International Workshop Agreement

IWA 6

Guidelines for the management of drinking water utilities under crisis conditions

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Lignes directrices pour le management des services de l'eau potable dans des conditions de crise

Reference number
IWA 6:2008(E)

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Foreword

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In order to respond to urgent market requirements, ISO has also introduced the possibility of preparing documents through a workshop mechanism, external to its normal committee processes. These documents are published by ISO as International Workshop Agreements. Proposals to hold such workshops may come from any source and are subject to approval by the ISO Technical Management Board which also designates an ISO member body to assist the proposer in the organization of the workshop. International Workshop Agreements are approved by consensus amongst the individual participants in such workshops. Although it is permissible that competing International Workshop Agreements exist on the same subject, an International Workshop Agreement shall not conflict with an existing ISO or IEC standard.

An International Workshop Agreement is reviewed after three years, under the responsibility of the member body designated by the Technical Management Board, in order to decide whether it will be confirmed for a further three years, transferred to an ISO technical body for revision, or withdrawn. If the International Workshop Agreement is confirmed, it is reviewed again after a further three years, at which time it must be either revised by the relevant ISO technical body or withdrawn.

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.

International Workshop Agreement IWA 6 was drafted at a workshop held in Tel Aviv, Israel, in October 2007, which was organized jointly by Israel's Water Authority and The Standards Institution of Israel (SII).

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Background

The Standards Institution of Israel (SII) has identified the area of water technologies and water security as critical and crucial for communities, countries and society as a whole. To address this issue, SII proposed to develop an ISO International Workshop Agreement (IWA) on water security, producing a framework which would constitute a basis for the justification of establishing a subcommittee within the framework of ISO/TC 224 or for developing standards in other technical committees. This request was approved by the ISO Technical Management Board (TMB).

This International Workshop Agreement is based on SII's proposed draft IWA on water security and consists of an introduction, a framework for the management of water crisis, and proposals for technological instruments and means for ensuring drinking water security, and on models for water distribution systems security.

This International Workshop Agreement includes the introduction and the description of the management elements required for a drinking water utility or facility. The second part of this International Workshop Agreement contains proposals for products and means and models.

Within the scope of the activity of the Standards Institution of Israel to be the leader in the standardization on the subject of water security, two working groups were appointed to examine the possibility of standardization on the subject of water security as preparatory activity for the Tel Aviv workshop in 2007:

— working group on the subjects of means and models;

— working group on the subject of management of a water crisis.

This International Workshop Agreement attempts to examine and select those possible standardization subjects on the topic of management of a water crisis.

It was decided at the Tel Aviv workshop to consider standardization with regard to two aspects:

a) examine the possibility of preparing a standard on the subject of a water crisis management system for a water utility;

b) identify possible standards for technologies, means and procedures.

A water utility that is interested in adopting a standard for management of a water crisis should first determine what is the minimum level of service that it wishes or is required to provide to its consumers and as a consequence, define the activities and measures meeting this level of service in emergency and crisis situations. These activities should comply with the requirements established by the relevant authorities and with existing standards and common practices.

Parts of this International Workshop Agreement are consistent with the following three guidelines developed by ISO/TC 224 on drinking water and wastewater services:

— ISO 24510, dealing with assessment and improvement of service to users,

— ISO 24511, dealing with management of wastewater utilities and assessment of wastewater services, and

— ISO 24512, dealing with management of drinking water utilities and assessment of drinking water services.

Appreciation is extended to Israel's Water Authority and The Standards Institution of Israel for both the organization of the workshop and the preparation of this International Workshop Agreement.

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Introduction

0.1 General

Water is the source of life, the most precious and important of all natural resources, without which the human species cannot survive. Nevertheless, many countries do not know how to maintain the desired level of water quantity and water quality.

Impairment of the drinking water would change the level of life of the affected population in the immediate period while in the medium-term period, it would affect their ability to survive.

