



Australian Government  
Civil Aviation Safety Authority



# SMS 4

SMS FOR AVIATION—A PRACTICAL GUIDE | 2<sup>ND</sup> EDITION

Safety assurance





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This kit is for information purposes only. It should not be used as the sole source of information and should be used in the context of other authoritative sources.

The case studies featuring 'Bush Aviation and Training' and 'Outback Maintenance Services' are entirely fictitious. Any resemblance to actual organisations and/or persons is purely coincidental.

## What is safety assurance?

Safety assurance activities are at the core of your SMS. Safety assurance includes systematic and ongoing monitoring and recording of your safety performance, as well as evaluating your safety management processes and practices.

**Safety assurance is the way you demonstrate that your SMS works.**

You have decided on your safety objectives; you have implemented them; and now you are monitoring and measuring how you are progressing to meeting these targets.

## Safety performance monitoring and measurement

You need feedback on your safety performance so that you can evaluate it and make changes where necessary. Your stakeholders may also need assurance of the level of safety within your organisation. For example:

- » Staff need to be confident that your organisation can provide a safe working environment
- » Line management needs feedback on safety performance to help allocate resources, given the often-conflicting goals of production, profit and safety
- » Passengers' concerns about their personal safety
- » Senior management seeks to protect corporate image (and market share)
- » Shareholders wish to protect their investment (in larger organisations).

What types of monitoring you do will depend on how large and/or complex your organisation is. You can monitor your safety performance by:

- » establishing an effective hazard and occurrence reporting system
- » front-line supervisors monitor and reporting day-to-day activities
- » doing regular or daily inspections (formal or informal) of all safety-critical areas

- » using safety surveys to canvass your employees' views about safety
- » systematically reviewing and following up on all reports of identified safety issues,
- » systematically capturing daily performance data [using programs such as flight data analysis (FDA), line operations safety audit (LOSA), maintenance operations safety audit (MOSA), normal operations safety survey (NOSS) and maintenance error decision aid (MEDA)]
- » regular operational audits, both internal and external
- » regularly communicating safety results to all personnel.



### Safety performance measurement

Outback Maintenance Services set SMART safety objectives: specific, measurable, achievable, realistic objectives with a specified timeframe in which they are to be achieved. By setting such objectives, Peter Lawson can monitor and measure how their SMS is going.

Six months into the process, he and Mick Jones, the safety officer, give everyone a report on progress with the database (which they have set up in an Excel spreadsheet on the hangar PC), the number of reports they have received, and (especially following the Beechcraft engine cowl fasteners incident), the new rostering system.

### Safety objectives

1. To encourage reporting of all incidents, no matter how trivial they may seem (Measure: positive increase in all reporting for each of the next three years)
2. To build an accurate database of these incidents, and give feedback to staff within two weeks of the initial report
3. To set up a more formal rostering and reporting system, so that we can track and minimise fatigue-related mistakes. This system will take into account limits on consecutive shifts, as well as extra time required for task completion if a night shift is involved.



### Safety performance monitoring and measurement checklist

- Established systems are in place to ensure feedback on safety performance is received and the data is analysed.
- Feedback data is used to evaluate safety performance and identify necessary changes.
- An indication of the level of safety within the organisation is available to all stakeholders.
- A safety performance monitoring program appropriate to the organisation is established and maintained.

## Internal safety investigation

For every accident or serious incident in your organisation, there are likely to be hundreds of minor events or near-misses, many of which have the potential to become accidents. You should review all reported events/hazards and decide which ones you should investigate, and how thoroughly.

You must have a clear policy, stating that the purpose of internal investigations is to find systemic causes and implement corrective actions, NOT to blame individuals. If you use the principles of a positive safety culture, your internal investigation procedures should state this.

Resources for carrying out safety investigations are normally limited, so the effort you make should be in proportion to the perceived benefit. In other words, how will the investigation assist in identifying systemic hazards and risks to your organisation?

Accountability for the management of internal safety investigations and the investigation process should be documented in your SMS. Your documentation should include:

- » The scope of the investigation
- » Who will investigate, including specialist assistance if required

- » Recording the investigation findings for follow-up trend analysis, and who is responsible for this
- » A timeframe for completion.

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

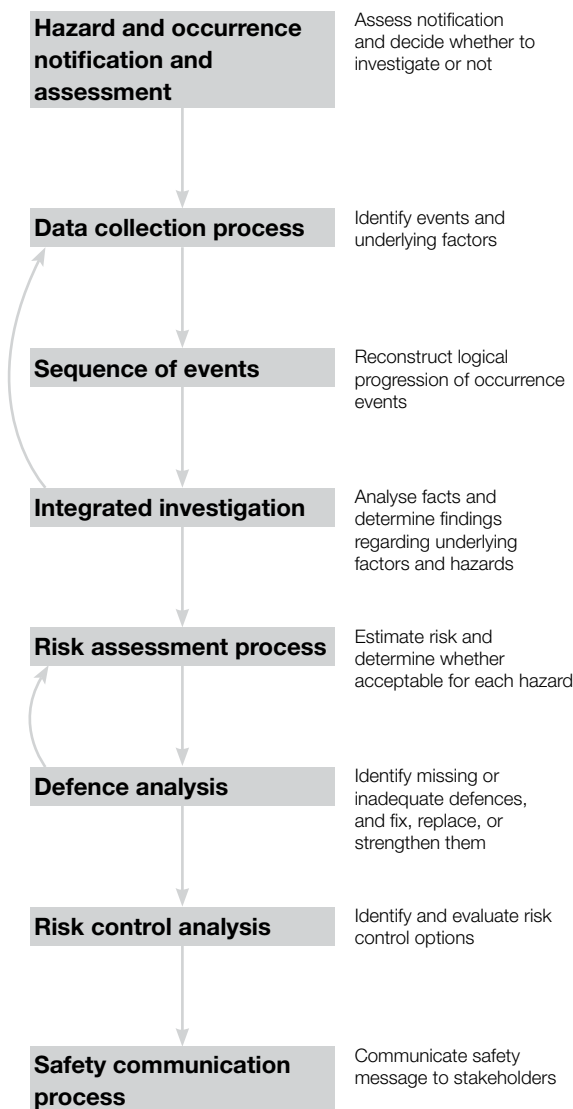
The investigative process should be comprehensive and should attempt to address the factors contributing to the event, rather than simply focusing on the event itself—the active failure. Active failures are the occurrences that took place immediately before the event and directly affect the safety of the system because of the immediacy of their adverse effects. They are not usually, however, the root causes of the event, *why it happened*, so applying corrective actions to these issues may not address the real cause of the problem. A more detailed analysis is usually required to establish the organisational factors that contributed to the event.

The figure opposite is an example of an internal safety investigation process.

Lessons learned about safety are more beneficial when they include a focus on root causes ('why?') rather than on a description of the accident or incident only ('what?'). Identifying root causes requires trained investigators who look beyond the obvious causes at other possible contributing factors, including, but not limited to, organisational issues.

You need to ensure that key operational staff are properly trained to conduct safety investigations and have appropriate support. Their output—identified safety issues—should be disseminated throughout the organisation, along with publishing of lessons learned from these identified safety issues. Is your internal safety investigation process doing its job? Is it confirming the validity of the hazards you have identified and reviewing your underlying hazards?

## Internal safety investigation process



## Internal safety investigation checklist

- The investigative process is comprehensive, and attempts to address the factors that contributed to the event, rather than simply focusing on the event itself. (The 'why', not just the 'what'.) Detailed analysis undertaken to establish the organisational factors that contributed to the event.
- All reported events/hazards are reviewed and a classification system guides the decision-making process on which ones should be investigated, and how thoroughly.
- The organisational safety policy states that the purpose of internal investigations is to find systemic causes and implement corrective actions, NOT to apportion blame to individuals.
- Where a positive safety culture/safety reporting culture policy is in place, the policy and protocols for internal investigations clearly reference it.
- The safety manager, or delegate, acts as the organisation's point of contact/coordinator for Australian Transport Safety Bureau (ATSB) investigations as a way of keeping informed as they progress.
- The effort expended on investigations is proportional to the perceived benefit in terms of potential for identifying systemic hazards and risks to the organisation.
- Accountability for the management of internal safety investigations is documented in the organisation's SMS manual.
- The extent of the investigation is depends on the actual and potential consequences of the event or hazard (as determined by an initial risk assessment).



