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Societal security — Emergency management — Guidelines for colour-coded alerts

Sécurité sociétale — Gestion des urgences — Lignes directrices relatives aux alertes à code couleur

Reference number
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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. www.iso.org/directives

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 292, *Security*.

Introduction

People may be faced in their daily lives with various kinds of risks. People at risk should be able to take appropriate safety actions when faced with hazards even though they may not have a full understanding of them.

Public warnings, through a combination of prior notifications and alerts, enable people at risk to take appropriate and timely actions to protect their safety.

Colour-coded alerts are used to notify people at risk of status changes on a safety or danger continuum in allowing them to take appropriate actions.

This International Standard will lead to better understanding of colour-coded alerts by reducing confusion and prompting more appropriate responses in an emergency situation.

Societal security — Emergency management — Guidelines for colour-coded alerts

1 Scope

This International Standard provides guidelines for the use of colour codes to inform people at risk as well as first response personnel about danger and to express the severity of a situation. It is applicable to all types of hazard in any location.

This International Standard does not cover the method for displaying colour codes, detailed ergonomic considerations related with viewing displays, or safety signs covered by ISO 3864-1.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3864-1, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

ISO 22322, *Societal security — Emergency management — Guidelines for public warning*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 22300 and the following apply.

NOTE All terms and definitions contained in ISO 22300 are available on the ISO Online Browsing Platform: www.iso.org/obp.

3.1
alert
part of public warning that captures attention of first responders and people at risk in a developing emergency situation

[SOURCE: ISO 22322, definition 3.1]

3.2
colour blindness
total or partial inability to differentiate certain hues

[SOURCE: ISO 5492:2008, definition 2.34]

3.3
colour-code
set of colours used symbolically to represent particular meanings

[SOURCE: ISO 17724:2003, definition 11]

3.4
hue
attribute of a visual sensation according to which an area appears to be similar to one of the perceived colours, red, yellow, green, and blue, or to a combination of two of them

[SOURCE: ISO/IEC 8632-1:1999, definition 4.1.61]

4 Guidance for use of colour codes

4.1 General

Red, yellow and green (and the spectrum in between in terms of hue) should be used to express the status of a hazard. Black, purple, blue and grey should be used to give supplementary information about the hazard.

4.2 Colour codes to express the status of hazard

4.2.1 General

Red is associated with danger and should be used to notify people at risk to take appropriate safety actions immediately.

Yellow is associated with caution and should be used to notify people at risk to prepare to take appropriate safety actions.

Green is associated with a safe status and should be used to notify people at risk that no action is required.

This International Standard does not define danger, caution or safety other than the suggested meaning given in Table 1.

Experts should classify the status of hazard into danger, caution or safe.

Table 1 — Colour codes

Colour	Associated meaning	Proposed action
Red	Danger	Take appropriate safety action immediately
Yellow	Caution	Prepare to take appropriate safety action
Green	Safe	No action required

4.2.2 Typical colours for colour-coding system

If more than three colours are needed to express the level of hazard, the colours and supporting information should be based on the following:

— the number of level of hazard should be minimized in order to limit the number of colours being used;

— hues between the red and green spectrum should be chosen;

— no more than seven colours should be used to avoid confusion;

— supporting information, which is understandable by users, should be added, including:

  — supplemental information (e.g. text, numbers, shape, symbol, size);

  — positional coding.

Figure 1 illustrates the different colours which can be used in colour code systems.

The colours in Figure 1 are indicative and should not be used for colour matching.

Annex B gives recommendations on colour specifications based on Munsell, CMYK, and RGB systems.

