



ADVISORY CIRCULAR

UCAA-AC-MET001

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GUIDANCE ON IMPLEMENTATION OF QUALITY MANAGEMENT SYSTEM FOR THE PROVISION OF METEOROLOGICAL SERVICES TO AIR NAVIGATION

1.0 PURPOSE

This Advisory Circular (AC) provides guidance on establishment and implementation of a Quality Management System for the provision of Meteorological Services for Air Navigation. The quality system established shall comprise of procedures, processes and resources necessary to provide for the quality management of the meteorological information to be supplied to the users.

2.0 REFERENCES

- 2.1 Regulation 10 of the Civil Aviation (Meteorological Services for Air navigation) Regulation, 2022.
- 2.2 ICAO Doc 9873 – Manual on the Quality Management System for the Provision of Meteorological Service to International Air Navigation.
- 2.3 ISO 9000:2015, Quality management systems - Fundamentals and vocabulary
- 2.4 ISO 9001:2015, Quality management systems - Requirements

3.0 GUIDANCE AND PROCEDURES

3.1 General

- 3.1.1 The Civil Aviation (Meteorological Services for Air Navigation) Regulation, 2022 under Regulation 10, requires the Meteorological Service Provider (MSP) to establish and implement a properly organized quality management system comprising of procedures, processes and resources necessary to provide for the quality assurance of meteorological information supplied to users.
- 3.1.2 The setting up of an adequately organized quality system should ensure that continued high quality of data and products are provided by the MSP.
- 3.1.3 The quality system established in accordance with this advisory circular should be in conformity with the International Organization for Standardization (ISO) 9001: 2015 series of quality assurance requirements and shall be certified by an approved QMS audit organization.

3.1.4 The International Organization for Standardization (ISO) 9000 series of quality assurance standards shall provide a basic framework for the development of a quality assurance programme for the MSP.

3.2 Development of the Quality System

In developing the aeronautical meteorological service quality management system, the MSP shall take into consideration the following;

3.2.1 The quality system provides the users with assurance that the meteorological information supplied complies with the stated requirements as per the Civil Aviation (Meteorological Services for Air Navigation) Regulation, 2022.

3.2.2 The quality system includes verification/validation procedures regarding the operational meteorological (OPMET) information exchange and resources for monitoring the adherence to the prescribed transmission schedules.

3.2.3 Demonstration of compliance of the quality system applied shall be by audit. If non-conformity of the system is identified, action should be initiated to determine and correct the cause. All audit observations shall be evidenced and properly documented.

3.3 Requirements of Quality Management Systems

3.3.1 Scope

The quality management system to be implemented by the MSP shall:

- (a) Demonstrate its ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements, and
- (b) Aims to enhance customer satisfaction through the effective application of the system, including processes for improvement of the system and the assurance of conformity to customer and applicable statutory and regulatory requirements.

3.3.2 Context of the QMS

The MSP shall determine external and internal issues relevant to its purpose and its strategic direction and affect its ability to achieve the quality of Meteorological service provided for air navigation. The MSP shall monitor and review information about these external and internal issues and maintain records of such information for verification whenever required.

3.3.3 Understanding the needs and expectations of interested parties

Due to their effect or potential effect on the MSP's ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements, the service provider shall determine;

- (a) The interested parties that are relevant to the quality management system;
- (b) The requirements of these interested parties that are relevant to the quality management system.

3.3.4 Determining the scope of the QMS

3.3.4.1 The MSP shall determine the boundaries and applicability of the quality management system to establish its scope and the scope should be properly documented. When determining this scope, consideration shall be made of;

- (i) External and internal issues.
- (ii) National requirements of relevant interested parties.
- (iii) Products and services of the meteorological service provider.

3.3.4.2 The MSP shall apply all the ISO 9001: 2015 requirements applicable within the determined scope of its quality management system.

3.3.4.3 The scope of the MSP's quality management system shall be made available to all internal stakeholders and maintained as documented information for verification by external stakeholders when required.

3.3.4.4 The scope shall state the types of products and services covered and justify any requirement of ISO 9001: 2015 that it determines as not applicable to the scope of the quality management system.

