles, in relation to maintenance, means principles that deal with the interaction between human performance and maintenance system components that are applied to improve safety of air navigation.

human performance, in relation to maintenance, means the human capabilities and limitations that have an effect on the safety of air navigation, such as fitness, health, stress, fatigue, drugs and alcohol, and work environment.

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

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

Norms: Informal work practices or unwritten rules that are accepted by a workgroup, team or organisation.

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

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

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

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

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

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

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

Safety Management: May be described as managing the identification of hazards and the mitigation of risks associated with those hazards until they reach the ALARP criteria.

Safety Manager: A person responsible for managing all aspects of the operation of the organisation's SMS.

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

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

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

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

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

Unit of competency: Under Australian National Standards, a defined group of competencies required for effective performance in the workplace. A competency comprises the specification of knowledge and skill and the application of that knowledge and skill at an industry level, to the standard of performance required in employment.

Usability: The effectiveness, efficiency and satisfaction with which users can achieve tasks in a particular environment of a product, equipment or system.

Violation: Intended or deliberate deviations from rules, regulations or operating procedures. A person committing a violation fully intends their actions.

6. SMS REQUIREMENT

6.1 Introduction

6.1.1 This AC describes the key elements of a SMS and the expected the safety outcomes, based around the SMS framework recommended by ICAO. It specifies the components and elements that need to be in place for AMOs to meet the requirements of Part 145 of CASR 1998 for an SMS program. Although the details and level of documentation of an SMS may vary, ensuring the key SMS elements are present, suitable, operating and effective will assist in ensuring the SMS is appropriate.

6.1.2 The AMO must develop and implement an integrated, comprehensive SMS for the entire organisation, and incorporate procedures to identify and maintain compliance with current safety-related, regulatory, and other requirements. As specified in paragraph 145.A.65 (d) of the Part 145 MOS, an AMO must have a documented SMS commensurate with the size and complexity of the organisation to ensure hazards are identified and risks are assessed and mitigated. In accordance with paragraph 145.A.65 (a) of the Part 145 MOS, the Exposition must contain safety and quality policies which:

- show safety as the overriding consideration at all times;
- encourage employees to report to the AMO maintenance-related incidents and errors; and
- require all employees to comply with quality and safety standards and procedures and co-operate with requests from independent quality auditors relating to maintenance services the employees provide.

6.1.3 A successful SMS provides, amongst other things, a systematic, explicit and comprehensive process for identifying hazards and the risks they bring, and for minimising those risks. As with all management systems, it involves target setting, planning, documentation and the measuring of performance targets. The organisational culture and the way people go about their work will have a significant impact upon the success of the SMS as will incorporation of HF principles. There are many benefits that can be gained once the SMS has been implemented and a summary of those benefits is provided at Appendix 1.

6.2 Size and Complexity Considerations

6.2.1 AMOs should ensure that the SMS is appropriate for the size and complexity of their organisation. One size does not fit all, but all the SMS components and elements required by Section 145.A.65 of the Part 145 MOS must always be evident.

6.2.2 The safety committee structure should reflect the distribution and hierarchical levels within the organisation. A single, simple safety committee may be appropriate for small AMOs, with less than 50 staff and one or two locations. Larger or more diverse AMOs may need several sub-committees focusing on local needs and issues. It may be appropriate for large AMOs to establish multi-tier safety committee structure, with local Safety Action Groups (SAG) consulting and/or answering to an Executive Safety Committee.

6.2.3 Small AMOs may choose not to appoint a dedicated Safety Manager. The Accountable Manager may instead choose to appoint a Responsible Manager to the role. In small AMOs, employees may perform multiple functions. The processes and the management of the SMS will be less formal and more simplified. The checklist items for this section of the exposition will provide benchmarks; some items will be more applicable than others, depending on the size of the AMO.

6.2.4 It is for the AMO to determine the size and complexity of its SMS and what will work effectively for that organisation. An AMO that has seven or less personnel employed in safety sensitive aviation activities (as prescribed by regulation 99.015 of the CASR 1998) may register with CASA to utilise the Micro Business SMS, as developed by CASA, for their SMS.

6.2.5 The Micro Business SMS is a framework on which small businesses may build and develop a safety management system that is relevant and appropriate. AMO that qualify may register to use the Micro Business SMS at MAAT@casa.gov.au.

6.3 SMS Framework and Fundamentals

6.3.1 Management is ultimately responsible for safety, as they are for other aspects of the enterprise such as their finance system and corporate governance. Regardless of the size and complexity of an AMO, senior management will have a significant role in developing and sustaining the SMS in concert with a positive safety culture. Without the sincere, unconditional and ongoing commitment of all levels of management, any attempt at an effective safety program will be unsuccessful. Notwithstanding this, responsibility for safety resides with every employee of the AMO as with safety, everyone has a role to play.

6.3.2 Ultimately, from the AMOs perspective, the success of the SMS hinges on the development of a safety culture that promotes open reporting through non-punitive disciplinary policies and continual improvement through proactive safety assessments and quality assurance. Every employee contributes to the health and safety of the AMO. In some AMOs, SMS activity will be more visible than in others, but the system must be integrated into way the organisation operates.

6.3.3 The SMS framework in is based on the ICAO guidance for SMS which influenced the SMS described in an AMO exposition as required by Section 145.A.65 of the Part 145 MOS. The SMS policy, plans and sub systems are described within this AC as follows:

- **Section 7 of this AC - Safety Policy and Management.** A comprehensive systematic approach to the management of aviation safety within an organisation, including the interfaces between the organisation and its suppliers, subcontractors and business partners. The full integration of safety considerations into the business, through the application of management controls to all aspects of the business processes critical to safety. Guidance on appointments made to manage safety is provided within Appendix 2.
- **Section 8 of this AC - Safety Risk Management Plan.** The use of active monitoring and audit processes to validate that the necessary controls identified through the hazard management process are in place and to ensure continuing active commitment to safety.
- **Section 9 of this AC - Safety Assurance System.** The use of quality assurance principles, including improvement and feedback mechanisms.
- **Section 10 of this AC - Safety Promotion.** Promotion of safety and the SMS throughout the organisation by the leadership team and appropriate safety system training for all staff – updated and validated periodically.
- **Section 11 of this AC – Internal Reporting and Associated Investigative Processes.** The safety policy and SMS documentation needs to be clear that the purpose of the safety reporting process and any subsequent internal investigations is to find systemic causes and implement corrective actions

7. SAFETY POLICY AND MANAGEMENT SYSTEMS

7.1 Safety Policy. Management commitment to and responsibility for safety needs to be formally expressed in a statement of the AMO's safety policy. The safety policy is a reflection of the organisation's philosophy of safety management and the foundation upon which the organisation's SMS is built. As per paragraph 145.A.65 (a) of the Part 145 GM - Safety and Quality Policy, Maintenance Procedures and Management Systems, an AMO's exposition must contain safety policies which show safety as the overriding consideration at all times; and encourage employees to report to the AMO maintenance-related incidents and errors; and require all employees to comply with safety standards and procedures.

7.2 In preparing a safety policy, senior management should consult widely with key staff members in charge of safety critical areas. Consultation ensures that the document is relevant to staff and gives them a sense of ownership in it. Corporate safety policy must also be consistent with relevant CASA regulations. The safety policy should be communicated to all employees and third parties and be reviewed periodically to ensure its ongoing relevance and for continuous improvement in the level of safety. The statement below may be used as it appears or may be altered so long as intent remains the same.

Sample Safety Policy Statement - Example

7.3 Safety is the first priority in all our activities. We are committed to implementing, developing and improving strategies, management systems and processes to ensure that all our aviation activities uphold the highest level of safety performance and meet national and international standards. Our commitment is to:

- develop and embed a safety culture in all our aviation activities that recognises the importance and value of effective aviation safety management and acknowledges at all times that safety is paramount;
- clearly define for all staff their accountabilities and responsibilities for the development and delivery of aviation safety strategy and performance;
- minimise the risks associated with aircraft operations to a point that is as low as reasonably practicable/achievable;
- ensure that externally supplied systems and services that impact upon the safety of our operations meet appropriate safety standards;
- actively develop and improve our safety processes to conform to world-class standards;
- comply with and, wherever possible, exceed legislative and regulatory requirements and standards;
- ensure that all staff are provided with adequate and appropriate aviation safety information and training, are competent in safety matters and are only allocated tasks commensurate with their skills;
- ensure that sufficient skilled and trained resources are available to implement safety strategy and policy;
- establish and measure our safety performance against realistic objectives and/or targets;
- achieve the highest levels of safety standards and performance in all our aviation activities;
- continually improve our safety performance;
- conduct safety and management reviews and ensure that relevant action is taken; and

- ensure that the application of effective aviation SMS is integral to all our aviation activities, with the objective of achieving the highest levels of safety standards and performance.

7.4 Commitment to SMS. Management's commitment and responsibility for safety risk management needs to reflect the organisations philosophy of safety management and become the foundation on which the organisations SMS is built. The creation of a positive safety culture begins with the issuance of a clear, unequivocal direction. Listed below are topics that may be covered in statements of corporate safety commitment.

7.5 Core values. Among our core values, we will include:

- safety, health and the environment;
- ethical behaviour; and
- valuing people;

7.6 Fundamental safety beliefs. Our fundamental safety beliefs are:

- safety is a core business and personal value;
- safety is a source of our competitive advantage;
- our business will be strengthened by making safety excellence an integral part of all aviation activities;
- all accidents and serious incidents are preventable; and
- all levels of management are accountable for our safety performance, starting with the Chief Executive Officer/Managing Director;

7.7 Core elements of our safety approach. The six core elements of our safety approach include:

- Top management commitment:
 - safety excellence will be a component of our mission; and
 - senior management will hold line management and all employees accountable for safety performance;
- Responsibility and accountability of all employees:
 - safety performance will be an important part of our management/employee evaluation system;
 - we will recognise and reward safety performance; and
 - before any work is done, we will make everyone aware of the safety rules and processes, as well as each one's personal responsibility to observe them;
- Clearly Communicated expectations of zero accidents:
 - we will have a formal written safety goal and we will ensure that everyone understands and accepts that goal; and
 - we will have a communications and motivation system in place to keep our employees focused on the safety goal;
- Auditing and measuring performance for improvement:
 - management will ensure that regular safety audits are conducted;
 - we will focus our audits on the behaviour of people, as well as on the conditions of the workplace; and
 - we will establish performance indicators to help us evaluate our safety performance;

- Responsibility of all employees:
 - each of us will be expected to accept responsibility and accountability for our own behaviour;
 - each of us will have an opportunity to participate in developing safety standards and procedures;
 - we will openly communicate information about safety incidents and will share the lessons learned with others; and
 - each of us will be concerned for the safety of others in our organisation;
- Objectives of the safety process. Our objectives include:
 - all levels of management will be clearly committed to safety;
 - we will have clear employee safety metrics, with clear accountability;
 - we will have open safety communications;
 - we will involve all relevant staff in the decision-making process;
 - we will provide the necessary training to build and maintain meaningful safety leadership skills; and
 - the safety of our employees, customers and suppliers will be a strategic issue of the organisation.

7.8 Safety objectives define what the AMO wishes to achieve. These objectives may be expressed in terms of short, medium and long term safety and express organisation's commitment to achieving the results. It should be publicised and widely distributed. A typical safety objective could read:

“The safety objective of our organisation is to continually improve the safety of our operations by identifying, eliminating or mitigating any deficiencies in conditions, policies and procedures, and by ensuring management and employees consider, at all times, the safety implications of their own actions and those of their colleagues.”

7.9 The SMS. The AMO must have in its exposition a written SMS for the AMO, which must, as a minimum, include the statement of the AMO's safety policy and management commitment to and responsibility for safety risk management as detailed above. Senior management should develop an organisational structure that is capable of providing adequate support to the management of the SMS. It should clearly depict safety accountabilities and lines of communication that reflect senior management commitment to safety and their recognition of the commitment of safety contributions of all levels of staff. This safety-focused structure could be clearly depicted in an organisation chart. An SMS Manual (Guidance on how to develop a SMS Manual is provided in Appendix 3) can be used to describe the way in which the organisation's SMS operates and may contain the SMS safety policy.

7.10 SMS - Safety Accountabilities of Managers. The safety accountabilities of managers include ensuring that there is:

- commitment by the managers for their responsibility for safety risk management;
- provision of the resources necessary for the effective safety management
- awareness of their safety responsibilities and accountability for safety at all levels of the organisation;
- promotion and demonstration of their commitment to the Safety Policy through active and visible participation in the SMS;
- compliance with all applicable legal/legislative requirements, standards and best practice;
- established maintained standards for acceptable safety behaviour;

- active encouragement of safety reporting with explicit support of a ‘just culture’, as part of the overall safety culture of the organisation, i.e. encouragement of, not reprisal against, employees that report safety issues; and
- periodic review of the safety policy to ensure it remains relevant and appropriate to the organisation.

7.11 Some examples of management’s commitment and support for safety may be evidenced by managers:

- discussing safety matters as the first priority during staff meetings;
- participating in safety committees and reviews;
- allocating the necessary resources such as time and money to safety matters; and
- setting a personal example.

7.12 As part of their safety accountabilities managers may set use safety targets as a way to meet the safety objectives. The most common weakness in setting targets is identifying outcomes, which usually means counting accidents. But, safe organisations can have accidents, while less safe organisations can be lucky, and avoid accidents. Although the ultimate objective is ‘no accidents’, there are more precise and useful approaches to measuring safety, especially in a safety system, than counting accidents. Sound safety target-setting concentrates on identifying systemic weaknesses which may identify accident or incident precursors.

7.13 These ‘weaknesses’ – or their mitigation – should be identified targets that are specific, measurable, achievable, results-focussed and time lined. As an example include a percentage reduction in incident and/or accident from the baseline levels and/or which focus on local activities and are aimed at combined reductions. It is also important to consider both positive and negative targets, e.g. an increase (of x%) in on-time delivery rates.

7.14 SMS - Appointment of Key Safety Personnel. Detail of the considerations to be made when appointing key personnel is provided in Appendix 2.

