CANADIAN STANDARDS ASSOCIATION

PLUS 4010

TECHNICAL GUIDE

Performance improvement for small & medium sized water utilities

CSA gratefully acknowledges the financial contributions of the following organizations towards the development of this publication:

- *AECOM (Canada) Ltd and the National Water and Wastewater Benchmarking Initiative*
- *Atlantic Canada Water and Wastewater Association*
- *British Columbia Water and Wastewater Association*
- *Canadian Water and Wastewater Association*
- *City of Calgary*
- *EPCOR Water Services Inc.*
- *Halifax Water*
- *Infrastructure Canada*
- *Ontario Clean Water Agency*
- *Ontario Municipal Water Association*
- *Ontario Water Works Association*
- *Niagara Region*
- *Regional Municipality of Durham*
- *Regional Municipality of Waterloo*
- *Water Environment Association of Ontario*
- *Western Canada Water and Wastewater Association*

CSA Special Publication

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Published in December 2009 by Canadian Standards Association
A not-for-profit private sector organization
5060 Spectrum Way, Suite 100, Mississauga, Ontario, Canada L4W 5N6
1-800-463-6727 • 416-747-4044

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ISBN 978-1-55491-211-7
Technical Editor: *Jeffrey Kraegel*

Foreword

This Technical Guide provides drinking water and wastewater utility owners and operators with practical tools to improve their utility's performance. By setting objectives, and then using "performance indicators" to measure progress towards those objectives, water utilities (i.e., both drinking water and wastewater) can become more efficient and effective in their operations.

The approach used in this Guide is based on the work of Canadian and international experts. In 2007 the International Organization for Standardization (ISO) published a series of three standards that were developed by its Technical Committee 224 *Service activities relating to drinking water supply systems and wastewater systems — Quality criteria of the service and performance indicators.* These have been adopted by the Canadian Standards Association through its Technical Committee on Water Quality Management Systems, and have been submitted to the Standards Council of Canada for recognition as National Standards.

The series consists of the following Standards:

- *Activities relating to drinking water and wastewater services — Guidelines for the assessment and for the improvement of the service to users* (adopted in Canada as CAN/CSA-Z24510)
- *Activities relating to drinking water and wastewater services — Guidelines for the management of wastewater utilities and for the assessment of wastewater services* (adopted in Canada as CAN/CSA-Z24511)
- *Activities relating to drinking water and wastewater services — Guidelines for the management of drinking water utilities and for the assessment of drinking water services* (adopted in Canada as CAN/CSA-Z24512)

The first of these standards provides general information on customer service and the principles behind the use of performance indicators. The other two standards show how to apply these principles to wastewater treatment and to the provision of safe, clean drinking water.

These standards are now starting to be implemented throughout the world. They represent a new and significant advancement in using performance indicators measured over time to assess and improve the performance of water service and systems. The CSA Technical Committee on Water Quality Management Systems adopted these standards for Canada in order to ensure that Canadian utilities have access to current information on the assessment and improvement of their systems, and that this information is in line with best practices as developed and used in the international community.

This Guide was written with the needs of small and medium-sized water utilities in mind, but the principles and activities outlined here can be applied to utilities of any size. The number of performance indicators used should be proportionate to the size of the facility. A utility that serves a very small community might start with three to five indicators, while a utility in a major city could use as many as 50.

Although this Guide is primarily based on the ISO standards, it also draws on information from the following sources

- National Water And Wastewater Benchmarking Initiative (NWWBI);
- Canadian Water and Wastewater Association (CWWA);
- Ontario Municipal Benchmarking Initiative (OMBI);
- Ontario Ministry of the Environment (MOE);
- *The Report of the Walkerton Inquiry*;
- Indian and Northern Affairs Canada (INAC);
- Statistics Canada (StatCan);
- Environment Canada (EC); and
- Interviews with experts in the field.

Note: *For more information see "Bibliography", p. 34.*

The CSA Technical Committee on Water Quality Management Systems gratefully acknowledges the financial support of Infrastructure Canada, the Canadian Water and Wastewater Association, and the other organizations listed inside the front cover in the development of this document. The Committee thanks Daniel Pelletier for preparing the first draft of this guide, and it also recognizes the important contribution of the Canadian Advisory Committee to ISO Technical Committee 224 towards the ISO standards, under the leadership of Mr. Duncan Ellison and with the support of the Standards Council of Canada.

CSA is a not-for-profit membership-based association serving industry, government and consumers. It has been a leader in standards development since 1919. Accredited by the Standards Council of Canada, CSA has published over 2000 standards for safety, design or performance of a wide range of products and services. Members are the heart of the CSA process for the development of standards. They come from all walks of life and include scientists, academics, environmentalists and technicians. They represent government, industry, labour and consumers. All of the CSA standards are the result of the knowledge and expertise shared by these members.

Acronyms used in this Technical Guide

INAC — Indian and Northern Affairs Canada

IWA — International Water Association

ISO — International Organization for Standardization

NWWBI — National Water and Wastewater Benchmarking Initiative

OMBI — Ontario Municipal Benchmarking Initiative

PDCA — Plan/Do/Check/Act

PI — Performance Indicator

WQMS — water quality management systems

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1 INTRODUCTION

About this Technical Guide

Utility owners and operators strive for continuous improvement of their water systems and the development of their staff. This ensures that they are able to meet and exceed users' needs, are cost efficient and effective in the use of resources to ensure sustainability, and are meeting the applicable environmental and health regulations.

Three international standards have been developed to guide utilities in setting and meeting objectives towards improving their operations. These are being adopted as National Standards of Canada in 2009:

- CAN/CSA-Z24510, *Activities relating to drinking water and wastewater services — Guidelines for the assessment and for the improvement of the service to users*
- CAN/CSA-Z24511, *Activities relating to drinking water and wastewater services — Guidelines for the management of wastewater utilities and for the assessment of wastewater services*
- CAN/CSA-Z24512, *Activities relating to drinking water and wastewater services — Guidelines for the management of drinking water utilities and for the assessment of drinking water services*

This Technical Guide was developed to assist utility owners and operators in the use of the CAN/CSA-ISO standards. It offers a consistent and standardized means of continuously improving their utility's effectiveness using performance indicators. As stated by well-known management guru, Peter Drucker, "you cannot improve what you do not measure."

This Guide also builds on existing quality standards published by ISO and CSA that incorporate the fundamental principle of "plan-do-check-act" (PDCA) as shown in the following diagram. The methodology is consistent with and supportive of ISO's management system standards. Implementing an overall ISO 9001 and 14001 management system can help a utility implement the CAN/CSA-Z24510, Z24511 and Z24512 standards. At the same time, these standards may help to achieve the technical requirements of CAN/CSA-ISO 9001 and 14001 for organizations choosing to implement them.