



**American Water Works
Association**

Dedicated to the World's Most Important Resource®

ANSI/AWWA G410-18
(Revision of ANSI/AWWA G410-09)

AWWA Standard

Business Practices for Operation and Management

Effective date: Jan. 1, 2019.

First edition approved by AWWA Board of Directors Jan. 25, 2009.

This edition approved June 9, 2018.

Approved by American National Standards Institute Oct. 5, 2018.



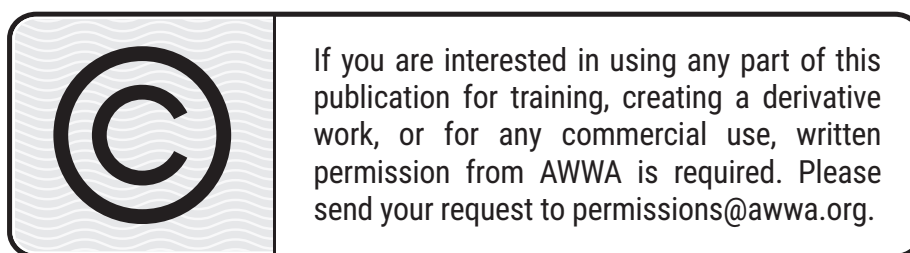
AWWA Standard

This document is an American Water Works Association (AWWA) standard. It is not a specification. AWWA standards describe minimum requirements and do not contain all of the engineering and administrative information normally contained in specifications. The AWWA standards usually contain options that must be evaluated by the user of the standard. Until each optional feature is specified by the user, the product or service is not fully defined. AWWA publication of a standard does not constitute endorsement of any product or product type, nor does AWWA test, certify, or approve any product. The use of AWWA standards is entirely voluntary. This standard does not supersede or take precedence over or displace any applicable law, regulation, or codes of any governmental authority. AWWA standards are intended to represent a consensus of the water industry that the product described will provide satisfactory service. When AWWA revises or withdraws this standard, an official notice of action will be placed in the Official Notice section of *Journal AWWA*. The action becomes effective on the first day of the month following the month of *Journal AWWA* publication of the official notice.

American National Standard

An American National Standard implies a consensus of those substantially concerned with its scope and provisions. An American National Standard is intended as a guide to aid the manufacturer, the consumer, and the general public. The existence of an American National Standard does not in any respect preclude anyone, whether that person has approved the standard or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standard. American National Standards are subject to periodic review, and users are cautioned to obtain the latest editions. Producers of goods made in conformity with an American National Standard are encouraged to state on their own responsibility in advertising and promotional materials or on tags or labels that the goods are produced in conformity with particular American National Standards.

CAUTION NOTICE: The American National Standards Institute (ANSI) approval date on the front cover of this standard indicates completion of the ANSI approval process. This American National Standard may be revised or withdrawn at any time. ANSI procedures require that action be taken to reaffirm, revise, or withdraw this standard no later than five years from the date of ANSI approval. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036; (212) 642-4900, or e-mailing info@ansi.org.



ISBN-13, print: 978-1-62576-323-5

eISBN-13, electronic: 978-1-61300-497-5

DOI: <http://dx.doi.org/10.12999/AWWA.G410.18>

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including scanning, recording, or any information or retrieval system. Reproduction and commercial use of this material is prohibited, except with written permission from the publisher.

Copyright © 2018 by American Water Works Association
Printed in USA

Committee Personnel

The AWWA Standards Committee on Business Practices for Operation and Management, which reviewed and approved this standard, had the following personnel at the time of approval:

Dwayne Schwartz, *Chair*

General Interest Members

S.M. Passarelli, * Standards Engineer Liaison, AWWA, Denver, Colo.

M.W. Grimm, Cadmus Group, Happy Valley, Ore.

C. Ly, Independent Consultant, Hacienda Heights, Calif.

A. Ramamurthy, Hazen and Sawyer, Virginia Beach, Va.

E.M. Rebitch, New Age Enterprise, Delmont, Pa.