## Management of change

Changes within your organisation can create hazards which can affect the safety of its operations. You may make changes to meet business demands and to be more flexible. However, while the changes need to be made effectively and efficiently, your main focus should be on implementing them safely. A change introduced to improve safety may introduce safety risks elsewhere—change invariably creates the potential for unintended consequences.

Management of change in SMS only applies to hazard ID and risk assessment related to the safety of operations. Other potential risk factors (such as the inability to sustain business growth) should be considered, as while they are additional to the scope of SMS change management, they may affect operational safety.

Different types of change introduce varying degrees of potential risk. The degree of scrutiny required, and the resulting level of detail at each step, should be proportionate to the degree of risk potentially introduced by the change.

Large-scale changes, such as major infrastructure projects or organisational restructures, should be managed as stand-alone projects, with safety validation documentation forming part of the project safety plan. A project safety plan will be an evolutionary document. For example, it may initially set out assumptions and replace these with more factual information as it becomes available. Similarly, the project safety plan may initially set out the risk assessment methodology and findings, later incorporating the safety requirements.

## Management of change guidance, procedures and checklist

By taking a systematic approach to implementing change, organisations can gain a much clearer picture of the objectives of change and how to achieve them safely.

### The need for organisational change

The need for organisational change can result from many different triggers. These include:

- » the appointment of new senior managers or a new management team
- » changes in customer requirements or expectations
- » changes in the work environment
- » changes in domestic or global trading conditions
- » an inadequate skills and knowledge base, leading to new training programs
- » innovations in operational practice
- » poor performance
- » new technology
- » new ideas about how to do things better
- » new contracts
- » recognition of operational problems, leading to a reallocation of responsibilities
- » regulatory or procedural changes
- » relocation or expansion
- » staff changeover
- » change in contractors, or bringing on new contractors.

## Management of change and risk management

Whether change is to be brought about through new projects, or through modifications to operating procedures, it will involve risks. There is a very strong link between change management and risk management—the two processes support each other and should be used together.

### The management of change process

The steps in the change process are:

STEP 1: Communicate and consult

STEP 2: Develop the case

STEP 3: Conduct risk assessment and planning

STEP 4: Prepare the project plan

STEP 5: Implement the change

STEP 6: Ongoing monitoring and review

Throughout all steps in the process, there must be ongoing communication and consultation with all those involved .

You must identify those who will be affected by the change, and work with them on each step of the process.

#### STEP 1: Communicate and consult

- » Have I determined who my stakeholders are? Internal? External?
- » Whom do I need to consult?
- » Have all my stakeholders been consulted?
- » Have I developed a communication plan?

#### STEP 2: Develop the case

Provide a compelling argument for making the change and a clear statement of the benefits that will result. If undertaken properly, this step will enable you to respond to people's questions, concerns and perceptions, thereby ensuring their willing participation, their sense of ownership and thus the project's eventual success.

##### Key activities

1. Establish the background and context that frame the case for change.
2. Develop the case for change.
3. Define the statement of need.
4. Determine the scope of change and the boundaries of the project or new venture.

##### Tips

Address the following questions to develop a strong and defensible case for change:

- » Why is a change required?
- » What is the purpose of the change?
- » Is the vision clear and are the objectives well defined?
- » What are my objectives?
- » What is the scope of the change?
- » What are the expected benefits and opportunities?
- » Do I have any limitations or restrictions?
- » Do I understand the importance of the change and its relevance to my organisation?
- » What resources do I lack?
- » What needs to be documented?



### STEP 3: Conduct risk assessment and planning

Whenever there is change, there are also likely to be both opportunities and risks. You should adopt a risk-based approach to planning change. Identify and quantify both opportunities and risks.

Risk management planning is based on establishing the context (as in step 2: Develop the case), and then identifying, analysing, evaluating and reducing risk to minimise the negative impact of change on aviation operations, while maximising potential benefits.

Don't make this process complicated. The most important part of the process is having all the people who are likely to be affected by the change, or who can add value to identifying potential risk, in the room to openly discuss the issues.

#### Key activities

1. Assemble a team to do the risk planning.
2. Develop your risk management plan.
3. Present this plan to the decision maker for approval.
4. Extract the risk treatment strategies and insert these as tasks into the project plan.
5. Re-evaluate your proposed risk treatment strategies to identify any new risks introduced as a result.

#### Tips

- » Ensure that the appropriate level of consultation takes place
- » Select a team encompassing the scope and breadth of the change
- » Use structured risk identification techniques such as SWOT (strengths, weaknesses, opportunities, threats) analysis
- » Use risk analysis tools that appropriately measure the consequences and likelihood of hazards for your organisation
- » When developing risk treatment strategies as project tasks, ensure that the tasks address the cause of each risk, not just the outcome

- » Examine the effectiveness of the risk treatment strategies by considering how much the project tasks will reduce the consequences or the likelihood of each risk
- » Calculate the residual risk and prioritise the risks
- » Link the venture risk management plan to the project plan for the change project or new venture.

### STEP 4: Prepare the project plan

Developing a project plan that considers the decisions and planning outlined in steps 1, 2 and 3 will ensure effective implementation. The project plan should address the need to manage the change and be developed specifically for the organisation, taking into account its unique culture and circumstances. The level of detail in the project plan will vary with the organisation, how complex the change is and the number of variables involved.

The critical feature of step 3 is the link back to the risk management planning in step 2. This is achieved by extracting the risk treatment strategies identified and planned for in the venture risk management plan and listing these items as tasks in the project plan. Each task will have a nominated timeline, responsibilities and resources.

A project plan must also outline internal implementation and communication strategies, and needs to engage all staff. This will give stakeholders confidence that the risks of the change have been taken into account, and that the risk treatments are being appropriately resourced and managed.

A project plan also provides a documented record of activities, tasks, resources and performance that can be used as a reference for future change management. Cultural and organisational factors need to be considered to ensure that the change is implemented smoothly and effectively. The key to effective implementation is engagement and communication. Many people in the organisation will want the benefits of the change, but will need to be given a high level of confidence or reassurance that the benefits will outweigh the costs.



## The key to effective implementation is engagement and communication.

### Key activities

1. Appoint a project director to be accountable for overseeing implementation and monitoring progress.
2. Appoint a project manager to be responsible for implementing the project plan.
3. Develop the project plan, including calculating the resources needed to implement it. Seek further approval if the scope or context has changed from step 2. Have a clear strategy for communicating the change.
4. Consider the 'people' aspect of change, the current cultural and internal barriers to change.

### Tips

Document all this, including:

- » a brief outline of the concept
- » the aim of the change
- » the objectives to be achieved
- » critical success factors (e.g. timeframe, resources, personnel)
- » a detailed description of all phases and associated tasks, responsibilities and milestones
- » key timings and critical path
- » allocation of resources
- » reporting requirements.

## STEP 5: Implement the change

Step 4 'executes' or implements the project plan developed in step 3.

This is where the change takes place. The principles of change management are used to guide the activity, focus and approach adopted in this step.

The pace of change and the required momentum also need to be considered in step 4. For larger and more complex projects, the change implementation program might need to be maintained over several years.

### Key activities

1. Undertake the tasks and activities in the project plan.
2. Report progress to the project director.
3. Continually communicate with staff and other stakeholders.
4. Review progress and performance, ensuring that the risk treatments listed in the risk management plan (step 2) have been implemented and are complete.

### Tips

- » Focus on getting it right.
- » It is more than just a policy.
- » Adopt a structured, project management approach.
- » Ensure ongoing communication with all stakeholders—internal and external.
- » Focus on managing priority areas first.



## STEP 6: Ongoing monitoring and review

To ensure that the change is implemented as intended and changing circumstances do not alter priorities, the plan must be constantly monitored, reviewed, and adjusted where necessary. Maintain communication and consultation with all stakeholders.

