



ICAO MID

**AIM-ing for quality**  
QMS Functions Systems & Processes

**Webinar**

# QMS Implementation Process

## A step-by-step framework for AIS QMS

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# ISO 9001:2015 Principles

|   |                                       |   |
|---|---------------------------------------|---|
| 1 | <b>Customer focus</b>                 | The primary focus of quality management is to meet customer requirements and to strive to exceed customer expectations.   |
| 2 | <b>Leadership</b>                     | Leaders at all levels establish unity of purpose and direction and create conditions in which people are engaged in achieving the organization's quality objectives.                      |
| 3 | <b>Engagement of people</b>           | Competent, empowered and engaged people at all levels throughout the organization are essential to enhance its capability to create and deliver value.                                    |
| 4 | <b>Process approach</b>               | Consistent and predictable results are achieved more effectively and efficiently when activities are understood and managed as interrelated processes that function as a coherent system. |
| 5 | <b>Improvement</b>                    | Successful organizations have an ongoing focus on improvement.  |
| 6 | <b>Evidence-based decision making</b> | Decisions based on the analysis and evaluation of data and information are more likely to produce desired results.  |
| 7 | <b>Relationship management</b>        | For sustained success, an organization manages its relationships with interested parties, such as suppliers.  |



# ISO 9001:2015 Content (Clauses)

1. **Scope**
2. **Normative references**
3. **Terms and definitions**
4. **Context of the organization**
  - 4.1 Understanding the organization and its context
  - 4.2 Understanding the needs and expectations of interested parties
  - 4.3 Determining the scope Of QMS
  - 4.4 Quality management system and its processes
5. **Leadership**
  - 5.1 Leadership and commitment
  - 5.2 Quality Policy
  - 5.3 Organizational roles, responsibilities and authorities
6. **Planning**
  - 6.1 Actions to address risks and opportunities
  - 6.2 Quality objectives and planning to achieve them
  - 6.3 Planning of changes
7. **Support**
  - 7.1 Resources
  - 7.2 Competence
  - 7.3 Awareness
  - 7.4 Communication
  - 7.5 Documented information
8. **Operation**
  - 8.1 Operational planning and control
  - 8.2 Requirements for products and services
  - 8.3 Design and development of products and services
  - 8.4 Control of externally provided processes, products and services
  - 8.5 Production and service provision
  - 8.6 Release of products and services
  - 8.7 Control of nonconforming outputs
9. **Performance evaluation**
  - 9.1 Monitoring, measurement, analysis and evaluation
  - 9.2 Internal audit
  - 9.3 Management review
10. **Improvement**
  - 10.1 General
  - 10.2 Nonconformity and corrective action
  - 10.3 Continual improvement

