Your Safety Management System
Is it working?

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**An introductory guide to evaluation of
Safety Management Systems suitable for:**

Aerial work operators.

Charter operators.

Air transport operators.

Maintenance organisations.

Aerodromes.

CIVIL AVIATION
SAFETY AUTHORITY
AUSTRALIA

The Civil Aviation Safety Authority (CASA) is responsible for the safety regulation of Australia's civil aviation operators, and for the regulation of Australian-registered aircraft outside Australian territory.

CASA set safety standards and ensures these are met through effective entry, compliance and enforcement strategies. Additionally, CASA provides regulatory services to industry, and plays a part in safety education for the aviation community. CASA also administers exams and issues Australian aviation licences.

Foreword

A successful business needs to be operated safely, not only to meet legal requirements and social responsibilities but also to be profitable. Accidents and incidents threaten all of these. A safety management system can help you identify, classify and manage the underlying and immediate risks to your business.

To check that your safety management system is working, you need to gather information to build on strengths, modify the system and address weaknesses before they lead to an accident or incident.

Evaluation is inseparable from management. It makes good safety sense and good business sense for all operators, regardless of the size and type of their organisation. Although a designated person in your organisation may be responsible for evaluation, all staff should be mobilised in the effort.

Like the rest of the safety management system, evaluation requires some investment of time, personnel and money. The cost need not be high, and the benefits outweigh the investment.

This guide outlines what evaluation is, the reasons for doing it, the processes and systems that you should evaluate and ways to use the crucial information generated.

This booklet is not a "how-to" manual, rather a general guide to the principles of evaluation. I urge you to use this guide to apply those principles to your own organisation.

Kim Jones

General Manager
Aviation Safety Promotion
Civil Aviation Safety Authority (CASA).

Although a designated person in your organisation may be responsible for evaluation, all staff should be mobilised in the effort.

About this booklet

This booklet is the third and final of a series of three safety management systems guidance booklets produced by CASA.

It follows *What's In It for You* and *Getting Started.* It outlines why you should evaluate, what evaluation is, when you should perform it and provides guidance on some of the tools to use.

Evaluation is the last of the 10 steps of a safety management system.

A list of additional resources can be found on page 42. These should be used in conjunction with CASA's safety management video and interactive CD-ROM.

A Safety Management System is an integrated set of work practices, beliefs and procedures for monitoring and improving the safety and health of all aspects of your operation. It recognises the potential for errors and establishes robust defences to ensure that errors do not result in incidents or accidents.

Call CASA's Safety Promotion Division on 131 757 (local call) to speak to a safety management specialist if you have any questions about evaluating your safety management system.

Definitions

The following terms are used throughout this booklet. They are derived from Australian Standards definitions used in AS/NZS 4360.

Audit: A methodical, planned review of routine organisational functions to identify areas in which performance may be enhanced. Audits form part of evaluation and analyse specific processes in detail. They may occur at random or at programmed intervals.

Benefit: Net project outcomes, usually translated into monetary terms. Benefits may include both direct and indirect effects.

Evaluation: An examination of the positive and negative aspects of a process, including a review of standards. An evaluation takes a "big picture" view of an operation or organisation. Results are presented in terms of findings, concerns, observations and recommendations.

Monitoring: Assessing whether a program is consistent with its design or implementation plan, and directed at the appropriate target population.

Quantitative data: Data that come from observations that can be measured. These evaluate more precisely the probability of an accident.

Qualitative data: Unstructured data, usually from written notes, views and opinions, which cannot be expressed in numbers. These review all factors affecting the safety of a product, system, organisation or person. They involve examination against a predetermined set of acceptability measures.

Validity: The extent to which a measure reflects the concept it is intended to measure.

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Introduction

Evaluation
helps you make
decisions about
safety in your
organisation.

A safety management system is an integrated set of work practices, beliefs and procedures for monitoring and improving the safety and health of all aspects of your organisation.

Why evaluate?

Evaluation is a set of techniques for monitoring and reviewing the adequacy of your safety management system. It helps you make decisions about safety controls in your organisation.

Direct benefits:

Evaluation helps you determine.

• The causal factors leading to accidents or incidents.

• The sources of deficiencies in the SMS.

• Areas that need improvement.

• The effectiveness and applicability of procedures.

• Areas of non-compliance with organisational operating procedures.

• Areas of non-compliance with legal requirements.

• Corrective action needed.

Evaluation answers the following questions:

• What are the outcomes of the safety management system?

• Are the objectives being achieved?

• Are there any shortcomings in the SMS?

• Is the SMS being implemented correctly?

• Have there been any positive or negative spin-offs?

Indirect benefits

Workplace relations

Postive safety evaluation results can enhance relations with staff by demonstrating that the organisation is acting to ensure their safety.

Marketing and public relations

You can use your evaluation results as a positive marketing and public relations tool to show customers you are working to prevent accidents and incidents.

