

CEN

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WORKSHOP

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AGREEMENT

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## PPE for Chemical, Biological, Radiological and Nuclear, (CBRN) Hazards

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## Foreword

This CEN Workshop Agreement has been drafted and approved by a Workshop of representatives of interested parties on 2009-12-21, the constitution of which was supported by CEN following the public call for participation made on 2008-06-16/17.

A list of the individuals and organizations which supported the technical consensus are listed below :

Blücher NL BV, the Netherlands  
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 999 Team Tech, UK  
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The CWA has been developed through the collaboration of a number of contributing partners in the Manufacture, Use, Testing or those Providing CBRN PPE industries.

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The final review/endorsement round for this CWA was started on 2009-10-07 and was successfully closed on 2009-12-21. The final text of this CWA was submitted to CEN for publication on 2009-12-24.

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Comments or suggestions from the users of the CEN Workshop Agreement are welcome and should be addressed to the CEN-CENELEC Management Centre.

**Following a resolution being adopted by CEN BT WG 161 Security and Protection of the Citizen, which related to the lack of any guidance on CBRN PPE, consideration was given by DG Justice, Law and Security, who then agreed to make available the funding for this Workshop Agreement.**

## Introduction

With the ever increasing number of natural disasters, industrial accidents and terrorist attacks, it was stated that there were no specific standards or guides on CBRN PPE (Chemical, Biological, Radiological or Nuclear Personal Protective Equipment) for Manufacturer's, Users, Notified Bodies and those who determine it necessary to provide CBRN PPE which is tested and certified, for selection and use in such events.

As far as legal obligations are concerned, all PPE must comply with the requirements of the PPE Directive 89/686/EEC. For the use of PPE the EU Directive 89/656/EEC has to be complied with. Directive 89/656/EEC excludes PPE for use by Emergency Services, but some EU member states have adopted additional legislation for this purpose.

Consideration was also given to the Medical Services Directive 93/42/EEC with regard to the design and testing of CBRN PPE. Since CBRN products are not considered sterile, self certification applies for most of these products. To overcome the problems of self certification self declaration, any CBRN PPE, even marketed as a medical device, shall be tested and certified by an accredited third party.

The present Standards affording protection against CBRN threats for civilian use are British Standard 8467 (protective clothing), BS 8468 (respiratory protection), NFPA 1971:2007 with the CBRN Option, and an Israeli hood standard certified for CBRN protection (PM-750 Personal Protection Respirator).

There are no standards to give guidance regarding the requirements and testing for proper CBRN PPE, for all categories of personnel who could be involved. This Workshop Agreement makes reference to standards, standards-like documents, legislation, guidance, that should be taken into consideration in order to mitigate the effects (direct or indirect) and consequences of CBRN events on EU Citizens.

There is presently no CEN Technical Committee, or indeed mechanism that can handle "Ensemble" standards, which is the compulsory route when addressing functional PPE that should protect adequately against CBRN. This is a matter that the Commission will need to consider. With the introduction of the new CEN TC 391 Security and Protection of the Citizen, it is felt this could be an avenue where such Ensemble Standards could be developed. However, the workshop gave priority to all individuals who might be engaged in a CBRN incident regardless whether or not these are professional responders or civilians who by job description have a duty to fulfil in such events.

The target audience of this document is therefore widespread and diverse. All stakeholders will need to consider the potential for such a CBRN incident and its impact on their premises and workers, in compliance with applicable regulations.

The members of the Workshop determined that they would develop CBRN PPE to protect the citizen by equipping Professional First Responders, Duty holders, Responsible Persons, Victims and members of the public who were the responsibility of those Occupiers, who had a legal responsibility towards them. The issue of CBRN protection for the citizens of the EU was determined to be too politically sensitive for the CWA to determine any resolution. Instead, the decision was taken to report this matter to DG JLS and this was done by the Chairman in preparation to the final meeting on 23 September 2009. This resulted in a new proposal being prepared by NEN, seeking support from DG JLS for a comprehensive Feasibility study to ascertain present gaps in the provision of CBRN protection for the Citizen and further areas regarding CBRN Detection, Decontamination and protection of Emergency Responders.

It is recognized that there are many potential types of CBRN event/incidents and this CWA has attempted to utilize those risks identified in the IMPACT study conducted by TNO for the EU Commission as a basis for threat levels. See Annex B.

In the initial stages of any CBRN event/incident, it is most unlikely that First Responders, Duty Holders, Employers or Victims would recognize what was involved; therefore the need for preventive CBRN PPE protection has to be considered. There may be occasions when it is imperative to evacuate large numbers of

potential victims, who might be contaminated; the Management of Emergency Services at such incidents is addressed by CWA 16107.

In the initial risk assessment conducted by the responsible person, consideration should be given to the protection for the untrained citizen faced with unknown but presumed pathogenic or toxic substances.

Such protection is defined as non occupational defence during evacuation or emergency movement through the presumed or confirmed hazard to an area of safety. In such circumstances, protection is identified as any device issued by the responsible person/duty holder, with self supply and is recognised as a broad base but limited protection.

