A Review of the Updated Terms of Reference for RIC

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ABSTRACT

The assessments of RIC's carried out between 2004 to 2005 found that some RICs, and especially those in developing countries, were not fully complying with all the Terms of Reference for RICs. The Expert Team concluded that all TORs should be reviewed. This update was approved by CIMO-XIV in December 2006.

The new TORs [2006] are separated into two categories, RICs with full capabilities and RICs with basic capabilities. These updated TORs are presented in terms of capabilities and corresponding functions that are then compared to ISO standards and laboratories requirements.

RESUMÉ

Les audits des Centre Régionaux d'Instruments qui ont eu lieu pendant la période 2004-2005 montrèrent que certains CRI et plus spécialement dans les pays en voie de développement, ne remplissent pas totalement les Termes de Référence pour les CRIs. Le groupe d'expert en a conclu que les Termes de Références devaient être révisés. Cette mise à jour a été approuvée par la CIMO-XIV en décembre 2006.

Les nouveaux Termes de Référence sont séparés en deux catégories, les CRIs avec les capacités totales et les CRIs avec les capacités réduites. Cette mise à jour est présentée en termes de capacités et de fonctions correspondantes puis sont comparés aux normes ISO et aux exigences des laboratoires.

1. Introduction

As recommended by CIMO-IX in 1985 *: « Considering the need for regular calibration and maintenance of meteorological instruments to meet the increasing needs for high quality meteorological and hydrological data, the requirements of Members for standardization of meteorological instruments, the need for international instrument comparisons and evaluations, and for training of instrument experts, it is recommended to establish Regional Instrument Centres »* [1]. The general terms of reference of Regional Instrument Centres was updated by CIMO-XIV in 2006 after a complete review of all RICs.
A big gap was found between developed and developing countries [2]. Old TOR seems to be inappropriate and should be updated. The new TORs have been developed with Quality Management ideas and separated into full and basic capability RIC.

The new TORS are presented, explained and compared with ISO standards such as ISO 9000 and ISO 17 025

2. Quality Approach

2.1. Introduction

A basic but fundamental approach to quality is the quality improvement loop. This can be seen as containing four steps: preparing and planning, realization of the product, checking of the results in view of the client's satisfaction, and finally reacting to this information to improve further actions. The gist in modern quality management is not only to control the final product, but the entire process.

2.2. Quality Management System

The introduction of a quality management system can be divided into five phases [3]. Those phases are summarized by:

1) **"Quality Policy":** The top management defines the quality policy and the quality objectives. The quality policy needs to be understood and accepted by all staff members.
2) **"Education and Training":** Well-trained and well-informed staff members are very important for the introduction of a QMS. The objective of phase 2 is to promote and maintain staff motivation, systematic human resource development and to introduce a QM information mechanism within the organization.
3) **"Process Analysis":** The processes have to be described and documented. The process analysis defines all sub-processes and records as well as the existing quality control procedures. The objective of this phase is to perform an inventory of the processes and help to prioritize the processes.
4) **"Realization and Implementation":** Processes have to be optimized and be focused on customers. Every single activity of a process has to be checked for standards, continuity with the following activities and for a customer-oriented output. The aim of this phase is to define the quality objectives, to create an interface to the customers, to introduce a document management system and to set-up a quality assurance system.
5) **"Evaluation and Process Control":** All staff members have been informed and trained appropriately. The quality objectives and the quality indices have been established and serve as indicator and measure for quality. At this stage, it is highly advisable to perform an internal audit or a pre-audit to close some possible gaps in the QM system. The objective for this phase is to assess oneself and prove that you are able to continually improve your QM system.

2.3. ISO 9001 Requirements

The ISO 9001:2000 [4] standard is based on a model of a process-based QMS. It includes a number of specific requirements for the QMS concerning:

- Types of documents used in the QMS (quality manual, quality plans, documents stating requirements and guidelines, instructions how to perform activities and processes, documents to provide objective evidence of performed activities or results achieved)
- Management responsibility (management commitment to a quality policy, quality objectives)
- Resource management (provision of resources, including human resources, infrastructure, work environment)
- Product realization (planning, determination and review of requirements related to product, design and development of product, purchasing)
- Measurement, analysis and improvement (monitoring and measurement of processes and product, internal audit, control of nonconforming product, analysis of data and improvement).

Top management must show evidence of its full commitment to the development and implementation of the QMS, continually improve its effectiveness and communicate the importance of meeting customer requirements. Management must also establish the quality policy and the quality objectives, conduct management reviews and ensure the availability of resources.

The ISO 9001:2000 standard itself is comprised of 8 elements:

1. Scope
2. Normative References
3. Terms and Definitions
4. Quality Management System
5. Management Requirements
6. Resources management
7. Product realization
8. Measurement, analysis and improvement

2.4. ISO 17 025 Requirements

"Management system" refers to the organization's structure for managing its processes - or activities - that transform inputs of resources into a product or service which meet the organization's objectives, such as satisfying the customer's quality requirements, complying to regulations, or meeting environmental objectives.

