



Chemical



Biological



Radiological



Nuclear



NaTech



Environmental

+C IFRC

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Sr. Officer, Tech & Bio Hazards
preparedness

**INTERNATIONAL
FEDERATION OF
RED CROSS AND
RED CRESCENT
SOCIETIES**

**192 National
Red Cross and
Red Crescent Societies**

**Leaving
no one behind**

Disaster risk knowledge

- Are key hazards and related threats identified?
- Are exposure, vulnerabilities, capacities and risks assessed?
- Are roles and responsibilities of stakeholders identified?
- Is risk information consolidated?

Detection, monitoring, analysis and forecasting of the hazards and possible consequences

- Are there monitoring systems in place?
- Are there forecasting and warning services in place?
- Are there institutional mechanisms in place?

Warning dissemination and communication

- Are organizational and decision-making processes in place and operational?
- Are communication systems and equipment in place and operational?
- Are impact-based early warnings communicated effectively to prompt action by target groups?

Preparedness and response capabilities

- Are disaster preparedness measures, including response plans, developed and operational?
- Are public awareness and education campaigns conducted?
- Are public awareness and response tested and evaluated?

Testimonial from Japanese RC – Medical response staff



Ayumi Watanabe
JRCS Emergency nurse
Fukushima RC Hospital

*“We were not at all aware of the possible damage at the nuclear power plant, and we started the treatment of tsunami survivors. But, soon after our arrival, we heard the news of the explosion, so that we had to pack up and change the location of our medical relief activities. **“You are going to leave us!”** survivors said to us reproachfully. My heart was close to breaking with a mixture of guilt and fear that I wanted to evacuate from the radiation danger.”*



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Understanding the Hazard



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Definitions

Emergency

A non-routine situation or event that necessitates prompt action, primarily to mitigate a hazard or adverse consequences for human life, health, property and the environment.

Nuclear or radiological emergency

An emergency in which there is, or is perceived to be, a hazard due to:

- (a) The energy resulting from a nuclear chain reaction or from the decay of the products of a chain reaction; or
- (b) Radiation exposure



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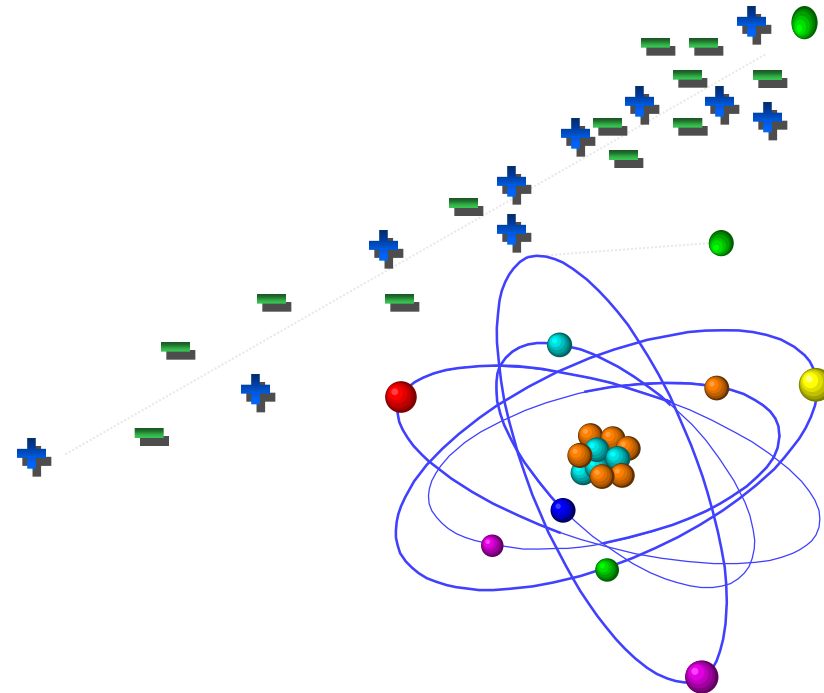
Environmental



What is Radiation?

Radiation: Energy in the form of particles or electromagnetic waves

Ionizing Radiation: Radiation with sufficient energy to remove an electron from an atom or molecule.





