

International Civil Aviation Organization**ICAO****INFORMATION PAPER****Asia and Pacific (APAC)
Thirteenth Meeting of the Meteorological Services
Working Group (MET/S WG/13)**

Bangkok, Thailand, 29 to 31 March 2023

Agenda Item 4: Quality management of meteorological services**QUALITY MANAGEMENT SYSTEM FOR AVIATION WEATHER SERVICES
IN HONG KONG, CHINA**

(Presented by Hong Kong, China)

SUMMARY

This paper intends to share Hong Kong Observatory's (HKO) experience in obtaining ISO 9000 certification for the implementation of a quality management system (QMS) for the Airport Meteorological Office (AMO) in 2002, and its subsequent improvements with regard to changing regulatory requirements and user expectations over the past two decades.

1. INTRODUCTION

1.1 Subsequent to the adoption of Amendment 72 to ICAO Annex 3 in which new recommendations on the establishment and implementation of a QMS in conformity with the ISO 9000 series of standards and certified by an approved organization were introduced, the HKO as the designated meteorological authority of Hong Kong, China implemented a QMS for its aviation weather service in support of international air navigation and the system was certified to ISO 9001:2000 in late 2002. Throughout the past twenty years, the AMO QMS had undergone two transitions in response to the adoption of ISO 9001:2008 and ISO 9001:2015, as well as implemented enhancements in response to ICAO's implementation of the Universal Safety Oversight Audit Programme (USOAP) and the Hong Kong Aviation Safety Programme. The following section outlines major milestones and enhancements made to the AMO QMS so far.

2. DISCUSSIONObtaining the first ISO 9000 certification

2.1 Prior to the implementation process, the HKO has already in place documented operational procedures on weather observation and forecasting, quality procedures in format and consistency checking and in message logging, as well as quality assurance measures such as regular customer satisfaction survey, customer liaison meetings, internal meetings on process improvement and day-to-day verification of weather forecasts for international air navigation.

2.2 The quality policy and objectives for the provision of aviation weather service were formulated and established taking into account of the recommendations from an ISO 9000 quality management consultancy service. ISO 9000 awareness training was provided to all relevant staff. This was followed by the appointment of management representatives within the HKO to lead the quality system implementation and certification activities.

2.3 Quality documentation of HKO AMO consists of four layers: quality policy and objectives; quality manual and quality system procedures; operational manuals and procedures; and record-keeping. In drawing up the quality documentation, the HKO made extensive use of ICAO and World Meteorological Organization (WMO) regulatory and guidance materials such as ICAO Annex 3 and WMO No. 8 - Guide to Meteorological Instrumentation and Methods of Observation. Training was provided in advance to prepare prospective auditors within the HKO for conducting the internal audits

2.4 The implementation of AMO QMS for aviation weather services included data and product quality assurance and control processes. Iterative activities were implemented following the Plan-Do-Check-Act (PDCA) cycle to achieve continuous improvements. In particular, activities to collect feedbacks (including customer satisfaction surveys, meetings with different aviation stakeholders like airlines, pilots, air traffic control personnel, airport authority management, and internal review meetings), as well as regular internal audits to confirm all processes were performing satisfactorily, were formally integrated into AMO's operation.

2.5 Once the AMO QMS was established and running smoothly, an accredited certification body was appointed to provide the certification audit service. The auditing process proceeded smoothly and the award of certificate took place in November 2002.

Transition to new versions of ISO standard (ISO 9001:2008 and ISO 9001:2015)

2.6 Since the implementation of AMO QMS, two revisions to the ISO 9000 standard had been published. The update for ISO 9001:2000 to ISO 9001:2008 involves the provision of clarification, addition of notes, and minor tweaks to the requirements, but no major changes in philosophy or requirements. There were only minor changes to the AMO QMS, and staff was provided with the necessary transition training. After a re-certification audit, the AMO QMS received ISO 9001:2008 certification in 2009.

2.7 ISO 9001:2015, on the other hand, adopts a new, uniform documentation structure that has become common to all ISO management standards. It introduces several modifications to the previous revision, as well as some completely new requirements. The most important of the new requirements is the focus on risk management. In view of the need to make significant changes to the AMO QMS, a campaign was launched covering:

- (i) The provision of transition training to all staff involved, especially the internal auditors who will be auditing the AMO QMS using the new standard;
- (ii) Modification of the AMO QMS. New terms were added in the quality manual of HKO AMO in accordance with changes in clauses of ISO 9001:2015 standard. These allowed a wider coverage of quality objectives, more emphasis on risks and opportunities and more attention to organisational knowledge. The working environment that also includes psychological and social aspects in addition to physical environment was taken into consideration to allow the achievement of product conformity.
- (iii) Engagement of an external consultant auditor to perform a pre-recertification audit to assess the conformity of the changes to AMO QMS against the new standard.