7.15 SMS Implementation Plan. Prior to approval of an AMO’s exposition the AMO must develop and demonstrate that it will adhere to an SMS implementation plan as required by subparagraph 145.A.65 (d) (1) (iv) of the Part 145 MOS. Appendix 4 provides guidance about SMS integration and implementation considerations. Appendix 5 provides Sources of Additional Information which may be useful when considering the implementation of a SMS and Appendix 6 is a SMS checklist that can be incorporated into the implementation plan.

7.16 An implementation plan is required to ensure that safety policy is implemented at all levels of the organisation and to develop goals that ensure safety objectives are met. The safety policy is part of the basis of the SMS implementation by managers and supervisors. Managers and supervisors need to lead the implementation and operation of the SMS by:

- actively supporting and promoting the SMS;
- communicating with all employees and parties;
- integrating safety management with other critical management systems within the organisation;
- ensuring that they and their staff comply with the SMS processes and procedures; and
- ensuring resources are made available to achieve the outcomes of the SMS.

7.17 SMS - Relevant Third Party Relationships and Interactions. This section of the SMS would contain detail of the way in which the safety management system manages interactions with companies and personnel external to the AMO. The provision of services supporting maintenance activities often involves third parties (service providers, contractors and suppliers) in such areas as ground handling, ground support, component repair, training, planning, painting, non-destructive testing (NDT) etc. An SMS should ensure that the level of safety of an organisation is not eroded by the inputs, services and supplies provided by external organisations.

7.18 Whether a large corporate contractor or small business, the AMO holds overall responsibility for the safety of services provided by the contractor. The contract or SLA should specify the safety standards to be met. The contracting authority then has the responsibility for ensuring that the contractor complies with the safety standards prescribed in the contract.

7.19 The organisation should consider the third parties previous safety record and any audit findings. In addition, the organisation should ensure that the third party understands the organisations SMS and their responsibilities relating to it. These factors should be given equal weight with other considerations like price, quality and timely delivery.

7.20 As a general guideline, a third party contract or SLA should include the following as a minimum standard:

- Any agreement for the provision of services should be supported by a written contract prior to services commencing;
- All third party providers should hold the appropriate qualifications/credentials or approvals for the work being outsourced;
- All third parties should understand the organisation's SMS, and their own responsibilities within the SMS program. The AMO must have a demonstrated process to assure themselves that the third party is aware of, and meeting these requirements;
- All contracted organisations should be able to demonstrate their ability to provide trained and competent staff. Where practicable, this training should include relevant HF training and assessment as outlined in AC 145-2, Human Factors Guidelines For Aircraft Maintenance;
- All written SLAs should contain a schedule of oversight to monitor the third party's performance on a regular basis;
- All agreements should contain details on how any noted safety hazards and deficiencies will be addressed and the time frame for these actions (risk management process as outlined in this AC);
- Where a service being provided is conducted under a licence or certificate approved by CASA, the written agreement should contain a statement requiring the third party to advise the contracting organisation of any regulatory action undertaken by CASA that may impact on the third parties ability to provide the required services;
- A documented procedure is established and maintained for managing third party interfaces;
- The contract or SLA specifies the safety standards to be met; and
- The AMO has the responsibility and safety oversight capability for ensuring the contractor complies with safety standards prescribed in the contract or SLA.

7.21 SMS - Coordination of the Emergency Response Plan. Where an AMO SMS includes an ERP, it must be documented as part of the SMS in accordance with paragraph 145.A.65 (d) of the Part 145 MOS. ERP accountabilities must be assigned to management personnel in accordance with sub-subparagraph 145.A.65 (d) 1 (ii) of the Part 145 MOS and a tangible demonstration of effectiveness of the ERP may be achieved by conducting drills and exercises with all key personnel at intervals defined in the approved control documentation to comply with the requirements of sub-subparagraph 145.A.65 (d) 3 (iv) of the Part 145 MOS – Safety and Quality Policy, Maintenance Procedures and Management Systems.

7.22 An ERP is an integral part of the SMS, and is activated in the event of a major occurrence. The ERP is designed to ensure the following is in place prior to an adverse event occurring:

- orderly and efficient transition from normal to emergency operations;
- delegation of emergency authority;
- assignment of emergency responsibilities;
- authorisation by key personnel for actions contained in the plan;
- coordination of efforts to cope with the emergency;
- safe continuation of operations or return to normal operations as soon as possible; and
- planned and coordinated action to ensure the risks attributable to a major safety event can be managed and minimised.

7.23 The ERP could be documented in a separate manual or incorporated into the organisations SMS Manual. The minimum elements to be included in an ERP are as follows:

- purpose of the ERP;
- activation of the organisational ERP;
- external agency interface (for example, aerodrome ERP, ATSB, CASA, coroner);
- passenger and crew welfare;
- casualty and next-of-kin coordination;
- accident investigation;
- organisation ERP response — accident site;
- preservation of evidence;
- media relations;
- claims and insurance procedures;
- aircraft wreckage removal; and
- emergency response training.

7.24 The primary function of the safety management documentation is to provide management with the ability to effectively communicate the organisation's approach to safety to the organisation, and contractors. The organisation should demonstrate that:

- an ERP that reflects the size, nature and complexity of the organisation is developed defining the procedures, the roles, responsibilities and actions of the various agencies and key personnel;
- key personnel in an emergency have easy access to the ERP at all times;
- the organisation has a process to distribute the ERP procedures and to communicate the content to all personnel;
- the ERP is periodically tested for the adequacy of the plan and the results reviewed to improve its effectiveness; and
- for larger, more complex AMOs:

- the organisation has memorandums of understanding or agreements with other agencies for mutual aid and the provision of emergency services; and
- the organisation has implemented Critical Incident Stress Management for its staff.

7.25 SMS - Safety Risk Management Plan. The process of risk management involves establishing an appropriate infrastructure and culture and applying a logical and systematic method of establishing the context, identifying, analysing, evaluating, treating, monitoring and communicating risks associated with any activity, function or process in a way that will enable organisations to minimise losses and maximise gains. Section 8 of this AC provides detailed guidance on risk management plan considerations.

7.26 SMS - Safety Assurance System. A safety assurance system includes documented procedures for safety performance monitoring and measurement; and the management of change; and communication of safety findings to the accountable and responsible managers to the accountable manager and to authors of safety reports. It also includes the mechanisms for continuous improvement, including regular reviews, of the SMS. Section 9 of this AC provides detailed guidance on safety assurance considerations.

7.27 SMS - Safety Promotion System. This part of the system includes documented details of the safety training, education and communication provided to all employees of the AMO. The SMS promotion system could utilise the concept of just culture in the promotion of SMS. Section 10 of this AC provides detailed guidance on the matters that need to be considered when developing the safety promotion system.

7.28 SMS - Internal Reporting System and Associated Investigation Process. These systems and processes regularly record and analyse safety data received from the AMO's internal reporting system; from operators or third parties and from the hazard identification and reporting processes of the AMO. The systems and processes need to be integrated into the safety assurance system.

8. SAFETY AND RISK MANAGEMENT PLAN

8.1 Risk management can be applied at many levels in an organisation. It can be applied at the strategic level and operational levels. The potential for human error, its influences and sources should be identified and managed through the risk management process. HF risk management allows an organisation to determine where it is vulnerable to human performance limitations.

8.2 In very broad terms, the objective of risk management is to eliminate risk where practical or reduce the risk (probability/consequence) to acceptable levels, and to manage the remaining risk so as to avoid or mitigate any possible undesirable outcome of the particular activity. It is therefore integral to the development and application of an effective SMS.

8.3 Risk can be managed via identification, reporting and surveys so that the risks determined can be managed by removal or mitigation measures.

8.4 Hazard Identification Processes

8.4.1 Hazards can combine in unforeseeable ways, so that even apparently trivial hazards can result in undesirable outcomes which may have catastrophic results. The starting point for the whole safety risk management process should be establishment of the context and hazard identification. Hazards can be identified from a range of sources including, but not limited to:

- brain-storming using experienced maintenance personnel;
- development of risk scenarios;
- trend analysis;
- feedback from training;

- maintenance programs;
- safety surveys and oversight safety audits;
- monitoring of normal maintenance operations;
- state investigation of the contribution of maintenance activities to accidents and serious incidents; and
- information exchange systems (similar organisations, regulators etc.).

8.4.2 Over time, the ‘database’ of reported hazards enables the organisation to:

- identify ‘hot spots’ that need particular attention; and
- conduct trend analysis which can provide the basis for improvement of hazard identification.

8.5 Hazard and Occurrence Reporting

8.5.1 Every event is an opportunity to learn valuable safety lessons. The lessons will only be understood, however, if the event is analysed so that all employees, including management, understand not only what happened, but also why it happened. This involves looking beyond the event and investigating the contributing factors, the organisation and HF principles within the organisation that played a role in the event.

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

8.6 Safety Surveys

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

8.6.2 A safety survey can be used to establish an organisational benchmark and then be re-used as a way of measuring improvement over a period of time. When conducting safety surveys, the following points should be considered:

- affected managers and employees should be told before the survey starts;
- affected managers and employees should receive an assurance of confidentiality regarding the information volunteered through the survey;
- any perception of bias should be avoided;
- surveys should not be used too often or they may start to be ignored;
- when conducting a survey interview, avoid criticism of the person being interviewed; and
- hearsay and rumour need to be substantiated before being accepted.

8.6.3 The organisation should demonstrate that:

- the organisation has a reporting system to capture errors, hazards and near misses;
- the reporting process is simple, accessible and commensurate with the size and complexity of the organisation;
- the organisation has attempted to proactively identify all the major hazards and risk related to its current activities;

- the safety reporting system provides feedback to the reporter of any actions taken (or not taken) and where appropriate to the rest of the organisation;
- safety investigations are carried out to identify underlying causes and potential hazards;
- safety reports are actioned in a timely manner;
- hazard identification is an ongoing process and involves all key personnel and appropriate stakeholders;
- individuals responsible for investigating reports are trained on investigation techniques;
- investigations establish causal/contributing factors (why it happened, not just what happened); and
- individuals express confidence and trust in the organisation's reporting-policy and process.

8.6.4 For larger, more complex AMOs:

- there is an active reporting system (as indicated by reporting levels of more than one report per employee per year);
- safety reports include the reporter's own errors and events that the reporter would not normally report (events where no-one was watching);
- the reporting system empowers personnel to propose corrective actions;
- the reporting system is actively used throughout the organisation;
- the reporting system is available to contracted organisations and customers to make reports; and
- there is a process in place to analyse reports and hazard logs to look for trends and gain useable management information.

8.7 Risk Management and Mitigation Process

8.7.1 Safety Risk Management is a formal process that is used to:

- identify hazards associated with an organisation's operations;
- analyse and assess the risks associated with those hazards; and
- implement controls, to prevent future accidents, incidents or occurrences.

8.7.2 The main elements of the risk management process are as follows:

- *Communicate and consult.* Communicate and consult with internal and external stakeholders as appropriate at each stage of the risk management process and concerning the process as a whole.
- *Establish the context.* Establish the external, internal and risk management context in which the rest of the process will take place. Criteria against which risk will be evaluated should be established and the structure of the analysis defined.
- *Identify risks.* Identify where, when, why and how events could prevent, degrade, and/or delay the achievement of safety objectives. Sometimes referred to as a Hazard Identification process, this encompasses a number of methodologies in identifying potential threats and past failures in order to determine the extent of the risks associated. Part of this process may include the establishment of a hazard log/register to ensure that hazards are tracked and treated as part of a formal process of prioritisation, documentation and assessment.
- *Analyse risks.* Determine consequences and likelihood of the event and therefore the level of risk. Identify and evaluate existing controls (measures in place that control the hazard or reduce the likelihood of occurrence or consequence). This analysis should consider the range of potential consequences (both commercial and operational) and

how these could occur. The determination may be the result of employing either qualitative, quantitative analysis techniques, or a combination of the two (semi-quantitative).

- *Evaluate risks.* Compare estimated levels of risk against the pre-established criteria of acceptability and consider the balance between potential benefits and adverse outcomes. This enables decisions to be made about the extent and nature of treatments required and about priorities.
- *Treat/Mitigate risks.* Develop and implement specific cost-effective strategies and action plans for increasing potential benefits and reducing potential costs and losses.
- *Monitor and review.* It is necessary to monitor the effectiveness of all steps of the risk management process. This is important for continuous improvement. Risks and the effectiveness of treatment measures need to be monitored to ensure changing circumstances do not alter priorities.