A.M. Sanchez Virnoche, FCS Group, Redmond, Wash.

R. van Buskirk, City of Rancho Cordova, Rancho Cordova, Calif.

Producer Member

R.W. Mundy, McWane Ductile Iron, Lexington, Ky.

User Members

J.J. Diaz, Startex Jackson Wellford & Duncan, Lyman, S.C.

H.C. Duffie, Mount Pleasant Waterworks, Mount Pleasant, S.C.

J.M. Hoyenga, * Standards Council Liaison, Eugene Water and Electric Board,
Eugene, Ore.

M. Klein, Carolina Water Service, Inc. of North Carolina, Charlotte, N.C.

D.S. Schwartz, City of Waynesboro, Waynesboro, Va.

C. Wachs, Montgomery Water Works & Sanitary Sewer Board, Montgomery, Ala.

J. Walsh, Arizona Water Company, Phoenix, Ariz.

K.B. Waterhouse, Connecticut Water Co., East Windsor, Conn.

* Liaison, nonvoting

This page intentionally blank.



Contents

All AWWA standards follow the general format indicated subsequently. Some variations from this format may be found in a particular standard.

SEC.	PAGE	SEC.	PAGE
Foreword		3	Definitions 3
I	Introduction..... vii	4	Requirements
I.A	Background..... vii	4.1	Strategic Planning 5
I.B	History..... viii	4.2	Capital Improvement Program 7
I.C	Acceptance viii	4.3	Continuous Improvement 10
II	Special Issues. viii	4.4	Engineering..... 12
II.A	Advisory Information on Application of Standards viii	4.5	Finance/Fiscal Management 16
III	Use of This Standard viii	4.6	Governance 22
III.A	Purchaser Options and Alternatives viii	4.7	Health and Safety 25
III.B	Modification to Standard..... viii	4.8	Human Resources 27
IV	Major Revisions..... viii	4.9	Information Management 29
V	Comments ix	4.10	Organizational Development..... 32
		4.11	Plant and Property Management 35
		4.12	Procurement..... 37
		4.13	Risk Management 40
		4.14	Asset Management 42
Standard		5	Verification
1	General	5.1	Documentation Required..... 48
1.1	Scope..... 1	5.2	Human Resources 49
1.2	Purpose 1	6	Delivery 49
1.3	Application..... 2		
2	References 2		

This page intentionally blank.

Foreword

This foreword is for information only and is not a part of ANSI/AWWA G410.*

I. Introduction.

I.A. *Background.* The AWWA Standards Program is designed to serve water, wastewater and reclaimed water utilities—hereafter, the water sector—their customers, owners, service providers, and government regulators. The standards developed under the program are generally intended to improve a utility’s overall operations and service. Among these standards is this effort to establish formal management and operations guidelines. These guidelines identify appropriate practices, procedures, and behaviors whose implementation will promote effective and efficient utility operations and contribute to protection of public health, public safety, and the environment.

AWWA’s standards process has been used for more than 90 years to produce American National Standards Institute (ANSI)—recognized standards for materials and processes that are used by the water sector. These standards are recognized worldwide and have been adopted by many utilities and organizations. Likewise, this performance standard is developed using the same ANSI-recognized formal process. Volunteer standards committees establish standard practices in a uniform and appropriate format.

Formal AWWA standards committees have been and continue to be formed to address the individual standard practices for the diverse range of water sector utilities. A formal standards committee was created in November 2006 to create this standard, Business Practices for Operation and Management.

AWWA has developed a series of utility management standards designed to cover the principal activities of water sector utilities. Some examples of the individual topics in this series include those for water treatment plant operation and management, distribution system operation and management, source water protection, emergency preparedness practices, security practices, communication and customer relations, business practices, water conservation program operation and management, reclaimed water operation and management as well as wastewater collection system operation and management and wastewater treatment plant operations and management. More topics will be added over time, including additional standards related to wastewater operations.