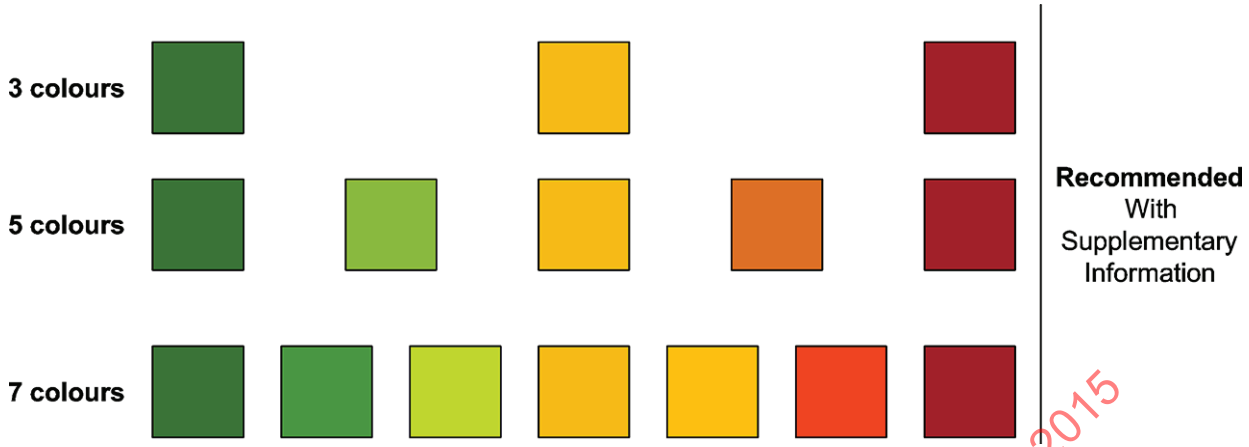


Figure 1 — Guideline for use of basic colours

4.2.3 Order and position for the red, yellow and green spectrum

The order of colours can provide positional cues so that people can easily recognize the meaning of the alert.

There are several ways to show and use the spectrum of red, yellow and green (see Figure 2). However, these colours should always be placed in a certain order where the increasing level of hazard is presented:

— from left to right, or

— from bottom to top.

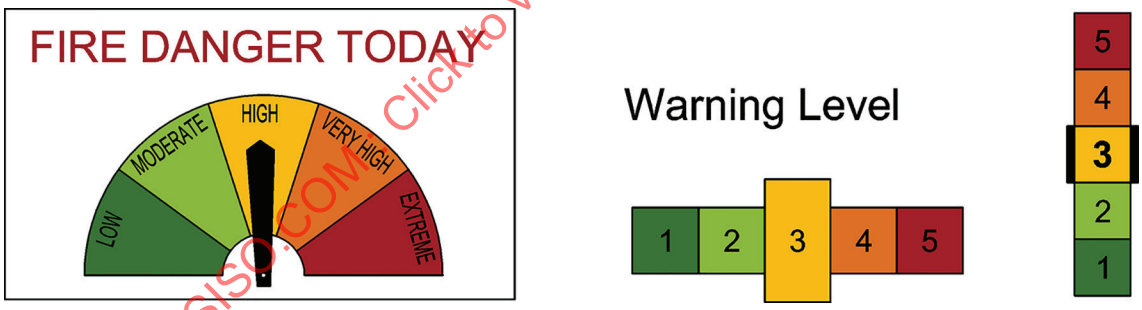


Figure 2 — Example of the order and position of colour-coding

4.3 Colour codes to give supplementary information

4.3.1 General

In addition to the red, yellow, green spectrum, black, purple, blue and grey may be used to provide additional information.

Annex B gives recommendations on colour specifications based on Munsell, CMYK, and RGB systems.

Table 2 — Supplementary colour codes

Colour	Associated meaning	Additional information
Black	Fatal danger	Can be used in addition to red to give supplementary information about fatal danger
Purple	Fatal danger	Can be used in addition to red to give supplementary information about fatal danger
Blue	Informational purposes	Can be used to give supplementary information. However, blue should not be used to indicate any level of hazard
Grey	No information available	Should be used to explicitly indicate that no information is available.

The applications using colour codes consistent with this International Standard are demonstrated in Annex A.

4.3.2 Black and purple

Black or purple should be used for fatal danger. Users may choose black or purple depending on cultural significance.