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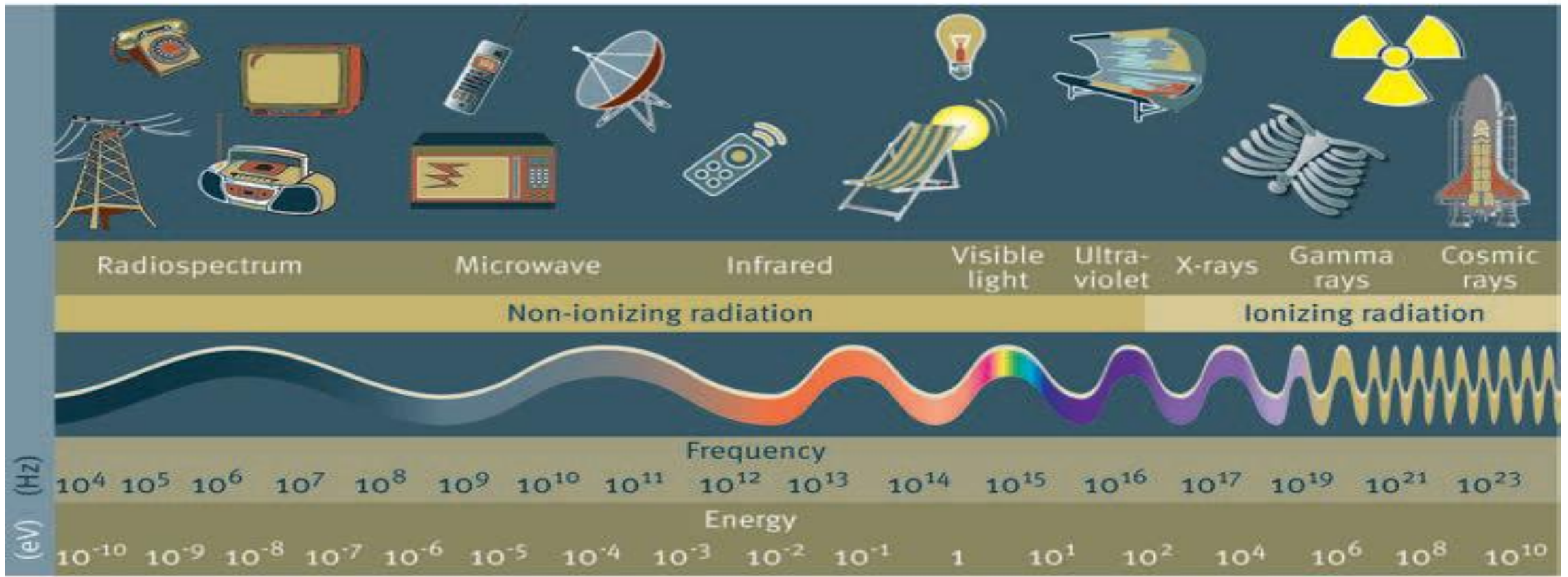
Radiation risks

Detrimental health effects of exposure to radiation (including the likelihood of such effects occurring), and any other safety related risks (including those to the environment) that might arise as a direct consequence of:

- (a) Exposure to radiation;
- (b) The presence of radioactive material (including radioactive waste) or its release to the environment;
- (c) A loss of control over a nuclear reactor core, nuclear chain reaction, radioactive source or any other source of radiation.