Figure 3: Risk Management Process—Overview

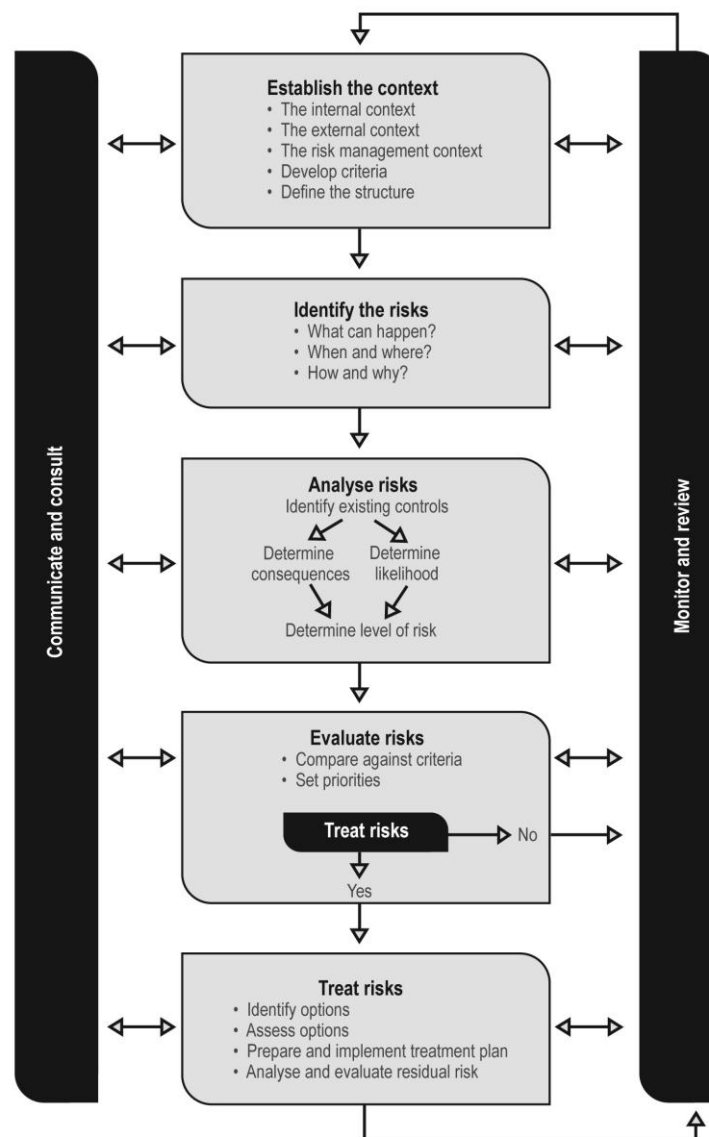


Figure 1: Risk Management Process — Overview

Source: AS/NZS 4360:2004)

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

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8.7.4 Safety risk analyses breaks down risk into two components — the probability of occurrence of a damaging event or condition, and the severity of the event or condition, should it occur. Safety risk decision making and acceptance is specified through use of a risk tolerability matrix. While a matrix is required, discretion is also required. The service provider should define and construct its risk matrix appropriate for their organisation. This is to ensure that each organisation’s safety decision tools are relevant to its environment, recognising the diversity in this area. An example of a potential matrix is included below:

Risk probability		Risk severity				
		Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
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

Figure 2: Example of a safety risk assessment matrix

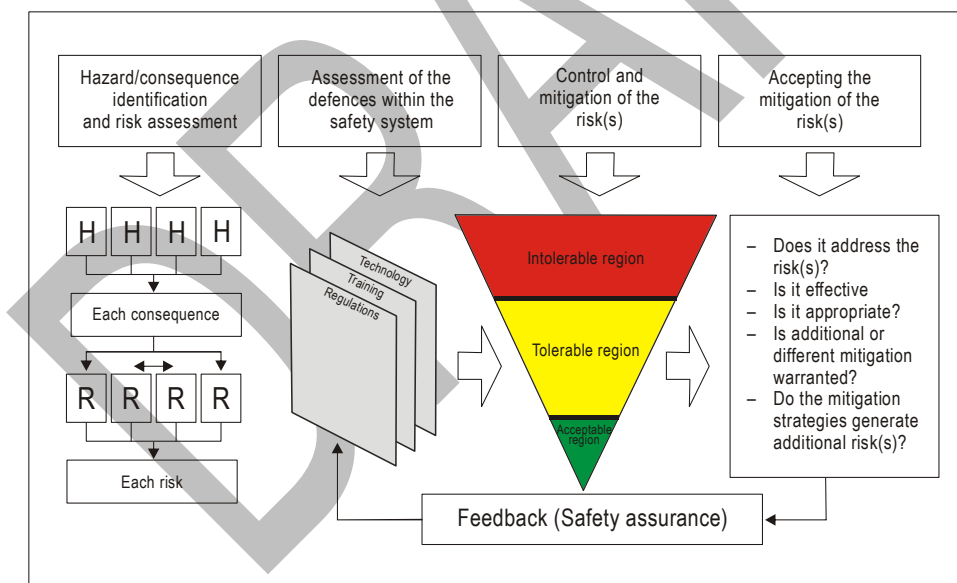


Figure 3: The Safety Risk Mitigation Process

8.7.5 After safety risks have been assessed through the preceding step, safety risk mitigation, if necessary, must take place. This step involves designing and implementing safety risk controls.

8.7.6 Figure 3 illustrates the safety risk management process including safety risk mitigation. These may be additional or changed procedures, new supervisory controls, changes to training, additional or modified equipment, or any of a number of other elimination/mitigation alternatives.

Almost invariably these alternatives will involve deployment or re-deployment of any of the three traditional aviation defences (technology, training and regulations), or combinations of them. After the safety risk controls have been designed, but before the system is placed “online,” an assessment must be made of whether the controls introduce new hazards to the system.

8.8 Safety Risk Mitigation

8.8.1 There are three generic strategies for safety risk mitigation:

- **Avoidance.** The operation or activity is cancelled because safety risks exceed the benefits of continuing the operation or activity.
- **Reduction.** The frequency of the operation or activity is reduced, or action is taken to reduce the magnitude of the 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.

8.8.2 In evaluating specific alternatives for safety risk mitigation, it must be noted that not all have the same potential for reducing safety risks. The effectiveness of each specific alternative needs to be evaluated before a decision can be taken. It is important that the full range of possible control measures be considered and that trade-offs between measures be considered to find an optimal solution. Each proposed safety risk mitigation option should be examined from such perspectives as:

- **Effectiveness.** Will it reduce or eliminate the safety risks of the consequences of the unsafe event or condition? To what extent do alternatives mitigate such safety risks? Effectiveness can be viewed as being somewhere along a continuum, as follows:
 - *Engineering.* This mitigation eliminates the safety risk of the consequences of the unsafe event or condition, for example, by providing interlocks to prevent thrust reverser activation in flight.
 - *Control.* This mitigation accepts the safety risk of the consequences of the unsafe event or condition but adjusts the system to mitigate such safety risk by reducing it to a manageable level, for example, by imposing more restrictive operating conditions.
 - *Personnel.* This mitigation accepts that engineering and/or control mitigations are neither efficient nor effective, so personnel must be taught how to cope with the safety risk of the consequences of the hazard, for example, by adding warnings, revised checklists, SOPs and/or extra training.
- **Cost/benefit.** Do the perceived benefits of the mitigation outweigh the costs? Will the potential gains be proportional to the impact of the change required?
- **Practicality.** Is the mitigation practical and appropriate in terms of available technology, financial feasibility, administrative feasibility, governing legislation and regulations, political will, etc.?
- **Challenge.** Can the mitigation withstand critical scrutiny from all stakeholders (employees, managers, stockholders/State administrations, etc.)?
- **Acceptability to each stakeholder.** How much buy-in (or resistance) from stakeholders can be expected? (Discussions with stakeholders during the safety risk assessment phase may indicate their preferred risk mitigation option.)
- **Durability.** Will the mitigation withstand the test of time? Will it be of temporary benefit or will it have long-term utility?
- **Residual safety risks.** After the mitigation has been implemented, what will be the residual safety risks relative to the original hazard? What is the ability to mitigate any residual safety risks?

- **New problems.** What new problems or new (perhaps worse) safety risks will be introduced by the proposed mitigation?

8.8.3 Additionally, safety risk mitigation strategies are mostly based on the deployment of additional safety defences or the reinforcement of existing ones. As discussed earlier, defences in the aviation system can be grouped under three general categories:

- technology;
- training; and
- regulations.

8.8.4 Furthermore, as part of safety risk mitigation, it is important to determine why new defences are necessary or why existing ones must be reinforced. The following questions may pertain to such determination:

- Do defences to protect against the safety risks of the consequences of the hazards exist?
- Do defences function as intended?
- Are the defences practical for use under actual working conditions?
- Are staff involved aware of the safety risks of the consequences of the hazards, and the defences in place?
- Are additional safety risk mitigation/control measures required?

8.8.5 Once the mitigation has been accepted, the strategies developed and deployed must, as part of the safety assurance process, be fed back into the organisation's defences, upon which the mitigation strategies are based, to ensure integrity, efficiency and effectiveness of the defences under the new operational conditions. Matters to be managed include:

- corrective actions resulting from the risk assessment, including timelines and allocation of responsibilities are documented;
- risk management is routinely applied in decision making processes;
- smart and robust mitigations and controls are implemented;
- risk assessments and risk ratings are appropriately justified; and
- senior management have visibility of medium and high risk hazards and their mitigation and controls.

8.8.6 For larger, more complex AMOs:

- there is evidence that risks are managed to as low as reasonably practical; and
- the organisation uses its risk management results to develop best practice guidelines that it shares with the industry.

9. SAFETY ASSURANCE SYSTEM

9.1 Introduction

9.1.1 This section covers the SMS elements of safety performance monitoring and measurement, internal safety investigation, change management; and continuous improvement of the safety system.

9.1.2 The SMS must include an acceptable safety assurance system in which safety performance monitoring and measurement demonstrate that SMS processes result in outcomes that are consistent with the documented policy and objectives required by sub-subparagraph 145.A.65 (d) 3 of the Part 145 MOS – Safety and Quality Policy, Maintenance Procedures and Management Systems.

9.2 Systems to Achieve Safety Oversight

9.2.1 The following elements are desirable:

- an organisation-wide system for the capture of written safety event/issue reports;
- a planned and comprehensive safety audit review system which has the flexibility to focus on specific safety concerns as they arise;
- a published system for the conduct of internal safety investigations, the implementation of remedial actions and the communication of such information;
- systems for effective use of safety data for performance analysis and for monitoring organisational change as part of the risk management process;
- arrangements for ongoing safety promotion based on the measured internal safety performance and assimilation of experience of other operations;
- periodic review of the continued effectiveness of the SMS by an internal, independent body; and
- line managers monitoring work in progress in all safety critical activities to confirm compliance with all regulatory requirements, organisational standards and local procedures.

9.3 Safety Performance Monitoring and Measurement

9.3.1 Safety management requires feedback on safety performance to complete the safety management cycle. Through feedback, system performance can be evaluated and any necessary changes effected. In addition, all stakeholders require an indication of the level of safety within an organisation for various reasons, for example:

- staff may need confidence in their organisations ability to provide a safe working environment;
- line management requires feedback on safety performance to assist in the allocation of resources between the often-conflicting targets of production and safety;
- senior management seeks to protect the corporate image (and market share); and
- share-holders wish to protect their investment.

9.3.2 The size and complexity of the organisation will determine the best methods for establishing and maintaining an effective safety performance monitoring and measurement program. Organisations providing effective safety oversight employ some or all of the following methods:

- hazard and occurrence reporting system;
- vigilant front-line supervisors maintain (from a safety perspective) by monitoring day-to-day activities;
- sample employees views on safety (from both a general and a specific point of view) through safety surveys;
- systematically review and follow up on all reports of identified safety issues;
- macro-analyses of safety performance (safety studies);
- regular audit program (including both internally and externally conducted safety audits); and

- communication of safety results to all affected personnel.

9.3.3 The organisation should demonstrate that:

- safety objectives and targets are established;
- appropriate SPIs are promulgated and are monitored and analysed for trends;
- risk mitigations and controls are verified / audited to confirm they are working and effective;
- a safety audit plan is established, which focuses on the safety performance of the organisation and its services;
- safety audits, which assess normal operations are carried out in accordance with the Safety Audit Plan;
- the safety objectives, safety targets and performance indicators are reviewed and updated periodically;
- the analysis and allocation of resources is based on outputs from the performance measurement;
- safety assurance and compliance monitoring activities provide feedback to the hazard identification process;
- safety assurance takes into account activities carried out in all directly contracted organisations; and
- monitoring is carried out on current, future and third party safety risks, and appropriate actions are taken to address unacceptable safety risks.
- For larger, more complex AMOs:
 - safety objectives, safety targets and performance indicators encompass all areas of the organisation;
 - performance measurements are defined for serious safety risks identified on the safety risk profile;
 - personnel at all levels are aware of the safety performance measures in their areas of responsibility and the results of performance measures are transmitted to them; and
 - when establishing and reviewing safety objectives, safety targets and performance indicators, the organisation considers: — hazards and risks; — financial, operational and business requirements; — views of interested parties.

10. SAFETY TRAINING AND PROMOTION

10.1 This section covers the SMS elements of safety culture, education, training; and communication. Safety must not only be recognised, but promoted, by the senior management as a core value. Procedures, practices, training and the allocation of resources clearly demonstrate management's commitment to safety.

10.2 The key elements of promoting safety within any AMO are:

- Safety Culture:
 - widely distributing and visibly posting organisational safety policy and mission statements signed by senior management;
 - clearly communicating safety responsibilities for all personnel; and
 - visibly demonstrating commitment to safety through everyday actions; and
 - implementing a 'Just Culture' process that ensures fairness and open reporting in dealing with human error.
- Safety Training:

- initial ‘new employee’ safety training;
- recurrent safety training for all employees;
- documented, reviewed and updated training requirements;
- defined competency requirements for individuals in key positions;
- introduction and review safety policies; and
- review of safety reporting processes.
- Safety Communication:
 - widely communicated status on safety performance related to goals and targets;
 - communication of all identified safety hazards;
 - overview of recent accidents and incidents and lessons learned;
 - communication of lessons learned that promote improvement in SMS;
 - communicate the realised benefits of SMS to all employees;
 - implement a safety feedback system with appropriate levels of confidentiality that promote participation by all personnel in the identification of hazards; and
- Communicate safety information with employees, as a minimum, through:
 - Safety newsletters
 - Bulletin board postings
 - Safety investigation reports
 - Internet website.

10.3 The key function of safety management promotion is to create awareness of the objectives of the SMS of the organisation and the importance of developing a positive safety culture.

10.4 A ‘just culture’ provides clear boundaries about confidentiality, reporting requirements and individuals responsibilities in relation to the SMS for both management and employees. However, in a ‘just culture’ policy, a clear distinction is required between what is acceptable behaviour and what is unacceptable, and that people are treated accordingly. ‘Just culture’ is a necessary evolution from the ‘blame free’ culture of the past. The ideal just culture embodies a spirit of openness and should also demonstrate support for employees and the systems of work. Senior management should be accessible and dedicated to making the changes necessary to enhance safety. They should be available to discuss emerging trends and safety issues identified through the system. A positive safety culture reinforces the entire safety achievement of the AMO, and it is critical to its success.

10.5 Safety Education and Training

10.5.1 As part of the implementation of training in SMS, a TNA should be undertaken for all operational safety critical personnel in the organisation.

10.5.2 Depending on the nature of the task, the complexity of safety management training required will vary from:

- initial and recurrent safety management awareness training for all staff;
- training aimed at management’s safety responsibilities;
- specific training for operational staff (such as maintenance managers, Licensed Aircraft Maintenance Engineers (LAMEs)/ Aircraft Maintenance Engineers (AMEs) etc.; and
- detailed training for safety specialists — such as the SM, Safety Representatives, and Safety Data Analysts (as required).