Winning contracts

The demonstration of a successful safety management system could be the difference between winning and losing a business contract.

Insurance

A demonstrated reduction in accidents and incidents may deliver lower insurance premiums.

Industry leadership

A good safety record will enhance your standing in the aviation industry, and encourage competitors to improve their standards to meet or exceed yours.

Freeing up funds for expansion

Accidents and incidents cost money, so reducing them releases funds for business expansion.

The demonstration of a successful safety management system could be the difference between winning and losing a business contract.

Organisation tightens taxi procedures after evaluation

Incident

Engineers at a medium-sized organisation operating from a metropolitan airport were taxiing a De Havilland Dash 8 aircraft across the airfield for routine servicing and maintenance.

The route from the operations base to the maintenance base crossed the main runway. Engineers qualified to taxi the aircraft were in the cockpit and had not quite completed their pre-start check.. Outside, a ground engineer in charge of the ground power unit signalled that he was ready to start the engine. The engines started normally and the aircraft taxied away.

The aircraft had travelled about 100 metres when the engineer at the controls realised that he had not yet received a taxi clearance.

He stopped immediately and received a belated clearance. There had been no conflict or concern with proximity to other aircraft.

Investigation

The engineering unit investigated the incident, and logged a report in the organisation's SMS databank.

Far from dismissing the event as an isolated, momentary lapse, the organisation's flight safety manager and safety management group wanted to determine the causal factors leading to the event and how to prevent a recurrence.

They found that:

• An organisation pre-start checklist did not exist for the maintenance engineers, who did their checks from memory.

• Although the organisation had a comprehensive training program in place, there was no mechanism to deliver refresher training to relevant maintenance staff.

• The engineer at the controls of the aircraft had qualified for taxi privileges eight years earlier and had received no follow-up training, as none was

They found that an organisation pre-start checklist did not exist for the maintenance engineers, who did their checks from memory.

required by the organisation.

In response to the findings, the engineering and operations sections decided that the engineers would adopt the start-up and taxi system, including the checklists, emergency sequences, and challenge-and-response techniques used by aircrew.

The organisation also included maintenance engineers in a training program originally designed for pilots. The program, on a simulator, covered:

• Engine pre-start and start checks.

• Placement of power levers and condition levers.

• Fuel management.

• Hydraulic pressure and capacity.

• The use of rudder and tiller control to steer the aircraft.

• The use of flap to assist the above.

• Brake capacity and actions in the event of hydraulic failure.

• Actions in the event of fire.

Flight operations suggested that a biennial check would suffice, however engineering management opted for an annual check, which became the scheduled period.

In this example, the organisation recognised that the maintenance engineers qualified to taxi were often in charge of aircraft that could produce up to 5000 horsepower. There is always the potential for catastrophic injury and damage, especially if the aircraft jumps the chocks, drags on wet, slick surfaces or if the brakes fail.

The engineers recognised a problem, corrected it immediately and recorded the event. Safety managers, for their part, monitored the SMS closely. Far from levelling blame at individuals, they saw a wider problem and corrected it with an in-depth response marked by cooperation among different specialists.

Flight operations suggested that a biennial check would suffice, however engineering management opted for an annual check, which became the scheduled period.

What to evaluate

Fact finding

Evaluation activities need to be built into an organisation's management practices, not added on. You must be clear on what information you need before you start evaluation.

Evaluation should cover the 10 steps of your safety management system as they apply to each area of your operations including:

• Flying operations.

• Maintenance.

• Management.

• Equipment.

• Passenger handling.

• Facilities, buildings

• Employee training.

• Employee qualifications.

• Manuals.

• Defect reporting.

• Record keeping.

Evaluation should consider your product, people, processes, services and contractors. These are integral to quality management. For example, scheduling problems could turn into safety problems.

Product/ service:

• Did you run the correct number of scheduled flights?

• Were the flights on time?

• Did the flights meet the prescribed weight limits?

• Were the aircraft serviceable?

• Was maintenance performed on time?

People:

How did your staff perform in:

• Check in?

• Baggage handling?

• Cockpit or cabin?

• Maintenance?

Processes:

• Do your processes achieve the planned results?

• Is the correct number of steps in place?

• Is the sequence correct?

• Is the process complete?

• Is the process applicable?

• Is there any redundancy?

Evaluation should consider your product, people, processes, services and contractors.

Services:

- Do your services live up to your planned objectives?

- Are they needed?

- Are they efficient and profitable?

Contractors:

External contractors may include maintenance organisations, persons accepting cargo on behalf of the operator and aerodrome operator personnel.

Before employing a contractor, you need answers to the following questions:

- Does the contractor have a safety management system?

- Are you required to inspect the contractor's work premises? If so, how will you evaluate them?

- Are the contractors able to provide the service?

Preventing future shocks

A medium-sized regional Western Australian airline runs five Fokker 50 aircraft between a central aerodrome and 11 satellite outports. The organisation employs approximately 170 people.

