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SAFETY MANAGEMENT SYSTEMS

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GENERAL

Jersey Aviation Circulars are issued to provide advice, guidance and information on standards, practices and procedures necessary to support Jersey Aviation Requirements (JARs). They are not in themselves law but may amplify a provision of the Air Navigation (Jersey) Law 2014 or provide practical guidance on meeting a requirement contained in the Jersey Aviation Requirements.

PURPOSE

This JAC describes the overall concept of safety management systems (SMS). It applies to all those parts of the aviation industry such as aerodrome operators, aircraft operators, Air Traffic Service (ATS) providers and maintenance organisations, required to operate an SMS. It is aimed at small sized operations.

RELATED REQUIREMENTS

This Circular relates to all JAR Parts which require the establishment and use of a safety management system.

CHANGE INFORMATION

This issue is a complete revision, it is based on Annex 19 Second Edition July 2016 and ICAO document 9859, fourth edition 2018.

ENQUIRIES

Enquiries regarding the content of this Circular should be addressed to the Office of the Director of Civil Aviation using the address on the DCA website www.cidca.aero

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Contents

1   Background

1.1   For many years' aviation safety has relied on compliance with regulations to prevent incidents, and accidents. As aviation continues to grow and becomes more complex a systematic approach to safety is needed. To do this, Safety Management Systems (SMS) are designed to complement regulatory compliance, providing a means to proactively mitigate risks and improve the safety of operations. The expectation of an effective SMS is for clear evidence that an organisation is managing risk above compliance.

1.2   There are times where a hazard creates risks that require controls that are beyond just compliance with regulations. SMS provides a set of processes which enable an organisation to identify, analyse, assess, prioritise and act to control these hazards and the risks they create.

1.3   Service providers and all their staff are responsible for the safe provision of their aviation services, not only within their organisation, but as part of the whole aviation system.

1.4   The International Civil Aviation Organisation (ICAO) Annex 19 to the Chicago Convention requires States to place requirements on certain service providers to have an SMS.

1.5   The ICAO Standards stipulate:

(a)   that the SMS be established in accordance with the ICAO SMS framework elements (see para. 3.3(b)); and

(b)   be commensurate with the size of the service provider and the complexity of its aviation products or services.

2   It makes good sense

2.1   SMS is simply adopting a business-like approach to safety; like the way in which finances are managed. Unless a company has a loss or looks at the direct and indirect costs of an occurrence, these costs are unlikely to be fully appreciated. Direct costs are usually easy to quantify, such as damage to the aircraft, compensation for injuries, disruption of services/activities and damage to property. These are usually then settled through insurance.

2.2   Indirect costs are more difficult to assess as these are often not covered by the organisation's insurance and the impact is often long after the occurrence. For example:

- loss of reputation
- loss of business
- legal fees
- damage claims
- medical costs not covered by worker's compensation
- cost of lost use of equipment
- time lost by injured person(s)
- cost of replacement workers
- increased insurance premiums
- aircraft recovery and clean-up
- fines

2.3   SMS has clear business benefits:

- a more stable operation with less disruption
- safer operations with less damage
- customer support (people notice safe operations seeing the way staff work)
- reduced insurance costs
- better working conditions for staff with rosters and morale
- being a good place to work keeping staff
- attracting good people to work for your organisation
- documented legal evidence if things go wrong
- ensures money Is spent on safety where it is really needed and not wasted

2.4   The cost to create and maintain an SMS is a good investment when compared to the cost of doing nothing. It makes sound business as well as safety sense. All organisation's shareholders have an expectation that all staff are managing risk.

3   The requirements in the JARs

3.1   An SMS must be created to meet the specific needs of each organisation. Aviation organisations are all different. So, the requirement describes the elements of a SMS, but do not direct how these should be done by an organisation. An organisation must look to develop and change its processes to meet the SMS requirements.

3.2   Each JAR Part that requires a SMS has the same text which is based on ICAO Annex 19.

3.3   The ICAO SMS framework elements appear in JAR Parts as follows:

(a)   An applicant for the granting of a certificate/approval shall establish, to the satisfaction of the Director, a safety management system (SMS which is commensurate with the size of the organisation and the complexity of its operation.

(b)   The safety management system shall include:

(1)   a safety policy and objectives signed by the Accountable Manager which reflects an organisational commitment towards safety throughout the organisation and sets out:

(i)   management commitment; and
(ii)   safety accountability and responsibilities within the SMS; and
(iii)   appointment of key safety personnel including a Safety Manager who is responsible for the implementation and maintenance of an effective SMS; and
(iv)   SMS documentation; and
(v)   coordination of emergency response planning

(2)   provision for safety risk management including:

(i)   hazard identification based on reactive and proactive methods; and
(ii)   safety reporting and investigation processes; and
(iii)   safety risk assessment and mitigation.

(3)   provision for safety assurance including:

(i)   safety performance monitoring and measurement; and
(ii)   the management of change; and
(iii)   continuous improvement of the SMS.

(4)   safety promotion including:

(i)   training and education, appropriate to each individual's involvement in the SMS, to ensure that personnel are trained and competent to perform their duties; and
(ii)   safety communication.

(5)   a quality management system in accordance with the relevant JAR, that as a minimum:

(i)   identifies applicable requirements, regulations and standards and demonstrate compliance with them;
(ii)   ensures technical manuals, checklists and other documentation is appropriately maintained and incorporates the latest amendments; and
(iii)   ensures that training programmes maintain staff proficiency and competency.

(c)   The safety management system shall be described in the relevant documentation and shall be acceptable to the Director.

4   What do the requirements mean?

4.1   The following will look at each of the SMS elements in the requirement (in boxes) section by section.

4.2   First, it is important to know that the SMS elements link together (see appendices A and G). They are all important to making a system work.

4.3

> (a)   An applicant for the granting of a certificate/approval shall establish, to the satisfaction of the Director, a safety management system which is commensurate with the size of the organisation and the complexity of its operation.

4.4   The SMS must be created to suit the organisation and its operation. They can be very different from one organisation to another. It is easier if the SMS is created by people who know the organisation. Adapting processes that are already in place also helps. The elements must be practical. When assessing to approve and monitor an SMS an Inspector will account for the size and complexity of the operation. For example, a small aircraft operator would have a simple set of SMS processes compare to a large airline.

4.5   The key starting point is the commitment by the head of the organisation to implement and maintain the SMS.

4.6

> (b)   (1) a safety policy and objectives signed by the Accountable Manager which reflects an organisational commitment towards safety throughout the organisation and sets out:

5   Safety Policy

5.1   The safety policy is a clear statement from the Accountable Manager and the management of an organisation that reaches all staff.

5.2   The safety policy can be viewed as a contract between managers and staff. It is what they should expect from each other and is the base to build the SMS.

5.3   It should be written clearly so all staff can understand it.

5.4   The safety policy should contain a commitment:

- to continuously improve the level of safety performance
- to promote and maintain a positive safety culture
- to provide the necessary resources to implement the safety policy and to deliver a safe service or product
- to comply with all applicable regulatory requirements
- to ensure safety is a primary responsibility of all managers and staff

5.5   The safety policy should contain:

- a reference and encourage the use of the safety reporting process
- a note the types of behaviours that are unacceptable, the circumstances where disciplinary action would, and would not apply (Just Culture)

5.6   It should be ensured that the safety policy:

- is signed by the current Accountable Manager
- is reviewed regularly
- is communicated to all staff throughout the organisation
- leads into the safety objectives

5.7   It should enable management and staff to create a positive safety culture. Managers should lead in showing they follow the safety policy.