Ionising versus Non – Ionising radiation

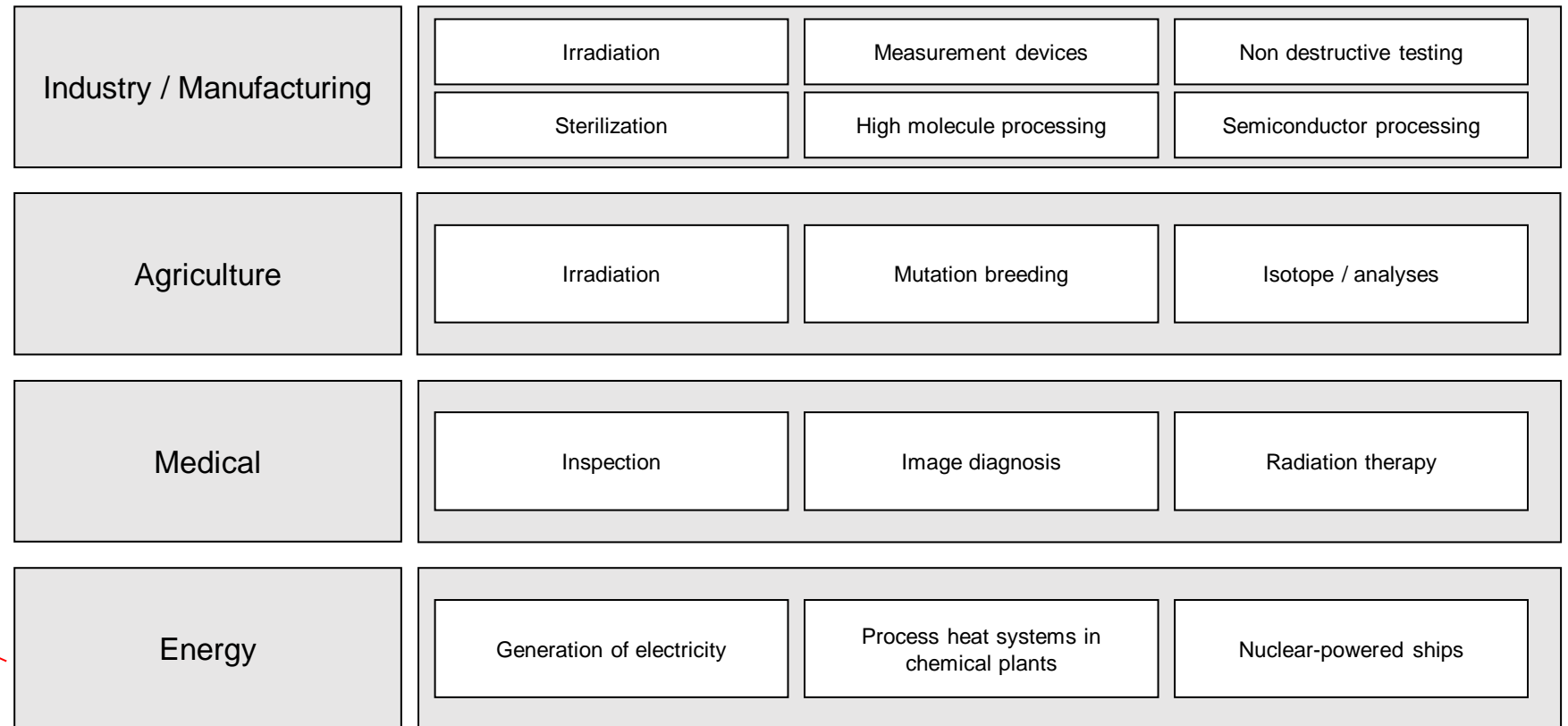
Examples of different applications using radiation



Non-ionizing radiation does not have enough energy—measured in electron volts (eV)—to make changes to atoms or molecules.

Peaceful uses of nuclear technology

- Using nuclear technology is familiar to people.
- Nuclear technology is used in wide applications.
- The power generation sector is the largest application.



Energy is the largest application of nuclear energy usage.

Based on : JAEA " Research report on market size for uses of nuclear technologies"

