



This is a preview of ISO/TR 24589-1:2024. [Click here to purchase the full version from the ANSI store.](#)

ISO/TR 24589-1

Examples of good practice for the management of assets of water supply and wastewater systems —

Part 1: Water supply

Exemples de bonnes pratiques de la gestion d'actifs de systèmes d'approvisionnement en eau potable et d'assainissement —

Partie 1: Approvisionnement en eau potable

First edition
2024-12

This is a preview of ISO/TR 24589-1:2024. Click [here](#) to purchase the full version from the ANSI store.



COPYRIGHT PROTECTED DOCUMENT

© ISO 2024

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

This is a preview of ISO/TR 24589-1:2024. [Click here to purchase the full version from the ANSI store.](#)

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principal aspects	1
4.1 Objectives.....	1
4.1.1 Water utility with multiple waterworks and distribution networks.....	1
4.1.2 Water distribution network.....	3
4.1.3 Waterworks.....	4
4.2 Strategies.....	10
4.2.1 Maintenance strategy.....	10
4.2.2 Renewals decision.....	11
4.2.3 Inspection strategy of water supply network.....	11
4.3 Structuring the process.....	12
4.3.1 Initial steps for the management of assets of water distribution systems.....	12
4.3.2 Linkage of tool or activity to specific utility objective.....	14
4.3.3 Flowchart to sustain the asset management plan.....	15
5 Investigation	17
5.1 Non-destructive pipe condition investigation techniques.....	17
5.2 High density polyethylene (HDPE).....	17
5.3 Hydraulic performance.....	19
5.4 Condition assessment framework for drinking water storage tanks – prioritisation based on visual inspection.....	21
6 Assessment	24
6.1 Degradation models based on service life.....	24
6.2 Assessment of maturity of operations to define action plans.....	24
6.3 Criticality.....	25
6.3.1 Networks: simplified criticality map base on the impact of a failure.....	25
6.3.2 Treatment plant: implementation of simplified and monetized FMECA (failure mode, effects and criticality analysis).....	26
6.4 Likelihood of failure: multicriteria evaluation for networks.....	28
7 Implementation	30
7.1 Prioritization of works.....	30
7.2 Sustainable field works.....	30
8 Operation and maintenance	30
8.1 Planned water leakage prevention action.....	30
8.1.1 General.....	30
8.1.2 Planned work.....	31
8.1.3 On-call service.....	35
8.2 Energy monitoring and optimisation.....	35
8.3 Monitoring and control.....	36
8.4 Monitoring.....	37
9 Rehabilitation	37
9.1 Network renewal plan.....	37
9.2 CAPEX optimization tool.....	39
9.3 Plant renewal plan.....	39
Annex A (informative) Summary of examples of good practices for asset management of water supply systems	40
Bibliography	43

This is a preview of ISO/TR 24589-1:2024. [Click here to purchase the full version from the ANSI store.](#)

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 224, *Drinking water, wastewater and stormwater systems and services*.

This first edition of ISO 24589-1, together with ISO 24589-2, cancels and replaces ISO 24589.

A list of all parts in the ISO 24589 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

This is a preview of ISO/TR 24589-1:2024. [Click here to purchase the full version from the ANSI store.](#)

This document is written within the overall concept of asset management, which is an activity all organizations undertake in some manner and to some degree. It focusses on the details of managing the physical assets at the operational level rather than the organizational (corporate management) level.

Water services are reliant on their assets to deliver their services to the resident populations in their jurisdictions. The assets (underground pipes, reservoirs, storage tanks, treatment plants, etc.) collectively form the physical infrastructure of the water services and are the consequence of the accumulated capital investments and operational expenditures on maintenance and rehabilitation over many years. In many of these services, the replacement value of these past investments amounts to many millions (even billions) of dollars depending on the size of the community served. The infrastructure represents therefore a major societal investment in essential services contributing to public health and the protection of the environment.

In many countries, these assets have been identified as critical infrastructures and programs are in place to assure their protection or their sustainability. Like many other organizations having assets, water services undertake programs of activities to manage the assets to ensure they continue to meet the needs of the community for reliable delivery of potable water. These management activities can be at the strategic, tactical or operational level. The activities can be part of a formal management system, or the result of specific legislative requirements, or ultimately just the result of due diligence by the service operators and managers.

This document is expected to serve as a supporting document for utilities operating management of assets in accordance with ISO 24516.

In many countries there is a sustainability problem, sometimes referred to as the infrastructure gap: this recognizes that, for various reasons, the infrastructure has not been maintained over the years on a truly sustainable basis, in other words funding of rehabilitation and replacement programs has been postponed, with a focus instead on short term repairs, or an allowed decrease in the level of service provided.

The condition of water infrastructures greatly influences the adequacy of the water service, specifically its quantity, pressure, quality, safety, reliability, environmental friendliness, degree of purification and economic efficiency. System condition-based rehabilitation approaches serve to meet these requirements with a focus on a holistic approach of condition-based, risk-oriented maintenance.

Once the installation and development of water assets is almost completed, the optimization of networks will become necessary in many places in order to respond to changing societal and economic conditions. Networks are subject not only to aging and to wear and tear, but also to adaptation processes resulting from growth, new legislative requirements, or changing customer service level expectations. This requires water utilities to focus increasingly on the growing need to rehabilitate existing water networks rather than removal and replacement of the networks. Rehabilitation will thus become essential in asset management, with ever more stringent requirements on the design and execution of rehabilitation.

In recent years, much effort has been applied to the whole issue of asset management on two levels: what are the principles and structure of an asset management system, and what are the good practices that can be implemented on a technical level to assess the condition of the assets and help decide when asset interventions (repair, rehabilitation or replacement) take place.

This document offers examples of how an asset management strategy is defined with regard to the overall performance expected by the owner. It includes several aspects of the operations and maintenance, including asset condition assessment and investment (new assets, rehabilitation and renewal) strategies.

The focus is on the following selected activities of the management of assets of water supply systems as addressed in ISO 24516-1 and ISO 24516-2.

- [Clause 4](#) covers the principal aspects of the management of assets, including examples of:
 - objectives;
 - strategies;

This is a preview of ISO/TR 24589-1:2024. [Click here to purchase the full version from the ANSI store.](#)

- [Clause 5](#) covers the tools and methods for investigation, including operational data collection, tools for diagnosis, and other sources of information, such as:
 - non-destructive pipe condition assessment techniques;
 - high density polyethylene (HDPE);
 - hydraulic performance;
 - drinking water storage tanks.
- [Clause 6](#) covers the assessment of the system against its performance expectations for the following aspects:
 - practical tools and methods for structural, functional, hydraulic performance;
 - examples of degradation factors and models of degradation;
 - practical tools and methods for criticality assessment (plants and networks);
 - examples of calculation to assess the likelihood of a failure.
- [Clause 7](#) covers the implementation of sustainable field works, providing examples of what matters from an asset management point of view.
- [Clause 8](#) covers the operation and maintenance by providing examples of leakage management, flushing, energy management, monitoring and control, pressure regulation and maintenance of civil structures.
- [Clause 9](#) covers the prioritization of rehabilitation of assets with examples of how it is done practically.

The examples of good practice for asset management of water supply systems covered in this document are applicable to all types and sizes of organization and utilities operating water systems.