5.8   For staff to be able to know about and find the safety policy it can be:

- placed in manuals
- placed on office walls and staff/office entrances
- placed on an intranet
- placed on small cards (ID sized)
- explained to new staff when they join
- explained to staff during training
- promoted in staff news letters

(See Appendix B for sample sections of safety policies).

6   Safety Objectives

6.1   Safety objectives are created so all staff know what they are working towards. The objectives should be short and high-level statements of the organisation's safety priorities. They should address the biggest safety risks to the organisation and be reviewed to make sure they remain the right ones. These may be included in the safety policy. All staff should know what these are.

6.2   When building a SMS, the safety objectives can be set to show progress of this work. For example, setting up a safety process and staff SMS training conducted.

6.3   Safety objectives can be based on process or outcomes. Process looks at how staff act and perform safely. Outcome looks at how events turn out. A set of safety objectives should include both. When coming up with safety objectives think about how they will show how safety is maintained or improving. Also, how will they be measured. A few good safety objectives are better than many bad ones.

6.4   Reporting and training are examples of a process objective. Wildlife strikes, and runway incursions are examples of outcome objectives.

7   Accountable Manager

7.1

(i)   management commitment

7.2   An Accountable Manager should be appointed (see Accountable Manager JAC). This person has the ultimate authority to ensure a safe operation. Within ICAO documentation the term 'Accountable Executive' is used for term 'Accountable Manager' that is used within JACs and JARs.

7.3   This person should:

- ensure and control allocation of adequate resources
- have the authority to halt operations
- establish, promote, the safety policy and appropriate safety objectives
- ensure safety actions are taken to control risks
- ensure there is a response to accidents and incidents
- ensure the SMS is created, maintained, performing and improving
- be seen by staff as interested and in charge of safety
- make timely safety decisions
- have the final authority to resolve safety issues
- set acceptable safety risk limits and fund safety risk actions

7.4   If a legal entity has several approvals, then there should be one Accountable Manager.

7.5   Through the safety policy the Accountable Manager should make it clear to all staff in the way they want the organisation to function. Staff need to know and feel that they can count on management to support that safety policy.

8   Management

8.1   The SMS will not function unless there is management buy-in with regular demonstrations and leadership by the Accountable Manager with support from their managers to create a safety culture.

8.2   Managers can support the SMS by:

- supporting the Safety Manager
- openly encouraging all reporting
- thanking staff who report
- ensuring non-punitive reporting in line with the safety policy
- ensuring a Just Culture following investigations
- talking to staff about safety issues and their concerns
- taking part in staff safety training
- taking part in safety meetings
- feeding back to staff on safety actions taken and the reasons why
- promote safety objectives, performance indicators and targets

9   Safety Accountability and Responsibility

9.1

> (ii)   safety accountability and responsibilities within the SMS

9.2   Accountability cannot be delegated. A responsibility can be delegated. Everybody is responsible for safety. Each person must understand their safety tasks and their areas of responsibility in the operation. It needs to be clear to all others who is responsible for doing tasks that ensure a safe operation.

9.3   There must be a clear structure in the organisation, so things can be passed up and down the correct lines. These may extend to other organisations, but these must be agreed and clearly understood by both organisations. If certain safety risks require a manager to sign them off, it must be clear who these managers are and what levels of risk they can sign off.

9.4   The way this works can be shown in:

- organisation charts
- documented role responsibilities
- documented department responsibilities
- job descriptions

9.5   Care must be taken to avoid conflict any of this and cause confusion. This may lead to tasks not being done with nobody taking any responsibility.

10   Safety Manager

10.1

> (iii)   appointment of key safety personnel including a Safety Manager who is responsible for the implementation and maintenance of an effective SMS

10.2   The Accountable Manager should appoint a Safety Manager who is responsible for the performance of the SMS. There should be a direct reporting line in the organisation between the Accountable Manager and Safety Manager. If the Safety Manager has other roles these should not conflict. For example, auditing their own performance in their other role.

10.3   Safety Manager responsibilities:

- manages the creation of the SMS
- enables hazard identification and risk assessment
- reports on safety performance
- monitors safety actions and checks if they are effective
- maintains SMS documentation and records
- ensures staff safety training
- collects, examines and shares safety data
- provides advice on safety matters
- monitors aviation safety issues to see how they impact the organisation
- manages safety related communication with other organisations and aviation authorities
- ensures safety meetings are conducted
- communicate safety issues and information

10.4   The selection of a Safety Manager should consider, for example:

- safety/quality management experience
- operational and technical experience
- being able to work with others
- being able to analyse and solve problems
- being able to manage projects
- having a understanding of human factors
- being good at writing, speaking and listening to people

10.5   If the selected Safety Manager does not have all the skills and knowledge required then training should be provided.

10.6   Staff must not think that everything to do with the SMS is done by the Safety Manager and nothing to do with them. The Safety Manager enables the SMS elements that allow other managers and staff to play their part.

11   Safety Management System Manual and Records (Documentation)

11.1

(iv)   SMS documentation

11.2   SMS is not just a document. An SMS manual on its own will not meet the SMS requirements. The SMS manual should clearly describe the organisation's SMS, it may be part of other documents. It should describe how the SMS works within the organisation with its policies and procedures.

11.3   The SMS manual must describe, or provide a reference to another document of the:

- safety policy and objectives
- SMS requirements

- SMS processes and procedures
- accountability and responsibilities for safe operations and SMS processes

11.4   The SMS manual should also include, or provide a reference to another document of the:

- voluntary and mandatory reporting procedure
- safety investigation procedure
- hazard identification and risk assessment procedure
- process for creating and monitoring safety performance indicators
- SMS training process
- safety communication processes
- internal audit procedures
- management of change procedure
- SMS document management procedure
- coordination of emergency response

11.5   When applying for an approval that requires a SMS the SMS manual should be submitted for review. When the SMS manual is acceptable it is then expected that the information is kept up to date as a controlled document. When operating the SMS will generate documentation that will provide proof that the procedures are working as per the SMS manual.

11.6   Documents the SMS will produce are:

- hazard register
- hazard and safety reports
- investigation reports
- safety performance reports
- completed risk assessments
- SMS review/audit report
- internal audit/safety survey reports
- SMS/safety training records
- safety meeting minutes
- safety communications
- SMS implementation plan
- emergency plan updates/exercise notes
- change management records

12   Coordination of Emergency Response Planning

12.1

(v)   coordination of emergency response planning

12.2   Some organisations are required to have an Emergency Response Plan (ERP). These deal with aviation emergencies (do not forget public health emergencies), incidents and accidents. The plans must be coordinated with other organisations and kept up to date.

12.3   The ERP should address emergencies that have been identified by the SMS with the actions to manage them. The objective is to deal with the emergency while maintaining a safe operation and a safe return to normal operations as soon as possible.

12.4   To do this an organisation needs to know for example:

- Who are the other organisations, and what are their contact details?
- How is the plan activated and communicated to other organisations?
- What resources, financial and material, are immediately available for use?
- What resources can be shared and found later?
- What information is needed from each organisation, and how is this shared?
- Who is responsible for what, and how may this change?

12.5   Regular full, partial and table top exercises can help answer these questions and keep the answers up to date. Exercises, where possible, should include other organisations. The aim of the exercise is to try and break the plans. From this, lessons can be learnt, and action put in place improve the plans.

13   Hazard Identification

13.1

> 2)   provision for safety risk management including:
>
>   (i)   hazard identification based on reactive and proactive methods

*Note: ICAO defines a '**hazard**' as a condition, or an object with the potential to cause or contribute to an aircraft incident or accident. '**Safety risk**' is the predicted probability and severity of the consequences or outcomes of a hazard.*

13.2   There needs to be a process to find hazards. This needs to be able to look back at what has happened before (reactive) and look forward to what could happen (proactive).