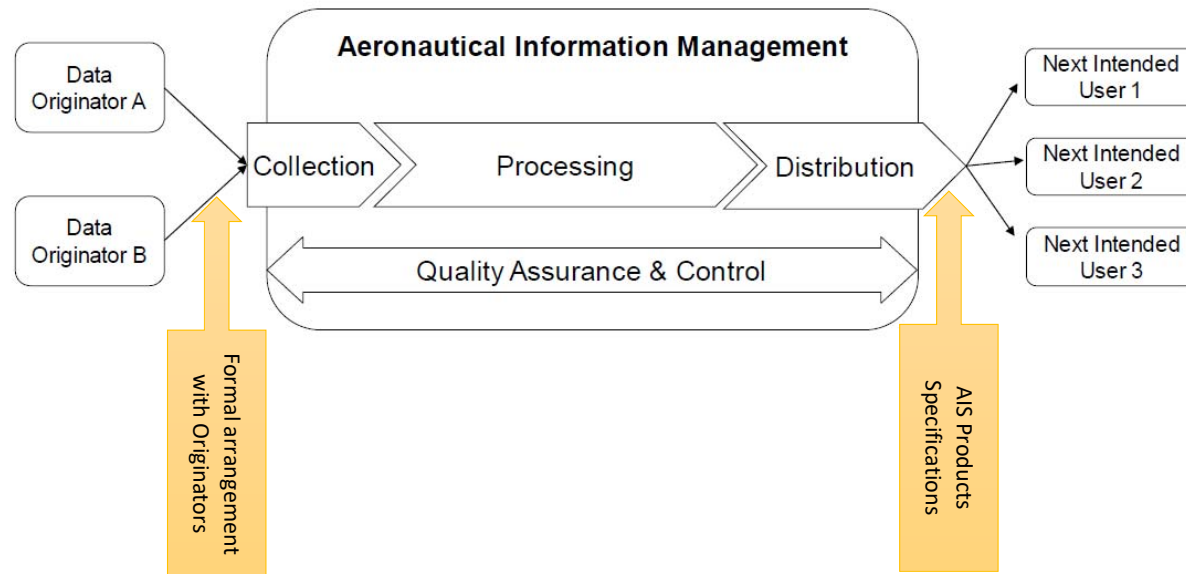
# Process approach: PDCA Cycle



- **Process approach:** application of system of processes, together with identification and interaction of these processes, and their management.
- The plan, do, check, act (**PDCA**) cycle provides a methodology to assist in the development and implementation of the process approach.



## Aeronautical Data Process & Quality



**Quality control** part of quality management focused on fulfilling quality requirements (focus on product; reactive; find defects; tests/checks)

**Quality assurance** part of quality management focused on providing confidence that quality requirements will be fulfilled (focus on processes; pro-active; prevent defects; quality audits)

**Error detection** and reporting processes improve the reliability of data and strengthen the procedures for checking and testing the output



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# AIM-ing for quality

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## A framework for QMS Implementation in AIS (Step-by-step Implementation)





## Step 1

### Take formal commitment/endorsement of top management

|                              |  |
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| <b>Description of Action</b> | <ul style="list-style-type: none"> <li>Take formal commitment/endorsement of the ANSP CEO/Director or DGCA and secure the required budget and human resources, if needed.</li> </ul> |
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## Step 2

- Select a Quality Manager; and
- Establish Implementation Team

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| <b>Description of Action</b> | <ul style="list-style-type: none"> <li>• Appoint a senior expert (from within or outside AIS) as Quality Manager</li> <li>• S/He must have knowledge on AIS &amp; QMS</li> <li>• Quality Manager is a full time job, s/he should work in AIS and be involved in daily AIS work.</li> <li>• Establish “Implementation Team” consisting of heads of AIS sub-units and key experts (AIP, Charts, NOF, etc.)</li> </ul> |
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## Step 3

### Select a recognized training provider

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| <b>Description of Action</b> | <ul style="list-style-type: none"> <li>• With the support of the Company Training Department; identify all qualified training providers</li> <li>• Select the best training provider</li> <li>• Sign contract for the provision of training</li> </ul> |
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## Step 4

### Provide initial training

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| <b>Description of Action</b> | <ul style="list-style-type: none"> <li>• Provide initial training (by the selected training provider) to ALL staff of AIS</li> <li>• Include relevant managers in the introductory training</li> </ul> |
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## Step 5 Conduct a Gap Analysis

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| <b>Description of Action</b> | <ul style="list-style-type: none"> <li>• AIS Director, Quality Manager and the implementation team members should be involved in the gap analysis</li> <li>• Gap analysis is to identify which clauses/sub-clauses of ISO 9001:2015 are addressed and which of them are not addressed (and need further work)</li> <li>• Standard templates for the Gap analysis exist widely on the internet</li> </ul> |
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## Step 6 Conduct an initial Management Review Meeting

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| <b>Description of Action</b> | <ul style="list-style-type: none"> <li>• “Management Review” is required after each internal and external audits as well as at any time this review is found beneficial, e.g. after Gap analysis, before external audit, etc.</li> <li>• AIS Director (or Deputy) chairs the meeting; Quality Manager is the secretary; QMS implementation team are members of the meeting</li> <li>• Clause 9.3 provides input and agenda for “Management Review” Meeting</li> </ul> |
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## Step 7 Commence work on rectifying identified gaps