10.6 Training Documentation

10.6.1 Documentation should be developed to support the SMS training plan, which includes:

- a listing of the personnel (staff and third party personnel) who require SMS training;
- a means of determining when each staff member is due to undergo a specific safety training course;
- a method of determining the training provided to each member of staff;
- safety induction course/s for staff who have not previously been exposed to an SMS;
- recurrent safety course/s for all operational safety critical personnel; and
- a means of determining the effectiveness of the safety training provided e.g. feedback questionnaire, course evaluations and competency assessments.

10.6.2 An SMS training register which incorporates individual training records should be established and maintained. This may be incorporated in a centralised training record system.

10.7 Initial Safety Training — All Staff

10.7.1 All staff should receive an appropriate induction course covering, for example:

- HF elements supporting SMS (see AC 145-2 Human Factors Guidelines For Aircraft Maintenance);
- basic principles of safety management;
- corporate safety philosophy, safety policies and safety standards (including corporate approach to disciplinary action versus safety issues, integrated nature of safety management, risk management decision-making, safety culture and expected behaviours etc.);
- importance of complying with the safety policy and with the procedures that form part of the SMS;
- roles and responsibilities of staff in relation to safety;
- corporate safety record, including areas of systemic weakness;
- corporate safety targets and objectives;
- corporate safety management programs (e.g. internal audit program);
- requirement for ongoing internal assessment of organisational safety performance (e.g. employee surveys, safety audits and assessments);
- reporting reportable matters, hazardous events and potential hazards;
- lines of communication for safety matters;
- feedback and communication methods for the dissemination of safety information;
- safety awards programs (if applicable);
- the individual's role in safety management; and
- safety promotion and information dissemination.

10.8 Safety Training for Management

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

- the principles of the SMS;
- risk management process;
- their responsibilities and accountabilities for safety; and
- their legal liabilities.

10.9 Specialist Safety Training

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

- investigating safety events;
- monitoring safety performance;
- conducting risk assessments;
- managing safety databases; and
- performing safety audits.

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

10.10 Training for the Safety Manager

10.10.1 The person selected as the Safety Manager needs to be familiar with most aspects of the organisation, its activities, its management and staff. The training suggested for the SM is identified in section 9.5.7 of this AC. In summary, these include:

- familiarisation with different aircraft, types of maintenance operations, SOPs etc.;
- understanding the role of human performance in accident causation and prevention;
- operation of the SMS;
- investigation of reportable matters and hazardous events;
- crisis management and emergency response planning;
- safety promotion;
- communication skills; and
- specialised training or familiarisation.

10.11 Safety Training for Operational Safety Critical Personnel

10.11.1 In addition to the corporate induction training outlined above, employees engaged directly in maintenance operations (planning staff, LAMEs/AMEs, etc.) require more specific safety training in relation to their role in the SMS and:

- procedures for reporting reportable matters;
- procedures for hazard reporting;
- specific safety initiatives;
- seasonal safety hazards and procedures (weather-related operations etc.);
- HF training (see AC 145-2 Human Factors Guidelines For Aircraft Maintenance);
- emergency procedures.

10.12 Delivery Methods

10.12.1 The Safety Manager, in consultation with the training manager should determine the best method of delivery that fits the training requirements considering the size and complexity of the organisation.

10.12.2 Supporting education material could be delivered via:

- an intranet system;
- an internal document circulation system;
- a safety library (centrally located);
- summaries (probably by the Safety Manager) notifying staff of the receipt of such information; and
- a range of available safety posters strategically situated in workplace areas.

10.12.3 The organisation should demonstrate that:

- there is a documented process to identify SMS training requirements so that personnel are competent to perform their duties;
- there is a validation process that measures the effectiveness of training and takes appropriate action for improvement;
- there is a process that evaluates the individual's competence and takes appropriate remedial action when necessary;
- training includes initial, recurrent and when applicable update training; and
- a training record is maintained for each employee trained.

10.12.4 In addition; larger, more complex AMOs should demonstrate that:

- SMS training requirements are documented for each area of activity within the AMO, including for areas where the activities undertaken are not described within the approval scope of the organisation and where training requirements are not specified under legislation.
- Appropriate SMS training is provided and recorded for all of the AMO's employees.
- SMS training is provided for third party contractors working in activities related to the AMOs operation.
- Employees have a mechanism to request additional SMS training in relation to their role in the SMS.
- Management recognises and uses informal opportunities to instruct employees on safety management.
- Training exercises and methods for all employees is kept current to reflect new techniques, technologies, results of investigations, corrective actions and regulatory changes.

10.13 Safety Communication

10.13.1 An ongoing program of safety promotion and communication should ensure that the organisations staff benefit from safety lessons learned and continue to understand the organisations SMS. Safety promotion is linked closely to safety training and the dissemination of safety information. It refers to those activities which the organisation carries out in order to ensure that employees understand:

- why SMS procedures are in place;
- what safety management means;
- why particular safety actions are taken; and

- the benefits of the SMS and the importance of safety vigilance.

10.14 Safety Communication and Safety Culture

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

10.15 Management's Role

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

10.16 Safety Promotion Focus

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

10.16.2 Staff should be aware of the existing hazards identified and the corrective actions that have already been implemented. The safety communication activities and training programs should therefore be practical and contemporaneous. They should:

- address the rationale behind the introduction of new procedures; and
- ensure the main focus is on 'what is going on within the AMO' from a safety perspective.

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

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

10.16.4 The Safety Manager Responsible Managers and Safety Representatives should be involved in encouraging employees to submit suggestions for promotional campaigns.

10.17 Motivation

10.17.1 If a safety message is to be learned and retained, the recipient first has to be positively motivated. Unless this is achieved, much well-intended effort will be wasted. Propaganda which merely tells people to avoid making errors to take more care etc. is largely ineffective as it does not provide anything substantial to which individuals can relate. This approach has sometimes been described as the 'bumper sticker' approach to safety.

10.18 Methods of Dissemination

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

10.18.2 Once a decision has been made to disseminate safety information, a number of important factors should be considered, including the:

- Audience — The message needs to be expressed in terms and vernacular that reflect the knowledge and culture of the audience.
- Response — What is expected to be accomplished?
- Media — Consider which form(s) of media are the most effective. Which methods do people pay attention to and how do they like to receive information? Most importantly, which method(s) have the greatest penetration and credibility? For example, print, web, multimedia etc.
- Presentation style — This may involve the use of humour, graphics, photography and other attention-getting techniques.

10.18.3 The organisational safety communication program should be based on several different communication methods for reasons of flexibility and cost. Typical methods available are:

- Spoken word — Perhaps the most effective method, especially if supplemented with a visual presentation. However, it is also the most expensive method, consuming time and effort to assemble the audience, aids and equipment.
- Written word — The most popular method because of speed and economy, the printed safety promotion material also competes for attention with considerable amounts of other printed material.
- Videos — while offering advantages of dynamic imagery and sound to reinforce particular safety messages efficiently, videos also have two main limitations: expense of production and the need for special equipment for viewing.
- Electronic media — Use of the intranet and internet offers significant potential for improvement in the communication of safety, as even small companies can establish and maintain a website to disseminate safety information.

11. INTERNAL REPORTING AND ASSOCIATED INVESTIGATIVE PROCESSES

11.1 Why report safety incidents and hazards?

11.1.1 Reporting is the first step to analysis, which enables us to consider and develop improvements to the work environment to prevent recurrence of safety incidents, in order to:

- manage the risks from events caused by the hazards identified in the report (including human factors) that may affect aircraft safety and result in personal injury, and / or equipment damage;
- help organisations identify and understand multiple contributing factors to events, incidents errors and violations;
- use the identified contributing factors to provide an organisation with a specific, effective focus to prevent future events;
- to create an open and honest reporting environment that will identify causes rather than culprits;
- to inform and encourage an organisations continuous improvement process; and
- to prevent incidents before they occur by education, training and good communication and the questioning of workplace ‘Norms’.

11.1.2 The safety policy and SMS documentation needs to be clear that the purpose of the safety reporting process and any subsequent internal investigations is to find systemic causes and implement corrective actions - not to apportion blame to individual(s). This accords with a 'Just Culture' principle which has proven to increase the likelihood that safety reporting will occur promptly, accurately and reliably.

11.1.3 When developing the AMOs internal reporting capability, ensure the following references are taken into consideration:

- internal reporting system (required under section 145.A.60 of the Part 145 MOS);
- operators or third parties (mentioned in sub-subparagraph 145.A.65 (d) 1 (v) of the Part 145 MOS);
- hazard identification and reporting processes (mentioned in sub-subparagraph 145.A.65 (d) 2 (i) of the Part 145 MOS); and
- safety assurance system integrated (mentioned in subparagraph 145.A.65 (d) 3 of the Part 145 MOS).

11.1.4 Organisations are required to meet statutory reporting requirements under the Transport Safety Investigation Act 2003. Immediately Reportable Matters (IRM) and Routine Reportable Matters (RRM) are required to be reported to the ATSB. IRM and RRM are events relating to an organisations operations, and therefore need to be included in the design of the organisations internal reporting system.

11.1.5 An IRS is a method of gathering valuable safety information from the people who are usually best placed to identify a range of hazards in an organisation — the employees. An organisation's IRS should encompass the following fundamental elements:

- procedures for reporting occurrences (including IRM and RRM), hazards, or safety concerns;
- methods for the collection, storage and distribution of data (hazard register or log);
- procedures for classifying and analysing data, safety reports and any other safety related information;
- documentation of corrective action and risk reduction strategies;
- determination of the effectiveness of corrective action; and
- on-going monitoring and review.

11.1.6 The IRS should be accessible by all operational safety-critical personnel and incorporates the identification of contributing HF. In addition, staff should be trained and encouraged to identify and report contributing HF when reporting hazards or occurrences. Systems to encourage open reporting include:

- just culture based, confidential hazard and incident reporting systems;
- a clear and accessible process for reporting issues;
- formal and informal meetings to discuss safety concerns; and
- feedback from management about action taken as a result of hazard and incident reports or safety meetings.

11.2 Safety Investigations

11.2.1 For every accident or serious incident, there will likely be hundreds of minor events or near-misses, many of which have the potential to become an accident. It is important that all reported events/hazards be reviewed and a decision taken on which ones should be investigated, and how thoroughly.

11.2.2 SMS procedures should state that the purpose of internal investigations is to find systemic causes and implement corrective actions, NOT to apportion blame to individuals. Where a 'Just Culture' policy is in place, the policy and protocols for internal investigations should clearly reference such policy.

11.2.3 Where the ATSB conducts an investigation into an event, the Safety Manager or delegate may act as the organisation's point of contact and the coordinator for the investigation. This ensures the Safety Manager and the Accountable Manager are kept well informed and involved (as necessary) as the investigation progresses. The person in charge of the investigation should have the authority to interview any manager or employee and access any company information source.

11.2.4 The level of resources allocated to an investigation should be balanced between the AMOs availability and the perceived benefit to the AMO, in terms of potential for identifying systemic hazards and risks; and therefore positively contributing to the safety health of the AMO.

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

11.2.6 The investigative process should attempt to address the factors that contributed to the event (latent conditions), rather than simply focusing on the event itself and the active failures that took place immediately prior to the event. Active failures take place immediately prior to an event and have a direct impact on the safety of the system because of the immediacy of their adverse effects. However they are not the root cause of the event; applying corrective actions to these issues may not address the real cause of the problem. Latent conditions exist within the system and contribute to the eventuality or severity of the actual event and may represent the root cause of an event. A detailed analysis is required to establish the organisational factors and latent conditions that contributed to the event.

11.2.7 The organisation should demonstrate that:

- There are procedures in place for the conduct of investigations.
- Measures exist to ensure that all reported hazards, incidents and accidents are reviewed and, where required, investigated.
- There is a process to ensure that hazards, incidents and accidents are analysed to identify contributing and root causes.
- When identifying contributing and root causes, the organisation considers individual human factors, the environment, supervision and organisational elements.
- Competent investigators are engaged, commensurate with the AMOs size and complexity.
- Results of the analyses are communicated to the Responsible Manager for corrective action and to other relevant managers for their information.
- There is a process to capture information from an investigation that can be used to monitor and analyse trends.
- There is evidence that the AMO has made every effort to complete the investigation and analysis process in the established timeframe.
- And for larger, more complex AMOs:
 - The AMO analyses other types of safety reports received from sources such as the environment, occupational health and safety and third party contractors that may have an impact on aviation safety.

- Third party stakeholders have been consulted during the root cause analysis process for example, manufacturers, suppliers and distributors.
- The AMO provides support to third party stakeholders in the conduct of investigation and analysis of hazards, incidents and accidents outside of the scope of their certificate.

11.3 Investigation Management

11.3.1 Where the ATSB conducts an investigation into an organisation event, the Safety Manager, or delegate, should be the organisation's point of contact/coordinator for the investigation. This way the Safety Manager will be kept informed as the investigation progresses.

11.3.2 Resources are normally limited, so effort expended should be allocated to investigations with the greatest perceived benefit in terms of potential for identifying systemic hazards and risks to the safety of flight.

11.3.3 The accountability for the management of internal safety investigations should be documented in the organisations SMS specifically to determine:

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

11.3.4 The accountable person in charge of the investigation should have the authority to:

- interview any manager or staff member; and
- access any company information source.

11.4 Scope of Safety Investigations

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

11.4.2 The investigative process should be comprehensive and should attempt to address the factors that contributed to the event, rather than simply focusing on the event itself or the active failures that took place immediately prior to the event. Active failures take place immediately prior to an event and have a direct impact on the safety of the system because of the immediacy of their adverse effects. However, they are usually not the root causes of the event. Applying corrective actions to these issues may not address the real cause of the problem. A more detailed analysis is required to establish the organisational factors that contributed to the event.

11.4.3 It is essential that the contribution of HF is properly investigated when incidents and accidents occur. This is done so that the organisation can learn from incidents and near misses in order to protect itself against the consequences of failing to accommodate human limitations in the design and operation of aviation systems.

11.4.4 The HF component of investigation should be based on a model or framework for systemic investigations considering human error, both at the individual and organisational levels. A number of human error models and frameworks (such as Reason's model) have been developed over the last two decades to aid in understanding how humans err and how accidents/incidents occur in the larger context of the systems in which these accidents/incidents take place.

11.4.5 Investigators should be trained in basic HF concepts, and procedures should be designed to examine the detail of human performance factors that may have contributed to the event. These include the systemic sources of the failure (e.g. component failures, design deficiencies of equipment and/or infrastructure, inadequate procedures and lack of training).