13.3   Reactive processes, this can be done by looking at reports of near miss occurrences asking, what could have happened? Also, looking at other organisations and asking could this have happened to us?

13.4   Proactive, this can be done by looking at changes and looking at the operation to find weak processes or seek any problems with equipment, the places and the conditions in which people work.

13.5   Proactive ways to find hazards include:

- audits of the operation
- managing changes
- people reporting things that do not work or could go wrong
- looking at data trends
- talking about 'what if' at safety meetings
- safely testing things out before doing them for real

13.6   Hazards can also be found by looking at people doing tasks. Looking back to see how they have done tasks and how they may do tasks, thinking about:

- the way staff are set up to work and communicate together
- the conditions staff work in (temperature, light, noise, vibration, air quality)

- the instructions and documents (are they clear, easy to use, easy to find, up to date, correct)
- the tools, equipment, machines and facilities (are they easy to use by all, make sense to all, operate correctly, are the right thing for the job)

(see the SHELL model appendix E)

13.7 Seeking hazards needs to happen all the time to keep improving. An organisation may not change much but many things around it will. These will change and bring new hazards.

13.8 It is important to always learn from others. This can be done by sharing reports with other organisations and attending other organisation's safety meetings. It can also be done by looking at:

- accident reports
- magazines articles
- websites (air accident organisations, aviation authorities, incident/accident listings, forums and other safety organisations)

13.9 Where people in different roles and organisations work together, finding hazards and risks should be done together. This will lead to a better capture of these. Then both organisations will then learn more about them. Involving people both new and old to the organisation can also help in this task.

14 Reporting

14.1

> (ii) safety reporting and investigation processes

14.2 Reporting is key to learning and improving safety although the report is just the start. Reports need investigating to learn from them and actions to improve safety. To do this:

- reporting should be easy to do
- staff are supported and encouraged to report
- staff are given credit for doing this
- staff can report concerns, near misses, incidents and accidents
- staff are trained how to report
- staff know what a mandatory/voluntary report is (see JAR Part 13)
- staff know how to file a mandatory/voluntary report
- staff know why reporting it is important to protect people
- staff understand it is in their job role
- staff see reporting in the safety policy
- there is an accepted and supported Just Culture by everyone
- staff understand Just Culture by knowing:
  - what the tolerated and not tolerated behaviours are
  - what errors, mistakes, recklessness and negligence are
  - how an investigation works
  - when, how and who judges them based on the facts
- staff can report without saying who they are
- staff get feedback
- staff see safety actions based on their reports

- staff know that reports provide data, (important in building a big picture)
- staff see the process works and grow to trust it

14.3   Sometimes people can be unsure if they should file a report. If they are in any doubt, then they should be encouraged to report it.

14.4   There can be reports that may not require or lead to any investigation. They do still provide useful data to find trends.

14.5   Always remember the aim is to improve safety. So, find out what happened and/or what could happen based on the facts. Work out how it can be stopped from happening again. Act, and then check that these actions work.

15   Investigation

15.1   Investigations can just become too focused on the person involved. Investigations should look at the things around a person in the organisation and ask, how did all these lead to and affect the occurrence outcome? The investigation should seek the facts. This may involve other organisations.

15.2   To do this think about:

- the way staff are set up to work and communicate together
- the conditions staff work in (temperature, light, noise, vibration, air quality)
- the instructions and documents (are they clear, easy to use, easy to find, up to date, correct)
- the tools, equipment, machines and facilities (are they easy to use by all, make sense to all, operate correctly, are the right thing for the job)

(see SHELL model appendix E)

15.3   After collecting evidence work out the facts. Then work out what caused the occurrence. Writing out a time line of events can help do this. An occurrence is usually a chain of events. Think of barriers that should have stopped that chain of events.

15.4   Looking down the chain of events can help to find the root cause. This is the event that, if removed, would have prevented the occurrence starting and leading up to the others. One method to help do this is called the five whys. State what happened, and then ask why? Based on the answer, ask why again and then repeat up to around five times. (see five whys Appendix F)

15.5   Also, there can be things found that made the occurrence worse and things that were not directly involved but wrong.

15.6   The investigation should find out what happened based on the facts.

- what were the barriers that failed and why?
- what was the root cause?
- what things made the occurrence worse?
- what other things were discovered?

16   Actions following an investigation

16.1   Once the investigation is over someone not involved should to review it. They can then provide any feedback to further improve the investigation.

16.2   Actions should now be created to:

- prevent the root cause happening again
- improve the barriers
- prevent the things that made the occurrence worse
- fix the other things that were found

16.3   The investigation should be looked at to see if there are any new hazards and risks. It is an import part of hazard identification. Also, does the investigation results affect any current hazards and risks?

16.4   The actions, hazards and risks should then be reviewed by someone that has not been involved to check them. Can they be done? Will they work?

16.5   The lessons learnt from an investigation should be shared with staff with the resulting actions explained.

16.6   Now based on the facts a review can see if those involved made any errors or mistakes. If so, what could they do to help themselves or others in the future? In rare cases, the facts could show that there may have been cases of negligence and recklessness. Sometimes this is not clear and the things going on around them in the organisation need to be considered. Each case should be carefully reviewed by those who understand the situation. It is important to do this carefully to support and grow a Just Culture that people trust.

16.7   Culpability models can help when looking at this, but care must be taken when using them. Whatever is used it should be set out to staff how this whole process works and who does it. People do not usually go to work to act negligently or recklessly.

17   Review of actions and reports

17.1   At some point after the actions have been completed they should be checked. This may form part of an audit.

17.2   Reports should be reviewed to look for trends. When looked at together or shared with others these may show that there is something that needs to be further investigated before it leads to a more serious occurrence. For example, a minor aircraft issue reported by different crews that is a failing part that may lead to a serious occurrence. Another example, different organisation's staff, Air Traffic Control staff and pilots reporting issues with an airport layout that may lead to a serious runway incursion.

18   Culture shown through reporting

18.1   Reports can show how mature a Safety Culture is. First reports tend to be about 'it' and things, 'it' did this or 'it' did not work. The next stage is about others, 'they' did this, or did not do. The final mature stage is reports about 'I', 'I' did this, or 'I' did not do. So, looking to see if a report is a 'it', 'them' or 'I' report can show the level of a Safety Culture.

18.2   'I' reports shows a good Safety Culture and that people trust in the Just Culture. Staff are respected for reporting as it is the right thing to do to improve safety. They know how and that they'll be fairly judged based on facts and supported.

19   Risk Assessment

19.1

> (iii)   safety risk assessment and mitigation.

19.2   There needs to be a process that looks for hazards, define the risks, assesses each risk and controls each risk with actions (mitigations). Note, a hazard can have several risks. Having a mix of people in the organisation, from different ages and experience levels, can help do this work.

19.3   The way in which people perform tasks is important to consider. People can also see things happening and act to solve a problem to prevent an incident or accident.

19.4   The first step is to define the hazard. Be careful, often the outcome is stated as the hazard. It is important to get this right. There should be the right amount of detail to describe it. It should be significant and reasonably foreseeable.

*Remember: ICAO defines a '**hazard**' as a condition, or an object with the potential to cause or contribute to an aircraft incident or accident. '**Safety risk**' is the predicted probability and severity of the consequences or outcomes of a hazard.*

20   Define the Safety Risk

20.1   After the hazard is defined, clearly define the safety risk. A correctly written safety risk will make the process easier. A safety risk can be written as an **event** due to the **hazard** (describe) leads to an **outcome**. Lots of outcomes could be created, judge to select the outcomes that could reasonably expected to happen that also accounts for the worse foreseeable outcome.

