Australian Government
Department of Defence

ADVISORY CIRCULAR

AC 004/2021 v1.0

Quality Management System

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An Advisory Circular is issued by the Authority to promulgate important information to the Defence Aviation community, but does not mandate any action. This includes informing the community on aviation safety / airworthiness matters, information that enhances compliance understanding for existing regulation, or policy guidance for aviation issues not yet regulated that requires further understanding.

Audience

This Advisory Circular (AC) is relevant to:

- Military Air Operators
- ANSP Operators
- AD Operators

Purpose

The purpose of this AC is to provide consolidated information regarding the requirements of DASR ARO.100(c)9, DASR ANSP.50 and DASR 139.70 implementing a Quality Management System (QMS).

Further information

For further information on this AC, contact:

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Status

This AC will remain current until cancelled by DASA.

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1.0	June 2021	GPCAPT Smith DACPA	Initial release

Contents

1 Reference material

1.1 Acronyms

The acronyms and abbreviations used in this AC are listed in the table below.

Acronym	Description
AC	Advisory Circular
AD	Aerodrome
AHRB	Aviation Hazard Review Board
AM	Accountable Manager
ANSP	Air Navigation Service Provider
ARO	Authority Requirements for Air Operators
AS	Australian Standard
ASR	Aviation Safety Report
CA	Check-Act
CAMO	Continuing Airworthiness Management Organisation
CDF	Chief of the Defence Force
DASA	Defence Aviation Safety Authority
DASR	Defence Aviation Safety Regulations
MAO	Military Air Operator
NZS	New Zealand Standard
OIP	Orders, Instructions, Publications
PDCA	Plan-Do-Check-Act
QMS	Quality Management System
SFARP	So far as is reasonably practical
SMS	Safety Management System
WHS	Work Health and Safety

1.2 Definitions

Terms that have specific meaning within this AC are defined in the table below.

Term	Definition
Approved Organisation	That which has been assessed by the authority and deemed to meet their applicable regulations and requirements.

1.3 References

1.3.1 DASR ARO.100

1.3.2 DASR M.A.712

1.3.3 DASR ANSP.50

1.3.4 DASR 139.70

1.3.5 AS/NZS ISO 9001:2016 – Quality Management Systems

Unless specified otherwise, all regulation references in this AC refer to the Defence Aviation Safety Regulation (DASR).

2 The purpose of a QMS

2.1.1 A MAO-AM, ANSP-AM and AD-AM[1] have regulatory requirement to ensure compliance, assure conformance and manage risk by eliminating the risk So Far As is Reasonably Practicable (SFARP) or mitigating the risk SFARP.[2] The QMS supports this requirement, and the ASMS is an integral part of this systems based approach. Having a well-functioning QMS allows the Accountable Manager (AM) to be reasonably informed about the level of compliance and conformance of their organisation at any point in time, to ensure they are meeting their responsibilities under the WHS Act and the DASRs. An organisation's QMS scaled appropriately to the operating risk and environment provides a strong foundation that underpins the SMS as shown in Figure 1 for a MAO.

