

COMMISSION FOR HYDROLOGY

THE IMPORTANCE OF STANDARDS IN NHS OPERATIONS¹

Purpose:

To provide Members of CHy a rationale for using standard procedures in National Hydrological Service operations, and to encourage the expanded use of such procedures and practices in accordance with WMO guidelines and recommendations.

For the development of a Quality Management System (QMS), standard procedures are an important second step. A previous step is the definition of what shall be done. This definition is included in the so called WMO standards², which are approved as a rule by Congress. WMO standards are included in the various volumes of publication No.49 (available on the Web), including [Volume III – Hydrology](#) published in 2006.

Background:

At the Fourteenth World Meteorological Congress in May 2003, Congress adopted [Resolution 27 \(Cg-XIV\)](#) and decided that WMO should work toward a Quality Management Framework (WMO-QMF) for NMHS's that would include the following elements to be addressed on a phased basis: (1) WMO technical standards; (2) quality management systems including quality control; and (3) certification procedures. In the years that followed, WMO has made significant progress toward achieving these elements, culminating with the forthcoming release of its *Practical Guide for the Implementation of a Quality Management System for National Meteorological and Hydrological Services*.

CHy-XIII, in 2008, supported this process by adopting a Quality Management Framework – Hydrology to provide an overall strategy, advice, guidance and tools for National Hydrological Services (NHSs) to attain efficiency, quality and effectiveness in their functioning; and to encourage NHSs to design and implement quality management systems based on the WMO Quality Management Framework. CHy also requested that the Advisory Working Group prepare and publish guidelines for implementing a Quality Management System (QMS) in NHSs.

A draft of those guidelines was made available for comment on the CHy e-Board and was subsequently revised to reflect comments received. The finalized document is entitled

¹ This document was made available on the CHy e-forum in advance of the 14th Session of the Commission for Hydrology held in Geneva, Switzerland, from 6-14 November, 2012. The original manuscript was prepared by Dr. Harry Lins on 13 June 2012 and was slightly revised in August 2013 by Dr. Paul Pilon and approved in its current form by Dr. Harry Lins, President CHy.

² The following is taken from Technical Regulations, Basic Documents No. 2, Volume IV – Quality Management, 2011 edition (WMO-No. 49). '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.'

[Guidelines for Implementing a Quality Management System in Hydrology](#). This guidelines document should be viewed as a companion document to *The Importance of Standards in NHS Operations*, with the latter highlighting conduct of NHS operations. Thus, it attempts to provide an answer to the question of why an NHS should use standard practices and adopt quality management procedures and practices.

As is noted in the [Guide to Hydrological Practices](#) (Volume II, Sixth Edition, 2009), defined standard procedures are an essential basis for ensuring the quality of a Hydrological Service's products and services. Increasingly, cooperators and clients require knowledge of the standards used by the Service as well as some indication of how well the Service is achieving those standards.

In many instances, clients require this information to demonstrate to their own users or regulatory agencies that they are achieving a required level of performance. Moreover, standards are not only needed for technical activities related to hydrometric data collection and data delivery, but also for all other activities undertaken within the Service, such as interpretive reports, finances, staff performance, and long-term planning.

Although the costs of implementing and utilizing standard procedures are commonly perceived to be high, the cost of having no standards may well be higher. A Service may discover that observations it had made over several years were in error because of an unrecognized fault in an instrument, or that a flow record required complete reprocessing because a weir was incorrectly rated. Fixing such problems will invariably force the Service to incur more direct costs than it would have done had standard procedures been implemented and utilized. No less important, however, are the potential indirect costs of being perceived by the user community as a Service that doesn't always provide reliable data or services.

The Benefits of Standard Procedures:

Surveys of managers and employees in business, government, and nongovernmental organizations have documented the value of using standard procedures and quality management to their operational efficiency and productivity. From an internal perspective, most assessments have noted that standards and quality management principles improve management efficiency, planning, problem-solving, communications, the ability to adapt and change, discipline, staff morale, and employee training, while simultaneously reducing redundancy, waste, costs, and staff turnover. Externally, these assessments have documented improvements in product and service quality, customer satisfaction, repeat sales and/or contracts, company image, and marketability, while also reducing complaints.

National Hydrological Services have utilized quality management principles for many decades. Although historically referred to by terms such as standard procedures, standard operating procedures, quality assurance, quality control, and QA and QC (quality assurance and quality control), the practices associated with these terms are the same as those encompassed within the more modern quality management system. Some NHSs employ the ISO 9000 Quality

Management Standard series, which has very rigorous certification standards. ISO certification represents the "gold standard" in terms of demonstrating that an organization is operating at the highest levels of quality in all technical and administrative aspects. However, many NHSs employ a broad array of standards and quality management practices, some of which exceed ISO standards, while not formally seeking ISO certification.

The decision to pursue certification or not is less important for a Service than deciding to employ quality management principles. Although there are numerous reasons for this, four of the more important are described below.

1. Better management and a more effective organization

The concept of "better management" encompasses a strong commitment to achieving increasing benefits and productivity by linking the cost of higher quality products and services to the level of users' satisfaction. It also includes an explicit approach to solving organizational problems that 1) defines clear responsibilities and lines of authority; 2) follows transparent rules that are applicable to every employee; and 3) strives to continuously improve as an intrinsic component of day-to-day leadership. Better management promotes a philosophy of measurement, calibration, and accountability at all times, not just when it seems to be required or when a crisis occurs. However, when a risk of non-quality arises, costs are necessarily reduced because of such an institutional philosophy.

Both managers and workers feel more secure in their positions because responsibilities are clear. From an organizational perspective, a QMS is an excellent tool for reducing redundancy, maintaining requisite expertise, and reducing training costs when staff changes. It also defines the chain of command during changes in management.

2. Employee satisfaction and commitment to the organization

A well-implemented QMS results not only in more satisfaction among management, but also among all employees. With a QMS in place, employees have a tool to demonstrate their level of job performance. They also know to whom and where to give direct feedback on existing and new methods and procedures based on their own experience. They will also acquire a clearer understanding of user needs, particularly in terms of service delivery expectations and quality, and how they are meeting user needs.

3. Improving the quality of products and services.

A core aspect of quality management is the delivery of products and services that are as close as possible to the users' requirements (specifications). This necessarily involves a continuous search for non-conformance in product and service specification, and the tracking of sources of such non-conformance. It implies considerable control of operational processes at all supervisory levels to ensure that instruments are regularly and properly calibrated and maintained, that field procedures are carefully selected and followed, that data are properly

recorded and quality assured, and that improved methods of reporting data and information are evaluated and utilized. The more comprehensive the system of quality management, and the more understood it is among all employees, the more successful it will be in detecting errors, managing their correction, and avoiding their recurrence. Moreover, it will significantly enhance the confidence that clients and co-operators have in the quality of the NHS's products and services.

4. Improving customer satisfaction

A QMS provides an important framework for demonstrating the value an NHS places on its user community, and on their needs and concerns. It generally will lead to a better definition of user requirements (specifications) as well as a standard process for handling complaints. It also provides a convenient reference tool for clients and partners to utilize when issues arise regarding data and information specifications, organizational responsibilities, and the redressing of claims.