Black can be replaced with black and white checkerboard.

NOTE When expressing fatal danger on computer screens or LED displays, black may be a problem since black is a non-luminescent colour. In such cases, using black and white checkerboard is recommended. See Figure 3 for a checkerboard example.

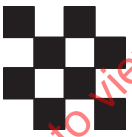


Figure 3 — Example of checkerboard

4.3.3 Blue

Blue should not be used to indicate a safe condition or any other level of hazard. Blue should be used for purely informational purposes that does not indicate levels of hazard.

4.3.4 Grey

Grey should be used to explicitly indicate no information is available.

4.4 Consideration for human factors and colour blindness

4.4.1 General

It is essential that colour-coded alerts are visible and that appropriate attention is paid to the performance of the display device and its associated ergonomic requirements.

Special consideration should be given to human limitations for distinguishing colours one at a time. Judgements about safety, relying only on colour-coding, should take account of human abilities to discriminate between different colours.

Whenever human judgment based solely on colour-coding is required, only red, yellow, and green should be used. Supplementary information to the used colour should be provided whenever people at risk can

be expected to include those with limited colour discrimination. Supplementary information should follow ergonomic advice for all kinds of colour blindness (see ISO/TR 22411 and ISO 9241).

NOTE Inability to distinguish between red and green is the most common form of colour blindness (ISO/IEC Guide 71:2001, 8.5.1).

4.4.2 Colour names

When appropriate, the colour name should be used as a supplementary way to warn people at risk.

EXAMPLE An audible "red alert" over a public address system can be used to warn people.

NOTE Some languages do not include words for all existing colours. Generally, names for black, purple, red, yellow and green are common in most languages while orange or amber are not found in many languages.

4.4.3 Text colours

When appropriate, text should be used to clarify the colour that is used. Such text can be placed separately or superimposed over the colour. When superimposing text over a colour-coded alert, the text colours shown in Table 3 are recommended in order to maintain satisfactory levels of contrast.

The selection of appropriate text font should take account of ergonomic requirements.

Table 3 — Recommended colours for superimposed text

Colour-coded alert	Text colours
Black	White
Purple	White
Red	White
Yellow	Black
Green	White

NOTE The choice of font has a significant impact on legibility. The appropriate font depends on conditions such as, but not limited to, viewing distances, levels of illumination and colour contrasts.

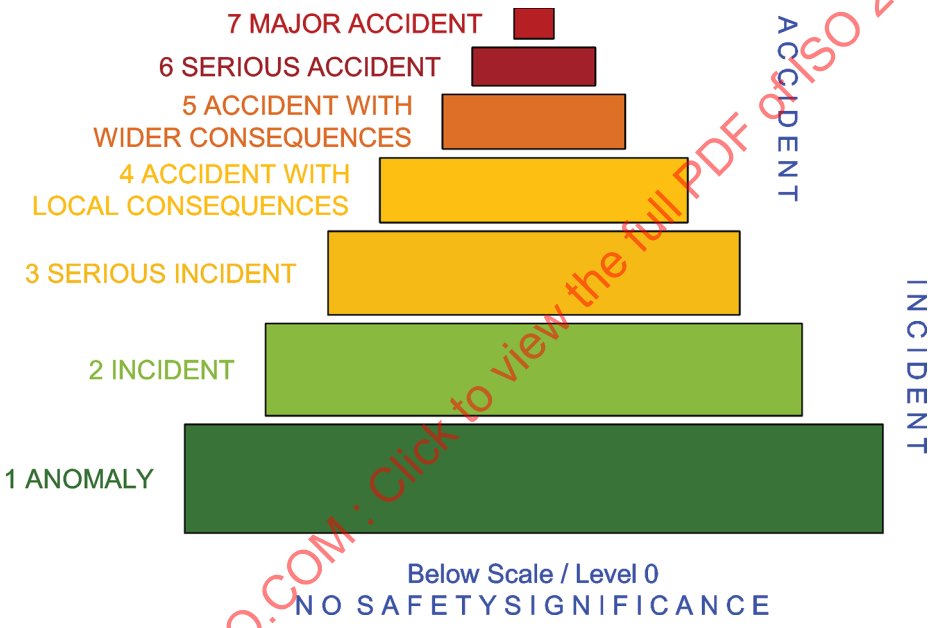
Annex A
(informative)

Examples on the use of colour codes in practice

A.1 General

This Annex gives three examples of colour codes used in practice. These examples are not based on the colour codes in this International Standard, but are presented for information.