Any incident involving drinking water systems that caused massive illness or unplanned interruption in the water supply in a large area would have enormous economic impacts and complicated psychological effects on the relevant population, creating a public panic situation requiring the local drinking water utilities and the authorities to operate extensive emergency systems in the affected area.

Severe damage resulting from an intentional disruption or destruction caused by a natural disaster or an accident, having an impact on the quantity or the quality of drinking water and causing a major disaster, would severely interrupt the living quality in the affected area and in its vicinity.

The destructive influence of such damage to drinking water could significantly deviate from the damaged geographic area and have a widespread effect, mainly in terms of creating panic and feelings of insecurity amongst the population.

Water utilities act within the context of increasing security risks and threats, more stringent legislation and regulation, heightened awareness of the need for adequate emergency response and remediation planning, concerns of interested and affected parties, and the need to assure operational continuity.

0.2 Main threats to the drinking water supply systems

The result of the occurrence of any of the many types of threats on the partial or full sudden interruption of the drinking water supply for an extended period of time would constitute a water crisis requiring the operation of local and national emergency systems at various extents and levels, depending on the actual damage and assessment of possible damages. In extreme occurrences, the possibility exists that the water crisis could continue for a long period of time, during which the supply of drinking water to the residents would come from alternative sources that were not damaged or contaminated.

The effects of the threats may be local, regional or national, depending on the preparedness and the professional and operational capability of the parties responsible for reducing the extent of the water crisis, its severity and its length as much as possible.

Potential threats to drinking water supply systems can be natural or man-made, intentional or non-intentional, and they are characterized by an interruption of essential infrastructure, materials, service or personnel, without which the locally agreed level of service cannot be attained.

0.3 Preparedness

Water utilities supplying drinking water have a primary function to be prepared for providing a continuous response during all stages of the crisis. The preparedness of drinking water utilities that bear the responsibility of preventing impairment to the water installations and their level of vigilance is a necessary condition for providing an appropriate and effective answer to dealing with water crises. It is advisable that drinking water utilities be prepared to provide a response at all times through coordination with local and/or national bodies,

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in order to minimize damages and to ensure the continued supply of water to the users. The scheme illustrated in Figure 1[1)] demonstrates the value of being prepared for the consequences of a water crisis.

