

# Technical Regulations

Basic Documents No. 2

Volume IV – Quality Management

2011 edition



**World  
Meteorological  
Organization**

Weather · Climate · Water

WMO-No. 49



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#### EDITORIAL NOTE

The following typographical practice has been followed: standard practices and procedures have been printed in semi-bold roman. Recommended practices and procedures have been printed in light-face roman. Notes have been printed in smaller type, light-face roman, and preceded by the indication: Note.

METEOTERM, the WMO terminology database, may be consulted at:

[http://www.wmo.int/pages/prog/lsp/meteoterm\\_wmo\\_en.html](http://www.wmo.int/pages/prog/lsp/meteoterm_wmo_en.html). Acronyms may also be found at:  
[http://www.wmo.int/pages/themes/acronyms/index\\_en.html](http://www.wmo.int/pages/themes/acronyms/index_en.html).

WMO-No. 49

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ISBN 978-92-63-10049-8

#### NOTE

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## GENERAL PROVISIONS

### Scope and purpose of the World Meteorological Organization Quality Management Framework

1. The World Meteorological Organization (WMO) has established, documented and implemented, and continues to maintain a Quality Management Framework (QMF).
2. Its purpose is to provide a comprehensive system of recommended procedures and practices, with regard to quality of data, products and services, that should be used by Members in establishing quality management systems for the provision of meteorological and hydrological services.

### Role of the constituent bodies of the World Meteorological Organization in the Quality Management Framework

3. The World Meteorological Congress:
  - (a) Approves, reviews and promotes the quality policy of the QMF;
  - (b) Defines, in alignment with the WMO Strategic Plan, and disseminates quality objectives to all WMO Members through the WMO Programme structure;
  - (c) Approves the quality management provisions of the Technical Regulations;
  - (d) Identifies and defines the QMF cross-cutting activities and encourages the harmonization of these activities among all WMO Programmes;
  - (e) Establishes and maintains a robust working relationship with the International Organization for Standardization (ISO).
4. The Executive Council of the World Meteorological Organization:
  - (a) Facilitates and monitors the implementation of the decisions of Congress pertaining to the QMF;
  - (b) On behalf of the Organization, considers the resolutions and recommendations of the Regional Associations and Technical Commissions pertaining to QMF matters and takes action thereon;
  - (c) Oversees and monitors progress in the implementation of quality management systems;
  - (d) Coordinates the ongoing development and maintenance of these *Technical Regulations, Volume IV – Quality Management*;
  - (e) Ensures that related quality management initiatives and activities are clearly specified, developed and coordinated. This will include the development, through an appropriate Task Team, of a list of valid documents that define quality requirements and indicators for relevant data, products and services.
5. The Technical Commissions:
  - (a) Develop comprehensive quality objectives;
  - (b) Develop and maintain international consensus and approval of all quality management documentation within their terms of reference;
  - (c) Develop required verification, validation, monitoring, inspection and other quality-related activities and tools specific to the data and products generated and exchanged, including relevant measures of success;
  - (d) Recommend documentation and records needed to provide evidence that data and products meet defined and established requirements.

## **The World Meteorological Organization quality policy statement and strategy**

6. WMO is dedicated to ensuring optimum affordable quality for all meteorological, climatological, hydrological, marine and related environmental data, products and services, especially those supporting the protection of life and property, safety on land, at sea and in the air, sustainable economic development, and the protection of the environment.

7. WMO will endeavour, through a process of continuous improvement, to pursue efficient management and good governance in order to:

- (a) Ensure that increasingly accurate and reliable warnings of severe events related to weather, water and climate are delivered to users in a timely and useful manner;
- (b) Specify and enhance provision of user-oriented weather, water, climate and related environmental services of identified quality to the public, governments and other users and customers;
- (c) Ensure that observations, records and reports on weather, water resources, climate and related natural environment, operational forecasts, warning services and related information are of identified quality for international exchange through the WMO coordinated systems, and that they comply with the relevant standards agreed jointly with other international organizations;
- (d) Address the need to enhance the capabilities of Members to deliver services to users and customers with the best available technology and to help improve cooperation and collaboration between Members in the implementation of quality management systems;
- (e) Address the need to enhance the capabilities of Members with comprehensive capacity-building activities that include training, through the development of partnerships and technology transfer.

### **Definitions and terminology**

8. The terminology, vocabulary, definitions and abbreviations used throughout this document are those of WMO and are provided in the Technical Regulations, Volumes I, II and III and in related manuals and guides.