At the scene of any incident/event (that turned out to be a CBRN incident) those affected may need immediate assistance in getting away from the hot zone. To achieve this in a hostile environment simple but effective CBRN PPE is required.

In certain scenarios rescues might not be possible until a full dynamic risk assessment has been carried out, this may mean first responders donning full ensemble CBRN PPE to carry out such a risk assessment. The Incident Commander at any such incident would need to give consideration to keeping all persons affected at the incident site within a designated quarantine area.

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Preview

## 1 Scope

This CEN Workshop Agreement aims at increasing the protection of those initially and primarily involved with any CBRN incident. This will cover Emergency Responders, Duty Holders, and Responsible Persons, Employers and Victims or potential victims. All of these people are potentially at risk from a CBRN incident.

This CWA provides both general guidance and codes of practice and requirements, testing, marking and certification of PPE to be applied in CBRN situations.

This CWA gives guidance on selection, as well as safety and effectiveness of PPE for CBRN scenarios. For use, care and maintenance the manufacturer's instructions have to be regarded.

This CWA contains guidance and risk assessment templates, which will allow those at risk to determine what level of risk this could be and the PPE required protecting the designated groups we have identified. Additional issues such as instruction, training and use of PPE are also addressed.

The management of any CBRN incident requires a variety of skills and those persons responsible should also refer to CWA 16107.

## 2 Normative references

The following referenced documents are indispensable for the application 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.

CWA 16107:2010, *Emergency Services Capability Framework*

NOTE CWA 16107 is applicable when considering the roles all of those recognised as having a role whilst attending a CBRN event.

## 3 Terms and definitions

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

**3.1 biological agents**  
biological materials that are capable of causing an acute disease or long term damage to the human body, the goods and the environment (including animal and vegetal organisms)

**3.2 CBRN agents**  
agents of chemical, biological, radiological or nuclear origin that are affecting human, animal or vegetable health by exposure of any kind

**C > Chemical Agents**  
threats by toxic, flammable or explosive chemicals

**B > Biologic Agents**  
threats by fungi, bacteria, viruses or sub-viral particles which may cause health problems

**R > Radiologic Agents**  
threat by compounds which emit radiation which may cause health problems

**Nuclear Agents > Atomic degradation Agents**  
threats by agents which contain elements whose nuclei degrade, emit radiation and form new and potential health threatening compounds or elements

**3.3****biological terrorism agents**

liquid or particulate agents that consist of a biologically derived toxin or pathogen used to inflict lethal or incapacitating casualties, generally on a civilian population as a result of a terrorist attack

**3.4****CBRN PPE**

all hardware that can be used by an individual to protect against the exposure to CBRN agents

**3.5****chemical flash fire**

ignition of a flammable and ignitable vapour or gas that produces an outward expanding flame front, as those vapours or gases burn

NOTE This burning and expanding flame front (fire ball) will produce both thermal and kinetic energy to the environment.

**3.6****chemical agents**

organic or inorganic substances that can be toxic, explosive, flammable, corrosive, and can cause harm to living organisms and non-living materials/property.

**3.7****chemical terrorism agents**

liquid, solid, and gaseous and vapour chemical agents and dual-use industrial chemicals used to inflict lethal or incapacitating casualties, generally on a civilian population as a result of a terrorist attack

**3.8****citizen**

any person within the EU boundaries, legally or illegally; it also referred to animals, which this CWA has not addressed

**3.9****cold zone**

area where the command post and support functions that are necessary to control the incident are located

[2000 Emergency Response Guidebook, U.S. Department of Transportation]

NOTE This is also referred to as the clean zone, green zone or support zone in other documents (EPA Standard Operating Safety Guidelines, OSHA 29 CFR 1910.120, NFPA 472).

**3.10****dual use industrial chemicals**

highly toxic industrial chemicals that have been identified as mass casualty threats that could be used as weapons of terrorism to inflict casualties, generally on a civilian population, during a terrorist attack

NOTE Dual-use industrial chemicals can be liquid, solid, or gaseous agents

**3.11****emergency response team**

fire fighters and other first responders that are trained and equipped to respond to incidents involving the accidental release of hazardous materials

**3.12  
hot zone**

area immediately surrounding a dangerous goods incident which extends far enough to prevent adverse effects from released dangerous goods to personnel outside the zone

[2000 Emergency Response Guidebook, U.S. Department of Transportation]

NOTE This zone is also referred to as exclusion zone, red zone or restricted zone in other documents (EPA Standard Operating Safety Guidelines, OSHA 29 CFR 1910.120, NFPA 472).

**3.13  
radioactivity**

energy (radiation) emitted in the form of alpha or beta particles, gamma or X-rays, due to the spontaneous transformation of the atomic nuclei of radioactive isotopes

**3.14  
radiological agents**

agents containing unstable (radioactive) atoms who emit radiation as they decay

**3.15  
stakeholder**

interested parties, more specifically for the purpose of this CWA: any citizen, responder, duty holder, employee or others affected by a CBRN incident

**3.16  
USAR**

Urban Search And Rescue

**3.17  
victim**

fatality, casualty, sufferer, wounded or contaminated person

**3.18  
warm zone**

area between hot and cold zones where personnel and equipment decontamination and hot zone support take place. It includes control points for the access corridor and thus assists in reducing the spread of contamination

[2000 Emergency Response Guidebook, U.S. Department of Transportation].

