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Event detection process: Guidelines for water and wastewater utilities

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National foreword

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Contents

Page

Foreword

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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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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, *Service activities relating to drinking water supply, wastewater and stormwater systems*.

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.

Introduction

This document has been created in response to an international demand for guidelines on the development of an event detection process (EDP) for drinking water and wastewater utilities (water utilities). The EDP is a key element of a water utility's wider event detection system. That system relies on, and is interrelated to, the water utility's sensor and sampling systems.

This document aims to support water utilities in the development of an EDP that monitors the relevant variables across their water/wastewater services and evaluates changes in those variables that can suggest an event has either occurred or could be imminent.

This document aims to be consistent with both the World Health Organization (WHO) Water Safety Plan approach for water supply and the WHO Sanitation Safety Planning approach for wastewater collection, treatment and disposal or reuse. Both take a risk-based approach to evaluating uncertainty about the quality and significance of data that suggests the occurrence of an event.

NOTE 1 This document addresses a wider range of event causation than that implied by the definition of 'hazard' in the WHO manuals.

For example (water): a change in the hardness of the water supplied could remain within acceptable limits for public health purposes but could still represent a change in water quality of material interest to some service users (e.g. breweries).

For example (wastewater): ingress of a volatile chemical into the wastewater system ought not to represent a direct health hazard in all circumstances, but, depending on its concentrations, could result in an explosion within the network or fire damage to the wastewater infrastructure.

Outputs from an EDP could help inform those within the water utility responsible for identifying events and alerting individuals responsible for event response decision-making. Such alerts could be required despite uncertainty about the quality and reliability of the data currently available.

Event response decisions can be based on those decision makers' knowledge, experience and assessment of the cause(s) and effect(s) of the event as it unfolds – including consideration of the EDP's outputs where appropriate.

At the discretion of the water utility, design of the EDP could incorporate elements of automated decision-making.

NOTE 2 If automated decision-making is proposed, consideration could require distinguishing between situations where automation could be appropriate and those where it would not be. For example, automation with low-impact outcomes could be acceptable but automation with high-impact outcomes could require greater caution. When considering automation, it is advisable to consider the appropriateness of inputs, the complexity of the system, the nature of the water utility and the effect of time delays.

A decision on whether to implement the water utility's procedure for dealing with an abnormal situation could be required in response to an identified or suspected event.

Such a decision could depend upon the confidence in the EDP's classification and output and the process underpinning it.

The guidelines could be of particular use to those water utilities that wish to enhance their ability to recognize abnormal events as a means to: maintain or improve public health provision; improve their operational processes; enhance the levels of their service provision; or reduce risks to the continued delivery of existing service levels.

In addition, development of an EDP can be a valuable aid to organizational learning and memory. The existence of an effective and efficient EDP provides a significant control against the risk of loss of individuals' knowledge and expertise by increasing a water utility's independence from such vulnerable resources. Regular use and review of an EDP's successes and failures can contribute to organizational learning and a reduction in the time taken to detect an event.

TECHNICAL SPECIFICATION **ISO/TS 24522:2019**

Event detection process: Guidelines for water and wastewater utilities

1 Scope

This document provides guidance for water utilities on the detection and classification of water and wastewater events.

The following subjects are within the scope of this document:

— publicly and privately owned and operated water utilities. It does not favour any particular ownership or operating model;

— all aspects of the drinking water system and the wastewater system;

— all causes of abnormal changes in water and/or wastewater service provision capable of detection by monitoring systems including accidents, unexpected operational changes, natural hazards and intentional disruption.

This document is independent of the measurement methods used to collect the data.

The document focuses on events which could imminently affect the water utility's interested parties.

The following are outside the scope of this document:

— methods of design and construction of drinking water and wastewater systems;

— plumbing and drainage systems not under the control of the water utility.

This document does not include details about action taken as a result of event detection. For such details see ISO 24518 and EN 15975 Part 1.

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, *Activities relating to drinking water, wastewater and stormwater services — 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 terminological databases for use in standardization at the following addresses:

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

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

3.1
classification
category that the *event* (3.5) falls into