Each outport undergoes an organisational review every six months, similar to that of an internal audit. The review provides valuable information on day-to-day operations, enabling the organisation to consider safety and quality issues, and to change procedures as required.

The following scenarios are primary examples of issues raised by previous reviews:

Scenario 1

• Non-uniformity of ground handling procedures throughout the satellite outports. (An examination at each outport against a standard checklist revealed this problem.)

The organisation operates flights to remote areas within Western Australia. It enlists locals at each outport to perform the ground-handling duties for the airline. In most cases these people are employed part time for this function. Generally they do not have any structured aviation training, but are trained by the organisation to perform ground handling duties..

When conducting the scheduled review of the outports, the quality manager found that local outport ground handling procedures did not comply with the organisation ground-handling manual. Even though visiting aircraft were refuelled and successfully turned around, and passengers ticketed and escorted to and from aircraft without incident, the potential for an incident or accident was increased by agents employing locally adapted or non-standard operating procedures.

Scenario 2

• Potential for electrocution from ground power units (GPU). (An investigation of an incident involving a GPU revealed that the unit had no formal maintenance cycle.)

The organisation uses ground power units (GPU) to provide ancillary power to aircraft while they are on the ground at the outports. During a routine

The quality manager found that local outport ground handling procedures did not comply with the organisation ground-handling manual.

Case study

turnaround procedure a ground handler suffered an electric shock from the GPU he was operating.

A report detailing the incident was submitted to the organisation and came to the attention of the quality manager. An investigation found that the insulation on the GPU cable had chafed through to live wiring .The live wiring was touching the metal casing, making it live also. This had been caused by the constant dragging of the cable across the rough tarmac surface

The organisation immediately issued a safety bulletin to the other outports instructing them to check their GPUs. Three other GPUs had the same problem.

The investigation and subsequent review of the incident revealed that there had been no scheduled servicing of the GPUs. The organisation immediately rectified the problem and now inspects the units regularly.

Further evaluation was undertaken as a result of the review findings.

Evaluation methodology

The evaluation tools used by the Western Australian organisation follow the quality management format.

• A comparison of the local outport checklists against the procedures laid out in the organisation ground-handling manual; and

• Work practices are checked, either by observing work behaviour or by checking records against work performed.

Evaluation of the system revealed a number of inconsistent procedures that varied from the organisation standard operating procedures.

In addition, data collected form one location showed a high staff turnover. A review (evaluation) of the work practices and detailed job descriptions revealed a shortage of personnel in the area.

Instilling the organisation's safety culture in all locations has been a challenge. However, regular review of the organisation procedures at each location has revealed marked improvements or has helped to pinpoint deficiencies. After each review, each outport receives a report highlighting problems or deficiencies and provides positive feedback where appropriate.

Reviews are conducted across the organisation at six monthly intervals and provide an overall picture of weaknesses or successes at each location. The reviews are compared to see if there may be problems that are common to all outports. When problems are identified, whether they are with equipment or procedures, a safety notice is issued to all locations.

Regular review of the organisation procedures at each location has revealed marked improvements or has helped to pinpoint deficiencies.

Findings

A report is produced by the quality manager and distributed to all outports. The findings and recommendations made in the previous report are followed up to ensure that any recommended actions have taken place.

Reviews of this Western Australian organisation have highlighted several key issues:

Positives:

• A willingness to utilise the organisation's reporting system.

• A willingness to communicate throughout the organisation.

Issues to be addressed:

• A failure to constantly apply organisation standard operating procedures.

• Inconsistencies among outports.

• Lack of maintenance procedures for some equipment.

• Changes required to the distribution of important safety information.

Choosing the time

Evaluation of your business should take place regularly. It is an ongoing process and can be reviewed either at fixed intervals or as required. Audits and evaluation may take place annually, in sync with the financial year. Safety audits may take place more frequently. Evaluation can be planned or performed as required.

Planned evaluation, or proactive evaluation, is performed before a task is undertaken, or in the planning phase of the task. It establishes the baseline data for future measurements, and can pinpoint gaps in your system. However, you can perform it more frequently; daily (through talks with staff), weekly (at staff meetings), or monthly (at safety committee or management meetings). You can also perform it before or after you make a change or at the end of a specific task.

Proactive evaluation measures:

• Changes in passenger loads on particular routes.

• Changes in the number of safety reports being submitted.

• The number of staff undertaking scheduled training.

• Communication strategies.

Interactive evaluation draws information from staff to verify that corrective actions were reviewed and effective. It should be carried out daily, often through informal talks with staff.

Reactive evaluation is performed after an event to identify shortcomings in your safety management system. It can be driven by external concerns, identified safety trends, or airworthiness directives from the regulatory authority.

The baseline data for future measurements, and can pinpoint gaps in your system.