20.2   For example, a mast on the approach to an aerodrome. The mast on the approach is the hazard that could lead to the following safety risks:

An aircraft collision (event)
with a mast on the approach to the aerodrome (hazard)
leads to aircraft damage and a loss of control (outcome)

An aircraft avoiding (event)
a mast on the approach to the aerodrome (hazard)
leads to a violent flight manoeuvre (outcome)

20.3   Any special terms, or codes used in writing a safety risks must be clearly defined so everybody understands it.

21   Assess the Safety Risk

21.1   Each safety risk is then assessed as to how likely it is first and then how bad the outcome could be.

21.2   To work out how likely this event is, think about:

- is there a history of events, or is it a one off?
- are there similar events happening?
- how often does the activity take place?

21.3   How likely can be rated by a word, description, or a probability (0.1, 10% or 1 in 10 chance). Using table 1 below a likelihood value can be assigned.

Likelihood	Meaning	Value
Frequent	Likely to occur many times	5
Occasional	Likely to occur sometimes	4
Remote	Unlikely to occur	3
Improbable	Very unlikely to occur	2
Extremely improbable	Almost will never occur	1

Table 1

21.4   How bad the outcome is (severity) can be rated by harm to people or the damage that can be reasonably expected following the safety risk happening. Consider:

- harm to people on the aircraft
- harm to people in contact with the aircraft
- harm to people from jet or propeller blast
- damage that weakens the aircraft
- damage that affects how it flies
- damage so the aircraft needs a major repair
- damage so the aircraft needs parts replaced
- damage to air traffic and aerodrome equipment that affects aircraft separation
- damage to air traffic and aerodrome equipment that affects aircraft ability to land

21.5   Using table 2 below a code can be assigned to the how bad the outcome is.

Severity (how bad)	Meaning	Code
Catastrophic	-Aircraft/equipment destroyed -Multiple deaths	A
Hazardous	-Large reduction in safety margins, staff cannot perform tasks -Serious injury -Major equipment damage	B
Major	-Significant reduction in safety margins, a reduction in the ability of staff to cope with tasks -Serious incident -Injuries to people	C
Minor	-Nuisance -Operating limitations -Use of emergency procedure -Minor incident	D
Negligible	-few consequences	E

Table 2

21.6   Combining how likely an event is and how bad (severity) it may be, creates the assessment of the safety risk. A safety risk that is almost certain to happen and has a very bad outcome is not acceptable. Safety actions must be taken. A safety risk that hardly ever happens and has a minor outcome is acceptable.

21.7   Between these two all other safety risks lie from those that are not acceptable and those that are. Using table 3 below the safety risk can be assessed using the likelihood value and severity code:

Safety Risk	Severity				
Likelihood	Catastrophic	Hazardous	Major	Minor	Negligible
Frequent	**5A**	**5B**	**5C**	**5D**	**5E**
Occasional	**4A**	**4B**	**4C**	**4D**	**4E**
Remote	**3A**	**3B**	**3C**	**3D**	**3E**
Improbable	**2A**	**2B**	**2C**	**2D**	**2E**
Extremely improbable	**1A**	**1B**	**1C**	**1D**	**1E**

Table 3

21.8   Any safety risks that are in the red area require action straight away to the stop the activity and safety actions to reduce the safety risk. Any safety risks that are orange can be **accepted** with safety actions to manage the risk. These may need the Accountable Manager or other management to make a decision to **accept** these and sign them off. Any safety risks that are green are ok and no further action is required. The organisation **accepts** the safety risk.

22   Control the Safety Risk

22.1   Any actions to control a safety risk needs to be balanced with time, cost and how difficult they are to do. Based on this, if a safety action can be done to improve safety it should be done even if it does not change the risk colour.

22.2   A safety risk should have several safety actions to ensure a safe operation and not rely on just one. A safety risk action can:

- **avoid/remove** the safety risk, such as stopping the operation.

- **reduce** the safety risk, this can be done by making it less likely to happen, or reducing how bad the outcome is, or actions that do both.

22.3   Care must be taken when reducing a safety risk. Ask, does the action taken only make the event less likely to happen, or reduce how bad it is, or both? In most cases it makes it less likely to happen. It is harder to reduce how bad the outcome is. The safety actions taken must make sense to how they reduce the safety risk.

22.4   For example, doing an aircraft engine run. This could lead to a safety risk of an aircraft jumping the chocks (event) whilst conducting an engine run in front of a hangar (hazard) leads to the aircraft colliding with a hangar (outcome). Actions to with this safety risk could be:

- ensuring all wheels are chocked will make the event less likely
- pointing the aircraft away from the hangar towards open space will reduce how bad (severity) of the outcome is, make it not very likely and remove the risk

22.5   When selecting actions to take think about:

- is the action going to be effective?
- does the benefit of it exceed the cost?
- is it practical?
- is it acceptable?
- can it be enforced?
- will it last over time?
- is it alone enough, or must there be other actions?
- does it change or create new risks?
- how much time does it take to do?
- how much time does it take to set up?

22.6   In summary, it is important to correctly identify the hazard. Select the reasonably foreseeable safety risks and write them clearly. Assess the risk, and where required create safety actions. Multiple safety actions should be used when needed and checked to see if they work.

23   Safety Risk Records

23.1   All the safety risk assessment work should be recorded and reviewed regularly. Most organisation do this using a hazard register which may be a document or a spreadsheet. These may capture the following information:

- hazard/risk identification (number/code)
- date created/reviewed
- hazard described
- risks related to the hazard described
- how likely and how bad (severity) it is currently
- current safety risk assessment now
- what actions are done now to prevent the risk happening
- what further safety actions are to be done by who and by when
- after the further safety actions the target how likely and how bad (severity)
- after the further safety actions the target safety risk assessment
- any manager sign-off of higher risks

23.2   Any person should be able to look at the record and clearly understand

- the hazard
- the risks related to that hazard
- what is done to control the risk right now
- what are the further safety actions, by when and by who
- what the safety risk assessment result will be following the actions
- who signs off any risks
- when was the last review

23.3   A risk may need some extra words to explain its context. Some actions may need extra words to explain how they reduce the safety risk. It may not be clear to everyone. It is important that staff understand safety risk actions and why they are being done.

23.4   The record is important to show how the organisation manages it risks. The record:

- shows what the top safety risks are
- can help create performance indicators
- can help decide where resources should go
- tracks safety risks and safety risk actions
- can be used for change management
- ensure safety lessons are not forgotten
- help with investigations
- helps when working with other organisations

24   Audits

24.1

> (3)   provision for safety assurance including:
>
> > (i)   safety performance monitoring and measurement

An organisation needs a process to check how well it is managing safety and that safety risk actions are working. This can be done through audits and shown by the safety performance indicators (see section 25).

24.2   Where possible audits should be done by people who are not working in the area that is being audited. Some organisations hire people from outside of their organisation to do audits for them.

24.3   Audits need to check:

- compliance with regulations
- compliance with policies and procedures
- compliance with safety risk actions
- are safety risk actions working?
- if the SMS is working?
- are findings closed and their actions working?

24.4   For small organisations that can only do a limited number of audits, these should be targeted. Audit things that relate to high risk safety actions and their areas of compliance. Audits should find out how well things work and what needs to be improved.

24.5   Typical audit questions can be:

- is there a policy and/or procedure for?
- is the policy and/or procedure documented?
- does the policy and/or procedure lead to meeting the requirements?
- do people follow the policy and/or procedure every time?
- do people understand the policy and/or procedure?
- is the policy and procedure reviewed regularly?
- are changes to policies and procedures tracked?
- have any recent changes to a policy or a procedure worked?
- do the right things result from the following of a procedure?
- are safety risks looked at when changes are planned to procedures?
- are the safety risk actions completed and work?
- are people trained and training refreshed as required?