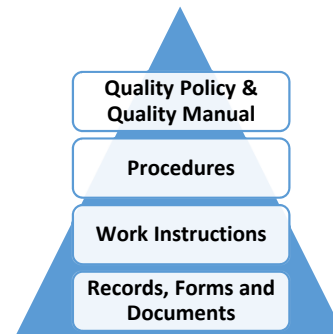
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| <b>Description of Action</b> | <ul style="list-style-type: none"> <li>The outcomes of step 5 (gap analysis) which were then discussed at the Management Review Meeting (step 6) and the actions resulting from step 6 will provide a priority for rectifying identified gaps</li> <li>It is important to monitor progress and to document the actions and results that will need to be considered at the next Management Review Meeting</li> </ul> |
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## Step 8 Identify processes and develop procedures

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| <b>Description of Action</b> | <ul style="list-style-type: none"> <li>• In consultation with AIS sub-units heads and key experts, work process (including flow diagram) and work procedures should be identified and documented</li> <li>• Reasonable balance between <u>over-documenting VS not providing sufficient details</u></li> <li>• Training may be needed</li> <li>• SMART KPI(s) be developed for each key activity to enable further measurement of the QMS system (e.g. NOTAM processing time from receipt of raw data to NOTAM issuance)</li> </ul> |
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## Step 9 Measure customer satisfaction

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| <b>Description of Action</b> | <ul style="list-style-type: none"> <li>• Develop customer satisfaction (feedback) survey tool (questionnaire); paper or online</li> <li>• Survey questions should be based on the customers' expectations &amp; requirements</li> <li>• Conduct customer satisfaction survey</li> </ul> |
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## Step 10

### Identify and train internal auditor(s)

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| <b>Description of Action</b> | <ul style="list-style-type: none"> <li>Identify qualified AIS experts who have the required attributes for being internal auditors</li> <li>Train the internal auditors (selected training provider should provide the required initial training and refresher training at specific intervals; e.g. every 2-3 years)</li> </ul> |
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## Step 11 Conduct a first internal audit

|                              |   |
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| <b>Description of Action</b> | <ul style="list-style-type: none"> <li>• Develop internal audit programme outlining: audit scope, audit criteria, references, definitions, audit schedule, audit performance, follow-up audits, corrective action, audit documentation, audit failure and management review</li> <li>• Develop annual internal audit plan/schedule</li> <li>• Conduct internal audit</li> <li>• Internal auditors should not audit the sub-unit they work in (e.g. internal auditor who works in charting sub-unit would audit NOF, etc.)</li> <li>• At each internal audit, rotate the auditors</li> </ul> |
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## Step 12 Conduct a Management Review Meeting

|                              |   |
|------------------------------|---|
| <b>Description of Action</b> | <ul style="list-style-type: none"> <li>• “Management Review” is required after each internal and external audits as well as at any time this review is found beneficial, e.g. after Gap analysis, before external audit, etc.</li> <li>• AIS Director (or Deputy) chairs the meeting; Quality Manager is the secretary; QMS implementation team are members of the meeting</li> <li>• Clause 9.3 provides input and agenda for “Management Review” Meeting</li> </ul> |
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## Step 13

Select a third-party organization to perform the ISO 9001:2015 certification of compliance

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| <b>Description of Action</b> | <ul style="list-style-type: none"> <li>• Select a qualified QMS certification body and sign the necessary agreements/contract for the conduct of external audit/certification process</li> <li>• If you had taken consultancy services for QMS implementation from an organization that is also a certification body, that organization should not be selected as the certification body</li> <li>• The selected certification body should be in compliance with the National and International requirements</li> </ul> |
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## Step 14