Vigilance pays off

A medium-sized operator had a fuel spill on the hangar floor.

Staff used recently-acquired special kits to clean up the spill. In keeping with organisation's policy to investigate all safety incidents, personnel involved compiled reports on the spill.

The organisation's quality control team reviewed the reports and made recommendations to the engineering manager on how to better handle similar events better in future. The team's findings were incorporated into formal response procedures.

As part of the organisation's evaluation system, all safety reports are reviewed and discussed monthly to ensure appropriate action has been taken to prevent a recurrence.

Ongoing safety issues are monitored until they are resolved.

The managing director heads the review team, with the flight operations safety manager, also an airline pilot. The flight operations manager, engineering manager, line maintenance manager and heavy maintenance manager make up the rest of the team.

Significant events are reported to the board of directors for review.

The organisation's safety system sets out guidelines for reporting and acting on safety related events. Formalised incident documents, including the engineering safety report and a corrective action system information request, are the vehicles for the flow of information.

All safety reports are reviewed and discussed monthly to ensure appropriate action has been taken to prevent a recurrence.

Evaluation has four steps: planning; data collection, data presentation, and action.

Planning data collection

When planning your evaluation program, consider what information you need and the resources available. The drivers for evaluation may be ongoing complaints, unmet needs of clients or customers, changes in regulations, or a need to check that your safety goals are being achieved.

When designing an evaluation program, consider:

• Purpose.

• Who the intended audience is.

• The kind of information you need.

• What sources you will use.

• How you will collect the information.

• When the information is needed.

• The resources available to collect the information.

Hint: Draw a flow chart to reflect the purpose of evaluation, who will be involved, and the expected costs and time scales.

Collecting the data

The methods you use to measure and assess your safety management system must be valid. They must produce results that are repeatable and consistent with results obtained using other tools.

Ways of getting the information you need include:

• Observation.

• Surveys and questionnaires.

• Interviews.

• Focus groups.

• Complaint forms or suggestion boxes.

• Audits.

> The drivers for evaluation may be ongoing complaints, unmet needs of clients or customers, changes in regulations, or a need to check that your safety goals are being achieved.

Safety surveys or questionnaires provide an in-depth analysis of an activity.

Observation

Observation, including informal site inspections, may highlight safety problems missed by other means of investigation.

Advantages:

• Quick to perform.

• Can prompt fast follow up action.

Disadvantages:

• Difficulty in interpreting behaviour.

• Difficulty in categorising observations.

• Observation can influence the behaviour of those being observed.

Surveys and questionnaires

Safety surveys or questionnaires provide an in-depth analysis of an activity. They can be conducted on or distributed to:

• All staff.

• Specific staff.

• Customers.

Advantages:

• Can be completed anonymously.

• Cheap to administer.

• Generates results that are easy to compare.

• Can generate a large amount of data.

• Can utilise proforma surveys and questionnaires.

Disadvantages:

• May not draw considered feedback.

• Wording can bias answers.

• Are impersonal.

• May require statistical sampling expertise.

• Responses may not give the full story.

Interviews

Formal and informal interviews are conducted one to one and are an important way of getting information. Interviews can be held with:

• Clients.

• Staff.

• Other service providers.

The interviews can be structured, with all respondents asked the same questions, or tailored to the individual.

Advantages:

• Draws a full range and depth of information.

• Develop a relationship with respondents.

• Flexibility.

Disadvantages:

• Time consuming.

• Difficult to analyse and compare.

• Costly.

• Interviewer can bias responses.

Formal and informal interviews are conducted one to one and are an important way of getting information.

Focus groups

Focus groups bring six to eight workers together to discuss their workplace. Normally, an outside facilitator leads the discussion. This elicits candid comments, which go to the evaluator in transcript for analysis.

Advantages:

• Quick and reliable pointer to common impressions.

• Produces a wide range and depth of information.

• Convey key information about the organisation.

Disadvantages:

• Difficulties in analysing.

• Requires a good facilitator.

• Difficulties in getting six to eight people together at once.

• Pressure to answer questions without much time for thought.

Complaint forms or suggestion boxes

Suggestion boxes for workers or customers can be a useful source of information about the environment, services or people within your organisation.

Advantages:

• Anonymous.

• Suggestions are often more honest.

• Easy to administer.

Disadvantages:

• Open to abuse.

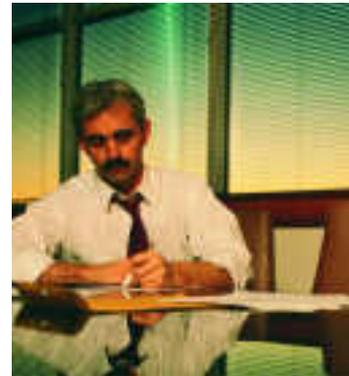• Contents must be monitored constantly.

Audits

An audit is a "microscopic" examination of every component of a total system.

Advantages:

• Provides clear directions.