24.6   Any audit finding needs actions to fix them. It is also important to ask what is the root cause of the finding? There are many methods to look for root cause, one is the five whys (see Appendix F). To check if the right actions are to be done ask do the actions address the root cause and stop the finding happening again? If no, then either the actions are wrong, or the root cause has not been found.

24.7   It is important that findings and the actions taken to close them are recorded and tracked. Findings should be reviewed to see if they raise new safety risks or change other safety risks.

25   Safety Performance Indicators and Targets

25.1   Safety performance indicators need careful thought. It should be clear what is being measured. It is better to choose things that can be measured with numbers rather than things that are described by words. Indicators need to be based on data that can be collected and is known to be accurate. Each indicator should relate to a safety objective (see Appendix C).

25.2   Indicators can be lagging or leading. A lagging indicator show what has happened, such as the number of apron incidents. Leading indicators measure things that are done to maintain and improve safety, such the number of completed apron safety courses by staff. Try to link a lagging indicator with a leading indicator.

25.3   A lagging indicators can be based on unlikely serious events or likely minor events. A measure of both works best. For example, aircraft control problems due to loading and aircraft load sheet errors.

25.4   How often the indicators are measured needs to be set. What is be measured needs careful thought. Will the measure indicate the right thing and a fair picture? To achieve this, things can be measured for example:

- per aircraft movement
- per sector flown
- per passenger handled
- over the time of operation (per hour/day/week/month/year)

25.5   It helps if together the safety performance objectives and targets are SMART (George T Doran, 1981):

- **S**pecific
- **M**easurable
- **A**chievable
- **R**ealistic
- **T**ime bound

25.6   Indicators can be created from:

- safety report data
- safety surveys of the operation (watching/listening the operation in action, checklists, talking to people about their work)
- findings data
- operational data (Flight Data Monitoring, hours the operation was restricted/closed, defects carried)
- paperwork checks and records (load sheets, flight plans, tech logs, training records, documents reviewed, maintenance records, checklists completed)

25.7 Care needs to be taken so that targets do not cause staff to do the wrong things to meet them. Targets should not stop all other safety issues being sorted out. Targets should not create issues between different areas of the organisation.

25.8 To start with an indicator may need a baseline to see how things are going before setting a target. A target can be a set figure, to increase, to maintain or to decrease. It can help to set targets in steps.

25.9 When the results of the indicators appear take care to understand the reasons behind them. An indicator can show that something is changing, but not always why. It is important to understand why before taking any actions.

25.10 It should be decided who is to measure each indicator, how the indicators are collected together and how these are then shared with staff.

25.11 In time triggers can be set by an organisation for certain indicators to monitor the operation. These can be used to start safety action to prevent a further decline in safety performance.

25.12 As a SMS grows safety performance indicators and targets will change.

26 Change Management

26.1

> (ii) the management of change

26.2 Change management is often not done, or fully understood. It is an important element of managing risks in a SMS. Many incidents and accidents start with something being changed, or while a change is going on. Managing change needs to be done with care to manage risks to safety.

26.3 Sometimes organisations think nothing changes. It would be very rare to find an aviation organisation that is all on its own and does not experience change. Even if an organisation does not change others around it and other things around it do.

26.4 Change can bring new safety risks and affect current safety risks. Changes can be:

- to the size of the organisation
- to staff and the organisation's structure
- to current or new equipment, tools, infrastructure, vehicles or aircraft
- where the operation takes place
- to regulation, policy, procedures and checklists
- to another organisation that affects your organisation

26.5 The change process should:

- define the change and why it is happening?
- what and who does it affect (see SHELL model appendix E)?
- find any new hazards and safety risks?
- check whether it affects current hazards and risks?
- decide what new risk safety actions need to be done by who, and when (any training)?
- decide what managers, staff and others outside of the organisation need to know and who is responsible to make sure this is done?

- decide who is responsible for managing the change, and checking all this?
- decide what needs to be done following the change to check things are acceptable?

26.6 Not everything needs to go through the process. There needs to be a way to identify a change and then decide how it is to be looked at. This will depend on how large, critical, complicated it is and how many people it involves. A small simple change may only be processed through a checklist to see if it needs anything more done. Some changes may need a review of the current safety risks, adding new safety risks, changing some safety risks and creating some safety actions. Some will require a safety risk review and their own safety assessment (see Safety Assessment (Aeronautical studies, safety cases, risk assessments) JAC).

26.7 People affected by the change should be involved throughout. This helps to:

- make a success of the change
- it being understood
- it being accepted
- find any safety risks
- create safety risk actions
- it being done safely

27 Continuous Improvement

27.1

(iii) continuous improvement

With the SMS finding hazards, reviewing safety risks, reporting, investigating, auditing, managing change and training, safety should be improving. As an organisation and the things around it change, so will the SMS. The SMS processes need to work for the organisation and work together. If this does not happen, learn from this and change them so they do. Do not be afraid to do this to get the SMS to work.

27.2 The SMS should be regularly checked. This can be done by:

- audit and reviews of SMS processes
- safety culture assessment
- safety surveys
- SMS process reviews
- review of safety performance indicators
- review of safety performance targets
- review of actions completed following audit findings
- safety risk review
- review of safety risk actions completed and checked

27.3 To show the Accountable Manager, managers and staff what the SMS is doing a regular summary report can be created telling them about:

- the top safety risks, safety actions taken and those to be done
- the current safety performance indicators and targets
- safety reports created
- investigations conducted with safety actions taken and those to be done
- SMS and other safety training completed

- changes processed and being looked at
- safety meetings conducted, actions taken and those still to be done

28 Training

28.1

> (4) safety promotion including:
>
> (i) training and education, appropriate to each individual's involvement in the SMS, to ensure that personnel are trained and competent to perform their duties

Staff need to be trained in their SMS roles so they can play their part.

28.2 When looking at what training is needed for a person doing a job consider:

- what skills do people need for the job?
- what do people need to know to do the job?
- what skills does the person already have and what do they know already?

The missing bits are then the things that need to be trained.

29 Refresher Training

29.1 When deciding when to do refresher training for a task consider:

- how often does someone do this?
- how complex is this?
- what are safety risks in doing this?
- if the task is linked to a safety risk action, how important is it to do and get right?
- has anything changed to do with the task?

29.2 The questions should guide to how often and what is refreshed. For example, if the job is not done often and is complex, it may need regular training to refresh a person's skills and what they need to know. A job that is an important safety risk action may need more regular training to ensure it is done correctly. Therefore, some safety critical jobs are done more often than regulations may require. This ensures people can always do the job to the right standard.

30 Training selection, check of understanding and skills

30.1 Training does not always mean classroom training. Training can be done in many ways and the best method should be selected. It could be for example, computer based, on the job, or self-study. Following training it should be checked to see if the person understands what they have been taught and that they have the skills to do the task. This can be done by:

- asking questions
- the person talking through the task as they do it
- a paper or computer-based test

30.2 Doing this will also check how good the training is, and where it may be improved.

31 Records of Training

31.1 A record of training should be kept for each person. A training record should include:

- what topics and skills they have been taught
- when the training was done and by who
- what checks were done to see if the person understood what was taught
- what checks done to show they could do the task (with any proof)

32 SMS Training

32.1 Staff should know their role in the SMS and understand it. Staff should get SMS training when they join or when they change their role in an organisation where it changes what they do in the SMS. Training needs to be adapted for different staff. Managers will need a more in-depth SMS understanding. Staff with roles that directly affect safety will need to know more than those that do not. SMS training should also be refreshed.

32.2 All staff should have some training in SMS because in some way everybody can have an impact on safety. If there are third party organisations involved in an operation it may be a safety risk action to train their staff too in your organisation's SMS.