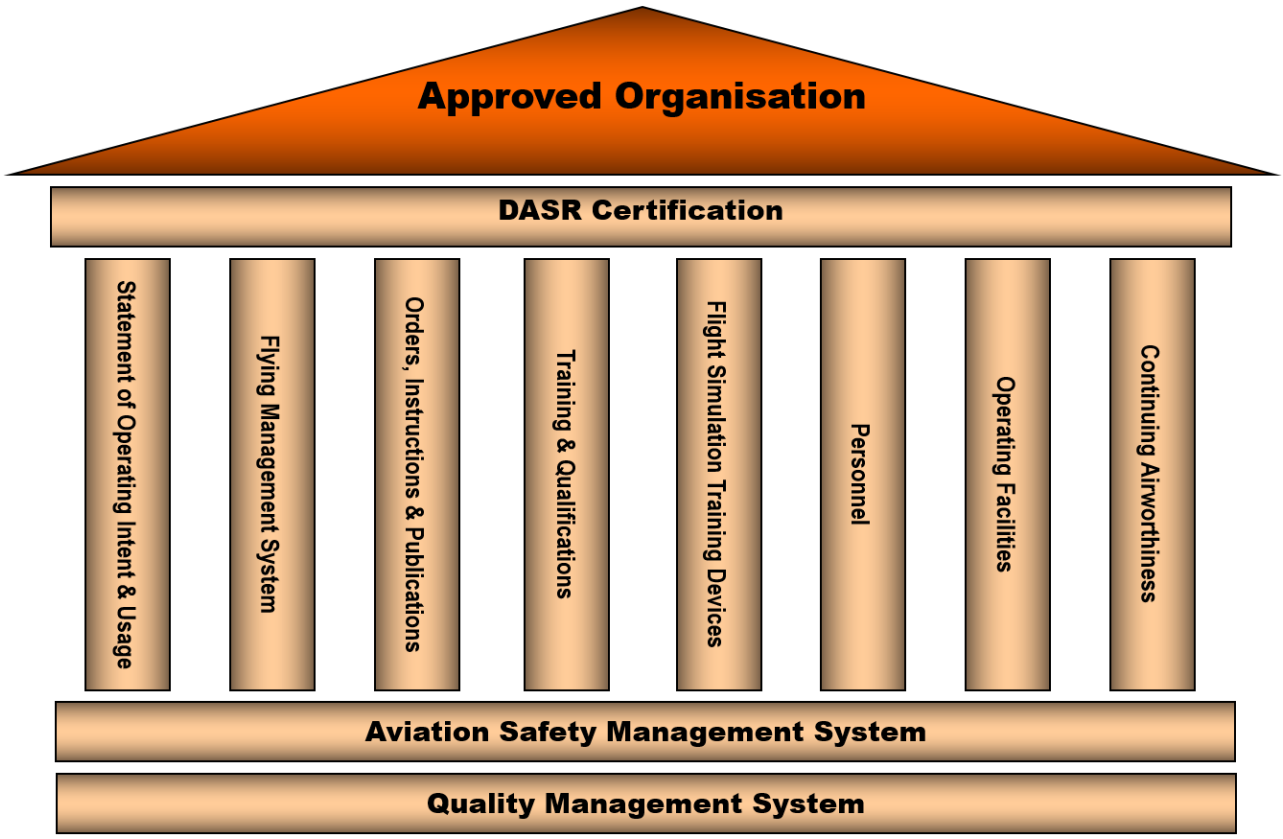

Figure 1. The DASR Foundations and Pillars of a MAO

2.1.2 An effective QMS, combined with an SMS, enables assurance of safe and quality products/practices. The implementation of a QMS within an organisation, will significantly improve the efficiency and safety gains across all aspects of the organisation as processes and procedures become ingrained and harmonised. The QMS can help meet the defined

[1] The term Accountable Manager (AM) will be used to address MAO, ANSP Operators and AD Operators as a collective

[2] DASR BR.60 *Oversight and Enforcement (EASA BR Article 10)*

organisational outcomes, improve performance, and provides a sound basis for continuous improvement through:

a. consistent and repeatable products and services that meet requirements

b. improved relationships through mutual understanding and networks

c. improved risk and opportunity management, to add value and maximise outcome effectiveness

d. demonstrated conformance with the approved system of management, for repeatability.

2.2 Introduction

2.2.1 During the 2021 DASA education and oversight program at MAOs, it was apparent that DASR ARO.100(c) does not provide the sufficient direction and guidance to enable an AM to meet compliance requirements. The aim of this Advisory Circular (AC) is to enable AM staff to identify the principles and elements of an effective QMS, and to develop them into a single management system, commensurate with size of the organisation. All Approved Organisations under the DASRs (Part 21, M, 145, 147, ANSP, 139, and MAOs) are required to implement quality management requirements. This is intentional and accords with global best practice. The QMS enables standardised internal processes and facilitates conformance with existing processes, procedures and requirements to effectively achieve defined organisational outcomes.

2.2.2 A QMS is defined in the DASR glossary as:

> *All activities of the overall management function that determine the quality policy, objectives and responsibilities, and implement them by means such as quality planning, quality controls, quality assurance and quality improvement.*

2.2.3 A QMS is a systemic and integrated collection of processes/procedures that set out how an organisation will consistently meet both regulatory and capability requirements. The system formalises and completely aligns with the organisation’s purpose and strategic direction It encompasses the aspirational objectives of the organisation, the policies that manage and direct operations, the processes/procedures that describe how operations must be conducted, the information resources required to support the QMS, and the people resources that are required to operate and maintain the QMS.

2.3 Quality Management Principles

2.3.1 **Context of Organisation**. The AMs are responsible for the projection of airpower to CDF and Head of Service direction. The AM and Service Chiefs manage their respective organisations to meet the capability needs of Defence. To enable and facilitate this required end-state, AMs must continually monitor and assess the quality of services they provide to ensure they meet the needs of the organisation. The AMs must manage Defence requirements as they pertain to their organisation, and in doing so, monitor the quality of the services provided. To achieve this, organisations should undertake regular meetings with representatives from the organisations that receive their product or services.