* American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036.

I.B. *History.* The first edition was approved by the AWWA Board of Directors on January 25, 2009. This second edition of G410 was approved on June 9, 2018.

I.C. *Acceptance.* There is no applicable information for this section.

II. Special Issues.

II.A. *Advisory Information on Application of Standards.* This standard is limited exclusively to and includes only those requirements for establishing effective operation and management business practices for water sector utilities. Separate standards adopted by the Standards Program cover development of a utility management system framework and other programs such as water treatment plant operation and management, distribution system operation and management, source water protection, security practices, emergency preparedness, and customer relations and communications.

III. Use of This Standard. It is the responsibility of the user of an AWWA standard to determine that the products and provisions described in that standard are suitable for and compatible with the user's intended application being considered.

III.A. *Purchaser Options and Alternatives.* The following information should be provided by the purchaser:

1. Industry standard used—that is, ANSI/AWWA G410, Business Practices for Operation and Management, of latest revision.
2. Details of federal, state, and local requirements.

III.B. *Modification to Standard.* No applicable information for this section.

IV. Major Revisions. Major revisions made to the standard in this edition include the following:

1. Updated requirements related to strategic plan in Section 4.1.2.1
2. Section 4.2 added references to AWWA standards J100—Risk and Resilience Management of Water and Wastewater Systems and G430—Security Practices for Operation and Management.
3. Section 4.2 added requirements for effective capital improvement program (CIP) project delivery, technologies for information management and process controls, and training.
4. Section 4.3 added references to continual improvement programs and requirements for practices, tools, and training.
5. Section 4.4 added engineering requirements for outsourcing, inspection, design data requirements, practices, and tools.

6. Section 4.5 added requirements related to financial accounting procedures, debt management metrics, rate-making methodologies and internal management controls.

7. Section 4.6 added governance requirements for corporate policies related to assets and data.

8. Section 4.8 added suggested training for succession planning.

9. Section 4.9 added requirements for outsourcing information systems, accountability for program execution, processes for ensuring performance, methods for alternatives, incorporating best management practices (BMPs), stakeholder involvement, and allocation of resources.

10. Addition of Section 4.14 on asset management including policies, procedures, strategies, organizational capacity and technology, and integration of practices.

V. Comments. If you have any comments or questions about this standard, please call AWWA Engineering and Technical Services at 303.794.7711, FAX at 303.795.7603, write to the department at 6666 West Quincy Avenue, Denver, CO 80235-3098, or e-mail at standards@awwa.org.

This page intentionally blank.





**American Water Works
Association**

Dedicated to the World's Most Important Resource®

ANSI/AWWA G410-18
(Revision of ANSI/AWWA G410-09)

AWWA Standard

Business Practices for Operation and Management

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes the critical elements of effective business practices for the operation and management of water, wastewater, and reclaimed water utilities (to be referred to as the water sector). It encompasses the major functions necessary to manage and sustain a successful utility.

Sec. 1.2 Purpose

The purpose of this standard is to establish criteria for how the water sector develops, measures the performance of, and improves the strategic planning, resource management, and support functions necessary to create and sustain a high-performing organization. This standard describes the framework that successful utilities should use in developing and improving the performance of these business practices, including the establishment of policies and performance standards, the creation of functions and practices, the development of organization capacity and technology, and integration of functions and practices with the larger organization and its strategies.

Sec. 1.3 Application

This standard can be referenced in the development and evaluation of the business practices described in Sec. 1.1. The stipulations of this standard apply when this document has been referenced and then only to the business practices described in Sec. 1.1.

SECTION 2: REFERENCES

This standard references the following documents. In their latest editions, they form a part of this standard to the extent specified within the standard. In any case of conflict, the requirements of this standard shall prevail.