9. Other definitions, terminology, vocabulary and abbreviations used throughout this document are those of the ISO 9000 family of standards for quality management systems, in particular those identified within *ISO 9000:2005, Quality management systems – Fundamentals and vocabulary*.

10. For the purpose of clarity, the word “standard” will be used as follows:

- (a) When it refers to a formal published document such as an ISO International Standard, it will be written as Standard;
- (b) When it refers to specific WMO manuals, procedures and practices, it will be written as WMO Standard.

### **Guiding principles of quality management**

11. The WMO Quality Management Framework (WMO-QMF) is built on the fundamental principles of the ISO 9000 family of standards for quality management systems, of which a subset is to be found in the Appendix to this document. These principles can underpin the achievement of objectives and the enhancement of capacity-building activities for Members. The quality management principles were developed by ISO Technical Committee ISO/TC176/SC2/WG15 and are available on the ISO website.

### **Development and implementation of a quality management system**

12. In order to meet their objectives, Members should develop and implement a properly organized quality system based on the WMO Technical Regulations, comprising the

procedures, processes and resources needed to improve efficiency and effectiveness in the provision of meteorological, climatological, hydrological, marine and related environmental data and products that are supplied to users.

13. Members should establish quality management systems that meet the requirements of the appropriate Standard of the *ISO 9000 Quality management systems* series or other internationally recognized practices and procedures, to fulfil their national and regional regulatory requirements and to meet the needs of their customers.

14. *ISO 9001:2008, Quality management systems – Requirements* specifies the requirements for a quality management system that can be used by internal and external parties, including third party (external) certification bodies, to assess an organization's ability to meet regulatory, customers' and the organization's own requirements. It focuses on the effectiveness of the quality management system in meeting customer requirements. Members should wherever possible adopt this approach to quality management.

15. *ISO 9004:2009, Managing for the sustained success of an organization – A quality management approach* is not a substitute for ISO 9001 but complements it. ISO 9004 focuses on meeting the needs and expectations of customers and will prove useful to service providers who wish to pursue ongoing improvement, measured through the satisfaction of customers and other stakeholders. It should be noted that ISO 9004 is not subject to external (third party) certification and uses a formal self-assessment process. It is mainly used by organizations pursuing improvement post third-party certification under ISO 9001.

### **Certification, registration and conformity assessment bodies**

16. Before seeking certification, Members should establish whether the certification body has adopted *ISO/IEC 17021:2006, Conformity assessment – Requirements for bodies providing audit and certification of management systems*. This Standard places rigorous requirements for competence and impartiality on the bodies that offer audit and certification to standards and will assist Members in making an informed decision.

#### Notes:

1. The terms certification and registration can be used interchangeably. Certification is most widely used internationally while registration is more commonly used in North America. The term certification will be used in this document.
2. Certification is provided by conformity assessment bodies (certification bodies) of which there are many located worldwide. Members should confirm that the certification body they choose has received endorsement as to its competence, credibility, independence and integrity by the accreditation body appointed by the national government. The list of accreditation bodies, with their contact information and website links, can be found on the Internet site of the International Accreditation Forum, under Members> Accreditation members.

### **Hierarchy of documentation**

17. Documentation across all WMO Programmes is established according to an identified hierarchy and it is a fundamental component of any robust quality management system. This includes a hierarchy of documented practices and procedures. Consequently, Members should ensure that in their National Meteorological and Hydrological Services (NMHSs) a hierarchy of documentation is established, harmonized and maintained. A simple documentation hierarchy should include as a minimum the following:

Level 1: A document that defines the quality management system (a quality manual);

Level 2: Documented procedures required by the quality management system and, if adopted, those required under the ISO 9000 series of quality assurance standards;

Level 3: Documents needed by the organization to ensure effective planning, operations and control of processes;

Level 4: Appropriate records for the verification and validation of the quality of data, products and services.

### **Regulatory requirements**

18. Each volume of the Technical Regulations (Volumes I, II and III) contains the standard and recommended practices for its particular area of focus. Members' NMHSs should build their quality management systems on the basis of these regulations.

### **Relationship between the World Meteorological Organization and the International Organization for Standardization**

19. The working arrangements between WMO and ISO for the development of joint standards became effective in September 2008.

20. ISO recognized WMO as an international standardization body through ISO Council Resolution 43/2007.

21. The working arrangements between WMO and ISO aim to strengthen the development of international standards and to avoid duplication of work on standards related to meteorological, climatological, hydrological, marine, aviation and related environmental data, products and services.