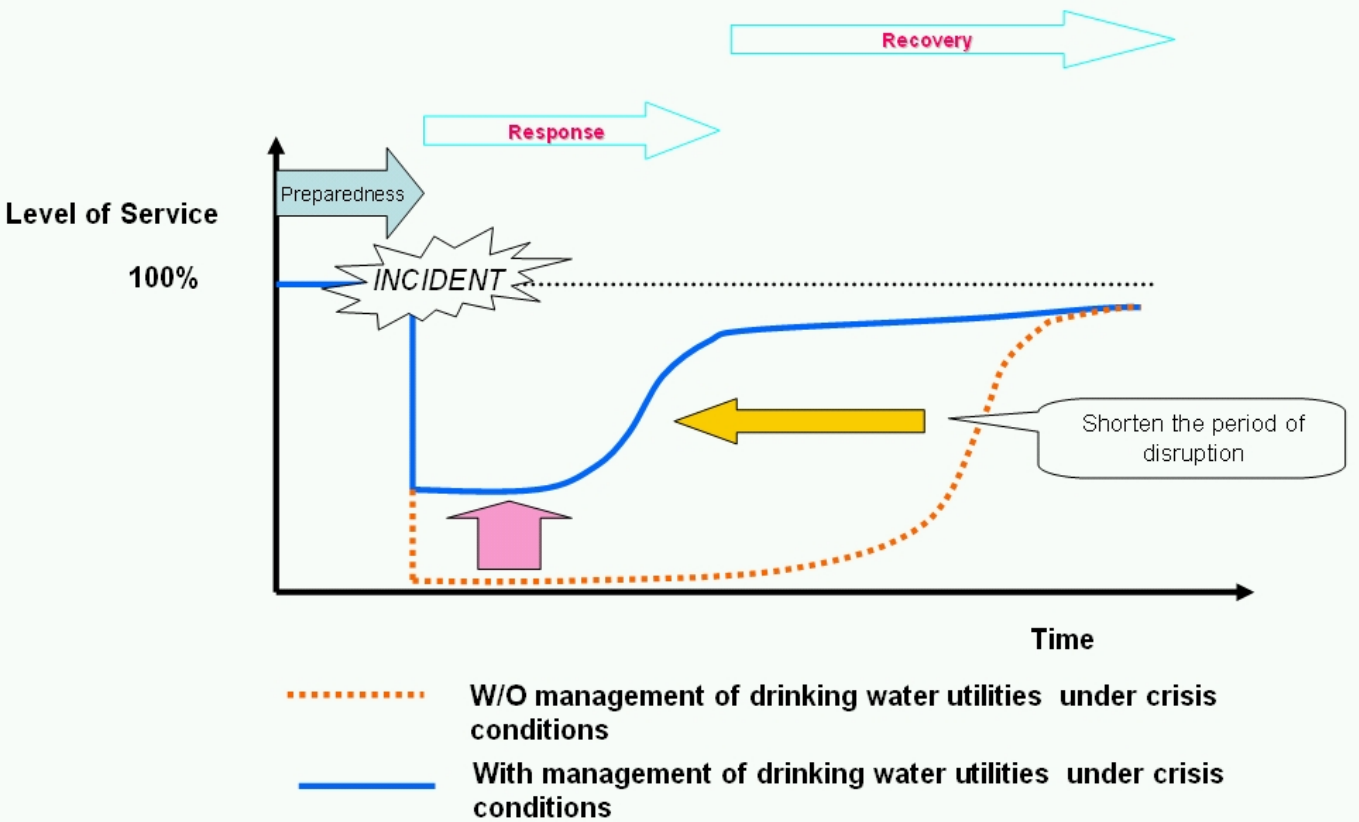

Figure 1 — Effectiveness of crisis management

0.4 Standardization in drinking water supply security issues

Comprehensive guidelines, in the form of International Standards for the management of drinking water utilities under emergency and crisis conditions, may be desirable and are currently under development.

NOTE 1 CEN/TC 164 are developing a standard on the security of drinking water supplies.

NOTE 2 Standardization for water security takes into consideration processes and procedures as defined in the documents of other international organizations, e.g. the World Health Organization.

While the management of drinking water utilities under crisis conditions needs to meet national or regional requirements of relevant authorities, the development of International Standards could provide assistance.

Some terminology standards on these issues are under development and it is advisable that they be considered when developing water security standards.

Other standards covering technologies, means and processes may need to be developed.

1) Taken from ISO/PAS 22399.

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Guidelines for the management of drinking water utilities under crisis conditions

1 Scope

This International Workshop Agreement is intended to identify and chart the critical elements that are of great significance to drinking water security. Its purpose is to set in motion a continuous process for the establishment of guidelines on management systems for drinking water utilities under crisis conditions.

This International Workshop Agreement provides the guidelines for a water utility, or any body responsible for the management of parts of the water supply system, to be prepared and ready to manage a water crisis. It also provides a roadmap for possible relevant International Standards that could be useful and could be developed.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1
consequence
outcome of an event

NOTE 1 There can be more than one consequence from one event.

NOTE 2 Consequences can range from positive to negative.

NOTE 3 Consequences can be expressed qualitatively or quantitatively.

NOTE 4 Adapted from ISO/IEC Guide 73:2002, 3.1.2.

2.2
crisis
any incident, human-caused or natural, that can result in water supply disruption or contamination and that requires urgent attention and action to protect life, property or environment

2.3
disaster
event that causes great damage or loss

2.4
disruption
incident, whether anticipated or unanticipated, which disrupts the normal course of operations at a water utility

NOTE 1 A disruption can be caused by either positive or negative factors that will disrupt normal operations.