• May be more objective.

• Form part of a planned process.

Disadvantages:

• Considers requirements of standards only.

• Limited perspective.

Data presentation, interpretation and reporting

Electronic databases enable you to process data to analyse trends. They point to ways to eliminate or counter problems.

The easiest way to interpret your evaluation results is to represent them graphically as:

• Flow charts.

• Pie charts.

• Bar graphs.

• Scattergrams.

• Checklists.

How you report your evaluation data depends on why you collected it, and your audience.

For example, was the evaluation done to upgrade your safety management system, to investigate an incident, or to demonstrate compliance with regulations?

How to evaluate

In most cases, the data will be compiled and analysed in a report. Staff will then have the opportunity to review the information.

We suggest you present the report in the following format.

1. Title page.

2. Table of contents.

3. Executive summary.

4. Purpose of the report.

5. Organisational background and what is being evaluated.

    a. Previous safety records (12 months).

    b. Program description.

        i. Statement of the problem.

        ii. Overall goal.

        iii. Outcomes.

        iv. Staffing.

6. Overall evaluation goals.

7. Methodology.

8. Interpretations and conclusions.

9. Recommendations.

10. Appendices.

Action

If the evaluation data turn up a recurring operational problem, you will be able to use this information as a basis for change. Discuss the problem and recommended action with relevant staff and communicate decisions to everyone involved.

This section takes you through evaluation of each of the 10 steps to establishing a safety management system as outlined in CASA's *Getting Started* booklet..

Step 1: Establish senior management commitment

While safety management encourages the involvement of all staff, without commitment from senior management your safety system will not be effective. Management commitment is hard to measure, but evidence of it includes:

• Allocation of time to safety management.

• Allocation of time for staff training.

• Participation in staff training.

• Provision of information and advice.

• Provision of adequate safety management resources.

• Written safety policy objectives.

• Determination of OH&S objectives and strategy.

• Communication with staff on safety issues.

• Action to ensure staff know their responsibilities.

Check:
☐ Is management committed to the safety management program?

Step 2: Set safety management policies and objectives

The purpose of developing safety management policies and objectives is to set out what your organisaton is striving to achieve and how it is going to get there.

Checklist:
☐ Are there written aviation safety policies, signed by the CEO?

☐ Are the policies and objectives workable, knowable and measurable?

> While safety management encourages the involvement of all staff, without commitment from senior management your safety system will not be effective.

The safety officer's outcomes can be measured against the responsibilities of the job laid out in the organisation operations manual.

Step 3: Appoint a safety officer (if applicable)

The safety officer's outcomes can be measured against the responsibilities of the job laid out in the organisation operations manual.

For example, one responsibility of the safety officer is to monitor the progress of safety reports and ensure that hazards are eliminated or minimised promptly.

Hint: To check that this has been done, you could track safety reports and follow-up action.

Evaluation should identify reasons why any report was not resolved, and point to ways of averting the problem. Reasons could range from time constraints to a lack of resources.

Checklist:

☐ Are safety reports being prepared promptly?

☐ Are hazards being eliminated or reduced promptly?

☐ Is the safety officer receiving enough support from the organisation?

☐ Is the safety officer credible?

☐ Is there a mechanism by which the safety officer can report to the CEO and make recommendations for change or action?

Step 4: Set up a safety committee (if applicable)

The work of the safety committee should be evaluated against the functions and responsibilities set out in the organisation operations manual.

The percentage of reports actioned and the number of hazards identified or eliminated are examples of statistics you can use to evaluate the committee's performance.

Checklist:

☐ Are hazards being eliminated or reduced?

☐ Is there a mechanism by which the safety committee can report to the CEO and make recommendations for change or action?

Step 5: **Establish a process to manage risks**

Risk management focuses on identifying hazards, analysing the risks, ranking them according to their probability and likelihood, and setting priorities for action.

Checklist:

☐ Is there an effective ongoing hazard identification program?

☐ Is there a system to rank hazards by their risk potential and prioritise them for action?

☐ Are the defences against the hazards identified?

Step 6: **Set up a reporting system to record hazards, risks and actions taken**

The reporting system is the easiest part of the safety management system to evaluate. You can sort your reports by type and compare them with the previous year's results to find out whether incident frequencies have changed.

Hint: If you use an electronic database to record and track your safety information and reports, it is easy to extract specific information and produce a graph or report for discussion.

Checklist:

☐ Is there a reporting system for hazards and risks?

☐ Does the reporting system cover contractors?

Step 7: **Train and educate staff**

Training can be evaluated in several ways.

Keep records of staff annual training requirements, such as renewal of ratings, to ensure they are equipped with the latest information relevant to their tasks.

Hint: It is more efficient to resolve training inadequacies immediately, as they could compromise safety.

> **The reporting system is the easiest part of the safety management system to evaluate.**

Audits, often performed by outside agencies, are critical to evaluation.

