

United Kingdom Overseas Territories Aviation Circular

OTAC 119-4
125-2
139-3
140-3
145-8
171-3
172-5
173-3
176-4

Documenting the Safety Management System

See also OTAC 'Safety Management Systems'

Issue 2
14 January 2008

Effective: on issue

GENERAL

Overseas Territories Aviation Circulars are issued to provide advice, guidance and information on standards, practices and procedures necessary to support Overseas Territory Aviation Requirements. They are not in themselves law but may amplify a provision of the Air Navigation (Overseas Territories) Order or provide practical guidance on meeting a requirement contained in the Overseas Territories Aviation Requirements.

PURPOSE

This OTAC gives guidance on documenting Safety Management Systems (SMS). It applies to all those parts of the aviation industry such as aircraft operators, maintenance organisations, ATC service providers and aerodrome operators required to implement SMS.

RELATED REQUIREMENTS

This OTAC relates to all OTAR Parts which require the establishment and use of a safety management system. It is supplementary to OTAC 119-3, 125-1, 139-1, 140-2, 145-7, 171-2, 172-4, 173-2, 176-3 which sets out the fundamentals of a Safety Management System.

CHANGE INFORMATION

Changes to the risk assessment classifications in Appendix D and editorial changes

ENQUIRIES

Enquiries regarding the content of this Circular should be addressed to Manager PQS, Air Safety Support International at the address on the ASSI website www.airsafety.aero, to the appropriate Overseas Territory Aviation Authority or to any office of ASSI.

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1 Definitions

The following definitions are reproduced from OTAR Part 1 for ease of reference:

Quality assurance means all those planned and systematic actions necessary to provide adequate confidence that a system, component, or facility will perform satisfactorily in service.

Safety management system (SMS) means a systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures.

2 Context

- 2.1 OTAC 119-3, 125-1, 139-1, 140-2, 145-7, 171-2, 172-4, 173-2, 176-3 describes in general terms the requirements for Safety Management Systems (SMS) in the Territories, and gives suggestions for implementation. It applies to all those parts of the aviation industry such as aircraft operators, maintenance organisations, ATC service providers and aerodrome operators required to implement SMS.
- 2.2 Any SMS must be properly documented to ensure traceability, standardisation and communication, and if necessary to enable co-ordination with external service providers and contactors.
- 2.3 It must be emphasised that the SMS needs to be designed to meet the specific needs of the individual organisation. It follows that the methods chosen for documenting SMS will not all be exactly the same. The suggestions and examples given in this OTAC are intended to illustrate some of the possibilities, however it will be up to each organisation to ensure that their documentation reflects their own needs.
- 2.4 The aim of any organisation in documenting their SMS should be to 'write what you do and do what you write', and no more. Only those tasks or actions and associated documentation which are required to make the SMS effective should be added.

3 General

- 3.1 The policies and procedures relating to the SMS will typically be expressed as a component of existing manuals (e.g. the Aerodrome Manual, Unit Manual of Air Traffic Services, Operations Manual, Maintenance Control Manual etc.) but may be contained in a separate SMS manual if the company prefers. In any case, detailed local procedures in other documents can be cross-referenced, so the SMS manual is likely to be thin.
- 3.2 The documentation must include a description of each component of the system and should clearly describe the interrelationships between each of these components. This is essential if company personnel, and the regulator, are to understand how the whole system is integrated. (Including a diagram of the SMS structure can assist.)

- 3.3 In common with all other aspects of the SMS, in order to ensure that the system is used and maintained effectively it is essential that the documentation reflects quality assurance principles; and complies with the requirements of the operator's quality system, if applicable.

4 Documenting the policy

- 4.1 There needs to be a clear statement of the organisation's policy, management principles and intentions, for a continuous process of improvement in the safety level - signed by the Chief Executive and/or Accountable Manager of the organisation.