3.4 Quality Management System and its Processes

3.4.1 The QMS Process

The MSP shall;

3.4.1.1 Establish, implement, maintain and continually improve a quality management system, including the processes needed and their interactions, in accordance with the requirements of the Civil Aviation (Meteorological services for air navigation) Regulations, 2022 and guidelines provided in this Advisory Circular.

3.4.1.2 Determine the processes needed for the quality management system and their application throughout the meteorological service for air navigation by;

- (i) Providing the inputs required and the outputs expected from these processes;
- (ii) Determining the sequence and interaction of these processes;
- (iii) Applying the criteria and methods (including monitoring, measurements, and related performance indicators) needed to ensure the effective operation and control of these processes;
- (iv) Providing the resources needed for these processes and ensure their availability;
- (v) Assigning the responsibilities and authorities for these processes;
- (vi) Addressing the risks and opportunities as determined in accordance with the requirements of actions to address risks and opportunities;
- (vii) Evaluating these processes and implement any changes needed to ensure that these processes achieve their intended results;
- (viii) Improving the processes and the quality management system.

3.4.1.3 To the extent necessary, the MSP shall:

- (i) Maintain documented information to support the operation of its processes;

- (ii) Retain documented information to have confidence that the processes are being carried out as planned.

3.4.2 Establishing the Quality Policy

- 3.4.2.1 The management of the MSP shall establish, implement and maintain a quality policy that:
- (i) Is appropriate to the purpose and context of the meteorological services and supports strategic direction of the organisation;
 - (ii) Provide a framework for setting quality objectives;
 - (iii) Includes a commitment to satisfy all applicable requirements;
 - (iv) Includes a commitment to continual improvement of the quality management system.

- 3.4.2.2 The quality policy shall also:
- (i) be made available to all personnel and maintained as documented information;
 - (ii) be communicated, understood and applied within the MSP;
 - (iii) be available to relevant interested parties and relevant stakeholders, as appropriate.

3.4.3 Establishing Quality objectives and planning to achieve them

- 3.4.3.1 The MSP shall establish quality objectives at relevant functions, levels and processes needed for the quality management system and the quality objectives shall:
- (i) be consistent with the quality policy;
 - (ii) be measurable;
 - (iii) take into account applicable requirements;
 - (iv) be relevant to the conformity of products, services and enhancement of customer satisfaction;
 - (v) be monitored at all times;
 - (vi) be communicated to all internal and relevant external stakeholders;
 - (vii) be updated as appropriate.
 - (viii) maintain documented information on the quality objectives.

- 3.4.3.2 When planning how to achieve the quality objectives, the MSP shall determine:
- (i) what will be done;
 - (ii) what resources will be required;
 - (iii) who will be responsible;
 - (iv) when it will be completed;
 - (v) how the results will be evaluated.

3.4.4 Leadership and commitment

- 3.4.4.1 The management of the MSP shall demonstrate leadership and commitment with respect to the quality management system by:
- (a) Taking accountability for the effectiveness of the quality management system;
 - (b) Ensuring that the quality policy and objectives are established for the quality management system and are compatible with the context and strategic direction of the MSP;
 - (c) Ensuring the integration of the quality management system requirements into the institutional business processes;

- (d) Promoting the use of the process and risk-based approaches in delivering the aeronautical meteorological services;
- (e) Ensuring that the resources needed for the quality management system are available;
- (f) Communicating the importance of effective quality management and of conforming to the quality management system requirements;
- (g) Ensuring that the quality management system achieves its intended results;
- (h) Engaging, directing and supporting the organizational personnel to fully contribute to the effectiveness of the quality management system;
- (i) Promoting continuous improvement;
- (j) Supporting other relevant management roles to demonstrate their leadership as it applies to their areas of responsibility.

3.4.5 Customer focus

3.4.5.1 The management of the MSP shall demonstrate leadership and commitment with respect to customer focus by ensuring that:

- (a) Customers, stakeholders, applicable statutory and regulatory requirements are determined, understood and consistently met;
- (b) The risks and opportunities that can affect conformity of products and services and the ability to enhance customer satisfaction are determined and addressed;
- (c) The focus on enhancing customer satisfaction is maintained.