### Conduct a second internal audit

|                              |  |
|------------------------------|--|
| <b>Description of Action</b> | <ul style="list-style-type: none"> <li>• Conduct internal audit</li> <li>• Internal auditors should not audit the sub-unit they work in (e.g. internal auditor who works in charting sub-unit would audit NOF, etc.)</li> <li>• At each internal audit, rotate the auditors</li> </ul> |
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## Step 15 Conduct a Management Review Meeting

|                              |   |
|------------------------------|---|
| <b>Description of Action</b> | <ul style="list-style-type: none"> <li>• “Management Review” is required after each internal and external audits as well as at any time this review is found beneficial, e.g. after Gap analysis, before external audit, etc.</li> <li>• AIS Director (or Deputy) chairs the meeting; Quality Manager is the secretary; QMS implementation team are members of the meeting</li> <li>• Clause 9.3 provides input and agenda for “Management Review” Meeting</li> </ul> |
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## Step 16 Prepare for the external audit

|                              |  |
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| <b>Description of Action</b> | <ul style="list-style-type: none"> <li>• In accordance with the third-part certification audit procedure and your internal documented procedures, prepare all the pre-requisites for the audit</li> <li>• You may conduct additional internal audits &amp; Management Review Meetings during the preparation, if needed, in order to make sure that any previously identified nonconformance has been closed.</li> </ul> |
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## Step 17

### Conduct the third-party certification audit

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| <b>Description of Action</b> | <ul style="list-style-type: none"> <li>• Third-party certification body conducts the audit</li> <li>• Minor non-conformances are not negative; they identify potential risks of the QMS</li> </ul> |
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# CERTIFIED ✓


|     |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |
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## Step 18 Continue improvement

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| <b>Description of Action</b> | <ul style="list-style-type: none"> <li>• Certification of compliance should be celebrated by all AIS staff and the top management as a promotional tool and recognition of the quality services that are provided.</li> <li>• Certification of compliance is not the end of the QM journey; it is a milestone.</li> <li>• Findings of the external audit need to be reviewed at a Management Review Meeting, and the appropriate actions taken to address any remedial actions.</li> <li>• The certification of compliance provides a baseline on which to measure ongoing improvement of AIS</li> </ul> |
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## Key points and Conclusions

- Developing and implementing a QMS without the formal endorsement and commitment of top management should not be attempted.
- During the development/implementation of QMS, Global aeronautical data quality provisions must be considered in the QMS processes (procedures for Quality assurance, Quality control and error detection) in order to ensure that the required quality levels are adequately met (data catalogue, quality aspects (accuracy, resolution, format, completeness, timeliness, etc.)).
- Conducting a gap analysis is a critical step as it identifies the current status of the existing management system relative to the standard – it provides a foundation for planning the development and implementation of the QMS.
- It is important to ensure that a significant body of evidence has been gathered, demonstrating the successful implementation of the QMS, prior to an external certification of compliance audit (for example, levels of customer satisfaction).
- It is important that members of top management (i.e. AIS Director or the Deputy) chair Management Review Meetings.
- Hiring a consultant to help with the implementation may be instrumental, in particular for AIS units at larger size.
- An organization that assists in the development and implementation of the QMS cannot also provide its services as the third-party certification body. This will create a potential conflict of interest.
- If there is a lack of confidence in the ability of the QMS to successfully undergo an external third-party audit, then the audit should be delayed until such time it is ready. To do otherwise would be setting up the QMS for failure, which is unacceptable.



## Further reading

- ISO 9001:2015 Standard, International Organization for Standardization (ISO)
- Quality Management Principles, International Organization for Standardization (ISO):  
<https://www.iso.org/files/live/sites/isoorg/files/store/en/PUB100080.pdf>
- Aeronautical Information Services Manual (ICAO Doc 8126), Seventh Edition, 2021 (unedited version)
- WMO-No. 1100 - Guide to the Implementation of Quality Management Systems for National Meteorological and Hydrological Services and Other Relevant Service Providers (2017 Edition)



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THANK YOU