- 4.2 This can take many forms, but simpler is better. Here are some examples:

- *Our objective is the proactive management of identifiable risks and the elimination of injury to personnel and damage to equipment. To that end, we will continuously examine our operation for hazards and find ways to minimize them. We will report incidents, train staff on safety management, document our findings and our responses, and strive for continuous improvement.*
- *To prevent accidents and to eliminate damage or injury, this company will maintain an active safety management system. I support the open sharing of information on all safety issues and encourage all employees to report significant safety hazards or concerns. I pledge that no disciplinary action will be taken against any employee for reporting a safety hazard or concern to this company's management. I pledge also that no staff member will be asked to compromise our safety standards to get the job done.*

5 Objectives for improvement

- 5.1 A key element in implementing SMS will be for the organisation to identify its objectives for safety improvement. To be meaningful these will have to include an element of safety performance measurement. It is important that the objectives are achievable, and they should be reviewed on a regular basis.
- 5.2 For the purpose of defining these objectives accident rates are not an effective measurement of safety, for in reality there will always be latent unsafe conditions within the system that might, if left unattended, lead to an accident. For example, an assessment of the improvements made to work/operating procedures might be far more effective than considering accident rates. Seeking input and involving all employees at this stage should make the task easier.
- 5.3 Once the safety objectives have been identified, they should be documented so that they can be communicated. A statement could be made to accompany the top level policy statement above.
- 5.4 To illustrate safety objectives and possible safety performance measures some examples are given in Appendix A.

6 Roles and responsibilities

- 6.1 For the SMS to function effectively the roles and responsibilities of all personnel must be defined. Everyone needs to be aware of their responsibilities - and it should be clearly stated that everyone has a responsibility for safety.

6.2 The responsibility for implementing and managing the components of an SMS will normally be given to the nominated postholders for specific parts of a larger organisation, for example the Operations Manager, Maintenance Manager etc. That person will in turn be held accountable to show that he or she has made a reasonable effort to implement SMS.

6.3 Here is an example to start with:

Ultimate responsibility for safety in the company rests with myself as the accountable executive. Responsibility for making our operations safer for everyone lies with each one of us - from managers to front-line employees. Each manager is responsible for implementing the safety management system in his or her area of responsibility, and will be held accountable to ensure that all reasonable steps are taken to prevent incidents and accidents.

6.4 Depending on the size and complexity of the organisation there will also be a need to give descriptions of the roles and responsibilities of, for example, each of the nominated postholders. If possible a 'Safety Adviser' should be nominated, who does not have responsibility for managing safety but to provide advice direct to the Accountable Manager.

6.5 Clearly it is important that all these descriptions reflect the reality of the roles undertaken.

7 Documenting the SMS processes

7.1 Implementation plan

7.1.1 Implementing SMS is a challenge for operators and regulators alike. At the initial stages it will help to record the results of the "Gap Analysis" used to identify which components have to be developed. Identifying who will do what and setting timescales provides a useful framework and a basis for liaison with the Overseas Territory Aviation Authority.

7.1.2 Communicating the plan at all levels to everyone involved in the operation is essential to the implementation and continued effective functioning of the SMS, and for developing an active safety culture. Commitment and flexibility are required from the start.

7.1.3 Guidance on implementation planning is included in paragraph 6 of OTAC119-3, 125-1, 139-1, 140-2, 145-7, 171-2, 172-4, 173-2, 176-3 *Safety Management Systems*.

7.2 Identification of hazards

Note: A 'hazard' is any condition or circumstance that could result in damage or injury.

7.2.1 Proactive approaches to identification of hazards involve actively seeking for them before they cause a problem. A procedure for reporting safety concerns, for example hazard/unsafe condition reports, is an example of being proactive. This boils down to encouraging reports of events that MIGHT occur as well as events that did occur. Gathering data on both is equally important. In practice, an organisation may find it convenient to develop a single report form suitable for all these reports.