Keep records of

• The type of training.

• The frequency of training.

• The application of training to the workplace.

Monitor the skill level of staff required to undertake annual refresher courses.

Checklist:
☐ Is there a formal system to ensure all staff meet the minimum regulatory requirements for their job?

☐ Is staff training, including annual renewal ratings, up to date?

Step 8: Audit your organisation and investigate incidents and accidents

Audits, often performed by outside agencies, are critical to evaluation. You need them to manage your business finance, and you will extract quality safety information from them. They follow a set format and are measured against specific rules or regulatory requirements.

Checklist:
☐ Do your audit criteria match your operating procedures?

☐ Have all incidents and accidents been investigated adequately?

Step 9: Set up a system to control documentation and data

Documentation is an auditable trail of action to minimise risk. It can provide evidence if you need to defend your actions.

Keep records of :

• Hazard assessments.

• Safety reports issued or received.

• Safety recommendations.

• Remedial actions.

Hint: Measure the control of documentation against the document requirements laid out in your operations manual. Check documentation against the requirements within the safety management system. If evaluation prompts you to change the reporting or documentation systems, let your staff know.

Checklist:

☐ Are files maintained and kept for the prescribed length of time?

☐ Are records of meetings and safety incident reports easily retrieved?

☐ Do staff know how to use the reporting system?

Step 10: Evaluation

The evaluation process itself can be reviewed and improved upon where necessary.

Checklist:

☐ Is your evaluation process giving you the answers you need?

☐ Is your evaluation system identifying gaps in your safety management system?

The evaluation process itself can be reviewed and improved upon where necessary.

Derek Smith

Qantas uses a range of tools to evaluate its safety management system including audit, staff feedback, key performance indicators, and database trend analysis.

Evaluating Qantas' SMS

Qantas' Engineering Technical Operations and Maintenance Service (ETOMS) has bases in Sydney, Melbourne and Avalon, and employs more than 5,500 people. The division maintains and services Qantas' fleet of 130 aircraft and provides engineering and maintenance support to the Australian Defence Force and more than 30 partner airlines.

According to Richard Rhimes, general manager quality and risk with Qantas' ETOMS division, "safety management systems have to be constantly refined. It's great to have policies and procedures for managing safety but they quickly fall into lack of use if you don't constantly evaluate and revitalise what you do."

Rhimes, who spent 27 years as a safety and risk auditor in the oil and gas industry, joined Qantas in 2000.

Qantas uses a range of tools to evaluate its safety management system including audit, staff feedback, key performance indicators, and database trend analysis.

The division conducts regular internal audits and is audited by the corporate safety department, 12 airworthiness regulators, the International Standards Organization (ISO) and 30 airlines at varying frequencies.

The safety management system is audited at three separate levels: the system itself, the way the system is administered, and how it is used on the line.

The division also relies on staff feedback to evaluate the system, and to identify areas for improvement, and is currently reviewing its hazard reporting system.

Evaluation processes indicated there were too many forms used by the division, including forms for defect reporting, aircraft damage, incidents, personal injury and bird strikes. "What we're trying to do now is get down to about three forms," says Smith. Qantas has also established a number of Key Performance Indicators (KPIs) to gauge the organisation's progress across a range of safety issues, from engine failures to workplace injuries.

According to Rhimes, the airline is currently on track to achieve that goal. "In the last two years there has been a tremendous amount of energy and activity, both at corporate and division levels, to identify problem areas,

improve training, and fine-tune systems to deliver a safe system so that people don't get hurt.''

Another area where Qantas has made significant progress is in the consolidation of its safety databases.

Previously ETOMS, flight operations, freight, in-flight services and airport services maintained separate databases, which, in some cases, led to duplication in the investigation process as well as limiting the ability of the divisions to monitor trends and identify potential safety risks.

Now hazards and defects are reported on one central system, reducing duplication and resulting in a more comprehensive picture of the organisation's safety health.

Richard Rhimes

Choosing the right person

The evaluator can either be a staff member or an external expert. If staff resources are limited, you could get an outside agency to design the evaluation and use a staff member to conduct the evaluation.

The evaluator should:

• Be qualified to the highest appropriate standards in the area.

• Explore the strengths and weaknesses of your organisation.

• Communicate clearly their intentions before the evaluation.

• Demonstrate honesty and integrity.

• Respect the opinions and actions of others.

• Communicate findings effectively.

Both internal and external evaluators may have advantages and disadvantages, some examples of which are shown in the table below.

	Advantages	Disadvantages
Internal	• Familiar with the business • Greater understanding of the issues and background • More committed to the result	• Too close to the action • Judgement may be distorted by past experiences in the organisation • Costs less • Distraction from primary duties • Pressure to deliver report rather than have accurate content
External	• More detached and critical • Fresh perspective • May have higher knowledge/ skill base	• May cost more • May be misled about the purpose of the evaluation • Little understanding of industry procedures

Ensure that your evaluator is aware of:

• The purpose of the evaluation.

