

Meeting QMS Certification in Aviation Services by the Tanzania Meteorological Agency (TMA)



ISO 9001:2008 CERTIFIED *“TMA is dedicated to providing timely quality professional meteorological services to enable its customer’s to deliver their services in a safe, efficient and regular manner.”*

This case study:

- Highlights the process undertaken by the Tanzania Meteorological Agency to obtain QMS certification in its aviation services to meet the ICAO requirement.
- Shows how capacity is met to fulfill the QMS requirements for certification in the four areas of capacity: Human resources, infrastructure, institutional arrangements and procedures of TRMA.
- Highlights desirable key capacity development elements for sustainability of the QMS system in Aviation services by the Tanzania Meteorological Agency.
- Shows potential for upscaling not only to other countries in RA-I but in all operational services by NMHSs for quality assured weather and climate services.
- Demonstrates desirable elements of the WMO Strategy for Service Delivery.

Background

STEP 1 – A clear set of requirements for QMS implementation and certification were defined by ICAO (the User) and incorporated in WMO Technical Regulations and adopted by the Tanzania Meteorological Agency.

In 2008, the Air Navigation Council of ICAO passed AMD 75 to the Annex 3 with a proposed Standard (2.2.2) requiring that aeronautical meteorological service providers shall implement a recognized Quality Management System (QMS), and a Recommended Practice (2.2.3) that the QMS should be in conformity with the ISO 9000 series of quality assurance standards and to be certified by an approved organization. The implementation of a QMS will ensure aviation meteorological services are based on customer-driven products that meet customer requirements satisfactorily and increase the safety of air transport. By agreement between WMO and the International Civil Aviation Organization (ICAO), all national aviation

meteorological services are required to have met agreed competency standards by the end of 2013. A well implemented successful QMS would entail the following elements:

ISO 9001:2008 shall guarantee the following when successfully implemented:

- Ensures that there is a requirement and a customer for every process
- Ensures that services rendered satisfy customer requirements consistently
- Minimizes waste (rework, scrap) and maps activities onto requirements

Effective Service Delivery is defined as the provision of services that are usable to users and meets their needs. The aviation industry is the largest user sector of meteorological services and the safety of life and property is imperative. WMO supported a QMS pilot project in the United Republic of Tanzania for the provision of quality assured meteorological services to civil air navigation using the consultancy services of MSN Canada, a company with relevant experience. It was envisioned the experience gained through this project will pave the way to cost-effective implementation of the project in other Member countries. The Project started in November 2008 and was expected to last for one year. QMS in Aviation services is a priority area in the WMO Strategic Plan for the 16th Financial Period and this case study demonstrates the importance of increased safety in meeting global societal needs. The QMS includes aviation forecaster competencies and highlights the need for improved skills for forecasters.

This case study examines how well the pilot project was implemented at TMA and determine the degree of sustainability of QMS in aviation services by TMA by mapping activities to the 8-Step WMO Capacity Development Strategy Model.



African Ministers responsible for national aviation at the 17th Aviation & Allied Business Leadership Conference held at the Hyatt Regency Hotel - The Kilimanjaro, Dar es Salaam, Tanzania, August 28-30, 2011, have agreed to the need to liberalize and fast-track air transport development in Africa strengthening cross-regional ties and working closely with the private sector and industry experts.

IMPLEMENTATION of the QMS

Activities

An analysis of implemented activities is performed to determine how closely this initiative follows the WMO CDS by mapping the WMO 8-Step Capacity Development Model on the implemented activities undertaken to ensure sustainability of quality aviation services by the NMHS of Tanzania. The following were the outcomes:

STEP 2 – Capabilities of the Tanzania Meteorological Agency aviation staff and infrastructure were evaluated including the existing process in place for the provision of aviation services and a baseline was established,

Activity 1

- 1.1 The first step involved obtaining firm commitment of the senior management, especially the CEO (the PR), for the project.
- 1.2 The next step involved the identification of the relevant sections in TMA that will seek certification under the ISO 9001:2008 Standard for Quality Management Systems.
- 1.3

STEP 3 – Gaps were analyzed and steps outlined to meet the requirements for QMS certification

Activity 2

- 2.1 This step Identified the resources required and those available which was a critical step to implement the strategies.
- 2.2 The activity also developed the QMS by identifying and describing the processes that will make it up and reviewed TMA's current performance against the eight principles of quality management - this is termed a "gap analysis". This task was carried out in a facilitated workshop environment.

STEP 4 – A strategic plan was developed by the consultant in collaboration with TMA

Activity 3.