32.3 By looking at each member of staff's role and tasks it can be found what elements of the SMS they need to know about and what they need to be able to do. Training may then be done in grouped elements.

33 SMS Training Content

33.1 SMS training should look to cover:

- who is the Accountable Manager and what does this mean?
- what is the safety policy?
  - why is one needed?
  - where can it be found?
  - what does it mean?
- why is reporting important and a positive thing to do in aviation?
  - what should you report?
  - how do you report?
  - what things should be included in a report?
  - what happens to a report?
  - how does an investigation work?
- what is Just Culture and why is it important?
- when things go wrong which behaviours are and are not acceptable?
- when things go wrong when and what disciplinary process do, and do not apply?
- what is a hazard and a risk?
- how are risks managed?
- who is responsible for safety for different areas of the operation?
- why everybody has a safety responsibility?
- why is it important to manage change?
- how are changes managed?
- why it is important to follow procedures?
- what do you do if you cannot follow procedures?
- where safety information can be found?
- what are the ways the organisation tell staff about safety issues?

33.2   Certain SMS roles may need training in the following areas:

- human factors/performance
- hazard identification
- risk assessments
- investigations
- just culture and culpability
- auditing
- training
- data collection and analysis
- safety communications

33.3   Accountable Managers and managers need:

- to know how to promote a safety culture
- an awareness of their SMS role, the safety accountability and responsibilities
- to know the importance of compliance with regulations
- to understand how to show they are committed to the SMS
- how resource allocation impacts on safety and the SMS
- to understand the safety policy and SMS promotion
- to be aware of the safety objectives, safety performance indicators and targets
- understand the acceptable/unacceptable behaviours and just culture
- how safety communication works between departments

34   Safety Communication

34.1

(ii)   safety communication

Sharing of safety information is important. Safety information should flow up and down an organisation and between organisations.

34.2   The organisation should be able to:

- tell staff about the SMS, safety policy and safety objectives
- inform staff about important safety issues and safety risks, sometimes quickly
- inform staff about new safety risk actions and changes to others, always saying why
- inform staff about new and changes to safety procedures (and why)
- allow staff to report safety risks and to know what was done about these
- inform staff about how the SMS is performing
- share the results of safety investigations and safety audits
- share the above point with other organisations
- share safety lessons from other organisations

34.3   Safety communication can be done through:

- meetings/team talks
- minutes of meetings
- newsletters/email/text alerts/app groups
- intranet
- reports
- noticeboards

- video/podcasts
- publications
- safety events
- training events

34.4   Meetings play a role in communication and the workings of an SMS. How many and how they work depends on the size of the organisation and the existing meeting structure. Small organisations may put their SMS related items in a current meeting or set up a regular safety meeting. (For meetings' content see Appendix D)

34.5   How well communication works should be checked every so often. This can be checked by simple audits and surveys checking if staff are aware of things you want them to know.

35   Quality Management

35.1

> (5)   a quality management system in accordance with the relevant JAR, that as a minimum:
>   (i)   identifies applicable requirements, regulations and standard and demonstrate compliance with them;
>   (ii)   ensures technical manuals, checklists and other documentation is appropriately maintained and incorporates the latest amendments; and
>   (iii)   ensures that training programmes maintain staff proficiency and competency.

A quality management system (QMS) should work with a safety management system. They should both support each other. For some organisations it is just the one management system that covers both SMS and QMS as they can share processes such as:

- reporting
- investigating
- auditing
- managing findings
- document control
- training

(See JAC – Quality Management Systems)

36   SMS Acceptance

36.1

> (c)   The safety management system shall be described in relevant documentation and shall be acceptable to the Director.

Section 11 describes the documentation required. Each Overseas Territory Aviation Authority will review this documentation and then the SMS in action.

37   How Should We Go About Implementing SMS?

37.1   The first step is to ensure all the top managers understand SMS, how it adds value to the organisation and then commit to building one. The management message is then a plan to build an SMS to create value for the organisation rather than one that is just for satisfying the aviation regulator. The previous sections in this JAC represent the 'structure' of an SMS. Aiming to create value a step by step plan should be formed to deliver this 'structure'.

37.2   When building a SMS all staff should be involved. The SMS will rely on them for it to work. Staff need to feel that it is their system and it will help if they are fully involved in creating it. They need to feel that their input is important and valued.

37.3   The organisation may already have some parts of a SMS, so find out what these are and what is missing. This is called "Gap Analysis". A summary of SMS components is provided in Appendix A.

37.4   The following steps are suggested as a guide:

	Subject/Task	Completed?
a.	Identify the Accountable Manager (see Accountable Manager JAC).	
b.	Appoint a Safety Manager to build the SMS. Provide SMS training for them and managers.	
c.	Conduct gap analysis to find out what you have already? What can be changed to work with the SMS? What do you not have? It may help to record these in the form of a table.	
d.	Create a plan based on your gap analysis, allocate people to the tasks and how long they have to complete these tasks.	
e.	Managers together create the safety policy with SMS objectives, safety performance indicators, targets to share with all staff.	
f.	Define roles and responsibilities for staff. What do they do in the SMS and what training will they require?	
g.	Coordinate emergency plans with other organisations.	
h.	Create a reporting process. This should include the steps of how to report, report review, report investigation, lessons learnt, safety actions, feedback and checking of safety actions.	
i.	Establish methods safety communications.	
j.	Create meetings you need or need to adapt for the SMS.	
k.	Create a process to identify safety hazards, assess the safety risks, create safety risk actions, monitor safety risks and check safety risk actions.	

l.	Create a management of change process, define what starts it and when you use it (see Safety Assessment JAC).	
m.	Create or update documents that describe your SMS.	
n.	Train all staff in how your SMS works and what their roles are.	
o.	Create audits/surveys to check your SMS is working (see Quality Management Systems JAC).	
p.	Design your regular SMS report to record and measure its performance.	
q.	Review steps, (do the SMS components work together, see examples of this Appendix G).	

38.5   It is rare that the first design of the SMS will all work. Warn staff this may happen and be ready to make changes to make it better.

38.6   Warning - although the steps may appear simple to follow, they can require a lot of work at first and take time. Some organisations seek outside help. If this is done it must be done carefully. Each organisation is different, and an SMS should be made for your organisation. Although a SMS may consist of the following it is not just a document, a software system or a person. It cannot be bought off the shelf and plugged into the organisation. Doing this can end up with no working SMS, wasting time and money.

38   Safety Culture is Essential

38.1   An active safety culture is at the heart of an SMS – this is the way managers and staff all share together the way they see, value and place safety in the way they work. Sometimes this is described as the way things work when nobody is watching. It is always there and is the norm.

38.2   Part of this is a Just Culture where staff feel safe to report things. Here all staff know:

- it is right and normal to report
- how reports are processed
- genuine errors and mistakes are opportunities to learn and improve
- negligence and recklessness are not tolerated
- how the results of investigations are judged and by who
- that those who make errors and mistakes are supported by all

For this to work managers must show good leadership, commitment, set a good example, and be seen to do so.

38.3   If there is no reporting, there is a problem. It is vital for hazard identification and safety improvement. It is the Accountable Manager's job to work with the management team to fix this. To see what needs to be fixed consider:

- is the safety policy understood by staff?
- do staff trust managers to follow the safety policy?
- do staff understand and trust the reporting and investigation process?

- have recent reports and investigations followed the safety policy intent?
- do managers demonstrate commitment to the safety policy?

38.4   An active safety culture should lead to the SMS becoming part of the day-to-day management and *'the way we do things round here'*.

Appendix A Elements of a Safety Management System (SMS)

This is a summary of the main elements of an SMS where required under the Jersey Aviation Requirements (JARs).