International EPR System



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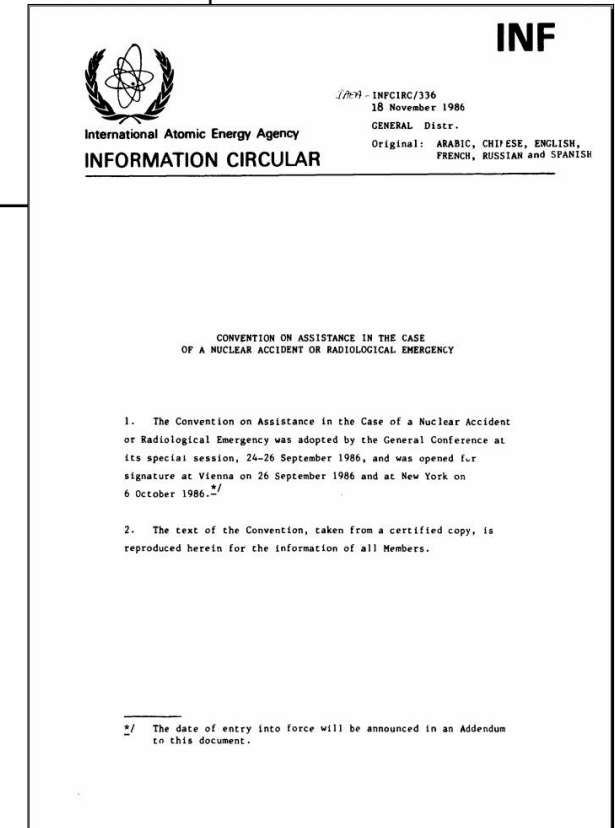
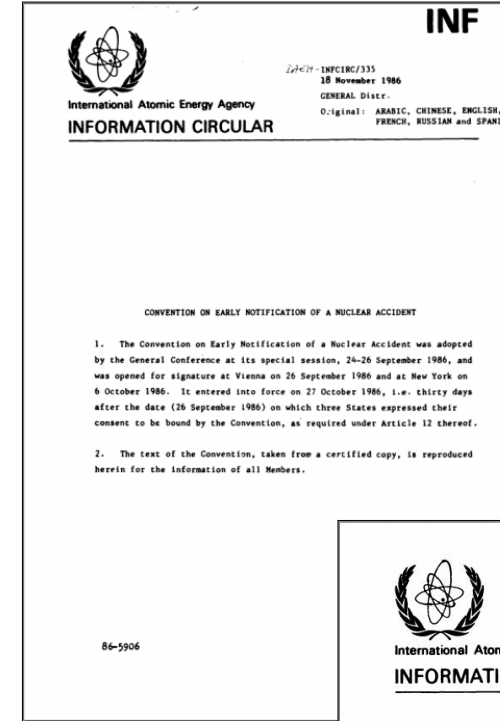
International EPR Framework



Conventions

- Convention on Early Notification of a Nuclear Accident (ENC)
 - 122 Parties – 69 signatories
 - including FAO, WHO, WMO, EURATOM
- Convention on Assistance in Case of a Nuclear Accident or Radiological Emergency (AC)
 - 117 Parties – 68 signatories
 - including FAO, WHO, WMO, EURATOM