This activity developed a comprehensive plan (including timelines and milestones) for the implementation of a QMS. Tasks were identified during gap assessment interviews and assigned to the Core QM Implementation Team with clearly defined milestones and timelines. Once the "gaps" were identified, strategies were developed to close and eliminate any performance gaps. The following implementation plan was developed:

Implementation Plan

1. Get firm **commitment of management**, especially the CEO and identify which section(s) of the NMHS are seeking certification.
2. **Budget.** Identify the resources required and those human resources available to realize the implementation.
3. Write a **comprehensive plan** (including timelines and milestones) for the development and implementation of the system.
4. **Appoint** an enthusiastic, motivated **Quality Manager** at a senior level within the organization and provide introductory training for all staff of the sections involved in the QMS.
5. **Review** the organization's **current performance** against the eight principles of quality management, identify shortcomings and develop the QMS by identifying and describing the processes that will ensure its proper functioning - this is termed a "gap analysis".
6. **Implement the QMS** and manage process performance by developing strategies to close and eliminate any gaps in performance. (Establish documents and work instructions to be included in the QMS including procedures for document control.)
7. Continually review by performing **gap analysis** or audits and where appropriate improve the processes, ideally every 6 months.
8. Prepare a **quality manual** (if possible electronically) as the core of QMS documentation that describes the procedures, the interaction between processes and defines the scope of the QMS. Use test drivers for each process.

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| 9. Develop and implement a control system for the QMS documentation and maintain a comprehensive quality records system (electronically where possible). |
| 10. Assess the organization's readiness to adopt the ISO 9000 series of Quality Management Standard through a mock audit and if ready, seek certification. If not, refine processes and close any gaps. |

Activity 4

This activity identified/formed the core project team and appointed a Quality Manager. The appointment of a Quality Manager was at senior level and ensured this individual possessed an understanding, appreciation and most important of all, a desire to be involved in delivering the QMS. The Quality Manager led the core QM Implementation Team who worked directly with the Consultant and possessed the following required skills:

- Project management skills
- Enough authority for effective follow-up throughout the organization
- Competent word processing & spreadsheet skills
- Competent intranet skills (for web-based documentation system)
- Ability to set aside 4-hour blocks of time to work on the project
- Initiative
- Technical writing ability
- Facilitation skills to gather information from individuals and groups of people

STEP 5 – National Ownership was secured STEP 6 – Both national and external support was provided.
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Activity 5

Introductory training for all staff of the sections involved in the QMS was provided. The focus of this training was to "demystify" the ISO 9001:2008 Quality Management Standard for the staff and assist in the overall acceptance and adoption of the QMS by the TMA staff. The eight principles of Quality Management and their practical application in the workplace were covered during the training. Hence the acceptance and adoption of the QM approach was secured with local staff "buy-in". This step was carried out by the consultant together with a WMO Secretariat representative as an overseer to ensure a smooth transition to certification. The following are the eight principles of QMS:

- Leadership;
- Process approach;
- Involvement of people;
- Systems approach to management;
- Customer focus;
- Factual approach to decision-making;
- Continual improvement;
- Mutually beneficial supplier relationship.

National Ownership & National Budgetary Support

It was important to secure the commitment of management and the Chief Executive Officer, the Director of TMA and Permanent Representative of Tanzania with WMO to the project and ensure that a national budget was provided for it. In addition to external assistance, national budgetary support by TMA is important and demonstrates national ownership critical to the sustainability of the programme. TMA allocated funds to support the QMS maintenance and improvement for a reasonable length of time beyond certification. These included the provision of final implementation assistance and a mock verification audit by the Consultant to determine readiness for certification.

STEP 7 - The comprehensive plan was implemented with appropriate oversight established by the appointment of a Quality Manager to lead the Implementation Team.

Activity 6

This activity implemented the QMS and managed process performance by developing strategies to close and eliminate any identified gaps. All four areas of capacity were covered including human, institution, infrastructure and process. Flow charts for the different processes were developed and included examples such as METAR and SPECI observations, TAF, calibration of instruments, purchasing, corrective and preventive action, nonconforming weather data processes, internal audit processes, control of measuring equipment processes, airport forecasting and briefing processes, central forecasting office, communication, human resource (professional competence) as well as document and record control processes.

Documents and work instructions that need to be included in the QMS were established and documented including procedures for control of infrastructure related activities. Templates for master list of calibrated instruments, management review meetings, evaluation of the effectiveness of the Quality Management System, master list of records and standards were also developed. Most of the procedures were viewed to be similar in most NMHSs and therefore can be used with slight adjustments to accommodate the identified differences e.g. automation, type of instruments, frequency of observations, type of office etc.

STEP 8 - Reviews and evaluations were conducted iteratively and the process was used for continuous improvement.

Activity 7

This activity involved the setting up of evaluation procedures with continuous review and process improvement. It was desirable to review the process via internal audit after a period of 6 months from the introduction of the QMS to identify shortfalls in the processes that were not adequately addressed. Identified gaps/shortfalls were assigned as tasks with timelines to members of the Core QM Implementation Team. The selection of the audit team was carefully completed and ensured no one audited their own work. The following attributes were used as criteria for the audit team:

- Ethical yet Open-Minded;
- Diplomatic;
- Perceptive and Versatile;
- Tenacious;
- Observant and Decisive;
- Self-reliant.