- 7.2.2 Risk assessments can also be proactive. These should be carried out in relation to all hazards identified initially, and then programmed to take place at regular intervals and whenever changes are planned - for example introduction of new equipment or changes in key personnel.
- 7.2.3 Depending on the complexity of the changes, consideration should be given to developing a Project Safety Management Plan to ensure that the SMS functions are coordinated and applied effectively throughout the transition.
- 7.2.4 The proactive and reactive approaches can become complementary when collating the hazard/unsafe condition reports, together with error reports and information from accident and incident reports. Other sources of information could include line management judgement, workplace opinions and audit reports. Some expertise will usually have to be applied to the information received to ensure that the hazards are properly identified and, depending on the source, verified before attempting risk analysis.
- 7.2.5 The secret to long term success is to use a simple report form and encourage reporting by making it easy. For example -
- have a collection box
 - keep supplies of report forms where they are handy
 - print your non-punitive disciplinary policy on the form
 - allow anonymous reports
 - also accept simple hand-written notes
- 7.2.6 Examples of the sort of issues where reports should be encouraged are given in Appendix B. Note in addition that formal reporting procedures must ensure that the occurrence reporting requirements of OTAR Part 13 are met.
- 7.2.7 An example of a report form is attached at Appendix C.

7.3 Risk assessment and mitigation

Note: A 'risk' is the consequence of a hazard, and is assessed in terms of severity and likelihood.

- 7.3.1 When hazards are identified, risk assessment and mitigation can be approached in a variety of ways, including risk analysis matrices and preparation of a "safety risk profile"¹. It is important to choose a method that suits the particular operation.
- 7.3.2 It is necessary to appreciate that a single hazard can result in a number of risks, and the severity and likelihood of each of those risks may differ. For example a transmission mast on the approach to an aerodrome is a hazard. The risks to aircraft that could result from the presence of the mast include:
- collision with the mast
 - loss of control conducting an avoidance manoeuvre
 - runway overshoot following de-stabilised approach
- 7.3.3 Risk assessment is the process of determining the severity of damage or harm that could result (in the worst case), and then the likelihood that this would happen. Determining the degree of risk is often accomplished using a risk

¹ This method is used in the International Standard for Business Aircraft Operations (IS-BAO).

assessment matrix (or grid). It is important that everyone has the same understanding of the terminology used, so definitions must be provided. Examples are provided in Appendix D.

7.3.4 It is important to document the basis on which the degree of risk was decided in each case, and any assumptions that were made. Recording this information will facilitate subsequent review and show that due care has been exercised.

7.3.5 Once the risks have been assessed and the reasons documented the organisation must decide when mitigation is required, i.e. measures taken to avoid a hazard, or to reduce the severity and/or likelihood of the risks. To be effective mitigation should not depend on a single line of defence. Management attention will be needed to ensure ongoing mitigation at several levels - defence in depth.

7.3.6 If it becomes apparent that a number of similar hazards exist without appropriate or effective mitigation, this may indicate a system safety deficiency and rectification actions should be given due importance, and possibly urgency.

7.3.7 Safety risk profiling is a method of taking an overview of the risks to ensure that the resources expended on safety are appropriately targeted and will result in optimum safety performance. Examples of areas to be considered are:

Technical factors, such as parts interchangeability and aircraft type;

Operational factors, such as weather information and approach aids;

Human factors, such as availability of equipment, working environment and human resources.

7.3.8 A safety risk profile must be periodically updated, particularly during times of operational change. In a mature system it can be used to generate feedback to the safety objectives and thereby provide the underlying rationale for the SMS.

7.3.9 To ensure implementation of the methods chosen to mitigate risks, i.e. closing the loop: decide on the method of communication, of ensuring feedback to staff, and for ensuring that manuals and instructions are kept up-to-date. This should be a standing agenda item for staff meetings. Documentary methods could include:

- bulletin board
- company safety newsletter
- company website
- e-mail to staff

7.4 **Monitoring and evaluation**

7.4.1 The organisation needs to define its processes for monitoring and evaluation to ensure that:

- remedial actions have been implemented as planned (are we doing what we said?);
- mitigation is effective (was it the right thing to do?); and
- the SMS remains effective and relevant to the operation.

- 7.4.2 This should be conducted through an internal audit process using conventional quality assurance principles, and in compliance with the requirements of the operator's quality system, if applicable. Audit intervals should be specified - once or twice a year should work well provided this is done thoroughly. An effective assessment will review all parts of the operation to identify strengths, weaknesses and areas of risk, and will follow a carefully prepared checklist. The checklist should be updated regularly.
- 7.4.3 There should be comprehensive documentation of audit findings, corrective actions and follow-up procedures. A written report should be provided to the Accountable Manager, containing the information needed for a management review. This provides a basis for evaluating the safety objectives.
- 7.4.4 The results of the audit should be communicated throughout the organisation.