11.5 Reporting

11.5.1 When developing the AMOs internal reporting and investigation capability, ensure the following references are taken into consideration:

- internal reporting system (required under section 145.A.60 of the Part 145 MOS);
- operators or third parties (mentioned in sub-subparagraph 145.A.65 (d) 1 (v) of the Part 145 MOS);
- hazard identification and reporting processes (mentioned in sub-subparagraph 145.A.65 (d) 2 (i) of the Part 145 MOS); and
- safety assurance system integrated (mentioned in subparagraph 145.A.65 (d) 3 of the Part 145 MOS).

11.5.2 The organisation should demonstrate that:

- There is an established and maintained confidential employee safety reporting and feedback system.
- The AMO encourages employees to use the safety reporting and feedback system without fear of punishment and to encourage submission of solutions and safety improvements where possible.
- Data from the safety reporting and feedback system is monitored to identify emerging hazards.
- Data collected in the employee reporting and feedback system is included in the analysis conducted under SMS.
- For larger, more complex AMOs, their SMS should:
 - identify interfaces between the employee reporting and feedback process and analysis of data process;
 - periodically measure performance objectives and design expectations of the employee reporting and feedback process;
 - ensure reporting procedures are followed for safety-related operations and activities; and
 - periodically review supervisory and operational controls to ensure the effectiveness of the employee reporting and feedback process.

Internal Safety Investigation Process

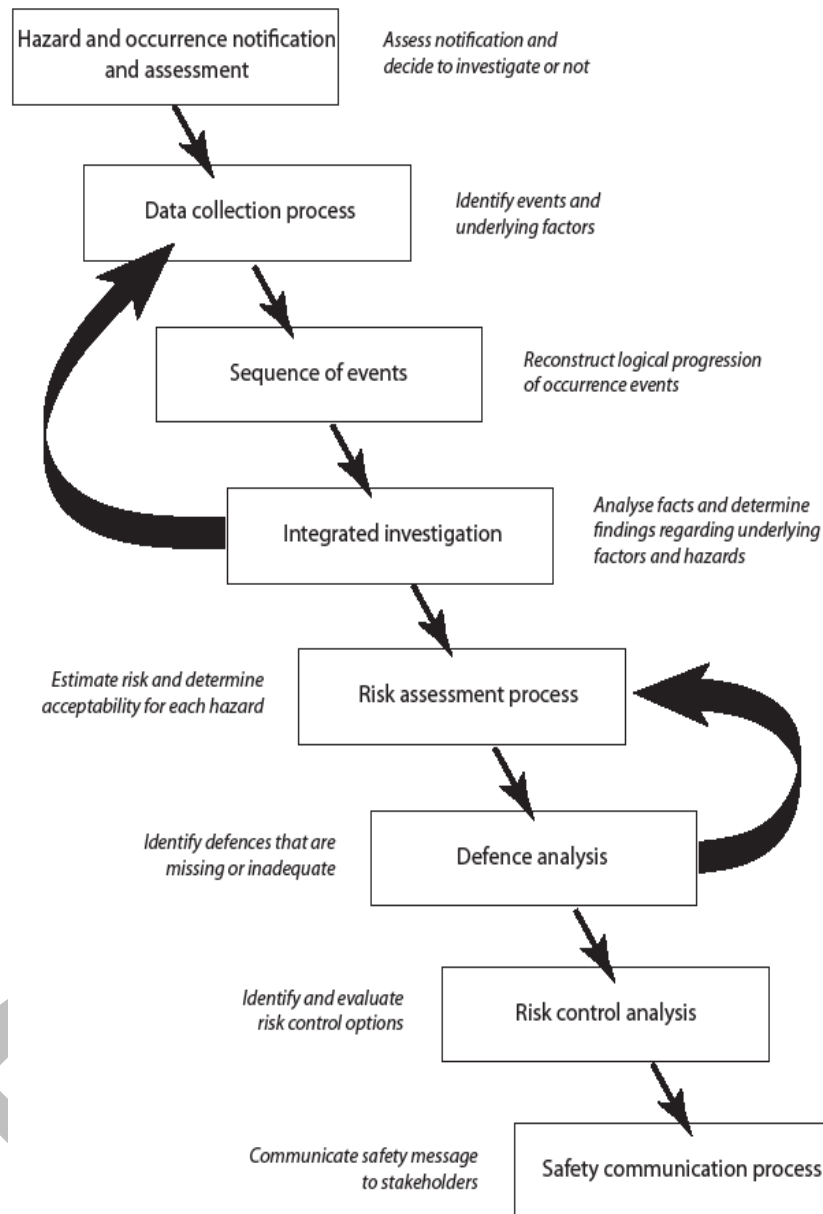


Figure 4: Integrated Safety Investigation Methodology

Executive Manager
Standards Division
May 2012

APPENDIX 1

BENEFITS OF A SAFETY MANAGEMENT SYSTEM

The Benefits of an SMS

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

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

- reduction in incidents and accidents (occurrences);
- reduced direct and indirect costs;
- safety recognition by the travelling public and customers;
- reduced insurance premiums; and
- proof of diligence in the event of legal or regulatory safety investigations.

Benefits for integrating HF into the SMS

The integration of HF in the SMS will also help to achieve the results listed above by:

- ensuring that human performance is optimally managed to improve safety capacity and efficiency;
- demonstrating all reasonable steps have been taken to manage safety and control risk from the perspective of human performance;
- reducing direct costs by considering HF issues in the SMS and as part of any significant change management activity;
- reducing indirect costs (such as staff turnover and stress-related leave);
- reducing duplication of activities and effort (and streamlines changes) resulting in cost reductions;
- improving staff motivation across the organisation; and
- improving staff acceptance of change.

SMS make economic sense

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

Direct Costs

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

Indirect Costs

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

- Loss of business and damage to the reputation of the organisation. Many operators will not contract an AMO to maintain their aircraft if the AMO has a questionable safety record or known ineffective SMS.
- Legal and damage claims. While organisations can take out insurance for public liability, it is hard to cover the costs of lost time handling legal actions and damage claims. An organisation should take action to protect its interests, and to do so will cost both time and money.
- Surplus spares, tools and training. If organisations have a spares inventory and people trained for a one-of-a-kind aircraft that is involved in an accident, the spares and training become surplus overnight. In many cases, the sale value of the spares is below the purchase cost.
- Increased insurance premiums. An accident may push organisations into a higher risk category for insurance purposes, and therefore could result in increased premiums. The implementation of an SMS could help an organisation negotiate a lower premium.
- Aircraft recovery and clean-up. This is often an uninsurable cost and is usually met by the operator.
- Internal investigations. 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 jeopardise the AMOs existing contracts.
- Cost of short-term replacement equipment. Short-term hire is usually far above the cost of operating organisation-owned equipment.

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

Industry/Social Costs

In 2003 the Bureau of Infrastructure, Transport and Regional Economics found that the industry/social cost of aviation accidents in Australia was \$114 million. Over one-third of this cost is made up of the loss to society of the productive capacity of the victims of aviation accidents. A quarter is attributable to damage to aircraft, and a fifth to family and community loss.

APPENDIX 2**APPOINTMENTS FOR SMS RESPONSIBILITIES****Accountable Manager**

The Accountable Manager is an extremely important person with regards to the SMS. They should establish and promote the safety and quality management policies required by paragraph 145.A.65 (a) of the Part 145 MOS and have full responsibility and ultimate accountability for the SMS to ensure it is properly implemented and performing to requirements. The Accountable Manager should also have control of the financial and human resources required to ensure the proper implementation of the SMS and have an awareness of their roles and responsibilities under the SMS in respect of the safety policy, safety standards and safety culture of the organisation. Accountable Managers can demonstrate their commitment to safety by:

- recruiting a management team appropriate to the size and complexity of the organisation;
- developing and disseminating a safety policy and safety objectives;
- creating and adequately resourcing the SMS program; and
- specifying roles, responsibilities and accountabilities of the management team in relation to aviation safety.

Appointment of Key Safety Personnel

The number, type, skills, composition and appointment approach of key safety personnel will differ greatly depending on the size and complexity of the AMO. At a minimum, the Accountable Manager of the AMO must appoint a Safety Manager. The Safety Manager should satisfy certain criteria as indicated below.

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

Medium Organisations — A medium sized AMO may have a separate Safety Manager, possibly with a small number of employees. There would be scope for one of the ‘Safety Representatives’ to be appointed as deputy when required.

Key Safety Personnel -Safety Manager

Depending on the size and complexity of the AMO, the Safety Manager should possess operational management experience and an adequate technical background to understand the systems that support the operation. Operational skills alone will not be sufficient. The Safety Manager should have a sound understanding of safety management principles, acquired through formal training and practical experience.

The Safety Manager must be nominated by the Accountable Manager, and have a direct line of corporate accountability to her/him; this ensures that the Accountable Manager is kept properly informed on safety matters. The Safety Manager must be responsible for the day-to-day operation of the SMS; as required by paragraph 145.A.65 (d) of the Part 145 MOS.

The Safety Manager, irrespective of other duties, will have responsibilities and authority for, but not limited to:

- ensuring that processes needed for the SMS are established, implemented and maintained;

- reporting to the Accountable Manager on the performance of the SMS and the areas where improvement is required;
- ensuring the promotion of awareness of safety requirements throughout the organisation;
- develop and mature the SMS over time, through engagement with the organisations executive, management at all levels and operational employees;
- drafting the SMS Manual;
- implementing, maintaining, reviewing and revision of the SMS;
- regular evaluation, reviews and fine tuning of the safety program;
- providing safety advice to management and staff;
- providing timely advice and assistance on safety matters to managers, employees and contractors at all levels;
- communicating with Heads of Departments on safety related issues;
- promoting safety awareness and a positive safety culture;
- liaison with CASA, Australian Transport Safety Bureau (ATSB) and other stakeholders on safety-related issues;
- exchange of valuable lessons learned with operators and other maintenance organisations;
- researching and sharing safety related information with other key safety personnel in the organisation;
- if delegated by the Accountable Manager, chairing the safety committee(s);
- incident and accident investigation coordination (unless a obvious conflict of interest involved and/or when independence can not be assured);
- managing immunity-based reporting systems (confidential reports);
- monitoring the progress of safety reports and ensuring that hazards are addressed in a timely manner;
- maintaining an appropriate reporting system to identify hazards, which includes the ongoing identification and management of hazards;
- overseeing the reduction of risks to ensure that they are ALARP;
- maintaining safety documentation;
- ensuring SMS induction and recurrent training are conducted in accordance with the SMS Manual;
- identifying ongoing safety training requirements to support the SMS programme objectives;
- overseeing the internal and external SMS audit programmes; and
- emergency response planning; and maintaining the Emergency Response Plan.

The Safety Manager needs to be ‘independent’ from operational areas, and have the ability to report directly to the Accountable Manager. This independence and a formal reporting line direct to the Accountable Manager gives the Safety Manager the ‘authority’ to look across the organisation from the safety perspective and make decisions free from potential conflicts of interest. Where possible, the Safety Manager should be assisted by safety representatives from each department or functional area.

The Safety Managers qualifications and attributes include the following:

- broad operational knowledge and experience in the functions of an aviation organisation (including continuing airworthiness management, engineering and maintenance services, cabin services, ground handling and flight operations);
- sound knowledge of safety management principles and practices;
- sound knowledge and understanding of HF principles including human performance limitations;
- good written and verbal communication skills;
- well-developed interpersonal skills;
- sound computer literacy;
- the ability to relate to individuals at all levels, both inside and outside the organisation;
- organisational ability;
- capable of working unsupervised;
- good analytical skills;
- leadership skills and an authoritative approach;
- worthy of respect among peers and management;
- instructional qualifications and experience e.g. Certificate IV in Workplace Training and Assessment;
- knowledge of documentation systems; and
- good understanding of aviation operations.

Safety Committee

If the organisation is large and complex, it is expected that there would be more than one group established to support the SMS program objectives. Typically, this would be a high level Safety Committee (Safety Review Board [SRB]) to oversee the SMS program, and one or more Safety Action Groups (SAGs) who take strategic direction from the Safety Committee. Smaller and less complex organisations may only need to establish a Safety Committee.

Safety Review Board

A SRB is normally be necessary for functional or senior management involvement in safety policy, overall system implementation and safety performance reviews. Membership and level of participation in the safety committee would depend on the size and structure of the organisation. The Accountable Manager, should chair (see note* following) this committee with representation from all relevant functional areas of the organisation as required, An SRB typically consists of the Accountable Manager, the Safety Manager and other members of the senior management team. The objective of the Safety Committee is to provide a forum to discuss safety issues and the overall health and direction of the SMS. Terms of reference for the SRB should be documented in the SMS manual. Roles of the Safety Committee may include:

- making, redefining Safety Performance Indicators (SPIs) and setting safety performance targets for the organisation;
- reviewing safety performance and outcomes;
- providing strategic directions to departmental SAGs — if established;
- monitoring solution implementation timelines and effectiveness;

- directing and monitoring the initial SMS implementation process; and
- commendations or decisions concerning safety policy and objectives.

Note: If the AM chooses to assign this task to an appropriate senior person, the SMS manual should clearly state and substantiate that the assigned manager performs the task on behalf of the AM whose accountability for safety is not compromised and that the Accountable Manager remains accountable for all decisions of the Safety Committee/SRB.

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APPENDIX 3**SMS DESIGN AND DOCUMENTATION — SMS MANUAL**

The primary function of the safety management documentation is to provide management with the ability to effectively communicate the organisations approach to safety to the whole organisation. The documentation should be written so that it reflects the intent and processes of the SMS. Thus, a change to the SMS will require an update of the SMS Manual. Any information that changes regularly should be put into annexes/appendices. This includes, for example, names of personnel assigned specific safety responsibilities. The amendment and distribution of SMS documentation needs to be controlled.