• Expectations of the organisation.

• Timeline for conduct of the evaluation and for submission findings.

• Who to report to and where to get support and information.

Internal evaluators

The safety officer may be responsible for the daily operating of your SMS and could be the most appropriate person to act as evaluator.

Other internal evaluators may include:

• A senior administrative officer.

• The chief maintenance engineer.

External evaluators

External evaluators must be qualified in the relevant subject matter to the highest standard possible. They may include:

• CASA compliance auditors.

• Financial auditors.

• OH&S/ work cover inspectors.

Check:
☐ Is your evaluator qualified?

The safety officer may be responsible for the daily operating of your SMS and could be the most appropriate person to act as evaluator.

Outside audits "reassuring"

John Cameron Aviation employs 13 staff and specialises in engine and airframe maintenance of piston and turbine helicopters. The organisation also manufactures helicopter accessories, including ferry fuel tanks and spotlights – and does hydrostatic testing and overhaul of fire and oxygen bottles.

When most businesses are slowing down for Christmas, Sydney-based John Cameron Aviation is gearing up for its busiest period of the year: fire season. With some helicopters involved in all-day fire bombing operations, maintenance organisations face a sudden rush of aircraft needing "hundred-hourlys", overhauls and ongoing maintenance support.

With just 13 staff, the workload can be demanding. Chief engineer Russell Shields recalls an incident some years ago when the organisation was working long hours to meet several tight deadlines:

"We had a new foreman on, we had far too much work on, and the boys worked through to three o'clock in the morning to get an aircraft back to the customer on time. When the owner received the aircraft back he found that one of the inspection panels was unfastened. The screws were on but they weren't done up. Fortunately the problem was picked up and nothing came of it."

Wiser for the experience, Shields says the organisation would never contemplate anything like that now. "Since then we've learnt better ways to do things: importantly we've learned that there are times when you just have to say no to the customer. We'll try to help out where we can but there's a point where you're not doing yourself or the customer any good by pressing on."

There have been other changes too. "We now use written checklists for every job," says Shields, "and key items are double-checked by one of the other guys before the aircraft goes out. That's on top of the regulatory requirement for a licensed aircraft maintenance engineer (LAME) to sign off on all maintenance."

Shields sees evaluation and striving for improvement as an important part of managing safety. "Safety is ongoing. You never get to a point where you think, 'Yep we're safe now, we can relax and focus on other parts of the business.' It's not like that. You have to keep working at it; you have to keep asking yourself, 'can we do it better?'"

For John Cameron Aviation, audit is an important part of the evaluation process: "Customers are demanding higher standards of safety than they ever did in the past. Where once you might have gotten by on a good safety record, these days customers want evidence that your practices and procedures are sound. They want independent assessments and audits."

While many operators may cringe at the thought of exposing their organisation to outside scrutiny, Shields believes the process is usually positive. "Sometimes a person from outside the organisation brings a fresh perspective to what you're doing. You may have done a job a thousand times and someone will come up with something new and suddenly you think, 'it's so obvious, why didn't we think of that before?'"

"It's also reassuring having someone from outside the business confirm that you're on the right track. If you're open and willing to learn from the process, it can be beneficial."

Russell Shields

It's working!

A medium-sized company servicing the mining industry with flights to and from minesites changed safety procedures after two incidents in which aircraft had brushed hangar walls prompting an evaluation of its safety management system.

One of the incidents occurred when an engineer was backing the aircraft into the hangar. The other took place soon after, when an aircraft was being positioned within the hangar. In that case, a wing tip connected with the wall.

The safety officer called for action to address the problem within 24 hours, and the company now ensures that a second person is on hand to help guide aircraft in and around hangars.

Following the incidents, the company, which runs six aircraft ranging in size up to a 30 seater, reviewed its method of interpreting its accident and incident data in a bid to extract more information from it.

It identified two areas that needed attention:

• Operations on the apron area.

• Operations at remote minesite airstrips, most of which lack ground staff.

The main hazard on remote airstrips, most of which are unfenced, was incursions by wildlife, including kangaroos and emus, especially at dawn and dusk.

The company has produced a client induction manual covering airstrip inspections and procedures. The manual urges aerodrome operators to inspect runways immediately before the arrival of aircraft, and to alert aircrew of any problems.

The company has also trained minesite personnel to help with refueling and other ground operations.

The company classifies its safety data into 15 categories, including remote aerodromes and passenger safety. It generates graphs to highlight trends in each category.

Quarterly safety committee meetings review the data and determine priorities for action based on the advice from the safety officer.

Conclusion

This booklet has outlined the basic principles of evaluation to light the path to an evaluation system to fit your organisation's functions and goals.

Procedures for monitoring and improving the safety and health of all aspects of your organisation should be developed, implemented and periodically reviewed.