3.4.6 The MSP's roles, responsibilities and authorities

3.4.6.1 The MSP management shall ensure that the responsibilities and authorities for relevant roles are assigned, communicated and understood within the meteorological authority.

3.4.6.2 The MSP management shall ensure effective assignment of the responsibilities for:

- (i) Ensuring that the quality management system conforms to the requirements of ISO 9001:2015.
- (ii) Ensure the processes are delivering their intended outputs;
- (iii) Report on the performance of the quality management system and opportunities for improvement in particular to top management;
- (iv) Ensure the promotion of customer focus throughout the meteorological authority;
- (v) Ensure the quality management system's integrity is maintained when changes to the quality management system are planned and implemented.

3.4.7 Actions to address risks and opportunities

3.4.7.1 When planning for the quality management system, the MSP shall consider issues within the organization and the needs and expectations of relevant stakeholders to determine the risks and opportunities that need to be addressed to:

- (i) Give assurance that the quality management system can achieve its intended result(s);
- (ii) Enhance desirable effects;
- (iii) Prevent or reduce undesired effects; and
- (iv) Achieve continual improvement.

3.4.7.2 The MSP shall plan:

- (i) actions to address these risks and opportunities;

- (ii) how to integrate and implement the actions into its quality management system processes; and
- (iii) how to evaluate the effectiveness of these actions.

3.4.8 Planning of changes

3.4.8.1 The MSP shall determine the need for changes to the quality management system, and the changes shall be carried out in a planned manner.

3.4.8.2 The MSP shall consider:

- (i) the purpose of the changes and their potential consequences;
- (ii) the integrity of the quality management system;
- (iii) the availability of resources;
- (iv) the allocation or reallocation of responsibilities and authorities.

3.4.9 Resources, Personnel and Infrastructure

3.4.9.1 The MSP shall;

- (a) Determine and provide the resources needed to establish, implement, maintain and continually improve the quality management system.
- (b) Consider the capabilities of and constraints on existing internal resources and what needs to be obtained from external providers.
- (c) Determine and provide the qualified personnel necessary for the effective implementation of its quality management system, the operations and control of its processes.
- (d) Determine, provide and maintain the infrastructure necessary for the operation of its processes and achieve conformity of products and services and the infrastructure may include:
 - (i) buildings and associated utilities;
 - (ii) equipment, including hardware and software;
 - (iii) transportation resources;
 - (iv) Information and communication technology.

3.4.10 Environment for operation of processes

3.4.10.1 The MSP shall determine, provide and maintain the environment necessary for the operation of its processes and to achieve conformity of products and services.

3.4.10.2 A suitable environment shall be a combination of human and physical factors, such as:

- (i) social (non-discriminatory, calm, non-confrontational etc);
- (ii) psychological (stress-reducing, burnout prevention, emotionally protective etc);
- (iii) physical (temperature, heat, humidity, light, airflow, hygiene, noise etc).

3.4.11 Monitoring and measurement of products and services

The MSP shall;

3.4.11.1 Determine and provide the resources needed to ensure valid and reliable results when monitoring or measurement is used to verify products and services' conformity to requirements.

3.4.11.2 Ascertain that the resources provided:

- (i) are suitable for the specific type of monitoring and measurement activities being undertaken;
- (ii) are maintained to ensure their continuing fitness for their purpose.

3.4.11.3 Retain appropriate documented information as evidence of fitness to monitor and measure resources and services.

3.4.12 Measurement traceability

3.4.12.1 Measurement traceability is an essential part of providing confidence in the validity of product and services provided by the MSP. The measuring equipment shall be:

- (i) Calibrated at specified intervals, against measurement standards traceable to international or national measurement standards.
- (ii) identified to determine their status;
- (iii) safeguarded from adjustments, damage or deterioration that would invalidate the calibration status and subsequent measurement results.

3.4.12.2 Determine if the validity of previous measurement results has been adversely affected when measuring equipment is unfit for its intended purpose and shall take appropriate action as necessary.