The design and implementation of the SMS must have taken into account potential human factors influences and the performance characteristics of personnel who will use its processes and procedures. The SMS should take into account human capabilities and limitations, both physical and cognitive, and be suitable for the tasks assigned to organisations and maintenance staff. A typical approach could include:

- considering HF and usability practices and principles in designing modifying and/or procuring systems. For example, international standards for user centred design;
- designing, where possible, systems and equipment to be tolerant of errors made by organisations;
- identifying, where possible, the ways that people may potentially interact with the system;
- assessing any risks associated with those interactions;
- ensuring risk management strategies are in place to manage the identified risks;
- assessing and monitoring any residual risk associated with human interaction; and
- evaluating and reviewing safety performance against stated objectives.

In accordance with paragraph 145.A.65 (d) of the Part 145 MOS, the AMO must have in the exposition, and comply with, a written SMS for the organisation, which must, as a minimum, include:

- a statement of the AMOs safety policy and objectives, including documented details of the following:
 - the management commitment to, and responsibility for, safety risk management;
 - the safety accountabilities of managers;
 - the appointment of key safety personnel;
 - the SMS implementation plan to ensure that safety policy is implemented at all levels of the organisation and to develop targets that ensure safety objectives are met;
 - the relevant third party relationships and interactions; and
 - the coordination of the emergency response plan;
- a safety risk management plan, including documented details of the following:
 - hazard identification processes; and
 - risk assessment and mitigation processes, including procedures for the remedial, corrective and preventative actions for the mitigation of risk or identified hazards;

- a safety assurance system, including documented procedures for:
 - safety performance monitoring and measurement;
 - the management of change;
 - communication of safety findings to individuals mentioned in paragraph 145.A.30 (b) of the Part 145 MOS, to the AM and to authors of safety reports; and
 - continuous improvement, including regular reviews, of the SMS;
- a safety promotion system, including documented details of training and education; and safety communication to all employees of the AMO;
- an internal reporting system and associated investigation process which should:
 - regularly record and analyse safety data received from the AMO's internal reporting system required under section 145.A.60 of the Part 145 MOS and from operators or third parties mentioned in sub-subparagraph 145.A.65 (d) 1 (v) of the Part 145 MOS and from the hazard identification and reporting processes mentioned in sub-subparagraph 145.A.65 (d) 2 (i) of the Part 145 MOS; and
 - be integrated into the safety assurance system mentioned in subparagraph 145.A.65 (d) 3 of the Part 145 MOS.

The following components and elements need to be documented:

- Safety policy, objectives and planning:
 - management commitment and responsibility;
 - safety accountabilities of managers;
 - appointment of key safety personnel;
 - SMS implementation plan;
 - third party interfaces — contracted activities;
 - coordination of the emergency response plan; and
 - documentation;
- Safety risk management:
 - hazard identification processes; and
 - risk assessment and mitigation processes;
- Safety assurance:
 - safety performance monitoring and measurement;
 - internal safety investigations;
 - the management of change; and
 - continuous improvement of the safety system;
- Safety training and promotion:
 - training and education; and
 - safety promotion.
- Internal reporting system and associated investigation:

APPENDIX 4

SMS INTEGRATION AND IMPLEMENTATION CONSIDERATIONS

When developing an organisation's SMS, a vital ingredient is the incorporation of HF principles. Integrating HF is essential in the elements of the SMS dealing with:

- risk management;
- management of change;
- design and procurement of systems, equipment, machinery and their subsequent usability;
- job and task design;
- selection and training of safety critical personnel;
- safety reporting and flight data analysis; and
- incident investigation.

The following list summarises the HF principles which are encompassed throughout the body of this document:

- adopt a holistic and integrated approach;
- put the people at the centre of the system;
- account for human variability;
- ensure transparency of organisational processes and actions;
- take account of social and organisational influences;
- involve staff and respect and value their input;
- encourage timely, relevant and clear two-way communication; and
- ensure fairness of treatment (e.g. the 'just culture' concept).

There may be organisational benefits in integrating some/all of hazards and the mitigation of cross-functional safety related data. When determining how the AMO's Safety Management Manual (SMM) and the SMS relate to other aspects of the organisation, consider the following questions:

- Is the SMM a stand-alone document or a component of another manual? The apparent isolation of the manual may provide clues to the centrality of its use within the organisation?
- Is the SMS referred to in other AMO manuals and/or policies or procedures? Are the links apparent within the organisation?
- Does evidence exist that the SMS is integrated into the function of the AMO? Or is there evidence to the contrary? It is likely, and somewhat acceptable, for the SMS to stand alone when first implemented. It should be evident that the SMS is increasingly integrated as it matures. Regardless of the size and/or complexity of the AMO, the aim is always to mature the SMS towards full integration with the organisational processes and other systems. Through the setting and monitoring of objectives, you should be cognisant of the necessary direction of growth and have steps in place to assure the organisation that this will occur as a managed process, rather than by chance.

- Whether the organisation has chosen to develop an overarching SMS manual, or has incorporated its SMS program into the exposition, CASA requires adequate document control to avoid any potential discrepancies on policy or procedures, omissions or conflicts that could result from having multiple manuals. The format used to document the SMS should allow end users to promptly locate required information to enable them to execute their functions.
- Amendments to the SMS manual will be treated as an amendment to the actual exposition and hence there is a need to follow the established approval process.

SMS and QMS Integration Considerations

SMS and QMS are the most obvious system to consider integration in the maintenance environment. In fact, because SMS and QMS share many common resources, there may be a tendency to assume that an AMO that has established and operates a QMS does not need, or already has, an SMS. This assumption is incorrect. There are many similarities between SMS and QMS, but there are also some important differences. Quality management focuses on assuring product/service quality, and the means to achieve it, whereas safety management focuses on the identification of hazards and the mitigation of risks associated with those hazards until they reach predetermined risk levels – known as ALARP (As Low As Reasonably Practicable). To achieve this, SMS utilises and integrates quality management techniques, risk management and HF principles into the processes and procedures of the AMO to ensure safety objectives are realised.

The SMS and the QMS are separate systems with different functions. They do however share many features, elements and capabilities. For example, the reporting systems, communications, training are similar and could be shared. Depending on the size of the AMO, some roles might also be shared between systems; including the Quality and Safety Manager roles. Integration has its benefits, such as consistency and resource maximisation. Effective integration can even expose relationships between hazards which are not obvious when the systems are operated in isolation. However, integration if not managed carefully can create problems and even induce risks into the operation. The AMO should therefore assure itself that there are no obvious misalignments or gaps between the integrated SMS and the QMS capabilities.

Coordination and integration may actually be quite a challenging task for many organisations, and could impact on the timelines and ability to successfully implement the SMS. In this case, it is probably better to plan for integration once the SMS is established and functioning effectively throughout the organisation (i.e. a phased approach).

When considering how to meet legislative requirements with respect to SMS, an AMO may choose to utilise a commercial ‘off-the-shelf’ system. Whilst this might be appropriate for some organisations, the program should always be tailored to meet the requirements of the AMO; rather than assuming that one size fits all. Particular attention should be given to the linkages between the individual components of the system to ensure it is functioning in a cohesive manner.

Implementation Options

Providing that the Safety Manager retains the responsibilities and oversight of the system as outlined in subparagraph 145.A.30 (c) 2 of the Part 145 MOS, the functions of the SMS may be achieved in a number of ways including any of the following:

- An AMO may establish its SMS in accordance with guidelines provided in this AC.

- Where one or more AMOs exist within a business group or operator, a department of the group may provide the safety management functions (including any monitoring and surveillance functions) for any or all of AMOs, if the manager responsible for the department that provides the safety management functions is the Safety Manger nominated for each of the Part 145 organisations.
- For a small AMO where the independence of any safety assurance functions within the SMS cannot be achieved, the organisation may have procedures that allow for the provision of those safety audit and investigation functions by:
 - another AMO or a person with appropriate technical knowledge and audit experience; or
 - an operator that holds an SMS as a requirement of its AOC to provide the safety management functions referred to in paragraph 145.A.65 (d) of the Part 145 MOS.
- Prior to implementing a newly designed, modified or procured system, awareness and/or training of those persons who interact with the system should be undertaken. All interfaces should facilitate good HF practice, and should accommodate the likely level of awareness and/or training of operators (including members of the public where applicable).

Safety Action Group(s). SAGs are accountable to, and take strategic directions from, the SRB. Managers and supervisors from a given functional area should be members of the SAG for that area. The functional head of that area should chair the SAG. The role of the SAG(s) includes:

- overseeing operational safety within the functional area;
- managing the area's hazard identification activities;
- implementing mitigation or corrective actions relevant to the area;
- assessing the impact of safety on operational changes and activating hazard analysis process as appropriate;
- maintenance and review of relevant performance indicators; and
- managing safety training and promotion activities within the area.

Gap Analysis and Project Planning. From the perspective of an SMS, a gap analysis is basically an analysis of the safety arrangements already existing within the organisation as compared to those necessary for the SMS to function. The gap analysis is important because the basic organisational structures necessary to start developing an SMS may already exist in the organisation; it will seldom be necessary to build an SMS from scratch because most organisations will have various activities related to an SMS in place and functioning — particularly if the AMO already has a functioning QMS. The development of an SMS should take advantage of and build upon existing organisational structures.

Once the gap analysis is complete and fully documented, the resources, structures and arrangements that have been identified as missing or deficient will form, together with those already existing, the basis of the SMS implementation plan. Organisations may format their SMS implementation plan to suit their individual needs. Note: Appendix 2 to Chapter 7 of ICAO Document 9859 provides GAP Analysis guidance.

A table may be used to account for each component and their respective sub-elements. The table can provide:

- 'Yes' and 'No' response, in terms of the compliance of the existing system, to the SMS requirements;
- remarks for partial compliance or deviations;

- actions required and timelines to achieve the criteria; and
- existing organisation documentation where the requirement is addressed.

It is important that the implementation plan provide indications of funds and human resources required to enact the changes. It is not enough that the gaps have been identified and a plan established to implement the missing components; the organisation should demonstrate through its implementation plan to CASA that it has the resources and desire to build its system in accordance with the plan.

The gap analysis and the implementation plan must be reviewed and approved by the AMOs senior management team. Once approved, the organisations management should be assured that:

- a documented procedure is established and maintained for managing the implementation; and
- development of the SMS is progressing satisfactorily and in accordance with the implementation plan.

For larger, more complex AMOs, the organisation must ensure that it is:

- integrating existing strengths and current capabilities during SMS implementation;
- proactively recognising developing issues for meeting the implementation plan;
- providing appropriate resources to manage continuing implementation of the SMS;
- defining specific triggers that would lead to a review of the organisations documentation; and
- continuously examining best industry practices for safety management by consulting other organisations of similar size and complexity.
- It must also ensure that it:
 - has defined specific triggers that would lead to a review of the company documentation; and
 - continues to examine best industry practices for safety management by consulting other organisations of similar size and complexity.

SMS Implementation Plan

The SMS implementation plan should be endorsed by the AM and be implemented within a timeframe agreed with CASA.

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

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

The planning (or establishment) group may be able to build upon existing strengths by reviewing the organisations current capabilities for safety management (including experience, knowledge, processes, procedures, resources etc.). Shortcomings in safety management experience should be recognised and resources to assist in development and implementation of the SMS identified. Many operational units may already have internal procedures in place for the investigation of incidents, hazard identification, safety monitoring etc. These should be reviewed and perhaps modified for integration in the SMS as required.

It is important that the organisation re-use as many existing procedures as practicable, to improve integration, acceptance and utilise proven procedures and processes. By building on such an experience base, the development of an SMS will be less disruptive. Building on the organisation's existing capabilities and experience enables the organisation to fast-track the SMS implementation; lessening the disruption to the delivery of products and/or services, and allowing the organisation to reap the safety and efficiency benefits sooner.

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

Implementation Timing

The organisation should agree to an SMS implementation timeline with CASA. Many organisations employ a phased approach (e.g. over 12 months) for SMS implementation. A suggested approach is provided below. CASA will require evidence of all phase 1 capabilities before issuing a Part 145 approval. The approval will be conditional on demonstration of phase 2 capabilities by the agreed phase 2 completion date; for example 12 months from the initial approval.

Phase 1 — Planning and Reactive Safety Management

Planning should provide a blueprint describing how the SMS requirements will be met and integrated into the AMO's work activities, and an accountability framework for the implementation of the SMS:

- Identify the Accountable Executive, the safety accountabilities of managers;
- Identify the person (or planning group) within the organisation responsible for implementing the SMS;
- Describe the system;
- Conduct a gap analysis of the organisation's existing resources compared with SMS establishing requirements;
- Develop an SMS implementation plan that explains how the organisation will implement the SMS in accordance with CASA's requirements and international Standards and Recommended Practices, the system description and the results of the gap analysis together with the timelines of implementation;
- Develop and apply a structured change management process;
- Develop documentation relevant to safety policy and objectives;
- Develop and establish means for safety communication; and
- Develop and apply an SMS continuous improvement program.

As part of phase one, the AMO should also implement those elements of the SMS implementation plan that refer to the safety risk management reactive processes:

- hazard identification and safety risk management using reactive processes;
- training relevant to:
 - SMS implementation plan components; and
 - safety risk management (reactive processes);
- documentation relevant to:
 - SMS implementation plan components; and
 - safety risk management (reactive processes).

Proactive Safety Management and Assurance

Proactive safety management and predictive processes should put into practice those elements of the SMS implementation plan that refer to safety risk management based on proactive and predictive processes:

- hazard identification and safety risk management using proactive processes; and
- training and documentation relevant to SMS implementation plan components and safety risk management (proactive and predictive processes).

To fully satisfy the requirements of phase 2 the AMO should also put into practice operational safety assurance:

- development of effective SPIs and safety performance targets;
- training relevant to operational safety assurance;
- documentation and instigation of processes relevant to safety assurance, including internal audit; and
- develop and maintain formal means for safety communication.

Note: 12 months is a suggested timeline. Other timelines may be agreed with CASA.

Gap Analysis and Project Plan

A gap analysis is conducted in three steps:

- clearly identify the required SMS elements, capabilities, resources and organisational structures;
- analyse the elements, capabilities, resources and structures already existing within the organisation; and
- identify the gaps between the requirements and what already exists with the organisation necessary for the SMS to function.

The gap analysis is a vital step in the process because many of the elements, capabilities, resources and organisational structures necessary to develop the SMS will - in most cases - already exist within the organisation. It is seldom necessary to build the SMS from scratch; particularly if the AMO already has a functioning QMS.

