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Drinking water, wastewater and stormwater systems and services — Guidelines for the provision of alternative water service for essential facilities during a crisis

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National foreword

This British Standard is the UK implementation of ISO 24595:2024.

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A list of organizations represented on this committee can be obtained on request to its committee manager.

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Drinking water, wastewater and stormwater systems and services — Guidelines for the provision of alternative water service for essential facilities during a crisis

Systèmes et services relatifs à l'eau potable, à l'assainissement et à la gestion des eaux pluviales — Lignes directrices pour la mise en place d'un service d'eau alternatif pour les installations essentielles en cas de crise

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Foreword

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 document 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).

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

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Introduction

Water is fundamental to life and its distribution is an essential service. Water supply systems are designed to be reliable, but they can be subject to disruption from internal or external factors, including operational error, lack of rehabilitation, non-intentional physical damage, malicious acts (e.g. vandalism, criminality or terrorism), natural disasters (e.g. earthquakes, floods, hurricanes or volcanic eruptions) and source water disruptions caused by environmental factors or human activity.

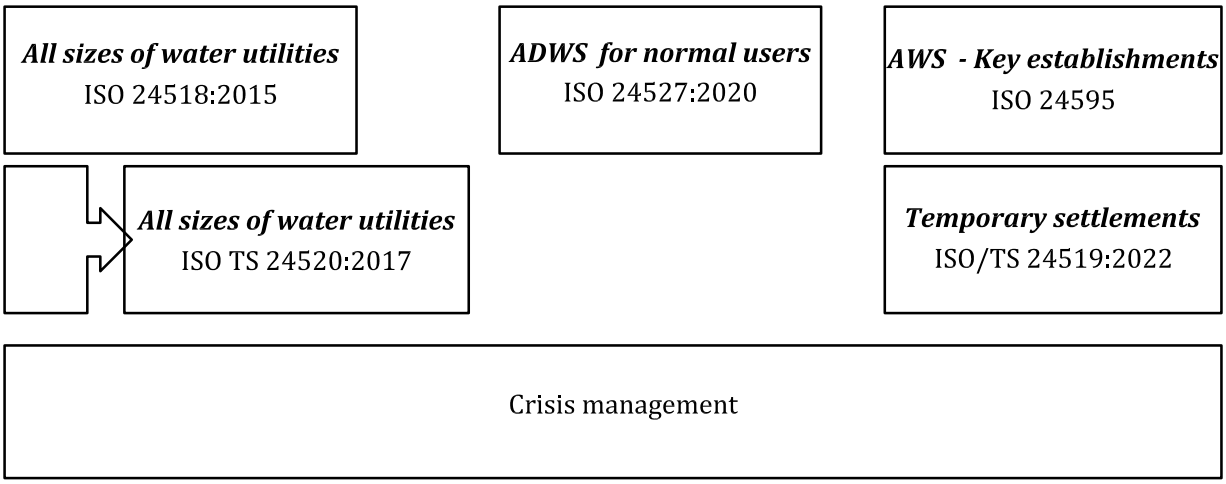
This document is intended for water utilities that normally provide a service without interruption through a water distribution network. It provides guidelines for the effective implementation of alternative water service (AWS) provision during extended periods of disruption or interruption of the water supply.

In many cases, operational and organizational processes will exist within water utilities to deal with short periods of localized interruption to water distribution. However, if the service interruption exceeds the duration or extent of anticipated events, an interruption can escalate into a crisis at local, regional or, exceptionally, national level.

NOTE 1 For adequacy and consistency, the guidance in this document typically assumes an operational response at a crisis level. However, it is applicable for all levels of operational incidents requiring AWS deployment, including normal business continuity preparedness and response.

NOTE 2 For guidance on the management of crises, see ISO 24518[1] and ISO/TS 24520.[2] For guidance on AWS distribution, see ISO 24527.[3]

This document does not concern the cases already covered by ISO 24518,[1] ISO/TS 24520[2] and ISO 24527.[3] Figure 1 shows the articulation between these three documents and this document, in order to show their complementarity.