8 Documenting the regulations

- 8.1 The Overseas Territories Aviation Requirements (OTARs) provide that each holder of a certificate, licence or approval must ensure that all persons employed, engaged, or contracted by them to perform safety-related activities, are familiar with the appropriate sections of legislation, the OTARs, any applicable conditions on the certificate, licence or approval.
- 8.2 In order that the SMS can properly complement regulatory compliance, the organisation must have a process for documenting the regulations, standards and exemptions by which it is regulated, for the various activities it conducts.
- 8.3 A person should be designated to ensure that this information is maintained and up to date.

9 Training provisions

- 9.1 To enable employees to comply with all safety requirements, they need the appropriate information, skills and training. To effectively accomplish this, the organisation should document the training requirements for each area of work.
- 9.2 The type of training to be given is already mandated via regulation for certain positions. This can include initial, recurrent and update training requirements and, where required, training specific to the operation of the SMS – it is important that each person understands the SMS processes at a personal level. The regulations provide a good starting point to identify what training is required.
- 9.3 It is recommended that a training file be developed for each employee, including management, to assist in identifying and tracking employee training requirements.

10 Emergency response plan

- 10.1 An emergency response plan (ERP) is designed to make it easier to cope with an accident or serious incident, and to minimise disruption to normal operations. All of the organisation's operational locations must have ERPs, and a means of coordinating them. This is an integral part of the SMS as it can reduce

consequential risks as well as improving the chances of survival for those involved.

10.2 An emergency response plan should not be unduly complicated - if it is to work in extremis it must be simple. It is really just a matter of thinking in advance about the steps to follow and organizing them on paper. Here are some suggestions for the points to be addressed:

- What is the nature of the emergency?
- Who to notify initially
- Care of survivors
- Emergency call list
- Notification of next of kin
- Public relations handling - point of contact
- Record keeping
- Accident scene protection/investigation
- Removal of wreckage
- Personnel briefings
- Useful forms for on-duty personnel

10.3 An emergency response plan must be useful to those who might be on duty at the time, must contain key data and guidance and everyone must know where copies are located.

10.4 Once a plan has been formulated, it is important to ensure that staff are adequately trained in the procedures that will be employed in the event of an accident or serious incident. Plans should be rehearsed regularly, both to familiarise staff and to reveal any problems. There should also be routine testing of emergency systems and all testing, training and rehearsals should be recorded with action taken if deficiencies are identified during practices.

11 Further advice and guidance

11.1 This OTAC is one of two on the subject of SMS. See also '*Safety Management Systems*' for guidance on the meaning of the requirements contained in the OTARs and some suggested steps towards effective implementation.

11.2 Other OTACs provide information and guidance on documentation, for example to Air Operator Certificate holders on the organisation, design and use of the flight safety documents system.

11.3 The theme of that OTAC is equally applicable in areas other than flight operations - that documents should be consistent with each other, and consistent with regulations, manufacturers' requirements and human factors principles.

Appendix A Objectives and safety performance measurement

The following examples are illustrative only.

Safety objectives

To identify and eliminate hazardous conditions

To provide safety-related educational material to all personnel

To provide a safe, healthy work environment for all personnel

To prevent and reduce aircraft accidents and incidents and to prevent resulting losses

To incorporate awareness, compliance, inspection, investigation and education by providing programs delivered to employees

To prevent damage and injury to non-company property and personnel resulting from our operations

Safety performance measurement

To increase the number of hazard reports received by X% over the previous year ²

To investigate all hazardous events within X number of days of the occurrence

To reduce days lost to injury by X% over the previous year

To assist in developing Standard Operating Procedures (SOPs), where applicable

To review, with safety in mind, all proposed new equipment acquisitions, facilities, operations and procedures

To improve the effectiveness of the safety management system through a yearly safety assessment that reviews all aspects of the SMS

To reduce annual insurance costs by X % over the previous year

² In a developing SMS with a new reporting system, you would expect to see an increase in the number of reports over the short term. This shows that the company culture encourages this feedback. In the long term, as the SMS matures, you would expect to see a decrease in number of hazard reports in a proactive company.