Once the gap analysis is complete and fully documented, any elements, capabilities, resources or organisational structures which have been identified as missing or deficient will need to be created or modified – as the case may be. These, together with elements, capabilities, resources and organisational structures which already exist, form the basis of the SMS Implementation Plan. Organisations may format their SMS implementation plan to suit their individual needs. Suggested structures and content can be found at Appendix 2 (Guidance on the development of an SMS GAP analysis for service providers) to Chapter 7 of ICAO Document 9859 provides GAP Analysis guidance.

A table may be used to account for each component and their respective sub-elements. The table can provide:

- 'Yes' and 'No' response, in terms of the compliance of the existing system, to the SMS requirements;
- remarks for partial compliance or deviations;
- actions required and timelines to achieve the criteria; and
- existing organisation documentation where the requirement is addressed.

It is important that the implementation plan provide indications of funds and human resources required to enact the changes. It is not enough that the gaps have been identified and a plan established to implement the missing components; the organisation should demonstrate through its implementation plan to CASA that it has the resources and desire to build its system in accordance with the plan.

The gap analysis and the implementation plan must be reviewed and approved by the AMOs senior management team. Once approved, the organisations management should be assured that:

- a documented procedure is established and maintained for managing the implementation; and
- development of the SMS is progressing satisfactorily and in accordance with the implementation plan.

Change Management

Unless properly managed, changes in organisational structure, facilities, scope of work, personnel, documentation, policies and procedures, can result in the inadvertent introduction of new hazards, exposing the AMO to new or greater risk. Effective AMOs seek to improve processes, with a conscious recognition that changes can expose the organisation to potentially insidious hazards and risks if not properly and effectively managed.

Regardless of the magnitude of change, large or small, there must always be a proactive and predictive consideration for safety implications. This is primarily the responsibility of the team proposing and/or implementing the change, but doesn't stop there. Change can only be successful if all personnel affected by the change are engaged, involved and participate in the process.

Management of change provides principles and a structured framework for managing all aspects of the change. Disciplined application of change management can maximise the effectiveness of the change, engage staff and minimise the risks inherent in change.

Change is the catalyst for the AMO to performing the hazard identification and risk management process. Some examples of change include but are not limited to:

- organisational structure;
- acquisition of equipment;
- new aircraft type included approval;
- significant personnel (critical personnel and/or large numbers);
- regulations;
- competition;
- customer base;
- security;
- financial status;
- new — schedule(s), location(s), type(s) of maintenance, aircraft type(s), equipment and/or operational procedures;
- the generation or alteration of maintenance data under the provisions of section 145.A.45 of the Part 145 MOS; and
- additional aircraft or equipment of the same or similar type.

The organisation should identify the changes likely to occur in the business which would have a noticeable impact on:

- resources — material and human;
- management direction — processes, procedures, training; and
- management control.

The organisation's change also has the potential to introduce new, or exacerbate pre-existing, HF issues. For example, changes in machinery, equipment, technology, procedures, work organisation or work processes are likely to affect performance.

The magnitude of change, its safety criticality and its potential impact on human performance should be assessed in any change management process. The purpose of integrating HF into the management of change is to minimise potential risks by specifically considering the impact of the change on the people within a system. Special consideration should be given to the 'transition period'. Any HF issues identified should be clearly documented. In addition the activities utilised to manage these issues should be integrated into the change management plan.

The organisation's SMS documentation should identify those changes that necessitate formal risk management processes, including HF issues. The organisation should demonstrate that:

- The organisation has established a process and conducts formal hazard analyses/risk assessment for major operational changes, major organisational changes, changes in key personnel and changes that may affect the way maintenance is carried out.
- Safety case/risk assessments are aviation safety focused.
- Key stakeholders are involved in the change management process.
- During the change management process previous risk assessments and existing hazards are reviewed for possible effect.
- For larger, more complex AMOs:
 - A validation of the safety performance is carried out after organisational changes to assure assumptions remain valid and the change was effective.
 - All organisational changes are subject to the change management process.
 - Safety accountabilities, authorities and responsibilities are reviewed as part of any change.

Continuous Improvement of the Safety System

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

- maintenance — the objective of which is to maintain current technological, managerial and operating standards, and
- improvement — which is aimed at improving current standards.

Under the maintenance function, the Safety Manager should first establish a SMS that includes policies, rules, directives and Standard Operating Procedures (SOPs) as specified in the AMOs exposition, and then work towards ensuring that all employees adhere to them. To achieve this, a combination of discipline and human resource development measures need to be employed.

Under the improvement function, management works continuously towards revising the current processes, in response to changing needs, operational environment or standards.

Management Review

Formal management reviews of the SMS should occur on a regular basis. Ideally, there would be a quarterly high level review process by the SRB to ensure:

- that the SMS continues to meet its safety objectives and targets;
- safety performance is monitored and measured against the objectives and targets; and
- identified hazards are addressed in a timely and appropriate manner.

Following the formal management review, there should be a periodic SAG review process at responsible management level to include, for example:

- monitoring and reporting on safety management activities by SAG/SRB;
- measuring and reporting on safety management performance;
- reporting on change management issues;
- reporting on resource issues; and
- reporting on safety training performance.

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

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

Based on the SMS review, recommendations could include:

- changed SMS objectives;
- changed safety objectives and/or targets;
- improved SMS processes/procedures; and/or
- an implementation plan for improvement changes.

APPENDIX 5

SMS CHECKLIST SUMMARY

Safety Management System	Self Check
The Bottom Line	
<ul style="list-style-type: none"> • The AMO must develop and implement an integrated, comprehensive SMS for the entire organisation, and incorporate procedures to identify and maintain compliance with current safety-related, regulatory, and other requirements. • The SMS should correspond to the size, nature and complexity of the organisation, being appropriate to its maintenance capability and all the hazards and risks associated with its activities. • The design and implementation of the SMS must have taken into account potential human factors influences and the performance characteristics of personnel who will use its processes and procedures. • The AMO has appointed a management representative(s) to manage, monitor and coordinate the SMS processes. 	
Management Commitment and Responsibility	
<ul style="list-style-type: none"> • There is a safety policy that includes a commitment towards achieving the highest safety standards signed by the AM. • The organisation has based its SMS on the safety policy. • The AM and the senior management team promote and demonstrate their commitment to the Safety Policy through active and visible participation in the SMS. • The safety policy is communicated to all employees with the intent that they are made aware of their individual safety obligations. • The safety policy includes a commitment to observe all applicable legal requirements, standards and best practice, providing appropriate resources and safety as a primary responsibility of all Managers. • The safety policy actively encourages safety reporting. • The safety policy states the organisation's intentions, management principles and commitment to continuous improvement in the safety level. • The safety policy is reviewed periodically. • Senior management has defined their commitment and responsibility for safety as a policy and conveyed the expectations and objectives of that policy to employees. 	
Safety Accountabilities of Managers	
<p>The AM has:</p> <ul style="list-style-type: none"> • established; and promotes the safety (and quality) management policies; • been appointed with full responsibility and ultimate accountability for the SMS to ensure it is properly implemented and performing to requirements; 	

Safety Management System	Self Check
<ul style="list-style-type: none"> • control of the financial and human resources required for the proper implementation of an effective SMS; and • an awareness of SMS roles and responsibilities in respect of the safety policy, safety standards and safety culture of the organisation. <p>The SM has:</p> <ul style="list-style-type: none"> • been nominated by the AM; • a direct line of corporate accountability to the AM; and • responsibility for the day to day management of the SMS. <p>General:</p> <ul style="list-style-type: none"> • Safety accountabilities, authorities and responsibilities have been defined throughout the organisation. • Staff at all levels are aware and understand their safety accountabilities, authorities and responsibilities in regards to all safety management processes, decisions and actions. • Safety management is shared across the organisation. • There are documented management organisational diagrams and job descriptions for all personnel including non-certified personnel. <p>for larger, more complex and/or more mature organisations:</p> <ul style="list-style-type: none"> • Employees are involved and consulted in the establishment and operation of the SMS. • SMS principles have penetrated all levels of the organisation and safety is part of the everyday language. • Safety accountabilities throughout the organisation are documented and individuals sign for their accountabilities. • Key safety activities, clearly described in senior management duties and responsibilities are incorporated into personal performance targets. • There is evidence that senior management recognises the significance of contributions from all levels of the organisation and has a mechanism for acknowledging those contributions. 	
Appointment of Key Safety Personnel	
<ul style="list-style-type: none"> • An appropriately competent person with the appropriate knowledge, skills and experience has been nominated to manage the operation of the SMS. • The person managing the operation of the SMS fulfils the required job functions and responsibilities. • There is a direct reporting line between the SM and the AM. • The organisation has allocated sufficient resources to manage the SMS including manpower for safety investigation and safety analysis. • Staff in key safety roles are kept current through additional training and attendance at conferences and seminars. <p>For larger, more complex and/or more mature organisations:</p> <ul style="list-style-type: none"> • The organisation has established a structured safety committee or board, 	

Safety Management System	Self Check
<p>appropriate for the size and complexity of the organisation, consisting of a full range of senior management representatives.</p> <ul style="list-style-type: none"> • The SRB or its equivalent monitors the safety performance of the operations and effectiveness of the SMS and is normally chaired by the AM. • The person(s) responsible for managing and maintaining the SMS is/are given appropriate status in the organisation that reflects the importance of the safety role within the organisation. • Safety Committees include stakeholders and significant contracted organisations. • Safety Committees are fully attended by all nominees and are focused on safety issues. 	
SMS Implementation Plan	
<ul style="list-style-type: none"> • A documented procedure has been established and maintained for managing the implementation plan. • Development of the SMS is being progressed satisfactorily and in accordance with the implementation plan. <p>and for larger, more complex and/or more mature organisations:</p> <ul style="list-style-type: none"> • Has integrated existing strengths and current capabilities during SMS implementation. • Proactively recognises developing issues for meeting the implementation plan. • Resources have been allocated to manage continuing implementation of the SMS. 	
Third Party Interfaces	
<p>The organisation has effective third party relationships and interactions in relation to safety including the following:</p> <ul style="list-style-type: none"> • A documented procedure has been established and maintained for managing third party interfaces. • The contract or SLA specifies the safety standards to be met. • The AMO has the responsibility and safety oversight capability for ensuring the contractor complies with safety standards prescribed in the contract. • The provision of services supporting maintenance involving third party interfaces (service providers, contractors, suppliers) in such areas as refuelling; component and aircraft line servicing and overhaul; construction and repair; training; planning, have been considered in the development of the SMS. <p>and for larger, more complex and/or more mature organisations:</p> <ul style="list-style-type: none"> • The AMO exercises responsibility for ensuring the contractor complies with safety standards prescribed in the contract. • The SMS actively ensures the level of safety of the organisation is not eroded by the inputs, services and supplies provided by external organisations. <p>The AMO has considered the third party's previous safety record and any regulatory breaches.</p>	

Safety Management System	Self Check
Coordination of the Emergency Response Plan	
<p>The organisation needs to develop and implement procedures that it will follow in the event of an accident or incident to mitigate the effects of these events:</p> <ul style="list-style-type: none"> • An ERP that reflects the size, nature and complexity of the operation has been developed defining the procedures, the roles, responsibilities and actions of the various agencies and key personnel. • Key personnel in an emergency have easy access to the ERP at all times. • The organisation has a process to distribute the ERP procedures and to communicate the content to all personnel. <p>and for larger, more complex and/or more mature organisations:</p> <ul style="list-style-type: none"> • The organisation has memorandums of understanding or agreements with other agencies for mutual aid and the provision of emergency services. • The organisation has implemented Critical Incident Stress Management for its staff. 	
Documentation	
<p>The organisation needs to clearly define and document (in paper and/or electronic formats) safety policies, objectives, procedures, and a document/record maintenance process and established, implemented, and maintained a safety management documentation that meets the safety expectations and objectives. The applicant should assure themselves that:</p> <ul style="list-style-type: none"> • There is documentation that describes the SMS and the interrelationships between all of its elements. • The SMS documentation is regularly reviewed and updated. • SMS documentation is readily available to all personnel. • The SMS documentation details and references the means for the storage of other SMS related records. <p>and for larger, more complex and/or more mature organisations:</p> <ul style="list-style-type: none"> • The SMS documentation is incorporated into existing organisational manuals. • There is evidence that the company has analysed the most appropriate medium for the delivery of documentation at both the corporate and operational levels. 	
Hazard Identification	
<p>The organisation needs to identify and document the hazards in its operations that are likely to cause death, serious physical harm, or damage to equipment or property in sufficient detail to determine associated level of risk and risk acceptability. The applicant should assure themselves that:</p> <ul style="list-style-type: none"> • The organisation has a reporting system to capture errors, hazards and near misses. • The reporting process is simple, accessible and commensurate with the size and complexity of the organisation. • The organisation has attempted to proactively identify all the major hazards and risk related to its current activities. 	

Safety Management System	Self Check
<ul style="list-style-type: none"> • SMS documentation clearly demonstrates how human factors influences have been considered in the hazard identification process. • The safety reporting system provides feedback to the reporter of any actions taken (or not taken) and where appropriate to the rest of the organisation. • Safety investigations are carried out to identify underlying causes and potential hazards. • Safety reports are actioned in a timely manner. • Hazard identification is an ongoing process and involves all key personnel and appropriate stakeholders. • Personnel responsible for investigating reports are trained on investigation techniques. • Investigations establish causal / contributing factors (why it happened, not just what happened) • Personnel express confidence and trust in the organisation's reporting-policy and process. <p>and for larger, more complex and/or more mature organisations:</p> <ul style="list-style-type: none"> • There is an active reporting system (as indicated by reporting levels of more than one report per employee per year). • Safety Reports include the reporter's own errors and events that the reporter would not normally report (events where no-one was watching). • The reporting system empowers personnel to propose corrective actions. • The reporting system is actively used throughout the organisation. • The reporting system is available to contracted organisations and customers to make reports. • There is a process in place to analyse reports and hazard logs to look for trends and gain useable management information. 	
Risk Management	
<p>The organisation needs to have determined and analysed the factors related to the likelihood and consequence of potential events associated with identified hazards and identified factors associated with unacceptable levels of likelihood and consequence.</p> <ul style="list-style-type: none"> • There is a structured process for the management of risk that includes the assessment of risk associated with identified hazards, expressed in terms of severity and probability of occurrence. • There are criteria for evaluating the level of risk and the tolerable level of risk the organisation is willing to accept. • The organisation has risk control strategies that include risk control, risk acceptance, risk mitigation, risk elimination and where applicable a corrective action plan. • Corrective actions resulting from the risk assessment, including timelines and allocation of responsibilities are documented. • Risk management is routinely applied in decision making processes. • Smart and robust mitigations and controls are implemented. 	