NOTE 1 ISO 24527:2020[3] is not applicable to:

— key establishments and facilities (e.g. hospitals, homes for the aged, schools, reception facilities and vital plants);

— water supplied for industrial, agricultural or commercial purposes;

— temporary settlements.

NOTE 2 In many countries, AWS for essential facilities, as described in this document, are regulated.

Figure 1 — Standards dedicated to crisis management

A significant water interruption (arising from quantity and/or quality issues) can impact public and personal health and well-being, and economic performance. A prolonged interruption can progressively threaten the coherence of the supplied community.

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When such a water interruption affects essential facilities, the impact is even more significant and can cause crucial economic and negative social effects.

Therefore, it is important to plan in advance in order to diminish the negative effects of such a crisis situation on the community.

The roles of relevant authorities, responsible bodies, water utilities and operators can differ between and within countries and result in different minimum requirements for AWS provision. Nevertheless, it is generally recommended that such organizations recognize the importance of uninterrupted water production and distribution, even at times of crisis experienced by the water utility, for the well-being of the supplied community.

Water utilities are encouraged to reduce the risk of water supply interruption. This is typically achieved by a combination of good planning, design, procurement, installation, operation and maintenance of the water assets. Such measures should include the provision of an AWS for essential facilities and users during a crisis.

It is also recommended that the water utility's capability to provide an AWS be consistent with the maximum likely service interruption (extent and duration) identified through risk assessment. The provision of an AWS for essential facilities necessitates thorough preparation (e.g. to address planning, procurement, logistics, control and communication), as well as awareness of the need and commitment at all levels of the organization to be effective and efficient.

AWS during a crisis can be provided using one of the three following actions, as appropriate:

a) arranging for an alternative source of water;

b) using the water distribution network in a non-conventional manner;

c) not using the water distribution network.

AWS planning and provision can include guidelines by responsible bodies on monitoring and control methods. This document covers water quality issues only to the extent that they relate to water provided via an AWS.

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Drinking water, wastewater and stormwater systems and services — Guidelines for the provision of alternative water service for essential facilities during a crisis

1 Scope

This document provides guidelines for alternative water service (AWS) provision during a crisis for the ongoing operation of essential facilities.

This document addresses:

— AWS principles and methods;

— AWS operational planning and implementation.

This document is not applicable to:

— planned water supply interruptions forming part of the drinking water utility's normal operations;

NOTE However, many of the principles and methods described can be appropriate in such circumstances.

— water supplied to temporary settlements, such as refugee camps;

— the development and implementation of a crisis management system for water service, which is covered by ISO 24518[1] and ISO/TS 24520,[2] or the development and implementation of AWS provision during a crisis for private users, which is covered by ISO 24527.[3]

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 24513, *Service activities relating to drinking water supply, wastewater and stormwater systems — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 24513 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
alternative water service
AWS
water provided to users by means other than through the normal drinking water system

Note 1 to entry: AWS can be required due to the loss of supply or due to the fact that the water is unfit for the intended use.

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3.2
containerized water
packaged water
water deployed in containers for alternative drinking water service provision

EXAMPLE 1 Bottled or canned water, pre-prepared and hygienically sealed, with a predetermined shelf-life.

EXAMPLE 2 A personal water bag, pre-prepared but empty, and filled during an incident.

EXAMPLE 3 Static water tanks; towed bowsers; mobile water tankers, disinfected and deployed, and filled during an incident.

3.3
drinking water allocation
daily per-capita water quota to be supplied to users during *alternative water service* (3.1) provision

Note 1 to entry: The relevant authority, the responsible body or the drinking water utility (in the absence of guidance from the relevant authority or responsible body) can determine drinking water allocation(s) for categories of users.

Note 2 to entry: Drinking water allocations can differ between categories of user and can exclude some categories of users.