2.8 The revised HKO AMO received ISO 9001:2015 certification in 2017 after a re-certification audit.

Strengthening the role as meteorological authority

2.9 The Objective of the ICAO Universal Safety Oversight Audit Programme (USOAP) is to promote global aviation safety through auditing Contracting States, on a regular basis, to determine States' capability for safety oversight by assessing the effective implementation of the critical elements of a safety oversight system and the status of States' implementation of safety-relevant ICAO Standards and Recommended Practices (SARPs), associated procedures, guidance material and safety-related practices. To strengthen the role as the meteorological authority of Hong Kong, China, a meteorological (MET) Inspectorate was established in 2008 within the HKO to conduct safety oversight functions as per the SARPs of Annex 3. Close coordination between HKO MET Inspectorate and Hong Kong Civil Aviation Department (CAD) Strategic Safety Office who is responsible for safety oversight on Annexes 1, 2, 4, 5, 11, 12 and 15 is maintained to review safety oversight matters.

2.10 While the MET Inspectorate is an entity independent from the provision of aviation weather services, the integration of its quality management procedures with the AMO QMS allows better sharing of resources, as well as providing a more comprehensive view of the performance of AMO as a whole.

Further improvements through managing aviation safety risk

2.11 A Safety Management System (SMS) is a systematic approach to managing safety, including the necessary organizational structure, accountability, responsibilities, policies and procedures. Although there is no requirement under ICAO Annex 3 for the establishment of SMS for aviation weather services on top of the safety oversight functions described in the preceding paragraphs, considering that certain AMO products and services are provided in support of international air navigation and their accuracy and availability will have safety implication to the users, the ICAO safety management framework¹ has been adopted in risk management at the operational level. A SMS was established in 2017 covering the products and services provided by AMO to proactively mitigate safety risks, as well as to effectively manage activities, safety performance and resources, while gaining a greater understanding of their contribution to aviation safety. Similar to the MET Inspectorate, quality management of the AMO SMS has also been integrated into AMO QMS for more effective operation of the system.

Useful guidance for implementing QMS for MET services

2.12 In 2017, WMO published a major revision to [WMO No. 1100 – Guide to the Implementation of Quality Management Systems for National Meteorological and Hydrological Services and Other Relevant Service Providers](#). This document provides comprehensive guidance on how to develop and implement a QMS, detailing the steps required to obtain certification of compliance with ISO 9001:2015. ICAO has also published Doc 9839 – *Manual on the Quality Management System for Aeronautical Information Services* in 2022, providing specific information on QMS of aviation stakeholders, like the relationship between quality and safety management systems. Both documents are valuable information sources to the establishment and continual improvement of QMS.

3. ACTION BY THE MEETING

3.1 Note the information contained in this paper.

¹ See ICAO Annex 19 – Safety Management and ICAO Doc. 9859 – Safety Management Manual

APPENDIX A – Current HKO AMO ISO 9001:2015 certificate

BUREAU VERITAS
 Certification



**HONG KONG OBSERVATORY AIRPORT
METEOROLOGICAL OFFICE**

1 CONTROL TOWER ROAD, HONG KONG INTERNATIONAL AIRPORT, HONG KONG

Bureau Veritas Certification Holding SAS - UK Branch certifies that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standards detailed below

ISO 9001:2015

Scope of certification

PROVISION OF AVIATION WEATHER SERVICES FOR INTERNATIONAL AIR NAVIGATION

Original cycle start date:	07-NOV-2008
Expiry date of previous cycle:	06-NOV-2020
Certification / Recertification audit date:	28-SEP-2020
Certification / Recertification cycle start date:	17-NOV-2020

Subject to the continued satisfactory operation of the organisation's Management System, this certificate expires on: **06-NOV-2023**

Certificate No. : 196364-U	Version: No. 1 , Revision date: 17-NOV-2020
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 Signed on behalf of BVCH SAS UK Branch


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Certification body address: 5th Floor, 66 Prescott Street, London E1 8HG, United Kingdom
 Local office address: Rm. 23-25, 10/F, Pacific Trade Centre, 2 Kai Hing Road, Kowloon Bay, KLN, H.K.

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organisation.
 To check this certificate validity please call: (+852-2815 2092)

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