Safety Management System	Self Check
<ul style="list-style-type: none"> • Risk assessments and risk ratings are appropriately justified. • Senior management have visibility of medium and high risk hazards and their mitigation and controls. <p>and for larger, more complex and/or more mature organisations:</p> <ul style="list-style-type: none"> • Risks are being managed to as low as reasonably practical. • The organisation uses its risk management results to develop best practice guidelines that it shares with the industry. 	
<p>Safety Performance Monitoring and Measurement</p> <p>The organisation needs to be able to monitor data, including products and services received from subcontractors, to identify hazards, measure the effectiveness of safety risk controls, and assess system performance. The applicant should assure themselves that:</p> <ul style="list-style-type: none"> • Safety objectives and targets have been established. • Safety targets are SMART. • SPIs are relevant and appropriate and are linked to the organisation's safety objectives and targets (reflect state SPIs where appropriate). • SPIs have been promulgated and are being monitored and analysed for trends. • Risk mitigations and controls are being verified/audited to confirm they are working and effective. • A safety audit plan has been established which focuses on the safety performance of the organisation and its services. • Safety audits which assess normal operations are being carried out in accordance with the safety audit plan. • The safety objectives, safety targets and performance indicators are reviewed and updated periodically. • The analysis and allocation of resources is based on outputs from the performance measurement. • Safety assurance and compliance monitoring activities feedback into the hazard identification process. • Safety assurance takes into account activities carried out in all directly contracted organisations. • Monitoring is being carried out on current, future and third party safety risks, and appropriate actions are taken to address unacceptable safety risks. <p>and for larger, more complex and/or more mature organisations:</p> <ul style="list-style-type: none"> • Safety objectives, safety targets and performance indicators encompass all areas of the organisation. • Performance measurements have been defined for serious safety risks identified on the safety risk profile. • Personnel at all levels are aware of the safety performance measures in their areas of responsibility and the results of performance measures are transmitted to them. 	

Safety Management System	Self Check
<p>When establishing and reviewing safety objectives, safety targets and performance indicators, the organisation is considering: - hazards and risks; - financial, operational and business requirements; - views of interested parties.</p>	
<p>The organisation needs to have established and maintained a confidential safety reporting and feedback system and is the data obtained from this system is monitored to identify emerging hazards and to assess performance of risk controls in the operational systems. These reports inform and are informed by the organisations internal investigation process. The applicant should assure themselves that:</p> <ul style="list-style-type: none"> • A confidential employee safety reporting and feedback system is established and maintained. • Employees are encouraged to use the safety reporting and feedback system without fear of punishment and to encourage submission of solutions/safety improvements where possible. • Safety reporting and feedback system monitored to identify emerging hazards. • Data collected in the employee reporting and feedback system is included in the analysis conducted under SMS • Measures exist to ensure that all reported hazards, incidents and accidents are reviewed and, where required, investigated. • There is a process to ensure that hazards, incidents and accidents are analysed to identify contributing and root causes. • When identifying contributing and root causes, the organisation considers individual human factors, the environment, supervision and organisational elements. • Results of the analysis are communicated to the Responsible Manager for corrective action and to other relevant managers for their information. • There is a process to capture information from reports that can be used to monitor and analyse trends. <p>and for larger, more complex and/or more mature organisations:</p> <ul style="list-style-type: none"> • Identifies interfaces between the employee reporting and feedback process and analysis of data process. • Periodically measures performance objectives and design expectations of the employee reporting and feedback process. • Ensures reporting procedures are followed for safety-related operations and activities. • Periodically review supervisory and operational controls to ensure the effectiveness of the employee reporting and feedback process. • There is a safety communication strategy that includes electronic communication, frequent meetings, SMS award systems, employee recognition system, SMS bulletins etc. • The effectiveness of safety communication is routinely assessed and the strategy revised as required. • The AMO analyses other types of safety reports received from sources such as the environment, occupational health and safety and third party contractors that may have an impact on aviation safety. 	

Safety Management System	Self Check
<ul style="list-style-type: none"> • Third party stakeholders have been consulted during the root cause analysis process for example, manufacturers, suppliers and distributors. 	
Internal Safety Investigation	
<p>The organisation needs to establish procedures to collect data and investigate incidents, accidents, and instances of potential regulatory non-compliance that occur to identify potential new hazards or risk control failures. The applicant should assure themselves that:</p> <ul style="list-style-type: none"> • There are procedures in place for the conduct of internal safety investigations. • Measures exist to ensure that all reported hazards, incidents and accidents are reviewed and, where required, investigated. • There is a process to ensure that hazards, incidents and accidents are analysed to identify contributing and root causes. • When identifying contributing and root causes, the organisation considers individual human factors, the environment, supervision and organisational elements. • Competent investigator(s) commensurate with its size and complexity are engaged. • Results of the analysis are communicated to the Responsible Manager for corrective action and to other relevant managers for their information. • There is a process to capture information from an investigation that can be used to monitor and analyse trends. • Every effort is made to complete the investigation and analysis process in the established timeframe. <p>and for larger, more complex and/or more mature organisations:</p> <ul style="list-style-type: none"> • Analyses other types of safety reports received from sources such as the environment, occupational health and safety and third party contractors that may have an impact on aviation safety. • Third party stakeholders have been consulted during the root cause analysis process for example, manufacturers, suppliers and distributors. • Provide support to third party stakeholders in the conduct of investigation and analyses of hazards, incidents and accidents outside of the scope of their certificate. 	
Change Management	
<p>The organisation's management need to be able to assess risk for changes within the organisation that may affect established processes and services by new system designs, changes to existing system designs, new operations/procedures or modified operations/procedures. The applicant should assure themselves that:</p> <ul style="list-style-type: none"> • The organisation has established a process and conducts formal hazard analyses / risk assessment for major operational changes, major organisational changes and changes in key personnel. • Safety Case / Risk assessments are aviation safety focused. • Key stakeholders are involved in the change management process. 	

Safety Management System	Self Check
<ul style="list-style-type: none"> • During the change management process previous risk assessments and existing hazards are reviewed for possible effect. <p>and for larger, more complex and/or more mature organisations:</p> <ul style="list-style-type: none"> • A validation of the safety performance is carried out after organisational changes to assure assumptions remain valid and the change was effective. • All organisational changes are subject to the change management process. • The risk to human performance associated with the change – including resistance to change is addressed within the implementation plan. • Safety accountabilities, authorities and responsibilities are reviewed as part of any change. 	
Continuous Improvement of the Safety System	
<p>The organisation needs to promote continual improvement of its SMS through recurring application of safety risk management, safety assurance, and by using safety lessons learned and communicating them to all personnel. The applicant should assure themselves that:</p> <ul style="list-style-type: none"> • The SRB or equivalent has the necessary authority to make decisions related to the improvement and effectiveness of the SMS. • The SMS is periodically reviewed for improvements in safety performance. <p>and for larger, more complex and/or more mature organisations:</p> <ul style="list-style-type: none"> • There is continuous improvement of the SMS. • Lessons learnt are incorporated into the policy and procedures. • The organisation benchmarks its SMS against other organisations and is an active promoter of SMS within the aviation industry. • Best practice is sought and embraced. • Surveys and assessments of organisational culture are carried out regularly and acted upon. • For safety related services the organisation requires contracted organisations to have an SMS. • Supplier and customer SMS are integrated. 	
Safety Education and Training	
<p>The organisation needs to document competency requirements for those positions identified in SMS and ensured those requirements were met. The applicant should assure themselves that:</p> <ul style="list-style-type: none"> • There is a documented process to identify SMS training requirements so that personnel are competent to perform their duties. • There is a validation process that measures the effectiveness of training and takes appropriate action for improvement. • There is a process that evaluates the individuals competence and takes appropriate remedial action when necessary. • Training includes initial, recurrent and when applicable update training. • A training record is maintained for each employee trained. 	

Safety Management System	Self Check
<p>and for larger, more complex and/or more mature organisations:</p> <ul style="list-style-type: none"> • SMS training requirements are documented for each area of activity within the AMO, including non-certificated areas where training requirements are not defined by regulations. • Appropriate SMS training is provided for all of the AMOs employees. • SMS training is provided for third party contractors working in activities related to the AMOs operation. • An SMS training file is developed for each employee, including management, to assist in identifying and tracking employee training requirements and verifying that personnel have received the planned training. • Employees have a mechanism to request additional SMS training in relation to their role in the SMS. • Management recognises and uses informal opportunities to instruct employees on safety management. • Training exercises and methods for all employees is kept current to reflect new techniques, technologies, results of investigations, corrective actions and regulatory changes. 	
Safety Communication	
<p>The organisation's senior management need to communicate the output of its SMS to employees and provided its oversight organisation access to SMS outputs in accordance with established agreements and disclosure programs. The applicant should assure themselves that:</p> <ul style="list-style-type: none"> • Safety plans and strategies are communicated throughout the organisation to all staff. • Significant events and investigation outcomes are communicated to staff, including contracted organisations, where appropriate. <p>and for larger, more complex and/or more mature organisations:</p> <ul style="list-style-type: none"> • There is a safety communication strategy that includes electronic communication, frequent meetings, SMS award systems, employee recognition system, SMS bulletins etc. • Significant events and investigation outcomes from external sources are communicated to staff including contracted organisations, where appropriate. • The effectiveness of safety communication is routinely assessed and the strategy revised as required. 	

APPENDIX 6

SOURCES OF ADDITIONAL INFORMATION

Safety Management Systems

- ICAO (2008) Safety Management Manual (SMM). International Civil Aviation Organization. Doc 9859 AN/460. Second Edition.
- ICAO SMS Training Material. International Civil Aviation Organization. Downloadable from: <http://www.icao.int/anb/safetymanagement/training.html>
- UK CAA CAP 712: Safety management Systems for Commercial Air Transport Operations.
- UK CAA CAP 726: Guidance for Developing and Auditing a Formal Safety Management System
- Part I Subpart 7 of the Canadian Aviation Regulations (CARs) - Safety Management System Requirements
- Transport Publication (TP) 8606, 2005-07-01 - *Inspection and Audit Manual*
- TP 13739, 2001-04-01 - Introduction to Safety Management Systems
- TP 14135, 2004-09-01 - Safety Management Systems for Small Aviation Operations — A Practical Guide to Implementation
- National Standard of Canada, CAN/CSA-ISO 9000-00 - Quality Management Systems-Fundamentals and Vocabulary
- Alan Waring, United Kingdom, 1996 - *Safety Management Systems*
- James Reason, United Kingdom, Ashgate, 1997 - *Managing the Risks of Organisational Accident*
- James Reason, United Kingdom 1987 - *Managing the Risks of Organisational Accidents*
- Shell Aircraft Aviation Safety Management Guidelines, January 2000
- Peter M. Senge, New York, Doubleday, 1990 - *The Fifth Discipline*
- R. Curtis Graeber and Mike Moodi, Flight Safety Foundation, IFA/IASS, South Africa, 1998 - *Understanding Flight Crew Adherence to Procedures: The Procedural Event Analysis Tool (PEAT)*
- James R. Evans and William M. Lindsay, U.S.A., South-Western College Publishing, 1999 - *The Management and Control of Quality*
- UAE GCAA CAR Part X: Safety Management System Requirements, 2011
- UAE GCAA CAAP 50: Safety Management System, 2011
- US Joint Helicopter Safety Implementation Team, Safety Management System Toolkit, 2009

Human Factors and Non Technical Skills

- UK CAA (2002). CAP 719 Fundamental Human Factors Concepts, downloadable from <http://www.caa.co.uk>
- UK CAA (2002). CAP 720 Flight Crew Training: Cockpit Resource Management (CRM) and Line-Oriented Flight Training (LOFT), 1 August, downloadable from <http://www.caa.co.uk>
- UK CAA (2006). CAP 737 Crew Resource Management (CRM) Training, 29 November, downloadable from <http://www.caa.co.uk>
- Edkins, G.D. (2002). A review of the benefits of aviation human factors training. *Human Factors and Aerospace Safety*, 2(3). 201-216
- GIHRE (2001). Enhancing Performance in High Risk Environments: recommendations for the use of Behavioural Markers. July, downloadable from <http://www.siaa.asn.au>
- Helmreich, R.L. (2000). On error management: Lessons from aviation. *British Medical Journal*, 320, 781–785
- Helmreich, R.L., Klinect, J.R., & Wilhelm, J.A. (2003). Managing threat and error: Data from line operations. In G. Edkins & P. Pfister (Eds.), *Innovation and Consolidation in aviation*. Aldershot, UK: Ashgate
- Helmreich, R.L., Merritt, A.C., Sherman, P.J., Gregorich, S.E., & Wiener, E.L. (1993). The Flight Management Attitudes Questionnaire (FMAQ) (NASA/UT/FAA Tech.Rep.No.93-4). Austin, TX: University of Texas Human Factors Research Project
- ICAO (1998). Human Factors Training Manual, DOC – 9683, International Civil Aviation Organization, downloadable from <http://www.icao.int>
- ICAO. (2002). Line Operations Safety Audit (LOSA). Doc 9803 AN/761. Montreal: ICAO
- NOTECHS: Non-technical skill evaluation in JAR-FCL. Downloadable from: <http://www.nlr.nl/id~4646/1~en.pdf>
- O'Connor, P., Flin, R., & Fletcher, G. (2002). Techniques used to evaluate Crew Resource Management training: A literature review. *Human Factors and Aerospace Safety*, 2(3). 217-233
- Salas, E., Wilson, K.A., Burke, C.S., & Wightman, D.C. (2006). Does Crew Resource Management training work? An update, an extension, and some critical needs. *Human Factors*, 48(2), 392-412
- Simpson, P; Owens, C. & Edkins, G. (2002). Cabin crew expected safety behaviours. *Human Factors and Aerospace Safety*, 3(3). 153-167