The following should be monitored for change:

- » Knowledge (new factors or information are included)
- » Stakeholders (new stakeholders are included over time)
- » Consultation (all relevant stakeholders are consulted)
- » Communication (high quality and appropriate methods used)
- » Risks (risk treatments are implemented, and new risks are identified, addressed and managed appropriately)
- » Common understanding (maintained by all participants)
- » Quality of decisions
- » Changes in legislation, regulation and market factors
- » Effectiveness of the implementation plan.

### Key activities

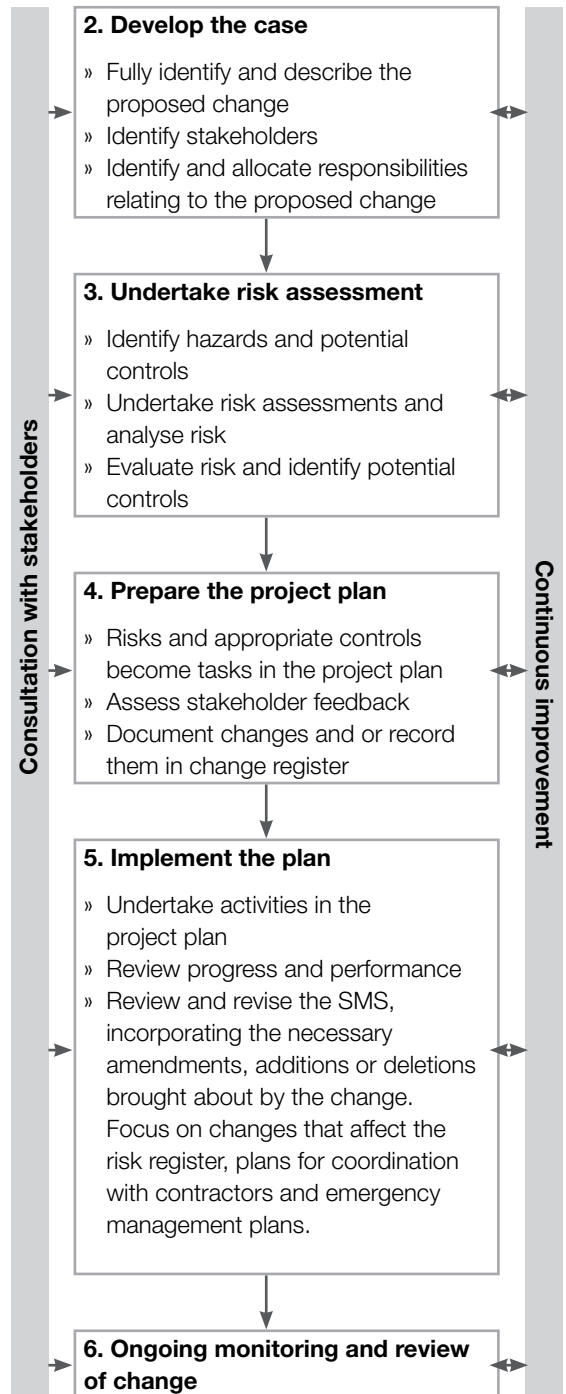
1. Check regularly to ensure the ongoing deliverables of the project plan are clear and understood.
2. Establish a means of receiving feedback – communicate, communicate, communicate!
3. Monitor feedback and determine actions to continuously improve project.
4. Measure the success of any actions taken.

### Tips

- » Make sure you know what you want to achieve
- » Identify the results that will tell you that you have achieved your aim
- » Be flexible and open to adjusting the plan
- » Provide effective feedback.

The following diagram summarises these steps:

## Management of change process





## Management of change checklist

- Management of change processes take safety issues into account.
- Changes likely to occur in the business which would have a noticeable impact on the following are identified:
  - Resources - material and human
  - Management direction - processes, procedures, training
  - Management control.
- The SMS documentation identifies the changes (including human factors issues) that require formal risk management processes.

## Continuous improvement of the safety system

You only know something is effective if you measure it. That is why it is important that your safety objectives are SMART – specific, measurable, achievable, realistic and within a timeframe.

[see Book 2 'Safety policy and objectives' page 09]

That way, you can measure and review what you have been doing, and improve on areas where your SMS is not as effective. Your review should look at all parts of your SMS to make sure they are still relevant and applicable. You need to outline how you are going to review each element of your SMS – safety policy and objectives; safety risk management; safety assurance; and safety promotion – in your SMS manual.

Small organisations should review their SMS at least once a year to ensure that:

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

A practical way for small operators to maintain a focus on improvement is to network with other operators and share information and good ideas to try.

For larger organisations, more formal periodic reviews are conducted by a safety committee. For example:

- » Reporting on the effectiveness of management of change activities and issues
- » Reporting on safety training performance
- » Evaluation of facilities, equipment, documentation and procedures through safety audits and surveys
- » Continued tracking of safety culture change or maturity level.



# BUSH

aviation and training

## Bush Aviation and Training hangar upgrade | case study

### Step 1 – Develop the case

Bush Aviation is preparing for their fleet growth (a 1997 King Air is due for delivery) with a planned new hangar and office building. Their current office and hangar are cramped, and the facilities outdated. The new building will be located near the current one, but aircraft will have to taxi past the construction site.

John Mathers identifies the various stakeholders who may be affected by his plans, and consults with them.

#### The stakeholders he identifies are:

- » The local shire council, and in particular the airport manager and the tourism officer
- » The local GP (who operates a Beechcraft)
- » The local chamber of commerce, and potential construction companies
- » Outback Exploration and other resources companies
- » Outback Maintenance Services and other operators at the airport
- » The aero club
- » CASA
- » ATC

### Step 2 – Undertake risk assessment

John Mathers, as CEO, and his part-time safety officer, Patricia Chee, together draw up a risk management plan.

They feel that the new hangar/office building will bring opportunities and risks. They focus on hazard identification and risk assessment relating to flight safety, but also take into account other factors, such as not being able to sustain their planned growth, even though this is beyond the scope of SMS management of change.

## Opportunities

1. Improved, more professional facilities to service expanding business
2. Increased income and increased efficiency
3. Additional jobs for line pilots/LAMEs etc.
4. Growth of the airport

## Hazards identified

The stakeholders have identified the following potential hazards associated with the proposed change:

1. Distraction during construction
2. Planned growth not sustainable due to lack of available staff with the necessary skills
3. Clearance issue with aircraft taxiing past the current building
4. Noise, dust and FOD potentially damaging surface finishes and engines
5. Potential for miscommunication and fatigue for Bush Aviation employees
6. Heavy machinery in the movement area.
7. Temporary removal of the boundary fence to allow construction access, increasing the chances that stray stock or wildlife could wander onto the airfield
8. Builders' vehicles parked near the tarmac.

### Safety risk management

The review team assess the risks associated with each identified hazard (see risk assessment section). None of the hazards are considered 'show stoppers' but some require mitigation before and during construction. Actions are allocated to the appropriate people, with timeframes for completion. The safety officer is appointed to oversee the plan to implement the identified solutions.

### Step 3 – Prepare the project/implementation plan

The safety officer continues to consult with the Bush Aviation pilots and other stakeholders as she prepares a project plan, holding fortnightly meetings with key personnel, as well as one-on-one meetings with Bush Aviation staff as issues arise. She also meets with a potential construction company to ensure that any of its concerns are covered in the implementation plan. They raise the issue of access and parking for construction vehicles, and the safety officer writes these into the plan.

To minimise noise and dust, it is recommended that the taxiway past the hangar be closed for the period of peak construction, and that a NOTAM be issued regarding the change.

### Step 4 – Implement the change

All actions are completed within the required timeframes. The management of change committee meets regularly to assess progress and take remedial actions when required.

### Step 5 – Ongoing monitoring and review

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

#### Example of continuous review strategy

Continuous improvement:

- » Biannual benchmarking exercise with similar-sized operators to gain further intelligence on practical safety initiatives
- » Bush Aviation uses the following tools to track improvement:
  - Annual independent safety audit
  - Annual safety culture survey.