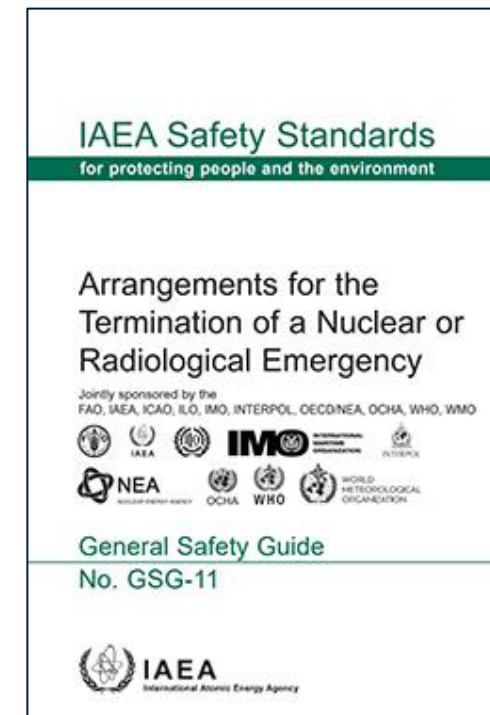
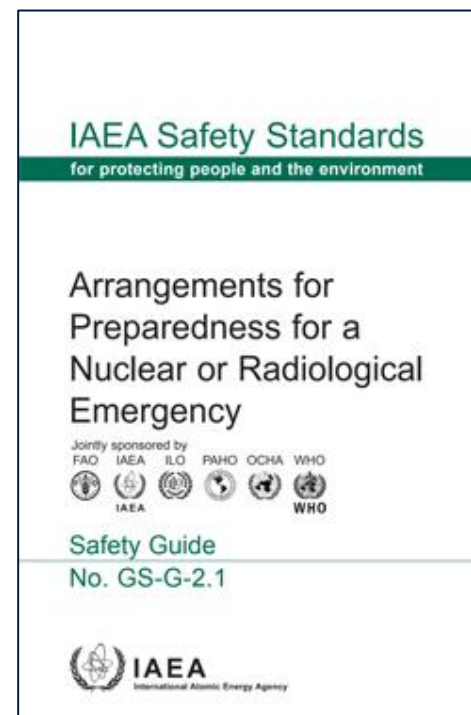
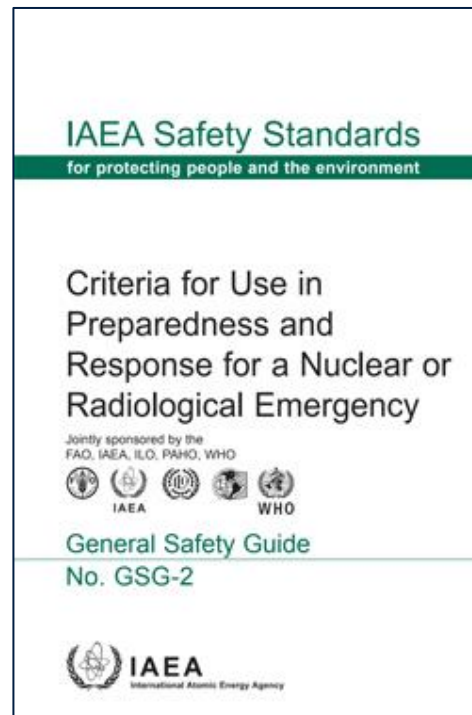
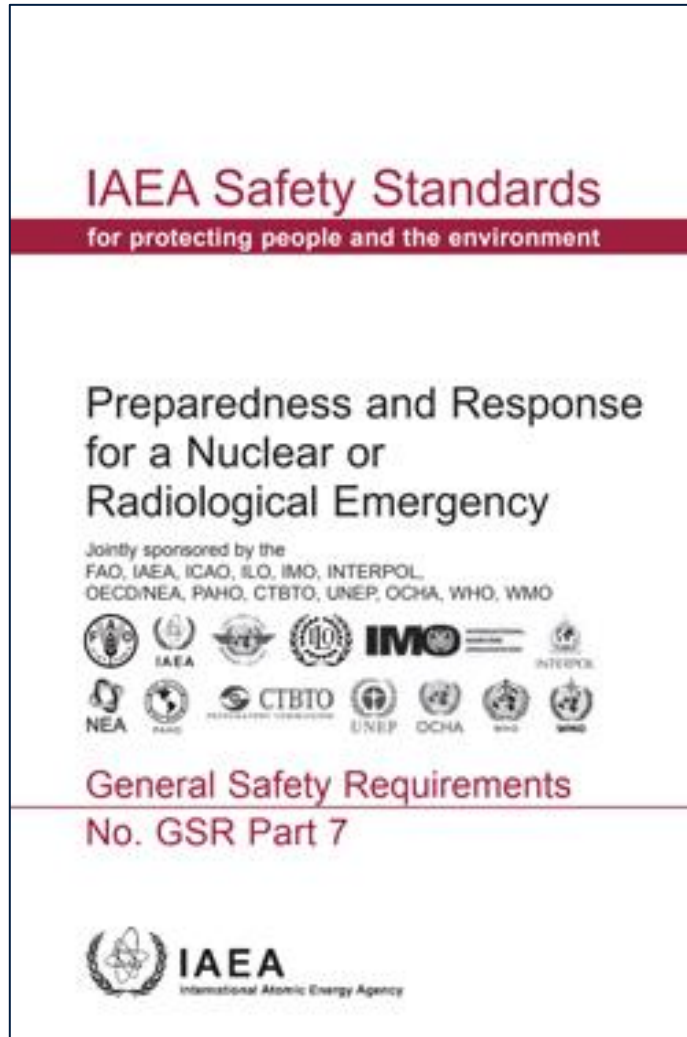
Both Conventions are applicable for nuclear or radiological emergency, regardless of its origin