3.4.13 Competence

3.4.13.1 The **MSP** shall:

- (a) Determine the necessary competence of personnel doing work under its control that affects the performance and effectiveness of the quality management system;
- (b) Ensure that the personnel are competent based on appropriate qualification, education, training and experience;
- (c) Where applicable, take actions to acquire the necessary competence and evaluate the effectiveness of the actions taken;
- (d) Retain appropriate documented information as evidence of competence.
- (e) Maintain personnel competence through periodic competence assessments.

3.4.14 Communication and Awareness

3.4.14.1 The MSP shall determine the internal and external communications relevant to the quality management system, including;

- (i) On what will be communicated.
- (ii) When to be communicated.
- (iii) With whom to communicate.
- (iv) How to communicate.
- (v) Who communicates

3.4.14.2 The MSP shall ensure that personnel providing services for air navigation are aware of:

- (i) The quality policy;
- (ii) Relevant quality objectives;
- (iii) Their contribution to the effectiveness of the quality management system, including the benefits of improved performance;
- (iv) The implications of not conforming to the quality management system requirements.

3.4.15 Creating and updating documents

- 3.4.15.1 When creating and updating documented information, the MSP shall ensure as appropriate;
- (a) Documented information determined by the MSP as being necessary for the effectiveness of the quality management system.
 - (b) Identification and description (title, date, author, or reference number);
 - (c) Format (language, software version, graphics)
 - (d) Media (paper, electronic); and
 - (e) Review and approval for suitability and adequacy.

3.4.16 Control of documented information

- 3.4.16.1 Documented information required by the quality management system and by this advisory circular shall be controlled to ensure that;
- (i) it is available and suitable for use, where and when it is needed;
 - (ii) it is adequately protected from loss of confidentiality, improper use or loss of integrity.
- 3.4.16.2 For the control of documented information, the MSP shall address the following activities, as applicable:
- (i) Distribution, access, retrieval and use;
 - (ii) Storage and preservation including preservation of legibility;
 - (iii) Control of changes (version control);
 - (iv) Retention and disposition.
- 3.4.16.3 Documented information of external origin determined by the MSP to be necessary for the quality management system's planning and operations shall be identified as appropriate and controlled.
- 3.4.16.4 Documented information retained as evidence of conformity shall be protected from unintended alterations.

3.4.17 Control of non-conforming outputs

- 3.4.17.1 The MSP shall;
- (a) Ensure that outputs that do not conform to their requirements are identified and controlled to prevent their unintended use or delivery.
 - (b) Take appropriate action based on the nature of the non-conformance and its effect on the conformance of products and services; this shall also apply to non-conforming products and services detected after delivery of products, during or after the provision of services.
 - (c) Deal with non-conforming products/services in one or more of the following ways:
 - (i) correction;
 - (ii) segregation, containment, return or suspension of the provision of products and services;
 - (iii) notifying the customer;
 - (iv) obtaining authorization for acceptance under concession.
 - (d) Retain documented information that:
 - (i) describes the non-conformity;
 - (ii) describes the actions taken;
 - (iii) describes any concessions obtained;
 - (iv) identifies the authority deciding the action in respect of the non-conformity.

- (c) Ascertain that conformity to the requirements shall be verified when non-conforming products and services are corrected.

3.4.18 Non-conformance and corrective action

3.4.18.1 When a non-conformance occurs, including any arising from complaints, the MSP shall:

- (i) react to the non-conformance and, as applicable:
 - take action to control and correct it;
 - deal with the consequences;
- (ii) evaluate the need for action to eliminate the cause(s) of the non-conformance, in order that it does not recur or occur elsewhere, by:
 - reviewing and analyzing the non-conformance;
 - determining the causes of the non-conformance;
 - determining if similar non-conformances exist or could potentially occur;
- (iii) implement any action needed;
- (iv) review the effectiveness of any corrective action taken;
- (v) update risks and opportunities determined during planning, if necessary;
- (vi) make changes to the quality management system, if necessary.
- (vii) Corrective actions must be appropriate to the effects of the non-conformances encountered.

3.4.18.2 The MSP shall retain documented information as evidence of:

- (i) the nature of the non-conformances and any subsequent actions taken; and
- (ii) the results of any corrective action.