2.3.2 The various 'quality' processes involved with respect to achievement of the required MAO end-state, product and services are:

a. understanding the organisation and its context

b. understanding the needs and expectations of interested parties

c. determining the scope of the QMS

d. Quality Management System processes.

2.3.3 **Leadership**. The AM must clearly establish the purpose and direction of the organisation with associated objective and measurable performance and health indicators to allow assessment of the organisation's progress towards the required end-state.

2.3.4 The AM must create and maintain the internal environment in which people can become fully involved in achieving the organisation's objectives. The implementation of a QMS will not be successful if there is a lack of commitment from command. Command must have a sound appreciation and understanding of all facets of quality management and in particular, issues related to quality assurance and continuous improvement. Practical evidence to commitment include:

a. for leadership and commitment:

i. Command takes accountability for the effectiveness of the QMS, through performance and health indicators

ii. Command empowers the QMS and associated staff

iii. Command provides clear and unambiguous direction.

b. for the organisation's QMS Policy Statement:

i. Clear, defined and objective organisation goals, which are regularly tested

ii. Goals are routinely formally reviewed, measured and amended to achieved defined end-states.

c. for organisational roles, responsibilities and authorities in the QMS (ie Duty Statements)

i. QMS responsibilities could be secondary duties, but it is how the personnel execute against those responsibilities that is important.

2.3.5 **Planning.** The quality policy guides the planning and setting of objectives, strategies and targets that will show how the organisation expects to implement quality management. Targets need to be realistic, relevant to capability requirement and measurable. The quality plan must include details of the continuous improvement program. The processes involved include:

a. Actions to address risks and opportunities (Risk Based Decisions, AHRBs, ASRs)

b. Quality objectives and the planning to achieve them (SMART[3] objectives)

c. Planning of changes (Purpose, resources, allocation of responsibilities).

2.3.6 **Support[4].** Staff must be suitably qualified and competent in their jobs, as the quality of their work directly affects the quality of service. This can be achieved through the provision of appropriate training and evaluation. Quality awareness training should also be provided to all relevant staff to heighten responsibility and quality consciousness, that is, to assist in building a quality-focused culture. With the implementation of the QMS, staff will need to take on additional responsibilities and implement processes such as the day-to-day consistency checks, required for the provision of the data for product quality assurance and control processes. Having time available is essential for QMS staff to ensure they are able to undertake their assigned roles and duties, and those responsibilities are not additions to a person already at capacity. The various processes involved are:

a. Resources (people, organisational structure, infrastructure)

b. Competence (Identify the initial and on-going training requirements ie the duty statements)

c. Awareness (orders, instructions and publications (OIP) and training)

[3] Specific / Measureable / Achievable / Realistic / Time bound
[4] Support to the QMS, support to all staff and support to QMS staff.

d. Communication (command direction, organisational communications, OIP)

e. Documented Information (process, practices, procedures and OIP).

2.3.7 **Operation**. The QMS is and overarching system (see Figure 1) which interfaces to other 'systems'[5]. 'Operations' addresses the core systems and processes of an organisation, enabling the delivery of capability. The desired result is achieved more efficiently when activities and related resources are managed as a 'systems based' process. A system, is a set of interrelated or interacting activities that transform inputs into outputs.

2.3.8 With respect to provision of quality services, the following points are provided for command consideration:

a. operation planning and control (scheduling and delegation of responsibility)

b. requirements for products and services (resource allocation)

c. design and development of products and services (unique requirements)

d. control of externally provided process, products and services

e. production and service provision

f. release of products and services

g. control of nonconforming outputs (internal evaluation, closed loop reporting system).

2.3.9 **Performance and Evaluation.** Analysis of accurate and applicable data is the basis for effective decisions. The data and analysis process relies on the collection of performance indicators, such as timeliness and conformance to the regulations, and capability performance records. Command instigated processes, which assist performance and evaluation include:

a. Monitoring, measurement, analysis and evaluation (Continuous Improvement Plan)

b. Internal audit (Surveillance Assurance Plan)

c. Management review (AHRBs, Capability Meetings).

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[5] The sub-systems of the holistic QMS can include whatever systems command needs to monitor, review and manage to enable provision of required capability and output. Such sub-systems 'management' could include finance, personnel, infra-structure, flight operations, maintenance, engineering, etc. When conducting compliance and conformance to the DASR, DASA expects a commander to manage the 'quality' sub-system.