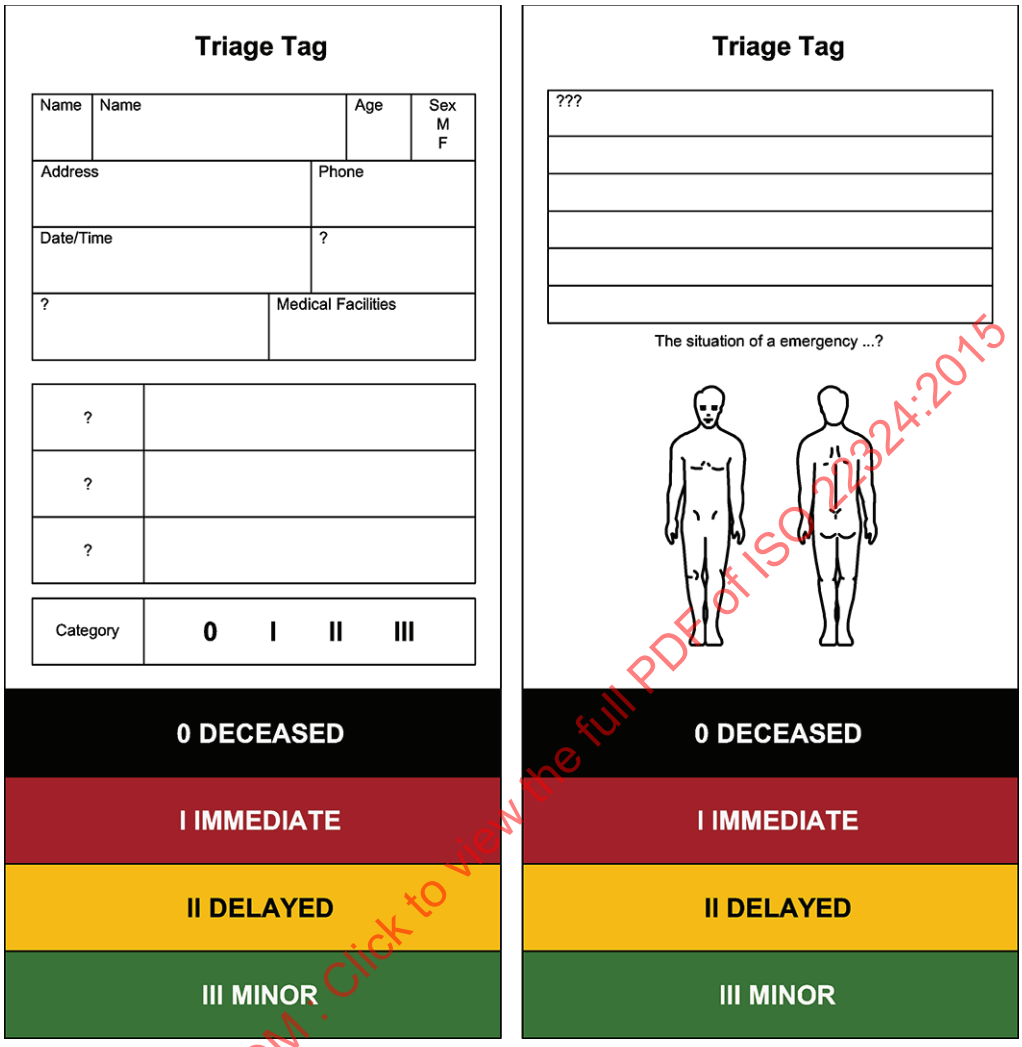
A.2 International nuclear and radiological event scale



NOTE Figure A.1 is referenced from The International Nuclear and Radiological Event Scale User's Manual - 2008 Edition, International Atomic Energy Agency (IAEA), Vienna (2009). The copyright of Figure A.1 is retained by IAEA.