NOTE It is also referred to as the contamination reduction corridor (CRC), contamination reduction zone (CRZ), yellow zone or limited access zone in other documents. (EPA Standard Operating Safety Guidelines, OSHA 29 CFR 1920.120, NFPA 472).

## 4 Risk management

### 4.1 Risk management approach

Toxic Industrial Materials (TIM's) are used across a broad range of industries and establishments and are often relatively easily accessible. Due to their wide use, TIM's are widely available both in and out of the EU. In order to successfully address the broad range of possible TIM's security issues, a risk-management approach is needed based on vulnerability<sup>1)</sup> and threat<sup>2)</sup> assessments in line with existing EU regulations.

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1) Vulnerability being defined as the impact an incident could have (taking into account protection and preparedness measures)

2) Threat being defined as the probability that an incident will occur (taking into account capability and intention)

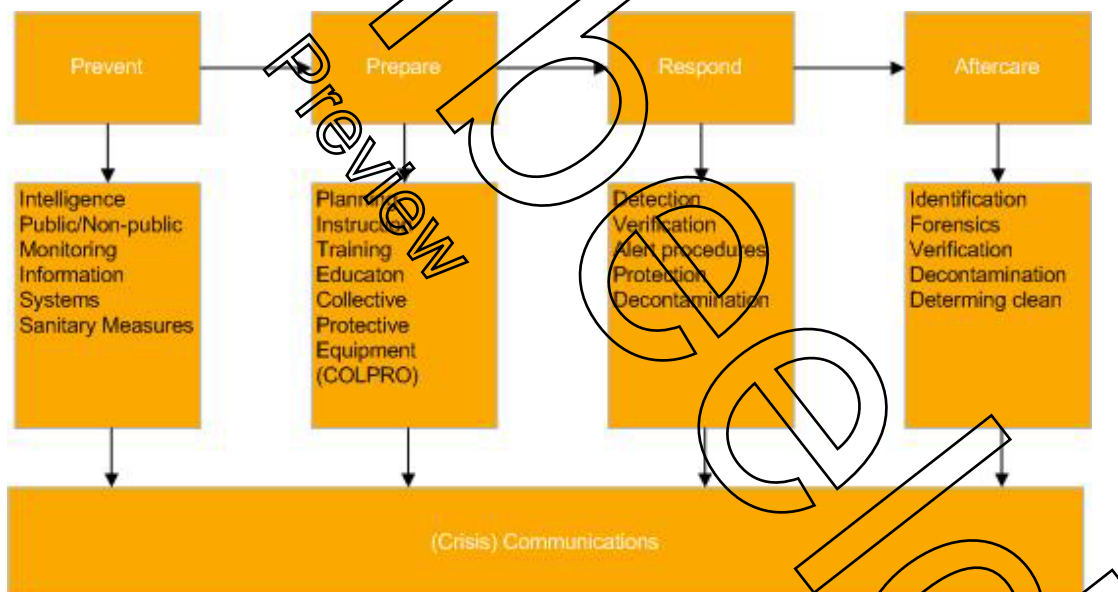


- The assessments being made must acknowledge the lack of internal borders within the EU. For example, due account must be taken of the possibility of acquiring materials in one state and carrying out attacks in another; as well as the effect of an incident close to the physical borders of two countries.
- A comprehensive set of mainly safety related EU legislation exists which are the basis of any risk assessment. Specific safety and security concerns should be addressed separately and in addition to the usual risk assessment.
- The schedules of chemicals included in the Chemical Weapons Convention<sup>3)</sup>, the Seveso II directive and NATO's International Task Force 25 (ITF-25) list of hazardous chemicals could serve as the basis for the identification and prioritisation of TIM's and CBRN warfare agents. Lists of chemicals already existing within the Member States should be taken into account as well.

The risk management process should lead to the identification of toxic agents which may be used for malicious purposes and the consequences of incidents involving such agents. The vulnerability assessment should be conducted based on the development of scenarios, though it is important to underline that so-called "worst case scenarios" may not be adequate with a view to assessing the state of preparedness and protection to low-impact incidents, which may nevertheless cause significant psychological, health and economic effects. The needs should be based on agreed methods and criteria taking the security concern at the EU level into account.

They would also need to take into consideration the basic principle that the danger stemming from a specific toxic agent is to a large extent dependant on the amount and degree of exposure. Toxicity in itself will seldom if ever be a sufficient criterion for singling out a specific chemical agent.

NOTE All carcinogenic substances by definition have no limit values; hence there is no "permissible" exposure level.



**Figure 1 — Intention of this document - Definition of CBRN PPE; context within CBRN protective measures**

3) It should be kept in mind that the Chemical Weapons Convention (CWC) schedules were not developed with terrorist risks in mind. Certain chemicals including pesticides and related toxic chemicals do not form part of the schedules.

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