3.4.19 Performance evaluation

3.4.19.1 The MSP shall conduct monitoring, measurement, analysis and evaluation to determine;

- (i) what needs to be monitored and measured;
- (ii) the methods for monitoring, measurement, analysis and evaluation needed to ensure valid results;
- (iii) when the monitoring and measuring shall be performed;
- (iv) when the results from monitoring and measurement shall be analyzed and evaluated.
- (v) Evaluate the performance and the effectiveness of the quality management system.
- (vi) Retain appropriate documented information as evidence of the results.

3.4.19.2 The MSP shall conduct customer satisfaction surveys through;

- (i) monitoring customers' perceptions of the degree to which their needs and expectations have been fulfilled.
- (ii) Determining the methods for obtaining, monitoring, and reviewing this information.
- (iii) Carrying out customer surveys, customer feedback on delivered products and services, meetings with customers, and compliments.

3.4.19.3 The MSP shall conduct continuous analysis and evaluation of their services by ensuring that;

- (i) analysis and evaluation of appropriate data and information arising from monitoring and measurement are done.
- (ii) The results of the analysis shall be used to evaluate the conformity of products and services;
- (iii) Determine the degree of customer satisfaction;
- (iv) Determine the performance and effectiveness of the quality management system;

- (v) Planning is being implemented effectively;
- (vi) effective actions is taken to address risks and opportunities;
- (vii) effective performance of external stakeholders;
- (viii) there is a need for continuous improvement of the quality management system.

3.4.19.4 The MSP shall use statistical techniques to analyse data.

3.4.20 Internal audit

3.4.20.1 The MSP shall conduct internal audits at planned intervals to provide information on whether the quality management system conforms to:

- (i) the MSP's requirements for its quality management system;
- (ii) the requirements of International Standard Organisation (ISO) 9001:2015;
- (iii) effective implementation and maintenance of the QMS.

3.4.20.2 The MSP shall:

- (i) plan, establish, implement and maintain an audit programme(s) including the frequency, methods, responsibilities, planning requirements, and reporting, which shall take into consideration the importance of the processes concerned, changes affecting the organization, and the results of previous audits;
- (ii) define the audit criteria and scope for each audit;
- (iii) select auditors and conduct audits to ensure objectivity and the impartiality of the audit process;
- (iv) ensure that the results of the audits are reported to relevant management;
- (v) take appropriate correction and corrective actions without undue delay;
- (vi) retain documented information as evidence of the implementation of the audit programme and the audit results.

3.4.21 Management review

3.4.21.1 Top management of the MSP shall review the quality management system at planned intervals to ensure its continuing suitability, adequacy, effectiveness, and alignment with the meteorological service provider's strategic direction.

3.4.21.2 The management review shall be planned and carried out taking into consideration:

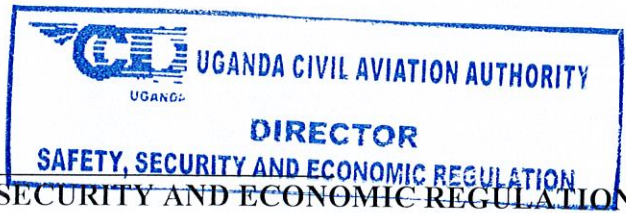
- (a) The status of actions from previous management reviews;
- (b) Changes in external and internal issues that are relevant to the quality management system;
- (c) Information on the performance and effectiveness of the quality management system, including trends in:
 - (i) customer satisfaction and feedback from relevant interested parties;
 - (ii) the extent to which quality objectives have been met;
 - (iii) process performance and conformity of products and services;
 - (iv) nonconformities and corrective actions;
 - (v) monitoring and measurement results;
 - (vi) audit results;
 - (vii) the performance of external providers;
- (d) The adequacy of resources;
- (e) The effectiveness of actions taken to address risks and opportunities;
- (f) Opportunities for improvement.

3.4.22 Management review outputs

3.4.22.1 The outputs of the management review shall include decisions and actions related to:

- (i) opportunities for improvement;
- (ii) any need for changes to the quality management system;
- (iii) Resource needs.

3.4.22.2 The organization shall retain documented information as evidence of the results of management reviews.



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