### Continuous improvement of the SMS checklist

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- An SMS is established that includes policies, rules, directives and standard operating procedures (SOPs).
- Management work continuously towards revising the current processes, in response to changing needs, operational environment, or standards.
- Demonstrated efforts are made towards ensuring that everybody follows SOPs (a combination of discipline and human resource development measures may be employed).
- Formal management reviews of the SMS occur on a regular basis.
- A quarterly high-level review process is conducted via the safety committee.
- Safety reviews validate the SMS, confirming not only that people were doing what they were supposed to be doing, but also that their collective efforts have achieved the organisation's safety objectives and targets.
- Through regular review and evaluation, management pursue continuous improvements in safety management and ensure that the SMS remains effective and relevant.



## Toolkit

### **Booklet 4** - Safety assurance tools

- » Generic issues to be considered when monitoring and measuring safety performance
- » Audit scope planner
- » Basic audit checklist
- » Information relevant to a safety investigation
- » Event notification and investigation report
- » Aviation safety incident investigation report
- » Corrective/preventative action plan
- » Checklist for assessing institutional resilience against accidents (CAIR)
- » Practical safety culture improvement strategy
- » Safety culture index





## Index of toolkit items

This is *your* safety toolkit with some best-practice tips and practical tools that can be adapted to meet your organisation's needs. We hope you find them useful, whether you are further developing your SMS, starting an SMS from scratch, or simply looking for some ideas to improve your existing SMS.

This list summarises the checklists/templates you will find at the back of each of the respective booklets.

This is not an exhaustive list of resources.

**NB:** There are many systems and products across various industries, so this toolkit can only include a very small sample of practices and/or tools for information.

Inclusion of materials does not imply endorsement or recommendation. Each organisation must select the most appropriate products for its individual and specific needs.

### Booklet 1 – Basics

- » Jargon busters
- » References

### Booklet 2 – Safety policy and objectives tools

- » SMS organisation checklist
- » Safety policy statement
- » Safety manager's job description
- » Role of the safety committee
- » SMS implementation plan
- » Ten steps to implementing an SMS
- » SMS gap analysis checklist
- » An effective emergency response plan (ERP)
- » Language and layout of procedures/documentation
- » Document register
- » Sample safety leadership rules
- » Aviation safety lifesavers policy
- » Healthy safety culture procedure

- » Appendix A – Workflow process for applying the healthy safety culture procedure
- » Appendix B – Bush Aviation and Training counselling/discipline decision chart.

### Booklet 3 – Safety risk management tools

- » Error prevention strategies for organisations
- » Risk register
- » Sample hazard ID
- » Guidance on job and task design
- » A six-step method for involving staff in safety hazard identification
- » Hazard reporting form

### Booklet 4 – Safety assurance tools

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- » Checklist for assessing institutional resilience against accidents (CAIR)
- » Practical safety culture improvement strategy
- » Safety culture index

### Booklet 5 – Safety promotion tools

- » How to do a training needs analysis
- » Sample safety information bulletin on fatigue
- » How to give a safety briefing/toolbox talk
- » Aviation safety toolbox talk
- » Safety briefing/toolbox meeting attendance form





## Generic issues to be considered when monitoring and measuring safety performance

The following is a list of generic aspects or areas to be considered to 'assure safety' through safety performance monitoring and measurement:

- » **Responsibility.** Who is accountable for operational management (planning, organising, directing, controlling) and their ultimate accomplishment?
- » **Authority.** Who can direct, control or change the procedures and who cannot? Who can make key decisions, such as safety risk acceptance?
- » **Procedures.** Specified ways to carry out operational activities that translate the 'what' (objectives) into 'how' (practical activities).
- » **Controls.** Elements of the system, including hardware, software, special procedures or procedural steps, and supervisory practices designed to keep operational activities on track.
- » **Interfaces.** Examining such things as lines of authority between departments, lines of communication between employees, consistency of procedures, and clear delineation of responsibility between organisations, work areas and employees.
- » **Process measures.** Means of providing feedback to responsible parties that required actions are taking place, with the expected and required results.



## Audit scope planner

SMS ITEM		Year 1	Year 2	Year 3	Year 4	Year 5
1	Safety policy and culture					
2	Governance, management, accountabilities, responsibilities and authorities					
3	Regulatory compliance					
4	Safety records, document control and information management					
5	Review of the safety management system					
6	Internal SMS audit arrangements					
7	Corrective action					
8	Safety performance targets and performance measures					
9	Management of change					
10	Internal communication					
11	Risk management					
12	Safety-critical worker competence					
13	Information, instruction, and training					
14	Procurement and contract management					
15	Engineering and operational safety systems					
16	Process control					
17	Asset management					
18	Safety interface coordination					
19	Occurrence and emergency management					
20	Investigations					
21	Third party audits					

Operators will need to develop their own audit scope planner requirements based on their own operating conditions, risks, incident history and determined safety objectives.





## Self-assessment checklist

You can use the following self-assessment checklist to identify administrative, operational and other processes, and training requirements, that might indicate safety hazards. You can then focus attention on those issues posing a possible safety risk.

### Management and organisation

#### Management structure

1. Does the organisation have a formal safety policy and written safety objectives?
2. Are the corporate safety policies and objectives adequately disseminated throughout the organisation? Is there visible senior management support for these safety policies?
3. Does the organisation have a safety department or a designated safety manager (SM)?
4. Is this department or SM effective?
5. Does the SM report directly to the accountable manager?
6. Does the organisation support the periodic publication of a safety report or newsletter?
7. Does the organisation distribute safety reports or newsletters from other sources?
8. Is there a formal system for regular communication of safety information between management and employees?
9. Are there periodic safety meetings?
10. Does the organisation participate in industry safety activities and initiatives?
11. Does the organisation formally investigate incidents and accidents? Are the results of these investigations disseminated to managers and operational personnel?
12. Does the organisation have a confidential, non-punitive, hazard and incident reporting program?
13. Does the organisation maintain an incident database?
14. Is the incident database routinely analysed to determine trends?
15. Does the organisation operate a flight data analysis (FDA) program?
16. Does the organisation operate a line operations safety audit (LOSA) program?
17. Does the organisation do safety studies?
18. Does the organisation use outside sources to do safety reviews or audits?
19. Does the organisation seek input from aircraft manufacturers' product support groups?

#### Management and corporate stability

1. Have there been significant or frequent changes in ownership or senior management within the past three years?
2. Have there been significant or frequent changes in the leadership of operational divisions within the past three years?
3. Have any managers of operational divisions resigned because of disputes about safety matters, operating procedures or practices?
4. Are safety-related technological advances implemented before they are directed by regulatory requirement, i.e. is the organisation proactive in using technology to meet safety objectives?

#### Financial stability of the organisation

1. Has the organisation recently experienced financial instability, a merger, an acquisition or other major reorganisation?
2. Was consideration given to safety matters during and following the period of instability, merger, acquisition or reorganisation?

## Management selection and training

1. Are there well-defined management selection criteria?
2. Is operational background and experience a requirement in the selection of management personnel?
3. Are first-line operational managers selected from operationally qualified candidates?
4. Do new management personnel receive formal safety induction and training?
5. Is there a well-defined career path for operational managers?
6. Is there a formal process for the annual evaluation of managers?

## Workforce

1. Have there been recent layoffs by the organisation?
2. Is a large number of personnel employed on a part-time or contractual basis?
3. Does the company have formal rules or policies to manage contractors?
4. Is there open communication between management, the workforce and unions about safety issues?
5. Is there a high rate of personnel turnover in operations or maintenance?
6. Is the overall experience level of operations and maintenance personnel low or declining?
7. Is the distribution of age or experience levels within the organisation considered in long-term organisational planning?
8. Are the professional skills of candidates for operations and maintenance positions formally evaluated during the selection process?
9. Are multicultural issues considered during employee selection and training?

10. Is special attention given to safety issues during periods of labour-management disagreements or disputes?
11. Have there been recent changes in salaries, working conditions or superannuation?
12. Does the organisation have a corporate employee health maintenance program?
13. Does the organisation have an employee assistance program that includes treatment for drug and alcohol abuse?