Evaluating your safety management system is an essential and on-going part of your business. Regular review of your safety will ensure that it remains effective and relevant to your organisation. It helps you rate your organisation's performance and solves safety problems. It is not a process to be feared but one to support.

Contact Information

For general information, visit CASA's website: www.casa.gov.au

For Safety Management Systems information visit:
http://www.casa.gov.au/avreg/business/sms/index.htm
or Call CASA's Safety Promotion Division, ph: 131 757 (local call).

Regular review of your safety will ensure that it remains effective and relevant to your organisation.

Appendix

Implementation & Evaluation Checklist

The following have been identified as key points in aviation safety management. Answer the questions frankly for your organisation. Any points to which you tick "no" require further exploration or action.

CATEGORY	FACTOR	STATUS
MANAGEMENT	**1.** Is management committed to the Safety Management Program?	☐ Yes ☐ No
	2. Is there a written aviation safety policy, signed by the CEO?	☐ Yes ☐ No
	3. Has a Safety Officer been appointed?	☐ Yes ☐ No
	4. Is the safety reporting chain appropriate?	☐ Yes ☐ No
	5. Is the Safety Officer sufficiently supported within the organisation?	☐ Yes ☐ No
	6. Is there a Safety Committee?	☐ Yes ☐ No
	7. Is the Safety Officer credible?	☐ Yes ☐ No
	8. Is the Safety Officer an enthusiast for his or her job?	☐ Yes ☐ No
	9. Are the roles and responsibilities of the personnel in the Safety Management Program documented?	☐ Yes ☐ No
	10. Are the values of management identified as being safety oriented?	☐ Yes ☐ No
	11. Are sufficient resources (financial, human, hardware) made available for the Safety Management Program?	☐ Yes ☐ No
	12. Are there appropriate safeguards in place to ensure that the Safety Management Program itself is properly evaluated?	☐ Yes ☐ No
	13. Have appropriate standards been documented?	☐ Yes ☐ No
	14. Is there an appropriate Emergency Response Plan?	☐ Yes ☐ No
HAZARD ASSESSMENT PROCEDURES	**15.** Is there an effective on-going hazard identification program?	☐ Yes ☐ No
	16. Does the hazard identification program include a confidential reporting system?	☐ Yes ☐ No
	17. Are confidential reports properly de-identified?	☐ Yes ☐ No
	18 Are hazards associated with contracted agencies included in the Hazard Reporting System?	☐ Yes ☐ No
	19. Is there a procedure established for acknowledging safety-related reports?	☐ Yes ☐ No
	20. Is there a process whereby the hazards are continuously assessed for their risk potential (likelihood and severity)?	☐ Yes ☐ No
	21. Are the defences against the hazards identified?	☐ Yes ☐ No
	22. Does the process include the identification of the need for further defences or hazard avoidance?	☐ Yes ☐ No

CATEGORY	FACTOR	STATUS
COMMUNICATION WITH MANAGEMENT	**23.** Is there an effective mechanism by which the Safety Officer or the Safety Committee reports to the CEO?	☐ Yes ☐ No
	24. Can the safety officer/committee make recommendations for change or action?	☐ Yes ☐ No
	25. Is there an obligation on the part of the CEO to give a formal response to any safety related recommendations?	☐ Yes ☐ No
	26. In the event that the CEO makes an unfavourable response to a safety recommendation, is there a procedure whereby the matter is monitored by the Safety Officer or Safety Committee until resolution is reached?	☐ Yes ☐ No
FEEDBACK	**27.** Are the results of hazard reports and safety suggestions made available to the initiator?	☐ Yes ☐ No
	28. Are the results of hazard reports and safety suggestions made widely available within the organisation?	☐ Yes ☐ No
DOCUMENTATION	**29.** Is the process for risk assessment and management, as described in the above procedures, fully documented?	☐ Yes ☐ No
	30. Does the Safety Management Program require the recording of identified hazards and defences?	☐ Yes ☐ No
SAFETY-RELATED LITERATURE, COURSES AND SEMINARS	**31.** Is there a supply of safety-related literature (eg periodicals, magazines, books, articles, posters, videos) readily available to all employees who have safety responsibilities?	☐ Yes ☐ No
	32. Are employees encouraged and assisted in attending training courses and seminars related to safety?	☐ Yes ☐ No
SAFETY INDUCTION AND CONTINUOUS TRAINING	**33.** Are employees trained in the procedure and policy of the Safety Management Program?	☐ Yes ☐ No
	34. Are new employees given sufficient training and checking in their technical duties prior to being permitted to work either supervised or unsupervised?	☐ Yes ☐ No
	35. Is the continuation training and checking of all employees adequate?	☐ Yes ☐ No
	36. Are employees given sufficient training in new procedures?	☐ Yes ☐ No
	37. Are trainers and checkers adequately trained and checked, both for competence and standardisation?	☐ Yes ☐ No

Further information

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