1   Safety Policy

There is a clear safety policy signed by the Accountable Manager and available for all staff to see.

2   Objectives for Improvement

There are safety objective(s) with performance indicators and targets.

3   Accountability and Responsibilities

An Accountable Manager/Safety Manager is identified with all staff safety roles and responsibilities documented.

4   Co-ordination of Emergency Response Plans

Emergency plans align with those of other organisations

5   Identification of Hazards

There are reactive and proactive processes to find hazards.

6   Reporting and Investigation

There is a report and investigation process that seeks to learn, identify trends and with safety actions to improve the safe operation of the organisation.

7   Safety Risk Assessment and Mitigation

Identified hazards have their risks assessed and controlled through safety actions that are explained to staff.

8   Safety Performance Monitoring and Evaluation/Continuous Improvement of the SMS

There are audits of SMS processes, regulations and safety actions. Safety performance indicators are measured against targets. There is a report for the Accountable Manager and staff showing the SMS in action.

9   Management of Change

There is a process to highlight changes. Changes are looked at for the new hazards, safety risks they present and how they impact current safety risks. Safety actions are created to control these.

10   SMS Documentation

The safety policy, safety objectives, SMS requirements (with any exemptions the organisation may hold), accountability and responsibilities and SMS processes are documented. How the processes work together should be described with any that link to other organisations. There are SMS process records such as safety meeting minutes, hazard logs/safety risk registers, audits, reports and investigations, safety performance measures, SMS review reports, training records, training materials and change management records.

SMS processes may be in an existing manual or a separate SMS Manual.

11   Safety Promotion

There is training for all staff in the organisation's SMS and in any special roles they may have in it. There are regular meetings that look at SMS items. There are ways to tell staff about important safety information. There is a process that lets staff know why safety actions are taken and why safety processes are created or changed.

Appendix B Example Sections of Safety Policies

The following are example <u>sections</u> of safety policies:

Example section 1)

I am committed to providing a safe and good quality service to our customers. With the management team we aim to continuously improve both our levels of safety performance and quality of service. I will ensure resources are available to support this policy, provide a safe operation and to comply with regulatory requirements. Safety is a primary responsibility for all staff and everyone has a role to play in supporting our safety culture.

To learn, I encourage and support all staff to use our reporting process whenever they see issues or any incidents. Where genuine errors and mistakes have occurred staff will not be punished. Action will only be taken after a full investigation where there is a clear case of recklessness or negligence.

Example section 2)

As Accountable Manager, I shall ensure:
- adequate resources to support this policy
- adequate resources for a safe service delivery
- compliance with regulations
- a safety culture which includes a just culture

All staff shall:
- always ensure safety is their primary responsibility
- commit to always improving our safety performance
- support a positive safety culture
- report all incidents and issues using our reporting system

We do not tolerate negligence and reckless behaviours where there is clear evidence. We understand people make errors and mistakes. In such cases they will not be punished but we encourage these to be reported so we can learn to improve.

Example section 3)

Our company is committed to good service and a safe operation. We shall do this by:
- always improving our safety performance
- all supporting our safety culture
- always putting safety as the primary responsibility for all
- committing resource to support this policy
- committing adequate resource for a safe operation
- complying with all regulatory requirements
- everyone reporting all issues and incidents within a Just Culture

We accept people make errors and mistakes. We aim to learn from these and not punish those involved. Reckless and negligent actions we do not tolerate.

Example section 4)

We are all responsible for safe operations and everyone's top responsibility is safety. To ensure a safe operation, we will maintain an active safety management system and comply with all regulations that apply to us.

We support the open sharing of information on all safety issues and I encourage all employees to report 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, unless such disclosure indicates, beyond all reasonable doubt, gross negligence or a deliberate or wilful disregard of regulations or procedures.

I pledge also that no staff member will be asked to compromise our safety standards to get the job done. I will always ensure the necessary resources to deliver a safe operation. We will work to improve safety and support our safety culture.

Appendix C Example Objectives/Safety Performance Indicators/Targets

Objective*:* To implement a Safety Management System (SMS)

Performance indicators/targets:

- to complete staff SMS training for all staff within 2 years
- to create a safety hazard log for each operational area within 2 years
- to set up and hold 4 safety meetings per year

Objective*:* to increase the number of reports made to learn and improve the safety of our operation

Performance Indicators/Targets:

- number of serious incidents/accidents per year (reduce)
- number of reports made per year (maintain or increase)
- complete report training for all staff within 2 years (% completed)
- increase the proportion of 'I' reports, compared to 'It' and 'Them' reports each year

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Objective: to improve the airworthiness internal quality system to improve airworthiness delivery

Performance Indicators/Targets:

- number of airworthiness occurrence reports per flight hour (reduce)
- number of external auditor airworthiness findings per year (reduce)
- number of internal audit airworthiness findings per year (reduce)
- external/internal audit airworthiness finding ratio per year (0.75 or below)

Objective: to improve wildlife hazard management to prevent wildlife strikes that result in damage to aircraft

Performance Indicators/Targets:

- number of wildlife strike occurrences that lead to aircraft damage each year (reduce)
- the average time spent per week on wildlife hazard patrol each year increase by x%
- complete staff wildlife hazard refresher training for all wildlife hazard staff over the next 2 years (x% complete)
- complete the on-aerodrome habitat plan action list over the next 2 years (x% complete)

Objective: to reduce Foreign Object Debris (FOD) on aerodrome operating areas to prevent FOD damage to aircraft

Performance Indicators/Targets:

- number of occurrences of aircraft damaged due to FOD each year (reduce)
- FOD patrols conducted each month increase by x% each year
- mass (kgs) of FOD collected per FOD patrol per year (reduce by x%)
- complete installation of new aerodrome FOD bins within this year (% complete)

Objective: to ensure the aircraft mass and balance plan is calculated correctly and is loaded as per plan to prevent loss of control events

Performance Indicators/Targets:

- number of events of misloading that affected aircraft control each year (zero)
- number of load sheet mass and balance errors per sampled load sheet (reduce)
- completion of Pilot/Handling Agent staff load sheet and loading recurrent training courses conducted (% completed)

Objective: to ensure an adequately staffed and a safe competent ATC Service

Performance Indicators/Targets:

- number of airprox events each year (reduce)
- number of qualified Air Traffic Control Officers available (maintain or increase)
- hours per month aerodrome is NOTAM'd closed in published hours due to ATCO fatigue (reduce)
- ATCO competency checks failed each year (reduce)

Appendix D Example Content for Safety Meetings

A safety meeting may include the following items:

- safety reports, investigations and safety actions
- hazard/risk log/register review/safety risk actions
- results of safety audits/surveys
- safety performance reports/indicators/targets
- planned changes (management of change) that impact on hazards/risks and required further safety risk actions
- review of external safety reports and actions, could it happen here discussion?
- safety concerns raised
- safety notices
- safety training conducted
- safety information from other organisations and publications

Safety meeting minutes should record:

- agenda
- date, time and location of meeting
- who should attend
- who did attend/apologies
- a review and agreement of the last meeting's minutes
- a review of previous actions that are open and those that can be closed, noting the actions that were taken
- what was discussed with any document references
- what was agreed
- what actions were agreed, and who is responsible for the completion of these actions and by when?
- a tracking record of outstanding actions and the completion of actions

At the first meetings there may not be much to talk about. The first few meetings could focus on building the SMS, promoting it and involving staff. As the SMS processes are created and start to work these should then feed the meeting. If there is still not much coming from the SMS look to see what is happening in other aviation organisations and safety publications. The OT or UK State Safety Programme plans and ICAO regional safety plans may provide information with topics to discuss.