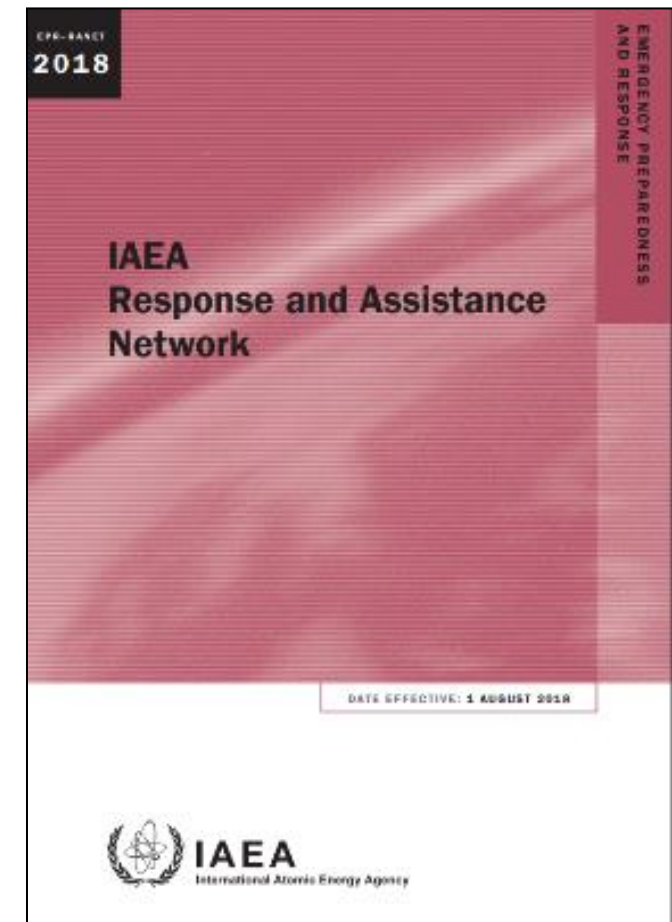
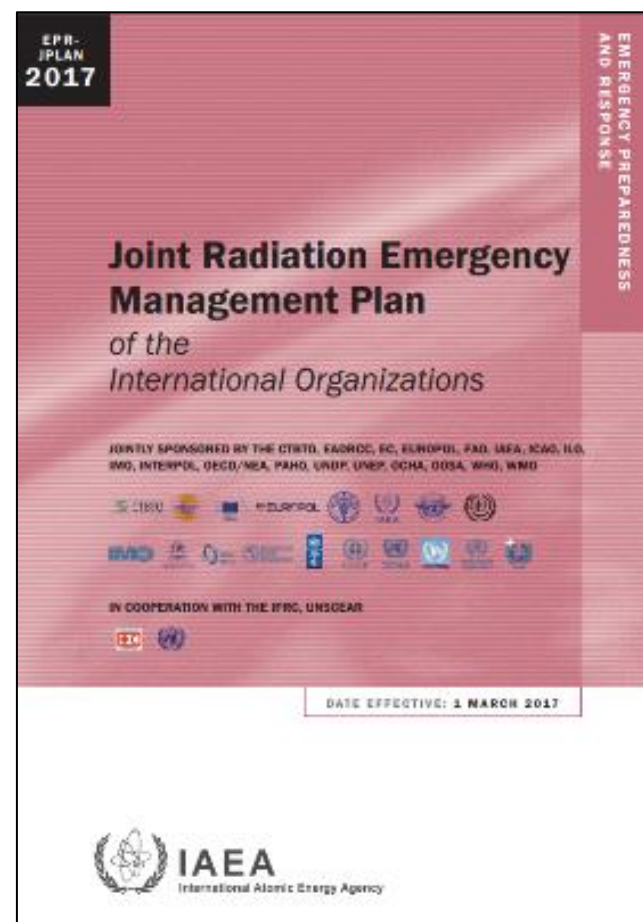
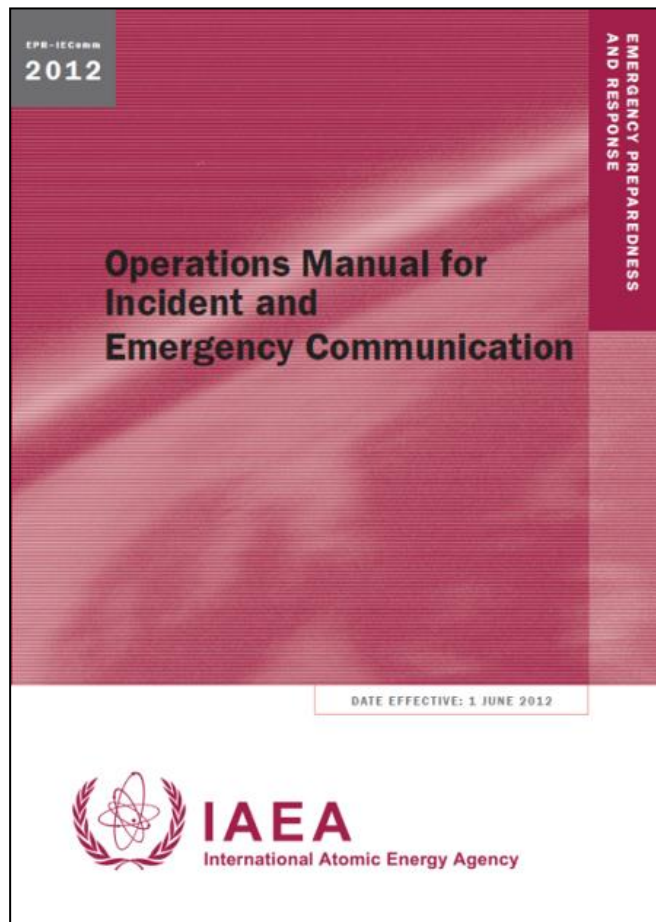
Safety Standards