## Relationship with the regulatory authority

1. Are safety standards set primarily by the organisation, or by the appropriate regulatory authority?
2. Does the organisation set higher standards than those required by the regulatory authority?
3. Does the organisation have a constructive, cooperative relationship with the regulatory authority?
4. Has the organisation been subject to recent safety-enforcement action by the regulatory authority?
5. Does the organisation consider the differing experience levels and licensing standards of other states when reviewing applications for employment?
6. Does the regulatory authority routinely evaluate the organisation's compliance with required safety standards?



# Information relevant to a safety investigation

A competent, professional safety investigation

- » **yields** information needed to:
  - identify trends and problem areas
  - permit comparisons
  - satisfy legal requirements
- » **identifies** the basic causes contributing directly/indirectly to each incident
- » **identifies** deficiencies within the system/organisation that allowed the incident to occur
- » **suggests** specific corrective actions to improve the SMS
- » **physically examines** the equipment used during the accident/incident. This may include examining the front-line equipment used, its components, and the workstations and equipment used by supporting personnel.
- » **documents** the broad spectrum of the operation; for example:
  - maintenance records and logs
  - personal records/logbooks
  - certificates and licences
  - in-house personnel and training records and work schedules
  - operator's manuals and SOPs
  - training manuals and syllabuses
  - manufacturers' data and manuals
  - regulatory authority records
  - weather forecasts, records and briefing material
  - flight planning documents.
- » **Recordings** (flight recorders, ATC radar and voice tapes etc.). These may provide useful information for determining the sequence of events.
  - As well as traditional flight data recordings, maintenance recorders in new generation aircraft are a potential additional source of information
  - Smartphones and tablets (with GPS) may also be valuable sources of relevant information
- » **Interviews** with individuals directly or indirectly involved in the accident/incident. These can be a principal source of information for any investigation. In the absence of measurable data, interviews may be the only source of information. However, because memory is fallible, and personal recollections can be biased, validate records of conversations whenever possible.
- » **Direct observation** of actions performed by operating or maintenance personnel in their work environment. This can reveal information about potentially unsafe conditions. However, the people being observed must be aware of the purpose of the observations.
- » **Simulations** These permit reconstruction of an occurrence and can facilitate a better understanding of the sequence of events that led to the occurrence, and the manner in which personnel responded to it. Computer simulations can be used to reconstruct events using data from on-board recorders, ATC tapes, radar recordings and other physical evidence.
- » **Specialist advice** Investigators cannot be experts in every field relating to the operational environment, and must realise their limitations. When necessary, they must be willing to consult with other professionals during an investigation.

## Event notification & investigation report

When an incident occurs, use this flow chart as a guide to completing the required actions in a timely manner.

### EVENT NOTIFICATION

Report number: (Must be completed for ALL events)

#### A. EVENT DETAILS:

1. Type:

- Incident/accident    Personal injury    Equipment damage    Environmental damage  
 Near-miss    Complaint    Ongoing condition    Hazard

2. Category (event title):

3. Date: / /

4. Time: am / pm

5. Reported date: / /

6. Reported time: am / pm

7. Reported to:

8. Witness name/s:

9. Location:

10. Description:

11. Diagram:

Sketch event scene, or a picture of the sequence of events, including location of involved people and equipment at the time of the event. Take photographs (attach in order) .

12. Organisation/s:



## EVENT NOTIFICATION (cont.)

### B. ENVIRONMENTAL IMPACT:

13. Environmental impact:

### C. EQUIPMENT:

14. Equipment name/type:

### D. PERSON/S DETAILS:

20. Name:

21. Employer:

22. Role:

23. Duty status at time of event:

24. Employment status:

On duty at workplace

Employee

Commenced:                      am/pm

Contractor

Travelling while on duty

Other, specify:

Travelling to/from work

25. Did person cease work before end of shift?      26. If yes, what time?      am/pm

YES    NO

27. Injury severity:  Fatality  Lost time  Disabling injury  Medical treatment  First aid

Occupational disease/illness

28. Activity being performed: (modify for your operation)

Aerial agricultural operations

Dropping

Sling load operations

Aerial photography

Feral animal control

Surveillance

Aerial surveying

Search and rescue

Winching/hoisting

### E. IMMEDIATE CORRECTIVE ACTIONS:

38. Immediate corrective actions:

39. Signature of person completing event report:

Name:

Signature:

Date:

Time:

40. Event notification sign-off by the shift supervisor:

Name:

Signature:

Date:

Time:

Use the guidance notes on the following pages to assist in fact-gathering to ensure you identify **all contributing factors** relating to the event.



# Event notification & investigation report

## ANALYSIS OF CONTRIBUTORY FACTORS

Report number:

(To be completed for any actual or potential event at Level 2 and above)

**INDIVIDUAL/TEAM ACTIONS** Identify the individual/team actions that contributed to or caused the event. These are the errors or violations that led directly to the event. Typically, they are associated with those who have direct contact with equipment, such as operators or maintenance staff. They are always committed 'actively' (someone did or didn't do something) and have a direct relation to the event.

**Check question:** Does the item tell you about an error or violation of a standard or procedure made in the presence of a hazard? (Tick only if applicable)

IT1	Supervision?	<input type="checkbox"/> Absent <input type="checkbox"/> Inadequate <input type="checkbox"/> Unsuitable	IT8	Safety compliance?	<input type="checkbox"/> Absent <input type="checkbox"/> Inadequate <input type="checkbox"/> Unsuitable
IT2	Authority?	<input type="checkbox"/> Absent <input type="checkbox"/> Inadequate <input type="checkbox"/> Unsuitable	IT9	Instructions given?	<input type="checkbox"/> Absent <input type="checkbox"/> Inadequate <input type="checkbox"/> Unsuitable
IT3	Operating speed?	<input type="checkbox"/> Exceeded <input type="checkbox"/> Unsuitable	IT10	Training for task?	<input type="checkbox"/> Absent <input type="checkbox"/> Inadequate <input type="checkbox"/> Unsuitable
IT4	Equipment use?	<input type="checkbox"/> Absent <input type="checkbox"/> Exceeded limits <input type="checkbox"/> Misuse <input type="checkbox"/> Unsuitable selection	IT11	Experience for task?	<input type="checkbox"/> Absent <input type="checkbox"/> Inadequate <input type="checkbox"/> Unsuitable
IT5	PPE?	<input type="checkbox"/> Absent <input type="checkbox"/> Exceeded limits <input type="checkbox"/> Misuse <input type="checkbox"/> Unsuitable selection	IT12	Misconduct?	<input type="checkbox"/> Mitigated <input type="checkbox"/> Unmitigated
IT6	Work procedure followed?	<input type="checkbox"/> Partially <input type="checkbox"/> Not followed <input type="checkbox"/> Unsuitable	IT13	Interruptions breakdown in team coordination?	
IT7	Equip/material handling?	<input type="checkbox"/> Inadequate <input type="checkbox"/> Unsuitable	IT14	Other	
CODE	Based on the above event facts, IDENTIFY the individual/team actions that contributed to the event – give reasons.				



## ANALYSIS OF CONTRIBUTORY FACTORS (cont.)

**TASK/ENVIRONMENTAL CONDITIONS** Identify the task/environmental conditions contributing to the event. These are the circumstances under which the errors and violations took place and can be embedded in task demands, the work environment, individual capabilities and human factors.