- Americans with Disabilities Act/US Equal Employment Opportunity Commission.
- ANSI^{*}/AIHA/ASSE Z10-2012—Occupational Health and Safety Management Systems (OHSMS).
- ANSI/AWWA G420—Communication and Customer Relations.
- ANSI/AWWA G430—Security Practices for Operation and Management.
- ANSI/AWWA J100—Risk and Resilience Management of Water and Wastewater.
- AWWA Manual M1—*Principles of Water Rates, Fees, and Charges*.
- AWWA Manual M36—*Water Audits and Loss Control Programs*.
- Effective Utility Management (EUM)—A Primer for Water and Wastewater Utilities.
- Financial Management for Water Utilities—Principles of Finance, Accounting, and Management Controls.
- ISO[†] 55000:2014—Asset Management—Overview, Principles and Terminology.
- ISO 55001:2014—Asset Management—Management Systems—Requirements.
- ISO 55002:2014—Asset Management—Management Systems—Guidelines for the Application of ISO 55001.
- OSHA Voluntary Protection Program (VPP).

^{*} American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036.

[†] International Organization for Standardization, Customer Service Division, 545 Washington Boulevard, Jersey City, NJ 07310.

- Project Management Institute (PMI); Project Management Book of Knowledge (PMBOK).

SECTION 3: DEFINITIONS

The following definitions shall apply in this standard:

1. *Asset Management (AM)*: The systematic care, disposal, maintenance, and/or replacement of the total resources of a business, including cash, notes, accounts receivable, inventories, securities, machinery, fixtures, land, buildings (owned or leased), rights of way, easements, or any source of wealth having economic value to the business. AM allows the organization to make rational, prioritized decisions on whether to repair, rehabilitate, or replace an asset based on economic and risk-based factors.
2. *Budget*: An estimate of proposed expenditures for a given period or purpose and a statement of the means of financing them.
3. *Capital improvement program (CIP)*: A plan, updated or compiled regularly by most utilities, that identifies facility and major equipment requirements over an extended period, often 20 years or more. The CIP is often a part of, or stems from, a water system master plan that combines water demand projections with supply alternatives and facility requirements. It is different from a replacement program, which concentrates on smaller assets generally funded from current revenues or from funds established for replacement. The CIP, by contrast, focuses on larger expenditures funded through some combination of debt, capacity charge revenues, and current revenues.
4. *Consultant*: In this manual, the term consultant refers to a qualified professional or a firm hired by the owner to perform planning, design, management, construction observation and other services, or to give advice related to such issues.
5. *Life Cycle Cost Analysis (LCCA)*: An analytical tool for decision making that determines the most cost-effective option of technically valid alternatives for building, owning, rehabilitating, maintaining, or disposing of an asset.
6. *Management*: The person or persons charged with implementing policies established by the organization's oversight body for controlling and directing the affairs and operations of a water utility, business, or institution.
7. *Potable water*: Water that is safe and satisfactory for drinking and cooking.

8. *Public–Private Partnership:* A cooperative shared risk arrangement between multiple public and private parties, established specifically to provide, manage, or operate a public asset or service, in which remuneration is linked to performance.

9. *Purchaser:* The person, company, or organization that purchases any materials or work to be performed.

10. *Reclaimed Water:* Wastewater that becomes suitable for beneficial use as a result of treatment.

11. *Supplier:* The party that supplies material or services. A supplier may or may not be a manufacturer.

12. *Wastewater:* A combination of the liquid and water-carried waste from residences, commercial buildings, industrial plants, and institutions, together with any groundwater, surface water, and stormwater that may be present.

13. *Collaborative Project Delivery Framework:* Various methods of capital project delivery approaches that include Design-Bid-Build, Design-Build, Construction-Manager-at-Risk, Design-Build-Operate, Design-Build-Finance-Operate-Maintain, and Concession.

SECTION 4: REQUIREMENTS

This standard applies to water, wastewater, and reclaimed water utilities, regardless of size, location, ownership, or regulatory status—hereafter referred to as the water sector. The requirements are progressive and intended to guide the utility from the bottom up in developing and maintaining effective business practices to manage and sustain a successful utility.