Activity 8

This activity developed the QMS documentation and ensured the documentation reflected the functions of TMA aviation services. Test drivers for the different processes were identified and assigned the task of ensuring that the documentation really reflected what the process does inline with the organization and user requirement. This was found to be most effective when the processes were test driven by different individuals at different situations and stations.

Activity 9

A quality manual was prepared that documented the procedures developed and described the interaction between processes while defining the scope of the QMS. Typical elements of a Quality manual were outlined.

Activity 10

A Document Control System for the QMS was developed for all the processes and documented. For the TMA case, it involved the introduction of observation operations log books, adding a remarks line in the METAR forms to accommodate amendments, sign-off forms for participants in daily weather conferences,

sign-off forms for crew who receive verbal briefing, putting control features onto daily trend type graphs for Temperature and Pressure, etc.

Activity 11

This activity ensured the maintenance of a comprehensive quality records system as well as conducted an internal audit to determine TMA's readiness to adopt the ISO 9001: 2008 Quality Management Standard by a mock audit and, seek certification. Audit results were used as feedback to refine the processes, close the gaps and act as initiators of reviews. User feedback was also sought using short questionnaires.

Outcomes of the internal audit

The audit identified non-conformities in numerous tables, records and work instructions that were found at the Observing stations and Central Forecasting Office. These documents were not controlled and hence did not have a defined retention time.

Corrective measures

A list of new open issues with new deadlines and responsible officers was drawn. Corrective Action Requests (CARs) were filed and the scope of the QMS was re-defined to include only those stations offering briefing services.

CERTIFICATION

The Tanzania Meteorological Agency received quotations from three registration bodies. During the last visit June 2009, a Management Review Meeting reinforced administration commitment and helped set the date for registration as from 30 October 2009. This was expected to sustain the current momentum that is absolutely necessary for a successful implementation of the QMS.

TMA had already calibrated thermometers and digital barometers operating in all seven stations. It was not immediately known where to calibrate anemometers and this was feared to have a serious impact on the project timing. The Consultant had advised TMA to have prior discussion with the registrar to agree on the calibration of only the three most sensitive and safety related instruments to aviation i.e. thermometers, barometers and wind measuring instruments (anemometers). The nearest WMO Regional Instruments Centres (RICs) in Nairobi, Kenya and Gaborone, Botswana were both not fully operational at the time of the project. Neighbouring countries wishing to implement QMS in the near future were likely to face a similar problem.

An internal audit performed before engaging the Registrar showed a number of issues that necessitated another final visit by the MSN Consultant to clear. CerTech Registration Inc, Canada won the tender for certification of ISO 9001:2008 for TMA. It was planned by TMA to include these costs in the next review process of their cost recovery with their counterparts, the Tanzania Civil Aviation Authority (TCAA) and Tanzania Airports Authority (TAA), the international air navigation service providers.

THE WAY FORWARD AND FUNDING OPTIONS

Costs for training that were by the terms of the Contract payable by WMO totaled Can. \$ 47,400. Travel, visa and subsistence costs payable by TMA were Can. \$ 11,000, making the total project cost (excluding TMA and WMO staff costs!) Can \$ 58,400. The completion of this Pilot Project is expected to provide documentation that Developing Countries, Least Developed Countries and Small Island Developing States can use in their pursuit to implement QMS. When making the best use of the pilot projects results, documentation and templates, costs could probably be reduced to about Can \$ 40,000 (equivalent to €24,225) per country (excluding registration) depending on the travel costs. The costs compare very well with those incurred by Latvia, Hungary and Denmark. By countries grouping together, the costs can be lowered further. Resource mobilization from donor agencies and partners for regional implementation is

another option. Cost recovery to enable Members fund sustainable implementation is also another source.

The last meeting of the CAeM Expert Team on Customer Relations (ET-CR) held in July 2009 in Austria agreed on the need for the development of regionalized implementation plans for Members. The Rapporteurs on Regional Aspects of the Aeronautical Meteorology Programme were assigned tasks of developing the Action Plans for their respective Regions in coordination with the WMO Secretariat. Mobilization of resources where feasible, would be done to speed up implementation.

RECCOMENDATION

As Members prepare to implement QMS, it was emphasized that the initial steps of the CEOs (PRs) committing themselves to the Project in writing, appointment of the Core QMS Implementation Teams and the Quality managers did not immediately require external funding and could be done.

This is a best practice example that could be replicated in other NMHSs in the quest to implement QMS in aviation services and meet ICAO competency standards by 2013.

Source: WMO website. www.wmo.int