**Check question:** Does this item describe something about the task demands, work environment, individual capabilities or human factors that promoted errors/violations, or undermined the effectiveness of the system's defences? (Tick only if applicable)

Workplace factors impact			Human factors impact		
WF1	Lighting	<input type="checkbox"/> Some <input type="checkbox"/> Significant	HF1	Complacency/ motivation	<input type="checkbox"/> Some <input type="checkbox"/> Significant
WF2	Weather Time of day	<input type="checkbox"/> Some <input type="checkbox"/> Significant	HF2	Alcohol/other drugs	<input type="checkbox"/> Some <input type="checkbox"/> Significant
WF3	Dust/contaminants	<input type="checkbox"/> Some <input type="checkbox"/> Significant	HF3	Familiarity with task	<input type="checkbox"/> Some <input type="checkbox"/> Significant
WF4	Noise	<input type="checkbox"/> Some <input type="checkbox"/> Significant	HF4	Fatigue	<input type="checkbox"/> Some <input type="checkbox"/> Significant
WF5	Wildlife	<input type="checkbox"/> Some <input type="checkbox"/> Significant	HF5	Time pressure	<input type="checkbox"/> Some <input type="checkbox"/> Significant
WF6	Surface gradient/conditions	<input type="checkbox"/> Some <input type="checkbox"/> Significant	HF6	Peer pressure	<input type="checkbox"/> Some <input type="checkbox"/> Significant
WF7	Workspace access/ restriction	<input type="checkbox"/> Some <input type="checkbox"/> Significant	HF7	Physical capabilities	<input type="checkbox"/> Some <input type="checkbox"/> Significant
WF8	Housekeeping	<input type="checkbox"/> Some <input type="checkbox"/> Significant	HF8	Mental capabilities	<input type="checkbox"/> Some <input type="checkbox"/> Significant
WF9	Tools/equipment condition/ availability	<input type="checkbox"/> Some <input type="checkbox"/> Significant	HF9	Physical stress	<input type="checkbox"/> Some <input type="checkbox"/> Significant
WF10	Task planning/preparation	<input type="checkbox"/> Some <input type="checkbox"/> Significant	HF10	Mental stress	<input type="checkbox"/> Some <input type="checkbox"/> Significant
WF11	Routine/non-routine task	<input type="checkbox"/> Some <input type="checkbox"/> Significant	HF11	Confidence level	<input type="checkbox"/> Some <input type="checkbox"/> Significant
WF12	Abnormal operational situation/condition	<input type="checkbox"/> Some <input type="checkbox"/> Significant	HF12	Secondary goals/ external factors	<input type="checkbox"/> Some <input type="checkbox"/> Significant
WF13	Risk perception/ management	<input type="checkbox"/> Some <input type="checkbox"/> Significant	HF13	Personality	<input type="checkbox"/> Some <input type="checkbox"/> Significant
WF14	Personnel safety	<input type="checkbox"/> Some <input type="checkbox"/> Significant	HF14	Manuals and procedures	<input type="checkbox"/> Some <input type="checkbox"/> Significant
WF15	Other workplace factor/s _____	<input type="checkbox"/> Some <input type="checkbox"/> Significant	HF15	Other human factors _____	<input type="checkbox"/> Some <input type="checkbox"/> Significant
CODE	Based on the above event facts, IDENTIFY the task/environmental conditions that contributed to the event – give reasons.				

**ORGANISATIONAL FACTORS** Identify the organisational factors that contributed to the event.

These are the underlying organisational factors that produce the task/environmental conditions affecting workplace performance. These may include fallible management decisions, processes and practices.

**Check question:** Does this item identify a standard organisational factor present before the event and that resulted in the task/environmental conditions, or allowed those conditions to go unaddressed? (Tick only if applicable)

HW	Hardware	<input type="checkbox"/> Contributing	MM	Maintenance management	<input type="checkbox"/> Contributing
TR	Training	<input type="checkbox"/> Contributing	DE	Design	<input type="checkbox"/> Contributing
OR	Organisation	<input type="checkbox"/> Contributing	RM	Risk management	<input type="checkbox"/> Contributing
OR2	Provision of tools/equipment				<input type="checkbox"/> Contributing
OR3	Planning and scheduling				<input type="checkbox"/> Contributing
CO	Communication	<input type="checkbox"/> Contributing	MC	Management of change	<input type="checkbox"/> Contributing
IG	Incompatible goals	<input type="checkbox"/> Contributing	CM	Contractor management	<input type="checkbox"/> Contributing
PR	Procedures	<input type="checkbox"/> Contributing			
CODE	Based on the above, IDENTIFY the organisational factors that contributed to the event – give reasons.				





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# Event notification & investigation report

## INVESTIGATION REPORT SIGN-OFF

Report number:

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### Involved person acceptance and comments

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Name:	Signature:	Date: (dd/mm/yyyy)
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### Safety officer acceptance and comments

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Name:	Signature:	Date: (dd/mm/yyyy)
-------	------------	--------------------

**Statutory reporting requirements** Yes / No      Completed Yes / No

**Corrective action review required?** Yes / No      How: (specify) \_\_\_\_\_

Review date: \_\_\_\_\_

### General comments

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Name:	Signature:	Date: (dd/mm/yyyy)
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### CEO/General manager acceptance and comments

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Name:	Signature:	Date (dd/mm/yyyy)
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## Aviation safety incident investigation report

AT

---

**Date**

**AT 0000 (hours)**

# DRAFT

**Investigation team:**

Name/department (leader) \_\_\_\_\_

Name/department \_\_\_\_\_

Name/department \_\_\_\_\_

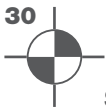
Name/department \_\_\_\_\_

Name/department \_\_\_\_\_

Name/department \_\_\_\_\_

**This document must not be copied**

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# Contents of report

## 1. Incident/accident description

### Incident/accident

Location:	
Time:	
Date:	

### Details of injured

Name:	
Company:	
Injuries sustained:	
Medical treatment:	

### Details of damage/impact

Damage to equipment:	
Environmental impact:	

### Risk rating

Actual consequence level:	Level
Potential consequence level:	Level

### Events leading up to the incident/accident

Incident/accident description

#### Photographs

» Insert photographs

#### Timeline

» Insert timeline chart



## 2. Key findings

The key findings outline why the incident/accident occurred. The contributing factors identified from the investigation have been categorised using the ICAO-recommended Reason model of accident causation. The analysis chart is shown as an appendix in section 6 of this report.

### Contributing factors

Based on the evidence to hand, the investigation team believe the following were the main contributing factors to the incident:

#### Absent or failed defences

- » Insert contributing factor
- » Insert contributing factor
- » Insert contributing factor
- » Insert contributing factor
- » Insert contributing factor

#### Individual or team actions

- » Insert contributing factor
- » Insert contributing factor
- » Insert contributing factor

#### Task or environmental condition

- » Insert contributing factor
- » Insert contributing factor
- » Insert contributing factor

#### Organisational factors

- » Insert contributing factor
- » Insert contributing factor
- » Insert contributing factor

## 3. Conclusions and observations

The investigation concluded the following findings were or could have been contributory factors to the incident/accident:

- » Insert conclusion or observation
- » Insert conclusion or observation
- » Insert conclusion or observation
- » Insert conclusion or observation
- » Insert conclusion or observation

## 4. Recommendations

The following recommended corrective actions are put forward for consideration.

The recommendations address the **absent or failed defences** and **organisational factors** identified as key findings of the investigation. These recommendations are applicable to [insert business group or site] and could benefit other Bush Air operations.

### Heading

Detail and explanation

### Heading

Detail and explanation

### Management review of the investigation report

The management of [business group and site] should formally review the investigation report for completeness, quality of the investigation and to endorse the recommended corrective actions.

It is recommended that the following action plan is implemented:

#### Distribution

To maximise the effectiveness of the investigation report, its findings and conclusions should be distributed as widely as practicable internally within Bush Air and externally to industry bodies.

#### Implementation of corrective actions

Corrective actions will be formally presented to the responsible manager for implementation. An action plan and time frame will be agreed and endorsed by the appropriate level of management. An action plan is attached in section six of this report (page 33).

#### Implementation monitoring

The completion of corrective actions must be documented and communicated by the responsible manager to the CEO and copied to the aviation safety manager. Where corrective actions have not been fully implemented, ongoing monitoring should be maintained until implementation is complete.



### Analyse effectiveness

The effectiveness of the corrective actions should be evaluated by a review of safety performance and through an audit within the next six months. A report will be prepared for management to detail compliance and progress achieved.

### Document archiving

Investigative data and reports will be archived in accordance with procedures specified in the Bush Air SMS manual (BASMS).

## 5. Significant lessons

The investigation has raised a number of key lessons which are covered in the body of the report. The significant lessons for Bush Air are:

### Heading

Detail and explanation

### Heading

Detail and explanation

### Heading

Detail and explanation

## 6. Appendices

### REASON MODEL ANALYSIS

The features of the Reason model analysis chart for the purposes of this interim report are:

- » It provides a graphical representation of all the key circumstances and factors relating to the incident
- » It outlines the relationship of the various elements considered throughout this report.