This standard requires that the utility establish goals to disseminate and promote the exchange of information, ideas, and opinions with the audience identified. Additionally, goals should serve to build trust, service excellence, credibility, and respect for others. Clearly defined goals that are achievable and measurable can be monitored for reporting progress and used to describe what constitutes success for the plan.

The utility shall develop a strategy to optimize efforts, periodically review progress, and make revisions as needed to improve the plan, keeping it relevant to meet the needs of the utility's strategic plan.

Sec. 4.1 Strategic Planning

4.1.1 *Policies and performance standards.* To meet this standard, an organization must demonstrate that it has in place policies and performance standards for strategic planning as follows:

4.1.1.1 Mission development. The governing body of an organization shall clearly identify the mission of the organization, including how the organization measures successful mission accomplishment.

4.1.1.2 Policies for developing and updating the strategic plan. Policies and procedures for developing and updating the organization's strategic plan shall be identified.

4.1.1.3 Policies related to expectations of management. The policies related to strategic planning shall clearly communicate the expectation for management to implement necessary programs, services, and projects to accomplish the mission of the organization.

4.1.1.4 Policies related to strategic planning processes and performance measurement. An organization shall establish policies describing the process for developing the strategic plan, key participants, time frames for developing the plan, and methodology for establishing the plan objectives and their measurement and reporting.

4.1.2 *Functions and practices.* To meet this standard, an organization must demonstrate that it has in place functions and practices for strategic planning as follows:

4.1.2.1 Strategic plan development. An organization shall develop, and periodically update, a strategic plan that guides the delivery of the organization's core services, maintenance of and investment in infrastructure, hiring and development of employees, and customer service. The strategic plan shall describe the organization's mission, vision, and core values; key constituencies and their objectives; and key assumptions and environmental influences. The strategic plan shall identify long-term goals and measurable objectives, such as product quality, customer satisfaction, operational optimization, operational resiliency, infrastructure stability, employee and leadership development, financial viability, community sustainability, water resources adequacy, and stakeholder understanding and support as outlined in the Effective Utility Management (EUM) Primer, the AWWA Utility Benchmarking Program and other industry-accepted metrics. The strategic plan shall identify the strategies for achieving these objectives.

4.1.2.2 Strategic plan updates. An organization shall update the strategic plan on a regular basis, no more frequently than annually and no less frequently than every five years, depending on the rate of change in the industry, organization, or regulatory environment.

4.1.2.3 A CIP plan to support the strategic plan. An organization shall have in place a CIP plan that identifies the capital investments needed over a specific time frame as well as a financial plan that adequately funds the strategies, construction, operation, and maintenance of facilities and programs outlined in the strategic plan.

4.1.2.4 Annual reporting of strategic plan progress. Each year, an organization shall report progress toward accomplishing the goals and objectives of its strategic plan to its customers, governing body, employees, lenders/investors, and other key stakeholders.

4.1.3 *Organizational capacity and technology.* To meet this standard, an organization must demonstrate that it has in place the organizational capacity and technology for strategic planning as follows:

4.1.3.1 Staff capacity. An organization shall have in place the administrative and management personnel and staff (or contracted expertise) to conduct and monitor the strategic planning and implementation process.

4.1.3.2 Technology. An organization shall have access to enabling technologies commensurate with the level of complexity and needs of the organization.

4.1.4 *Integration of functions and practices.* To meet this standard, an organization must demonstrate integration of its functions and practices for strategic planning into the organization as follows:

4.1.4.1 Integration with performance management. An organization shall have management and employee performance goals, objectives, and action items linked to the organization's strategic plan. Annual performance appraisals shall reference achievement of the objectives of the strategic plan.

4.1.4.2 Integration with strategic and operational plans. An organization shall have mechanisms in place for the integration of the strategic plan into the departmental operational plan, budgets, work plans, goals, and objectives; operational plans, budgets, work plans, goals, and objectives must be consistent with and in furtherance of the strategic plan.