Appendix B Examples of issues that should be reported

NB this is without prejudice to the requirements of OTAR Part 13.

General issues

- Incorrect or inadequate procedures - a setup for error
- Poor communication between different parts of the organisation
- Out of date manuals
- Lack of adequate training and recurrent training
- Inadequate training
- Excessively long working days
- Inadequate tool or equipment control
- Missing or unsecured equipment
- Broken equipment
- Poor shift changeovers
- Unreasonable customer expectations or unplanned requirements

Aerodromes and flight operations

- Obstacles and limited clearances for manoeuvring
- Refuelling hazards
- Flight preparation
- Defects records not completed
- Excessive duty times
- Crews rushing through checks
- Failure to adhere to standard procedures
- Inadequate, incorrect or missing checklists
- Lack of up to date manuals
- Emergency exit paths blocked
- Unruly passengers
- Runway incursions

Near misses

- Accidents or incidents that nearly happened


Appendix C Hazard/unsafe condition/error/incident report form

This example is illustrative only.

Consider printing your non-punitive disciplinary policy on the form, for example:

To prevent accidents and to eliminate damage or injury, this company will maintain an active safety management system. I support the open sharing of information on all safety issues and encourage all employees to report significant safety hazards or concerns. I pledge that no disciplinary action will be taken against any employee for reporting a safety hazard or concern to this company's management. I pledge also that no staff member will be asked to compromise our safety standards to get the job done.

This example is provided by courtesy of SMS Aviation Safety Inc. and Bermuda DOA:

	BERMUDA GOVERNMENT DEPARTMENT OF AIRPORT OPERATIONS	File# _____ Original issue, October 2005	
HAZARD REPORT FORM			
1. Type of Report			
<input type="checkbox"/> Confidential (Provide to the OSQ)		<input type="checkbox"/> Non-Confidential (Provide to your Manager)	
2. Identification (optional)			
Name			
Company			
Phone Number		Email	
3. Describe the hazard			
Use reverse of page if more space is required			
4. How could this hazard be addressed in the future? (optional)			
Received by (Manager or OSQ):			
_____	_____	_____	
Name	Signature	Date	

Appendix D Risk assessment matrix

This example is illustrative only. Other models may be found with different numbers of levels on the severity/likelihood scales.

Table 1 Severity

	Qualitative definitions
Extreme Harm	Accident As defined in OTAR 1 Fatal or serious injuries caused, structural damage etc.
Moderate Harm	Serious incident Outcome not under control Affecting or would affect safety of operation
Slight Harm	Minor incident No or minor injuries caused
Nuisance	No immediate effect on safety

Table 2 Likelihood

	Very Unlikely	Unlikely	Possible	Likely	Very Likely
Qualitative definition	Unlikely ever to occur	Unlikely to occur during total operational life	May occur during total operational life	Likely to occur once during total operational life	Likely to occur several times during total operational life

Table 3 Risk Classification

	Very Unlikely	Unlikely	Possible	Likely	Very Likely
Extreme Harm	MEDIUM RISK	HIGH RISK	HIGH RISK	VERY HIGH RISK	VERY HIGH RISK
Moderate Harm	LOW RISK	MEDIUM RISK	MEDIUM RISK	HIGH RISK	VERY HIGH RISK
Slight Harm	LOW RISK	LOW RISK	LOW RISK	MEDIUM RISK	MEDIUM RISK
Nuisance	LOW RISK	LOW RISK	LOW RISK	LOW RISK	MEDIUM RISK

To assess the level of risk:

1. Select the expression for severity of harm that could result (in the worst case);
2. Select the likelihood that this would happen;
3. Cross-reference using the table to determine the degree of risk.

If the risk is classified as MEDIUM or above (yellow, orange or red) additional mitigation should be considered – and even then the risk may remain unacceptable.