The chart is also designed to:

- » Provide a framework to organise the data collected
- » Assist in assuring the investigation follows a logical path
- » Aid in the resolution of conflicting information and the identification of missing data
- » Provide a graphic display of the investigative process for management briefing.

Accordingly, this chart should not be considered in isolation but in the context of all the comments in this report and, no doubt, the additional matters that will be addressed in the final report.

## Analysis chart

Organisational factors	Task/ environmental conditions	Individual/team actions	Absent or failed defences	Incident

### Corrective action plan

Item Ref	Recommendation	Responsible department	Responsible person	Completion date	Sign off

**Close-out of incident** – All corrective actions have been completed. Where corrective actions have not been fully implemented, the following measures have been put in place to ensure ongoing monitoring until implementation is complete.

Name:	Signature:	Date:
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### Heading

Detail and explanation

### Heading

Detail and explanation

## 7. Report sign-off

To maximise the effectiveness of the investigation report, its findings and conclusions should be distributed as widely as possible, especially to the various people involved in the incident.

The completion of corrective actions must be documented and communicated by the responsible manager to the CEO, as well as the aviation safety manager. Where corrective actions have not been fully implemented, ongoing monitoring should be maintained until implementation is complete.

<b>Feedback to those involved and comments</b>		
Name:	Signature:	Date:
<b>Feedback to the involved person/s manager/s and comments</b>		
Name:	Signature:	Date:
<b>CEO's acceptance of findings and comments</b>		
Name:	Signature:	Date:
<b>Aviation safety manager's acceptance of findings and comments</b>		
Name:	Signature:	Date:



# Corrective/preventative action plan

## Recommendations for corrective actions

Investigations should identify recommendations for corrective actions to prevent incidents and accidents recurring. Do this by addressing all contributing factors identified during an investigation.

Not all contributing factors can be completely eliminated, and some may be eliminated only at a prohibitive cost. The investigation team should work with line management to develop corrective actions.

The corrective actions recommended by the investigation team should be:

### SMARTER

**S** Specific  
**M** Measurable  
**A** Achievable  
**R** Realistic  
**T** Timely

plus

**E** Effective  
**R** Reviewed

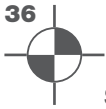
Each recommendation states the action management should take to correct a contributing factor. The team reviews each contributing factor and:

- » formulates recommendations which, if implemented, will reduce the likelihood of that factor contributing to future similar incidents
- » recommends improvements to the system defences to limit the consequences of the contributing factor, so that residual risk is recognised by management as acceptable
- » makes interim recommendations for immediate corrective actions after an incident or near-miss to mitigate current risks, before taking long-term corrective actions.

Management must fully evaluate any corrective action to ensure change/s do not weaken other defences, or expose other risks.

# Corrective action plan example

ITEM REF	RECOMMENDATION	RESPONSIBLE AREA	RESPONSIBLE PERSON	COMPLETION DATE	SIGN-OFF
1.1	<p><b>Communication</b></p> <ul style="list-style-type: none"> <li>» Shift handovers are formalised between outgoing supervisors and incoming supervisors. As far as possible during these handovers there should be no interruptions, and all information on operations, field activities/plant status etc. should be conveyed.</li> <li>» Until the handover is complete, incoming supervisors should not make decisions, or give authorisation on operational matters.</li> </ul>				
1.2	<p><b>Incompatible goals</b></p> <ul style="list-style-type: none"> <li>» Clear communication to all personnel that normal protocols or practices should not be altered for non-operational purposes, and that safety must always be the key driver above any other needs of the organisation (including operations/production, time constraints etc.).</li> </ul>				
1.3	<p><b>SWIs (safe work instructions)/procedures</b></p> <ul style="list-style-type: none"> <li>» Key roles and responsibilities are specified to ensure accountabilities/or responsibilities are clearly defined.</li> </ul>				



# Checklist for assessing institutional resilience against accidents (CAIR)

**YES** = This is definitely the case in this company/organisation.

**?** = Don't know; maybe; could be partially true.

**NO** = This is definitely not the case in this company/organisation.

<b>1. Mindful of danger</b>	<input type="checkbox"/> YES	<input type="checkbox"/> ?	<input type="checkbox"/> NO
Senior managers are ever-mindful of the human and organisational factors that can endanger their operations.			
<b>2. Acceptance of setbacks</b>	<input type="checkbox"/> YES	<input type="checkbox"/> ?	<input type="checkbox"/> NO
Senior management accepts occasional setbacks and nasty surprises as inevitable. It anticipates that employees will make errors and trains them to detect errors and recover.			
<b>3. Commitment</b>	<input type="checkbox"/> YES	<input type="checkbox"/> ?	<input type="checkbox"/> NO
Senior managers are genuinely committed to aviation safety and provide adequate resources to serve this end.			
<b>4. Regular meetings</b>	<input type="checkbox"/> YES	<input type="checkbox"/> ?	<input type="checkbox"/> NO
Safety-related issues are considered at high-level meetings on a regular basis, not just after a bad event.			
<b>5. Events reviewed</b>	<input type="checkbox"/> YES	<input type="checkbox"/> ?	<input type="checkbox"/> NO
Past events are thoroughly reviewed at top-level meetings, and the lessons learned are implemented as company-wide reforms, rather than local repairs.			
<b>6. Improved defences</b>	<input type="checkbox"/> YES	<input type="checkbox"/> ?	<input type="checkbox"/> NO
After an occurrence, the primary aim of senior management is to identify the failed system defences and improve them, rather than divert responsibility to particular individuals.			
<b>7. Health checks</b>	<input type="checkbox"/> YES	<input type="checkbox"/> ?	<input type="checkbox"/> NO
Senior management adopts a proactive stance towards inadequate flight safety. It does the following:			
» takes steps to identify recurrent traps and remove them			
» strives to eliminate the workplace and organisational factors likely to provoke errors			
» brainstorms new scenarios of failure			
» conducts regular health checks on the organisational processes known to contribute to occurrences.			
<b>8. Institutional factors recognised</b>	<input type="checkbox"/> YES	<input type="checkbox"/> ?	<input type="checkbox"/> NO
Senior management recognises that error-provoking institutional factors (e.g., under-manning, inadequate equipment, inexperience, patchy training, human-machine interfaces etc.) are easier to manage and correct than fleeting psychological states such as distraction, inattention and forgetfulness.			

**9. Information**  YES    ?    NO

It is understood that the effective management of safety, just like other management processes, relies on the collection, analysis and dissemination of relevant information.

**10. Sampling of 'vital signs'**  YES    ?    NO

Management recognises the necessity of combining reactive outcome data (i.e., near-miss and incident reporting) with active process information. The latter entails far more than occasional audits. It involves regular sampling of a variety of organisational processes (e.g., scheduling, budgeting, procedures and training), identifying which vital sign is in most need of attention and then carrying out remedial action.

**11. Employees attend safety meetings**  YES    ?    NO

Meetings relating to flight safety are attended by employees across the organisation.

**12. Career boost**  YES    ?    NO

Assignment to a safety-related function (quality or risk management) is seen as a fast-track appointment, not a dead end. Such functions attract the appropriate status and salary.

**13. Money vs. safety**  YES    ?    NO

Acknowledgment that commercial goals and safety issues can come into conflict. Measures are in place to recognise and resolve such conflicts in an effective and transparent manner.

**14. Reporting encouraged**  YES    ?    NO

Policies are in place to encourage everyone to raise safety-related issues. (One of the defining characteristics of a pathological culture is that messengers are shot, and whistleblowers dismissed or discredited.)

**15. Trust**  YES    ?    NO

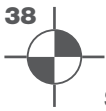
The company recognises the critical dependence of a safety management system on the trust of the workforce, particularly in regard to reporting systems. (A safe culture — an informed culture — is the product of a reporting culture. This can only arise where this is trust.)

**16. Qualified indemnity**  YES    ?    NO

Policies relating to near-miss and incident-reporting systems make it clear that the organisation's stance includes qualified indemnity against sanctions, confidentiality and the organisational separation of the data-collecting department from those involved in disciplinary proceedings.