22. Standards developed under these working arrangements will be called common standards.

Note: The ISO 9000 family of standards for quality management systems are exclusively stand-alone ISO Standards and will not be addressed under these working arrangements.

### **Reference and guidance material**

23. The following documents will provide Members with valuable information and guidance pertaining to the implementation of a quality management system:

- *A Practical Guide for the Implementation of a Quality Management System for National Meteorological and Hydrological Services* (WMO-No. 1100) (in preparation);
- *Guide to the Quality Management System for the Provision of Meteorological Service for International Air Navigation* (WMO-No.1001), which is a joint WMO/ICAO guide;
- *Guidelines for Implementing a Quality Management System in Hydrology* (in preparation);
- *Guidelines on Quality Management Procedures and Practices for Public Weather Services* (WMO/TD No.1256);
- *ISO 9000:2005, Quality management systems – Fundamentals and vocabulary*;
- *ISO 9001:2008, Quality management systems – Requirements*;
- *ISO 9004:2009, Managing for the sustained success of an organization – A quality management approach*;
- *ISO/IEC 17021:2006, Conformity assessment – Requirements for bodies providing audit and certification of management systems*.

24. Members should also avail themselves of the additional and valuable reference material on quality management available on the WMO Quality Management website and the ISO website.

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## APPENDIX. THE EIGHT PRINCIPLES OF QUALITY MANAGEMENT

Note: This section is based on the eight quality management principles of the ISO 9000 family of standards for quality management, which were developed by ISO Technical Committee ISO/TC176/SC2/WG15. A brochure entitled *Quality management principles*, which describes the principles and the benefits derived from their use, is available on the ISO website ([http://www.iso.org/iso/qmp\\_2012.pdf](http://www.iso.org/iso/qmp_2012.pdf)).

- 1. User/customer focus.** The National Meteorological and Hydrological Services (NMHSs) of Members should identify, document and understand the current and future needs of their users/customers for meteorological, hydrological, marine, aviation and related environmental data, products and services. The means to achieve this may include conducting regular customer satisfaction surveys, liaison meetings and visits to users/customers.
- 2. Leadership.** Congress and the Executive Council provide the overall leadership that establishes the purpose and direction of the Organization based on the WMO Convention (Article 2) and the strategic planning process. Congress, the Executive Council and the Secretary-General maintain the organizational environment in which all Members and WMO constituent and working bodies are fully involved in achieving the Organization's objectives. In turn, the top management of NMHSs should clearly define the direction of their organization and create an environment where staff are encouraged to work in that direction to achieve the organization's objectives.
- 3. Involvement of people.** Members of Technical Commissions and Regional Associations, and experts from Members should be fully involved in the implementation of the WMO-QMF and the quality management systems of Members. Staff are the essence of an organization; their full involvement allows their abilities to be used for the benefit of Members.
- 4. Process approach.** The desired results are achieved more efficiently when programme activities of NMHSs are managed as processes. Processes may be operational, scientific or administrative and they provide the mechanism to achieve customer satisfaction.
- 5. System approach to management.** Members' NMHSs are encouraged to identify, understand and manage interrelated processes as a system so that this can contribute to the Members' effectiveness and efficiency in achieving their objectives. An example is the identification and management of the interrelated processes associated with the recording of observations, with forecast products and services, and with the dissemination and archiving of records in the context of a system.
- 6. Continual improvement.** Continual improvement in the quality of observations, records and reports on weather, water resources, climate and related natural environment, and in operational forecasts and warning services, should be a permanent objective of all Members. Specifically, the effectiveness and suitability of the quality management system should be evaluated, areas for improvement should be identified and shortcomings rectified. Regular management reviews should be conducted and staff should be encouraged to make suggestions on ways to improve all aspects of service delivery.
- 7. Factual approach to decision-making.** Effective decisions are based on the analysis of data and information. They should never be based on unsubstantiated beliefs or suppositions.
- 8. Mutually beneficial supplier relationships.** Mutually beneficial relations between NMHSs and other relevant organizations will enhance their ability to create value added meteorological, hydrological, marine, aviation and related environmental products and services. Members' NMHSs and their suppliers are interdependent, and a mutually beneficial working relationship enhances the ability of both to create value for their respective customers. Suppliers should be evaluated and selected on the basis of their ability to meet requirements and in light of their past performance.



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