Sec. 4.2 Capital Improvement Program

4.2.1 *Policies and performance standards.* To meet this standard, an organization must demonstrate that it has in place policies and performance standards for its CIP as follows:

4.2.1.1 Capital improvement planning policies. To ensure acceptable performance of its infrastructure over the infrastructure's design life (including the ability to meet current and emerging regulatory requirements, population growth, and changing demand and usage), an organization shall have in place a policy of developing a multiyear CIP that specifies in detail the organization's plans for replacing, rehabilitating, and/or expanding its system infrastructure. Development of the CIP should also consider sustainability programs (e.g., Envision) and resiliency programs based on other AWWA standards such as AWWA J100, Risk and Resilience Management of Water and Wastewater Systems and AWWA/ANSI G430-14, Security Practices for Operation and Management. Consider also potential implications of water loss as outlined in AWWA Manual M36, *Water Audits and Loss Control Programs*.

4.2.1.2 Policies for using consultants. An organization shall have in place a policy or strategy for using consultants to support the planning and execution of its CIP. The policy or strategy shall consider the cost-effectiveness and risk associated with employing individuals with highly specialized skills versus contracting with qualified professional service providers for those same skills.

4.2.1.3 Performance measurement. An organization shall have in place performance standards and metrics for the execution of its CIP to ensure that the scope, schedule, and budget of individual projects, as well as the CIP, meets the organization's standards for performance. These standards and metrics shall monitor the execution of the CIP to assist in making course corrections where necessary and to compare the performance of the organization's CIP with that of other similar organizations.

4.2.1.4 Policies for project selection. An organization shall have in place policies that stipulate the procedures for the development, evaluation, prioritization, and selection of CIP projects. Such policies may call for the use of cost-benefit analysis, multi-objective decision-making tools, committee-based evaluation processes (e.g., business case evaluation [BCE]), and value engineering, among others.

4.2.1.5 Policies for financing system growth. An organization shall have in place policies that establish how system growth and expansion will be financed

(i.e., the role of developers' fees, capacity charges, grants, governmental subsidies, private capital, concessions, etc.). An organization shall also have in place standards for selecting project delivery frameworks that include design, construction, and inspection/acceptance of system infrastructure that is financed and constructed by private developers, and policies that clearly establish the responsibility for maintaining that infrastructure in the future.

4.2.2 *Functions and practices.* To meet this standard, an organization must demonstrate that it has in place functions and practices to support its CIP as follows:

4.2.2.1 *Accountability for program execution.* An organization shall establish clear accountability for its CIP with a single organizational segment, office, or individual—either a capital improvement program director/manager, or in the case of smaller systems, the general manager or another management-level employee with adequate engineering, business, and system planning experience and the ability to effectively manage contract resources and ensure adequate professional development, mentorship, and training for this role.

4.2.2.2 *Effective CIP project delivery.* An organization shall establish clear project management processes (e.g., PMI PMBOK Project Management Standards) to efficiently and effectively deliver capital projects. Collaborative project delivery frameworks should be considered as part of the project cost, financing, and risk analyses and assessments.

4.2.2.3 *Stakeholder involvement.* The process of developing an organization's CIP shall include key stakeholders, including engineering, maintenance, finance, customer service, and other stakeholders as necessary. External regulators, investors/lenders, and customers should also have a designated role in the development of a CIP, although such role may be advisory in nature.

4.2.2.4 *Consideration of costs in selecting among alternatives.* An organization's process for selecting between capital improvement project alternatives shall consider each alternative's life-cycle costs (i.e., long-term maintenance costs and capital costs), environmental costs, and community impacts ("social" costs).

4.2.2.5 *Supporting tools.* An organization shall have in place robust programs/tools for supporting the development of its CIP, including condition assessment programs, water audit and loss control programs, and tools for forecasting future population and consumption.