**17. Blame**  YES    ?    NO

Disciplinary policies are based on an agreed (negotiated) distinction between acceptable and unacceptable behaviour. All recognise that a small proportion of unsafe acts are indeed reckless, and warrant sanctions, but the large majority of such acts should not attract punishment. (The key determinant of blameworthiness is not so much the act itself — error or violation — as the nature of the behaviour in which it is embedded. Did this behaviour involve deliberate and unwarranted risk-taking, or a course of action likely to produce avoidable errors? If so, the act would be culpable regardless of whether it was an error or a violation.)

**18. Skills – technical & non-technical**
 YES     ?     NO

Managers encourage their employees to acquire the mental/behavioural (or non-technical), as well as the technical, skills necessary to achieve safe and effective performance.

(Mental skills include anticipating possible errors and rehearsing the appropriate recoveries. Such mental preparation at both the individual and organisational level is the one of the hallmarks of high-reliability systems, and goes beyond routine simulator checks.)

**19. Feedback/communication**
 YES     ?     NO

The organisation has effective, tailored, two-way feedback channels to communicate the lessons learned from both reactive and proactive safety information systems. The emphasis is always on generalising these lessons, and communicating them widely.

**20. Acknowledgement of error**
 YES     ?     NO

The organisation has the will and the resources to acknowledge its errors, to apologise for them, and to reassure any victims that the lessons learned from such mishaps will help to prevent their recurrence.

**Score**

(Add up your score for each question to arrive at a total)

Score **1** for each question where you answered  **YES** = This is definitely the case in this company.

Score **0.5** for each question where you answered  **?** = Don't know; maybe; could be partially true.

Score **0** for each question where you answered  **NO** = This is definitely not the case in this company.

**Interpreting the score**

- 16–20** So healthy as to be barely credible!
- 11–15** In good shape, but don't forget to be uneasy.
- 6–10** Not all bad, but there is still a long way to go.
- 1–5** The organisation is very vulnerable!
- 0** Jurassic Park!

With acknowledgement to Professor James Reason, published in *Flight Safety Australia*, January-February 2001



# Practical safety culture improvement strategy

[according to Prof. James Reason]

## The five key ingredients of an effective safety culture



Each of these safety culture ingredients can be measured using tangible and visible safety data, most of which is already being collected, but not always systematically tracked.

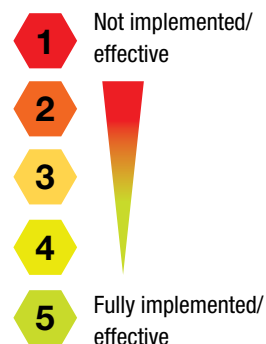
*Managing the risks of organisational accidents.*  
Aldershot, UK, Reason, J. (1997), Ashgate.

## Method

Convene a representative safety taskforce to brainstorm the type of data that could easily be collected and represents each of the five safety culture ingredients.

Each indicator can then be given a rating from 1-5, for its implementation and effectiveness:

Each indicator should measure a demonstrable behaviour rather than superficial attitudes.



For example, indicators of a flexible culture could be:

- » succession planning
- » critical role planning

or of an informed culture:

- » risks identified and change managed.



# Safety culture index

All employees, irrespective of the area in which they work, contribute to safety, and each is personally responsible for ensuring a positive safety culture. The purpose of this questionnaire is to obtain your opinions about safety. Please answer all the questions as honestly as possible. Give your own answers, not those of other employees.

Give your name so we can contact you for clarification if necessary, but all your answers will be kept confidential and your reply will be de-identified. Please complete the following section to best identify your position and job description and indicate your base.

Name: \_\_\_\_\_

Phone: \_\_\_\_\_

Grade (if known) \_\_\_\_\_

Job title \_\_\_\_\_

Work area \_\_\_\_\_

Base \_\_\_\_\_

Please send this cover sheet and the completed questionnaire forms to: XXX

NOTE: This form will be destroyed as soon as the data is recorded in the database.

Circle the appropriate number (1 to 5) in its box against each of the 25 questions. If you **strongly disagree** with the statement, **circle 1**. If you **strongly agree**, **circle 5**. If your opinion is somewhere in between these extremes, **circle 2, 3 or 4** (for **disagree, unsure or agree**). Please respond to every question. Adding all the responses gives a safety culture score for the company, which is checked against known benchmarks.

## Notes

### Several separate results are obtained from a safety culture survey using this form:

1. A 'benchmark' safety culture score that can be compared with similar companies world-wide.
2. A means of comparing the views of management with those of staff regarding the company's safety culture.
3. A means of evaluating the results of any changes made to the company's safety management system when a follow-up survey is carried out.

4. Identification of areas of concern, indicated by '1' and '2' responses, which can assist in the allocation of safety resources.
5. A means of comparing the safety culture of different departments and/or operational bases.

**The higher the value, the better the safety culture rating. Use the following as a guide only, but an average company safety culture score of 93 is considered a minimum. Anything less would suggest that improvements are needed.**

- » Poor safety culture 25-58
- » Bureaucratic safety culture 59-92
- » Positive safety culture 93-125.

Organisations with a **poor safety culture** treat safety information in the following way:

- » Information is hidden
- » Messengers are shot
- » Responsibility is avoided
- » Dissemination is discouraged
- » Failure is covered up
- » New ideas are crushed

Organisations with a **bureaucratic safety culture** treat safety information in the following way:

- » Information may be ignored
- » Messengers are tolerated
- » Responsibility is compartmentalised
- » Dissemination is allowed, but discouraged
- » Failure leads to local repairs
- » New ideas present problems

Organisations with a **positive safety culture** treat safety information in the following way:

- » Information is actively sought
- » Messengers are trained
- » Responsibility is shared
- » Dissemination is rewarded
- » Failure leads to enquiries and reforms
- » New ideas are welcomed

Source: Edkins, G.D. (1998). The INDICATE safety program: A method to proactively improve airline safety performance. Safety Science, 30: 275-295.

Number	Statement	Company rating				
		Disagree		Agree		
1	Employees are given enough training to carry out their tasks safely.	1	2	3	4	5
2	Managers get personally involved in safety enhancement activities.	1	2	3	4	5
3	There are procedures to follow in the event of an emergency in my work area.	1	2	3	4	5
4	Managers often discuss safety issues with employees.	1	2	3	4	5
5	Employees do all they can to prevent accidents.	1	2	3	4	5
6	Everyone is given sufficient opportunity to make suggestions regarding safety issues.	1	2	3	4	5
7	Employees often encourage each other to work safely.	1	2	3	4	5
8	Managers are aware of the main safety problems in the workplace.	1	2	3	4	5
9	All new employees are provided with sufficient safety training before commencing work.	1	2	3	4	5
10	Managers often praise employees they see working safely.	1	2	3	4	5
11	Everyone is kept informed of any changes which may affect safety.	1	2	3	4	5
12	Employees follow safety rules almost all of the time.	1	2	3	4	5
13	Safety within this company is better than in other airlines.	1	2	3	4	5
14	Managers do all they can to prevent accidents.	1	2	3	4	5
15	Accident investigations attempt to find the real cause of accidents, rather than just blame the people involved.	1	2	3	4	5
16	Managers recognise when employees are working unsafely.	1	2	3	4	5
17	Any defects or hazards that are reported are rectified promptly.	1	2	3	4	5
18	Mechanisms are in place in my work area for me to report safety deficiencies.	1	2	3	4	5
19	Managers stop unsafe operations or activities.	1	2	3	4	5
20	After an accident has occurred, appropriate actions are usually taken to reduce the chance of recurrence.	1	2	3	4	5
21	Everyone is given sufficient feedback regarding this company's safety performance.	1	2	3	4	5
22	Managers regard safety to be a very important part of all work activities.	1	2	3	4	5
23	Safety audits are carried out frequently.	1	2	3	4	5
24	Safety within this company is generally well controlled.	1	2	3	4	5
25	Employees usually report any dangerous work practices they see.	1	2	3	4	5
<b>Safety culture total:</b>						

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