Figure A.1 — An application of the IAEA-system using seven colours including purple as a fatal colour

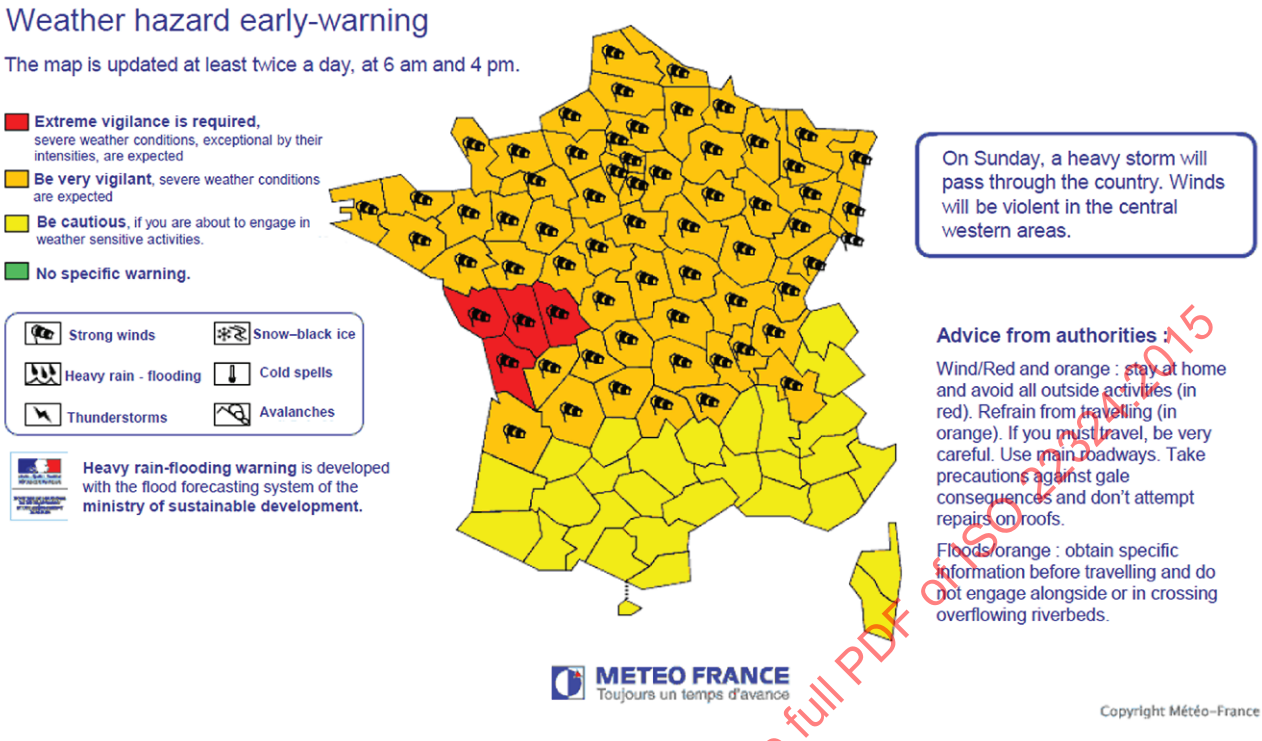
A.3 Triage tags



NOTE Figure A.2 is made following the guidelines of the Japanese Ministry of Health, Labour and Welfare.

Figure A.2 — An example of Japanese triage tag

A.4 Meteorological map



NOTE The copyright of Figure A.3 is retained by METEO FRANCE.

Figure A.3 — An application of the French system using four colours with supplementary information