2.3.10 **Continuous Improvement. Continuous** improvement of the organisation's performance should be a permanent objective of the organisation. Specifically, the effectiveness and suitability of the QMS have to be evaluated and areas for improvement identified and rectified actioned. Management reviews have to be conducted regularly using the data collected from the monitoring and measurement process to identify areas for further improvement. Communication and Feedback channels may need to should be established to allow all staff in the organisation to make suggestions on ways to improve the service. Areas may include:

a. Nonconformity and corrective action

b. Continual improvement.

2.4 Identifying Good Practice

2.4.1 To support this management function, many acceptable international standards exist to guide effective implementations of QMS. The typical standard used is the AS/NZS ISO 9001:2016 – Quality Management Systems – Requirements (available on-line from the Defence Library Service); and this standard can be tailored to the specific needs and simplicity required by the AMs.

2.4.2 If the creators of the QMS keep in mind that Defence is the ‘customer’ of the organisation’s output (ie. capability), then this will ensure that the elements of the QMS maintain the correct context.

2.4.3 ISO 9001 certification may have significant burden for the organisation and as such has not been articulated as a DASR compliance requirement, although the elements could be used to guide the creation of a QMS.

2.4.4 For an AM, the QMS’s main ‘quality’ focus is continuous improvement of operational processes to deliver the product or service that defines the organisation's mission.

2.4.5 For a QMS to attain its objectives, it needs to clarify:

a. **An organisation’s structure.** The size, scope and complexity of the QMS required to achieve command intent?

b. **Operational policies and procedures.** How does the organisation conduct its business, whilst achieving regulatory compliance?

c. **Planning and scheduling operations.** What is the output, end state, effect and capability the organisation needs to achieve?

d. **How and what resources will be allocated.** How will the QMS be empowered to achieve command intent?

e. **How the business will manage quality of service**. How will the QMS be integrated into the 'business as usual' work practices of the organisation to empower and enable achievement of required end-state(s)?

2.4.6 With respect to application of an organisation's QMS to address DASR responsibilities and obligations, the primary focus areas are:

a. **Capability.** The maintenance and projection of the required airpower effect in accordance with higher command direction.

b. **Operational Quality.** Provision of the required airpower at a standard and quality to meet the needs of the end-user.

c. **Business Objectives.**

i. To ensure the organisation complies with designated DASR

ii. To assure the organisation's people, processes and product conform to designated DASR

iii. To ensure associated organisation hazards and risks are eliminated SFARP and if that is not possible, to minimise the risks SFARP in accordance with the WH&S Act 2011.

2.5 QMS Effectiveness Indicators

2.5.1 The effectiveness multiplier of a QMS is the expected continuous improvement cycle (ie. closed-loop actions) to meet defined organisational outcomes and improve performance. This is the 'Check Act' of Plan-Do-Check-Act (PDCA) cycle. This is a simplified version of ISO 9001 principles of performance, evaluation and improvement. Effective 'Check-Act' (CA) is in itself dependent on command commitment and is reflected in the indicators listed below. Without an effective CA process, the QMS is another management overhead without clear value-add. Some of the system indicators of an effective QMS, linked to the CA of the PDCA cycle, are:

a. All organisational OIP have been assigned a review date, and are reviewed and updated before the due review date.

b. OIP review dates have been assigned based on risk to business outcomes should OIP fail, so that 'riskier' OIP is reviewed more frequently.

c. Compliance audits of all OIP are scheduled and conducted over a given period, with OIP assigned higher relative risk to business outcomes (should they not be followed), audited more frequently. (OIP Comply)

d. Conformance audit schedules of the organisation are regularly adjusted to account for internal and external influences, or other intelligence, such as ASRs. (People conform)

e. A voluntary Opportunity for Improvement system, or similar, exists and is effectively used.

f. Trends of 'findings-related actions', 'safety-related actions' and 'Opportunities for Improvement' closure timeliness are decreasing.

g. Trends of repeat audit findings are decreasing.

h. Key safety-related and business-related performance indicators have been established and are reported regularly, actions are raised based on the 'so what' of the indicator, and timely action closure is tracked.

i. 'QMS staff' appointments, proficiencies, and duties have been promulgated.

j. QMS-related PDCA cycle is defined in practical terms for the organisation (ie. what is visible to the nominal staff member, to show effective closed-loop actions).

k. Command appointments take an active interest in results of all above indicators, and direct effective closed-loop actions.