NOTE 2 An example of an anticipated disruption is a hurricane.

NOTE 3 An example of an unanticipated disruption is a blackout or an earthquake.

2.5
emergency
sudden, urgent, usually unexpected, occurrence or event requiring immediate action

NOTE An emergency is usually a disruptive event or condition that can often be anticipated or prepared for, but seldom exactly foreseen.

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2.6
exercising
evaluating programmes, rehearsing the roles of team members and staff and testing the recovery of an organization's systems

NOTE 1 An organization's systems include, for example, technology, telephony and administration.

NOTE 2 Exercises include activities performed for the purpose of training and conditioning team members and personnel in appropriate responses, with the goal of achieving maximum performance.

NOTE 3 An exercise can involve invoking operational response and recovery procedures, but is more likely to involve the simulation of an incident, announced or unannounced, in which participants role-play in order to assess what issues might arise prior to a real invocation.

2.7
event
occurrence of a particular set of circumstances

NOTE 1 The event can be certain or uncertain.

NOTE 2 The event can be a single occurrence or a series of occurrences.

NOTE 3 The probability associated with the event can be estimated for a given period of time.

[ISO/IEC Guide 73:2002, 3.1.4]

2.8
impact
evaluated consequence of a particular outcome

2.9
incident
event that might be, or could lead to, an operational interruption, disruption, loss, emergency or crisis

2.10
incident management plan
clearly defined and documented plan of action for use at the time of an incident or disruption, typically covering the key personnel, resources, services and actions needed to implement the incident management process

2.11
mitigation
limitation of any negative consequence of a particular incident

2.12
prevention
measures that enable an organization to avoid, preclude or limit the impact of a disruption

2.13
probability
extent to which an event is likely to occur

NOTE 1 ISO 3534-1:1993, definition 1.1 gives the mathematical definition of probability as "a real number in the scale of 0 to 1 attached to a random event. It can be related to a long-run relative frequency of occurrence or to a degree of belief that an event will occur. For a high degree of belief, the probability is near 1."

NOTE 2 Frequency rather than probability may be used to describe risk.

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NOTE 3 Degrees of belief about probability can be chosen as classes or ranks, such as

— rare/unlikely/moderate/likely/almost certain, or

— incredible/improbable/remote/occasional/probable/frequent.

[ISO/IEC Guide 73:2002, 3.1.3]

2.14
response programme
plans, processes and resources to perform the activities and services necessary to preserve and protect life, property, operations and critical assets

NOTE Response steps generally include incident recognition, notification, assessment, declaration, plan execution, communications and resources management.

2.15
risk
combination of the probability of an event and its consequences

NOTE 1 The term “risk” is generally used only when there is at least the possibility of negative consequences.

NOTE 2 In some situations, risk arises from the possibility of deviation from the expected outcome or event.

NOTE 3 Adapted from ISO/IEC Guide 73:2002, 3.1.1.

2.16
risk acceptance
decision to accept a risk

NOTE 1 The verb “to accept” is chosen to convey the idea that acceptance has its basic dictionary meaning.

NOTE 2 Risk acceptance depends on risk criteria.

[ISO/IEC Guide 73:2002, 3.4.10]

2.17
risk assessment
overall process of risk identification, analysis and evaluation

NOTE Risk assessment involves the process of identifying internal and external threats and vulnerabilities, identifying the likelihood of an event arising from such threats or vulnerabilities, defining critical functions necessary to continue the organization’s operations, defining the controls in place necessary to reduce exposure, and evaluating the cost of such controls.

2.18
risk management
coordinated activities to direct and control an organization with regard to risk

NOTE Risk management generally includes risk assessment, risk treatment, risk acceptance and risk communication.

[ISO/IEC Guide 73:2002, 3.1.7]

2.19
risk reduction
actions taken to lessen the probability, negative consequences, or both, associated with a risk

[ISO/IEC Guide 73:2002, 3.4.4]

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