Note 3 to entry: The size of drinking water allocations can be varied at different times during the crisis.

EXAMPLE Per-capita domestic user in first 12 h of crisis response; per-capita per-day domestic user after first 12 h; per-capita per-day special needs user.

[SOURCE: ISO 24527:2020, 3.5.]

3.4
essential facility
entity whose service or role is considered essential for the proper functioning of the community and would be seriously disrupted by the interruption of the water service

Note 1 to entry: This decision is in the hands of the civil and/or military authorities.

EXAMPLE Hospitals, homes for the aged, schools, prisons, military establishments, essential industrial, agricultural or commercial establishments, livestock facilities.

Note 2 to entry: The definition focuses on disruption to the "proper functioning of the community". Farms are generally outside the community, but livestock handling and retention facilities can be; for example, abattoirs are normally within an urban area.

4 Principles for AWS provision for essential facilities during a crisis

4.1 General

During a crisis involving an interruption to water distribution, the water utility should ensure that an AWS is provided to users and essential facilities.

The needs for AWS provision to essential facilities should be a high priority.

Combined efforts of the essential facility, water utility and other relevant or responsible authorities during preplanning, planning and AWS implementation are necessary.

The water utility should involve the essential facilities during the preparedness phase in order to advise them to plan the necessary arrangements, such as water treatment units, equipment and point of distribution (POD).

Water allocation to keep essential facilities running is significantly higher than the allocation of drinking water for normal users (as discussed in ISO 24527[3]). It should be determined jointly by the water utility and the essential facilities under supervision of the relevant authorities and/or responsible bodies.

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The required water quality for AWS provision is determined jointly by the relevant authorities, the essential facilities and/or responsible bodies.

The water quality to be supplied should be tested in order to ensure compliance with the requirements. If the required water quality is not available, it is recommended that the feasibility of using mobile water-treatment units is considered in order to bring the water to the required quality.

Non-drinking water may be used in the essential facilities' processes that do not require drinking water quality.

Communication, information and training are key elements for AWS.

4.2 AWS approaches

4.2.1 General

The water utility may adopt one or a combination of the AWS approaches described in 4.2.4.2 and 4.2.4.3; see also Annex B and Annex D.

4.2.2 Alternative source of water

4.2.2.1 General

A primary response to providing AWS is to ensure that the water utility has alternative sources of water available to it for use in an emergency.

Examples of alternative sources of water can include available but currently unused groundwater extraction facilities, supplementary deeper extraction pipes in surface water resources, major stocked storage reservoirs of unused or treated water resources and arrangements with neighbouring water utilities to transfer water as needed to the utility facing a crisis.

4.2.2.2 Providing emergency water storage above ground or underground

Once the amount of water needed for the essential facility during crisis is determined, the construction of the appropriate storage facilities for the calculated volume of water should be planned and implemented.

4.2.2.3 Using alternative water sources (drinking and non-drinking quality)

The use of alternative water sources should be implemented when and if it is technically possible to connect different water source(s) to the essential facility, either directly from the source to the facility without passing through the water utility's network or by using the regular water utility's network.

Such a solution may be applied exclusively, if the alternative source is of drinking water quality, or as a partial solution, if the alternative water source is non-drinking water but can be used for part or all of the required processes for sanitary purposes, e.g. toilet flushing.

For guidance on the management of crises, see ISO 24518[1] and ISO/TS 24520.[2]

4.2.2.4 Connecting the water utility's network to an alternative water supply network

In some cases, with a relatively small effort the water utility or relevant facility can be connected by emergency or temporary connections to a nearby water supply network that was not affected by the crisis situation (e.g. bypassing damaged network areas of the regular supply system via mobile transmission lines).

Such a solution may be applied exclusively, if the alternative source has the capacity to supply the entire demand and is of drinking water quality, or as a partial solution, if the alternative water source does not have the capacity to supply the entire demand or is non-drinking water but can be used for part or all of the required processes for sanitary purposes, e.g. toilet flushing.

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