“transnational emergency”



Operational Arrangements







Communication / Warning System



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Notification and official information exchange

- Through officially designated Contact Points

Convention on Early Notification of a Nuclear Accident and Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency



INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, 1987

IAEA NUCLEUS Go to USE Exercise Site

Kenny, Pat (IAEA Publisher) Settings Sign Out

IEC Status: Basic response Date/Time: 2011-07-05 07:27 UTC

Home Events Address Book Documents Links Submissions

Welcome to USIE

The IAEA Unified System for Information Exchange in Incidents and Emergencies (USIE) is an IAEA web portal for Contact Points of States Parties to the Early Notification and Assistance Conventions and of IAEA Member States to exchange urgent information during incidents and emergencies, and for officially nominated INES National Officers to post information on events rated using the International Nuclear and Radiological Event Scale (INES).

[Read More >](#)

Latest Events

Strong Earthquake near east coast of Japan Japan | INES-7 | 11 Mar 2011 06:46

In March 18, rating of the INES on the events in Fukushima Dai-ichi Nuclear Power Station, by the Tohoku Regional Pacific Ocean Offshore Earthquake is temporary estimated Rating 5. However, Nuclear and Industrial Safety Agency (NISA) estimated total amount of discharge from Fukushima Dai-ichi...

Published on 11 Mar 2011 07:59 | Last updated on 30 Jun 2011 10:29

Overexposure of 4 workers at an irradiation facility Bulgaria | INES-3 | 14 Jun 2011

On 14 June 2011 activities on preparation for recharging of a gamma-irradiation facility with Co-60 sources in Town of Stambolitsky were performed. A device already recharged with sources has been taken out instead of an empty one due to personnel error. As a result four workers were exposed to a...

Published on 29 Jun 2011 07:25 | Last updated on 29 Jun 2011 07:25

Over exposure of workers beyond annual regulatory limit India | INES-2 | 30 May 2011

Kakrapar Atomic Power Station (KAPS) is a twin unit station with 220 MWe Pressurized Heavy Water Reactors. Refueling of these reactors is done when the

Report Event >

Request Assistance >

Request Information >

For Information

Event information published on this site is, unless otherwise indicated, made available here to official IAEA contact points free for public use.