Appendix E SHELL Model

S = Software   H = Hardware   E = Environment   L = Liveware
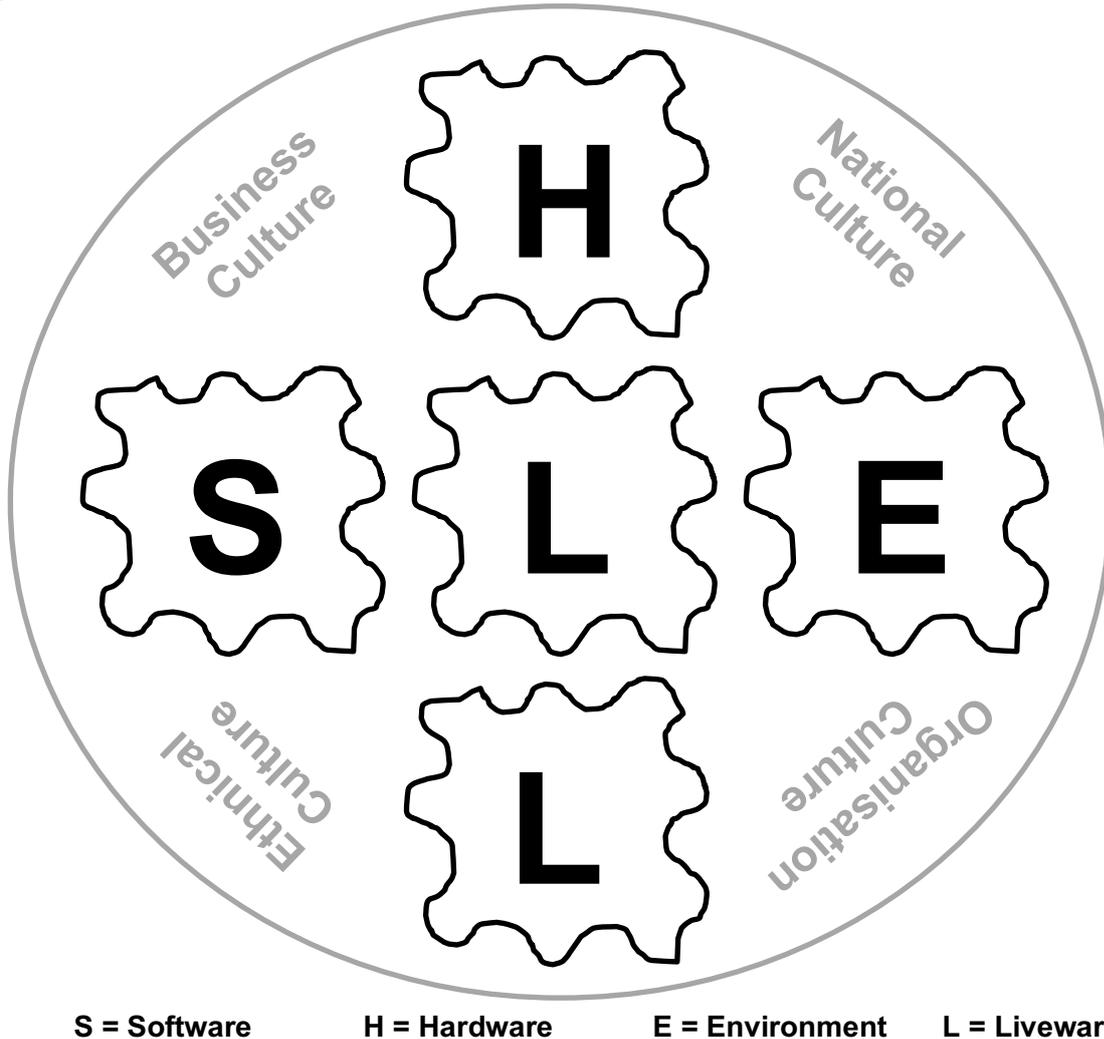
This is one example of a model that helps to look at how different things affect a person when they are doing a task. This can help improve risk assessments, investigations, change management, designing training and procedures.

Although people are great at adapting, how well they operate can vary. Many things can affect a person. The blocks in the SHELL model are the things that can affect a person when working.

All these things interact within a culture that is a mix of many, for example to name a few, business, national, organisation and ethnical.

The edges of each block show that these do not go together perfectly. This is where hazards and safety risks can be found. Safety actions can then be created to mitigate these. By thinking about the person in the middle we can look at how these other things may affect the way they perform when doing a task.

The parts in the model are:

Software - instructions, procedures, manuals, regulations, checklists, training, computer software etc…

Hardware - equipment, tools, facilities and machines used.

Environment - conditions where the work is done, temperature, light, noise, vibration, wind, humidity, damp, ice, infrastructure, terrain etc...

Liveware - a person (with one in the middle), so working with people in and outside your organisation, working in groups, working with supervisors and managers, relationships, communication, culture etc…

Culture – this can affect how all the parts interact.

Example, a person tasked with boarding passengers. Some things to consider for example:

Software –
Are the procedure instructions clear and simple to follow to meet the regulations?
Can the member of staff do the boarding process after training?
Is the boarding computer software easy for the person to use and understand?

Hardware -
Can the person easily get to and set up the boarding computer?
Are barriers to control passenger easy to move and adjust quickly?
Can the person access the passengers address system at the gate?
Is the passenger address system simple to use with clearly labelled buttons and displays?
Is the gate door access easy to use?

Environment –
Is the person protected from the weather (sun, rain, wind, cold) when working?
Is there enough light to conduct boarding correctly?
Is there enough space for the person to work whilst checking the passengers?

Liveware –
Can the person communicate with the aircraft crew easily?
Can the person be clearly heard using passenger address system in a room full of passengers?
Is the person calm and confident in dealing with groups of people?
Can the person speak clearly in a language most of the passengers will understand?

Culture –
Would the person feel comfortable and be able to clearly express an opinion when dealing with the aircraft Captain if things were going wrong?
Is the person able to voice concerns with other staff?
Is the person able to say I got that wrong?
Does the person feel supported in their work?
Does the person feel they have the power to delay a departure to ensure a safe and correct boarding process is completed?

After considering these, where things are not quite right think about what can be done to improve these. If these are done it should make it more likely that the person will now be able to correctly complete the task in the future.

See also, Human Factors in Aviation Organisations JAC for other models and further Human Factors information

Appendix F 5 whys

The 5 whys can help to find a root cause. It looks at cause and effect in around 5 steps. The idea is to keep asking a 'why' question after each answer around 5 times. It is important to stick to facts when doing this. It should help lead to the cause that needs to be fixed to stop the issue happening again. Care needs to be taken as the results can depend on the knowledge or opinion of the person doing it.

Example:

1) Why did the aircraft divert?

    A door warning light came on

2) Why did the door warning light come on?

    The door had come ajar during flight

3) Why did the door come ajar?

    It was not properly secured by the handling agent staff after loading

4) Why was the door not properly secured by the handling agent staff?

    They had not been trained on this new type and how to check the door was secure.

5) Why have they not been trained on this new type and how to check the door was secure?

    This handling agent was missed when training was given for the new aircraft and our safety/quality management actions had not been tracked to being completed and our audit did not check this had not been completed.

    Action to:

    - complete new aircraft training with handling agents
    - review/complete change management actions for new aircraft
    - review/complete audit of actions for new aircraft introduction
    - review safety/quality processes to ensure any outstanding actions are reviewed before new aircraft operation starts

Appendix G SMS in action

An SMS is a collection of processes that work together in different ways to manage risks. Data and safety actions are always appearing to ensure a safe operation (think of the arrows below moving to reconnect with different process when required). The SMS is constantly closing and keeping shut the gaps in your safety net. Information flows around it. Here are some examples: