



# NUCLEAR, RADIOLOGICAL, BIOLOGICAL AND CHEMICAL EVENTS



ICRC

IN BRIEF

## WHAT ARE NUCLEAR, RADIOLOGICAL, BIOLOGICAL OR CHEMICAL EVENTS?

Nuclear, radiological, biological or chemical (NRBC) events are actions or occurrences that may lead to the release and dispersal of hazardous materials in quantities and in circumstances that put individuals or groups at significant risk.

### HAZARDOUS MATERIALS

#### NUCLEAR AGENTS

Radioactive materials generated by nuclear fission or fusion, such as those associated with an operating nuclear power plant or with the explosion of a nuclear weapon

#### RADIOLOGICAL AGENTS

Radioactive materials occurring naturally, as by-products in industrial processes or manufactured for use in industry or medical therapy

#### BIOLOGICAL AGENTS

Naturally occurring or genetically altered microorganisms (viruses, fungi and bacteria) and toxins (poisonous chemicals produced by biological organisms)

#### CHEMICAL AGENTS

Naturally occurring or man-made toxic substances used in everyday life, industry and medicine, or for law-enforcement/military purposes

The release of such hazardous materials in an NRBC event may be unintentional or intentional.

#### UNINTENTIONAL RELEASE

Caused by outbreaks of disease, natural disasters, transport or industrial accidents, collateral damage in a conflict, remnants or contaminants from past use of such agents, etc.

#### INTENTIONAL RELEASE

Targeted or indiscriminate military action, or attacks by individuals or groups using purpose-built or improvised devices, to cause injuries or deaths, temporarily incapacitate, or terrorize

## WHY ARE NRBC EVENTS OF CONCERN?

Exposure to NRBC agents may be very damaging to health or even lethal, and persistent agents—those that linger and remain effective—may be hazardous for both the local population and the responders. The nature of the agent and the degree of exposure will determine the consequences.

#### HEALTH EFFECTS MAY:

- range from sickness and injury to serious illness or death
- be temporary or long-term
- be immediately apparent or may take time—a few hours to years in some instances—to become evident
- be exacerbated by adverse psychological reactions, caused by uncertainty about the extent or the effects of exposure.

An additional source of concern is that most NRBC agents are difficult to detect or recognize—being invisible, odourless or impalpable.

Exposure to NRBC agents may occur not only when they are released and dispersed but also afterwards, in places that have been contaminated. It may occur even in places initially unaffected, as a result of cross-contamination through transfer by exposed persons or materials. Possible 'routes of exposure' are listed below:

- inhalation (of airborne agents)
- contact with eyes, skin or open wounds
- consumption of contaminated food or water
- hand-to-mouth transmission after contact with contaminated material
- person-to-person transmission
- inhalation of re-suspended, persistent agents
- contact with/intake of persistent agents.



## WHAT TO DO IN CASE ...

In case of imminent or of actual exposure, the sole purpose of action is to reduce the risk of adverse health effects.

Protective steps to be taken are, in sequence:

- avoiding or minimizing time spent in areas affected
- maximizing distance from areas affected or sheltering in place
- using physical barriers as shielding
- removing agents (by any available means) if exposure has occurred
- seeking medical attention.

#### SPECIFIC ACTION AT PERSONAL LEVEL

- Maintain calm and self-control
- Use purpose-built or improvised face mask and protective clothing (e.g. long-sleeved shirts and long pants, to cover the entire body)
- Move to unaffected or well-ventilated locations—if this is not safe or feasible, shelter in place in a sealed location, i.e. with the windows closed and the air-conditioning—if any—turned off, as a minimum
- Stay upwind from contaminated areas or any potential source of agent release
- Avoid contact with persons who have or who may have been exposed, and with surfaces and objects that may be contaminated
- Avoid consumption of water or food products that may be contaminated

#### In case of exposure:

- Move quickly to an unaffected and well-ventilated location or shelter
- Undress and discard and seal contaminated clothing in plastic bags (seek assistance, if possible)
- Decontaminate by showering, washing, and wiping and/or scraping the contaminants off exposed body parts and hair (as thoroughly as possible)
- Change into clean clothing and seek immediate medical attention and advice, especially if symptoms become apparent

## POSSIBLE INDICATIONS OF AN NRBC EVENT

- Suspicious devices or packages (boxes with wiring, compressed air cylinders with tubing, containers with powders, liquids or aerosols, etc.)
- Oily film or unusual powdery or gel-like substances on exposed surfaces
- Unusual liquid sprays or vapours in the air, falling on the ground or on exposed surfaces
- Unauthorized, unexplained, or out-of-season spraying in the area
- Unexplained odours (smell of bitter almonds, peach kernels, mown hay, cut grass)
- Cases of nausea, difficulty in breathing, convulsions, disorientation, or patterns of illness inconsistent with natural disease (reported or confirmed by public health agencies)
- An abrupt spike in the rate of death among animals in the area
- Low-lying clouds or fog unrelated to weather, clouds of dust or of suspended, possibly coloured, particles
- People dressed unusually (long-sleeved shirts or overcoats in warm weather) or wearing protective masks, particularly in crowded areas such as underground train stations or stadiums

In the absence of any other information, the following “1-2-3 protocol” should be considered in case of casualties:

### IF 1 CASUALTY: PROCEED AS USUAL

### IF 2 CASUALTIES: EXERCISE CAUTION

Look for other indications before proceeding;  
seek advice if unsure

### IF 3 CASUALTIES: DO NOT PROCEED

Refer to “What to do in case ...”  
and take action accordingly; seek advice

## MISSION

The International Committee of the Red Cross (ICRC) is an impartial, neutral and independent organization whose exclusively humanitarian mission is to protect the lives and dignity of victims of armed conflict and other situations of violence and to provide them with assistance. The ICRC also endeavours to prevent suffering by promoting and strengthening humanitarian law and universal humanitarian principles. Established in 1863, the ICRC is at the origin of the Geneva Conventions and the International Red Cross and Red Crescent Movement. It directs and coordinates the international activities conducted by the Movement in armed conflicts and other situations of violence.



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