ISO 9001 is a generic management standard that can be applied to any business enterprise, public administration, or government department.

Growth in the use of management systems generally has increased the need to ensure that laboratories can operate to a quality management system that is seen as compliant with ISO 9001 as well as demonstrate technical competency. Therefore, ISO 17025 [5] was written to incorporate all the ISO 9001 requirements that are relevant to the scope of testing and calibration services as well as specifying the technical requirements for technical competence.

Testing and calibration laboratories that comply with ISO 17025 will also operate in accordance with ISO 9001.

The ISO 17025 standard itself is comprised of 5 elements:

1. Scope
2. Normative References
3. Terms and Definitions
4. Management Requirements
5. Technical Requirements

Elements 4 and 5 contain the actual accreditation requirements.

3. Terms of Reference

3.1. Capabilities

a) A RIC must have, or have access to, the necessary facilities and laboratory equipment to perform the functions necessary for the calibration of meteorological and related environmental instruments.
b) A RIC must maintain a set of meteorological standard instruments and establish traceability of its own measurement standards and measuring instruments to the SI,
For RIC with basic capability this requirement is limited to : For calibrating one or more of the following variables: temperature, humidity, pressure and others specified by the Region.
c) A RIC must have qualified managerial and technical staff with necessary experience in fulfilling its functions,
d) A RIC must develop its individual technical procedures for calibration of meteorological and related environmental instruments using calibration equipment employed by the RIC,
e) A RIC must develop its individual quality assurance procedures,
f) A RIC must participate in, or organize inter-laboratory comparisons of standard calibration instruments and methods,
g) A RIC must, as appropriate, utilize the resources and capabilities of the Region to the best interest of the Region,
h) A RIC must, as far as possible, apply international standards applicable for calibration laboratories, such as ISO 17025,
i) A recognized authority must assess a RIC, at least every five years, to verify its capabilities and performance

3.2. Corresponding Functions

j) A RIC must assist Members of the Region in calibrating their national meteorological standards and related environmental monitoring instruments,
k) A RIC must participate in or organize, WMO and/or regional instrument inter-comparisons, following relevant CIMO recommendations,
l) According to relevant recommendations on the WMO Quality Management Framework a RIC must contribute positively to Members regarding quality of measurements,
m) A RIC must advise Members on inquiries regarding instrument performance, maintenance and the availability of relevant guidance materials,
n) A RIC must actively participate in, or assist in the organization of regional workshops on meteorological and related environmental instruments,
o) The RIC must cooperate with other RICs in standardization of meteorological and related environmental measurements,
p) A RIC must regularly inform Members and report, on an annual basis, to the president of the Regional Association and to the WMO Secretariat on services offered to Members and activities done. (Web-based approach is recommended)

3.3. Concordance

TOR	Designation	ISO 9001	ISO 17 025
a	Facilities	#6	#5.3
b	Standard	#7.6	#5.5
c	Manager & staff	#6.2	#5.2
d	Technical Procedures	#7.6	#5.4
e	Management system	#4	#4
f	Comparison	#7.6	#5.4
g	Efficiency	#8	#5.4
h	ISO Standard		
i	Assessment	#8.2	#4.14
j	Traceability	#7.6	#5.6
l	CIMO	#4.2	#4.3
m	WMO QMF	#4	#4
n	Advise	#5.2	#4.7
o	Cooperation	#5.2	#4.7
p	Communication	#5.5	#4.7

4. Conclusion

Quality Approach was put into these news Terms of Reference for Regional Instrument Centre. The requirements are similar of those used by industry or laboratory. That means, it is well known, understandable and implemented outside of NMS. So clearly, it is easy to find helpful tools such as software, example or documentation, but also to find help within external consultancy (other NMHS, private bodies).
But never forget that, as said in introduction, the fundamental approach to quality is the quality improvement loop. The Quality must be used as an improvement tool, and only as a tool. As you use a computer instead of a typewriting machine to improve your documentation, the use of QMS must improve your calibration, therefore your observation data, your forecast.
With the new Terms Of Reference, WMO is encouraging RICs to implement Quality Management Systems. In this context, it should be noted that the implementation and the accreditation according to the ISO 17 025 standard are elements of international credibility and recognition that must not be ignored.

5. Bibliography

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[2] Duvernoy, J: RIC: Review and strengthening; TECO 2006.

[3] World Meteorological Organization: Quality Management System for NMHS, 2004.
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[4] International Organization for Standardization: Quality management systems – Requirements. ISO 9001:2000.

[5] International Organization for Standardization: General requirements for the competence of testing and calibration laboratories. ISO/IEC 17 025:2005