2.6 Indicators of a poorly functioning QMS

2.6.1 If there is no established QMS, or a poorly functioning QMS, symptoms can include:

- difficulty in the AM demonstrating compliance or knowing the level of compliance/conformance at any point in time
- poorly structured and maintained OIP (no amendment cycle, and out of date OIP)
- short term planning, reactive rather than proactive, with no clear end-state
- deficient supervision/monitoring
- inability to effectively determine where resources are needed
- lack of clear, defined procedures
- conflicting requirements
- procedures not being communicated nor executed

- ineffectual organisational change as a result of reports (eg. ASR or DASA findings).

2.7 SMS and QMS

2.7.1 An SMS is defined in the DASR glossary as:

> *A systematic approach to managing aviation safety, including the necessary organisational structures, accountabilities, policies and procedures.*

2.7.2 QMS and SMS are very similar on the surface. They rely on the following:

- Creating policies and procedures
- Clarifying organisational structure
- Continuous monitoring of the environment
- System data for fact-based decision making
- Continuous improvement
- Creating a system to rely on as a means of integrity rather than a person/people to rely on.

2.7.3 Both QMS and SMS use the same kind of organisational structure for reaching their respective objectives. The structure is simply the creation of a formal documentable framework for an organisation to rely upon.

2.7.4 The primary difference between QMS and SMS is their primary objectives. QMS has a primary concern that is outcome oriented. SMS implementations are primarily concerned with delivering safe outcomes through structured and documented risk management processes.

2.7.5 Integrating QMS and SMS can be extremely beneficial to an organisation. Combined QMS and SMS are usually called[6]:

- Quality and safety management systems (QSMS);
- Safety and-quality management systems (SQMS); or
- Integrated management systems.

2.7.6 The above point's amount to the same thing: combined quality and safety operations. Combining QMS and SMS operations involves 5 general steps, which are:

[6] 4 Considerations about QMS and SMS in Aviation Safety Management – Tyler Britton

a. Ensuring upper management support

b. Redesigning policies and procedures to incorporate QMS and SMS

c. Creating goals that combine SMS and QMS objectives

d. Combining and/or coordinate QMS and SMS resources

e. QSMS performance monitoring.

2.7.7 The following are elements that DASA would consider are consistent with a useful QMS in the Military Aviation context:

- Key Appointments – QM (Quality Manager)
- QMS Policy Statement/Aim and Objectives
- Duty Statements
- OIP Management
- Integrating CAMO QM and SMS processes
- Continuous Improvement
- Evidence Based Decision Making
- Encompassing/Linked with contracted organisations QMS.

2.8 Useful Information

2.8.1 MAO QMS is a specific obligation under DASR ARO.100(c)9.

2.8.2 CAMO QMS is a specific obligation under DASR M.A.712. The CAMO QM will be a good source of experience and information when the MAO is introducing the MAO QMS.

2.9 Frequently Asked Questions

1. Is an organisation required to have an ISO 9001 compilant QMS?

No, to be ISO 9001 compliant would require an independent certification authority to review the organisation's QMS and assess against the standard. DASA does not require an ISO 9001 certified QMS, although the framework or a '9001 like' QMS would be a suitable outcome. A significant point to reemphasize is that the QMS needs to be contextualised for the size and complexity of the organisation. QMS are tailorable in scope (ie can be limited to specific organisational functions) and level (ie can be limited to specific outcomes), and do not have to be third-party certified to be effective. Seeking third-party certification provides an independent view of the effectiveness of the QMS against the specified international standard.

2. Is the CAMO QMS enough to satisfy the requirements of DASR ARO.100(c)9?

No, the CAMO QMS only serves the MAO's coordination of the maintenance organisation, which may only be a small part of the MAO. The QMS needs to cover all parts of the MAO (see Figure 1) and could cover other elements, such as business and finance. This scope needs to be defined by the commander.

3. Does the QMS have to have a specific (only responsibility) management position?

No, although a good QMS would assign the responsibilities of a QM to a specific person. Depending upon the size and complexity of the organisation, a specific QM position (only responsibility) may be warranted.

4. My organisation has many of these things already, isn't that a QMS?

During the 2021 Oversight program, DASA observed that MAOs largely had aspects of a 'QMS like' system but failed at the ability to integrate into a single interrelated system that has the ability operate in harmony with the various other process occuring simultaineously, and then leveraging off this efficiency.

5. Are there any good examples that DASA has seen?

There are well documented QMS examples and are subject to change over time. For good examples contact your DASA-ACPA Desk Officer.