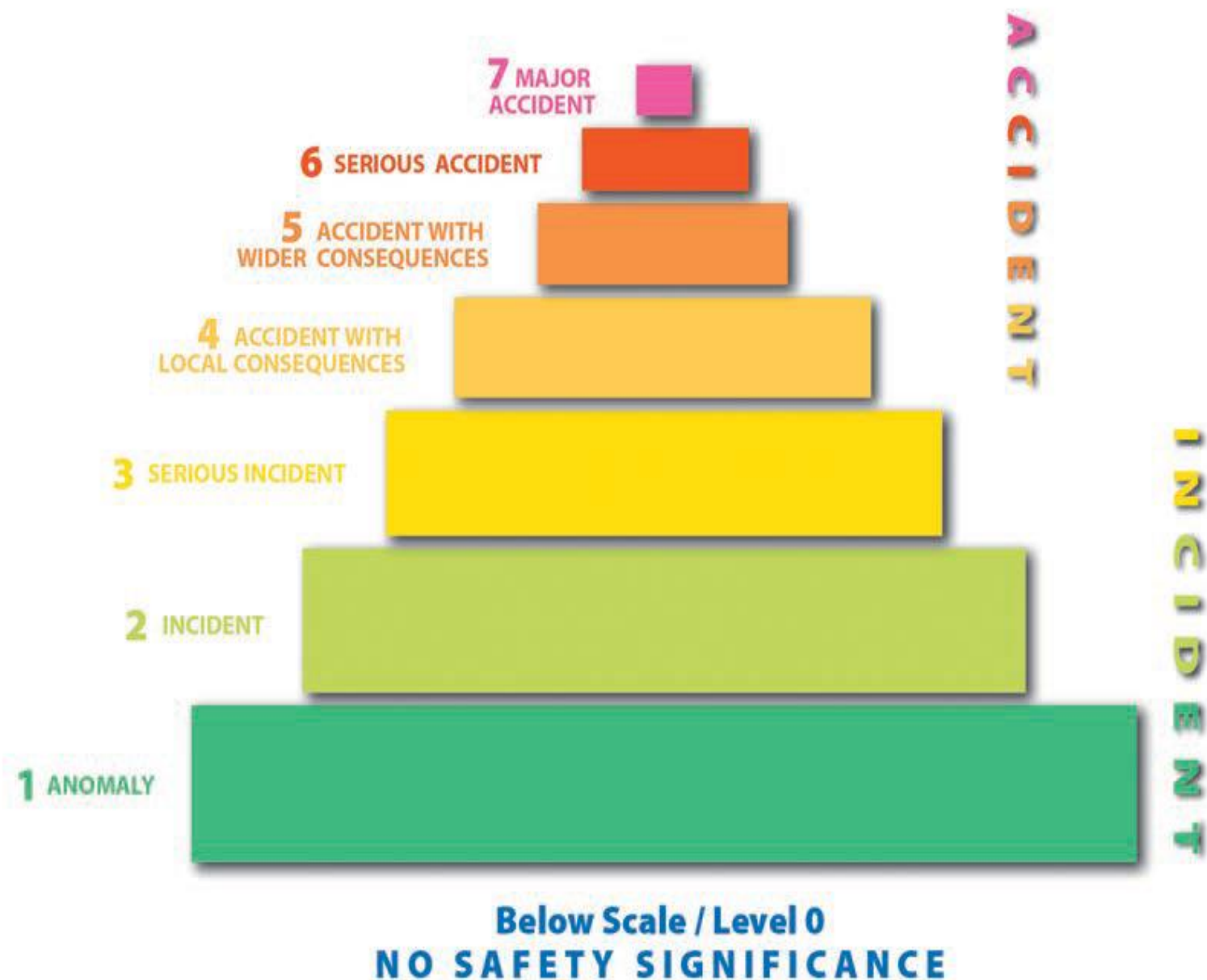
Announcements

There are currently no announcements available.

Calendar Events

There are currently no upcoming calendar events available.

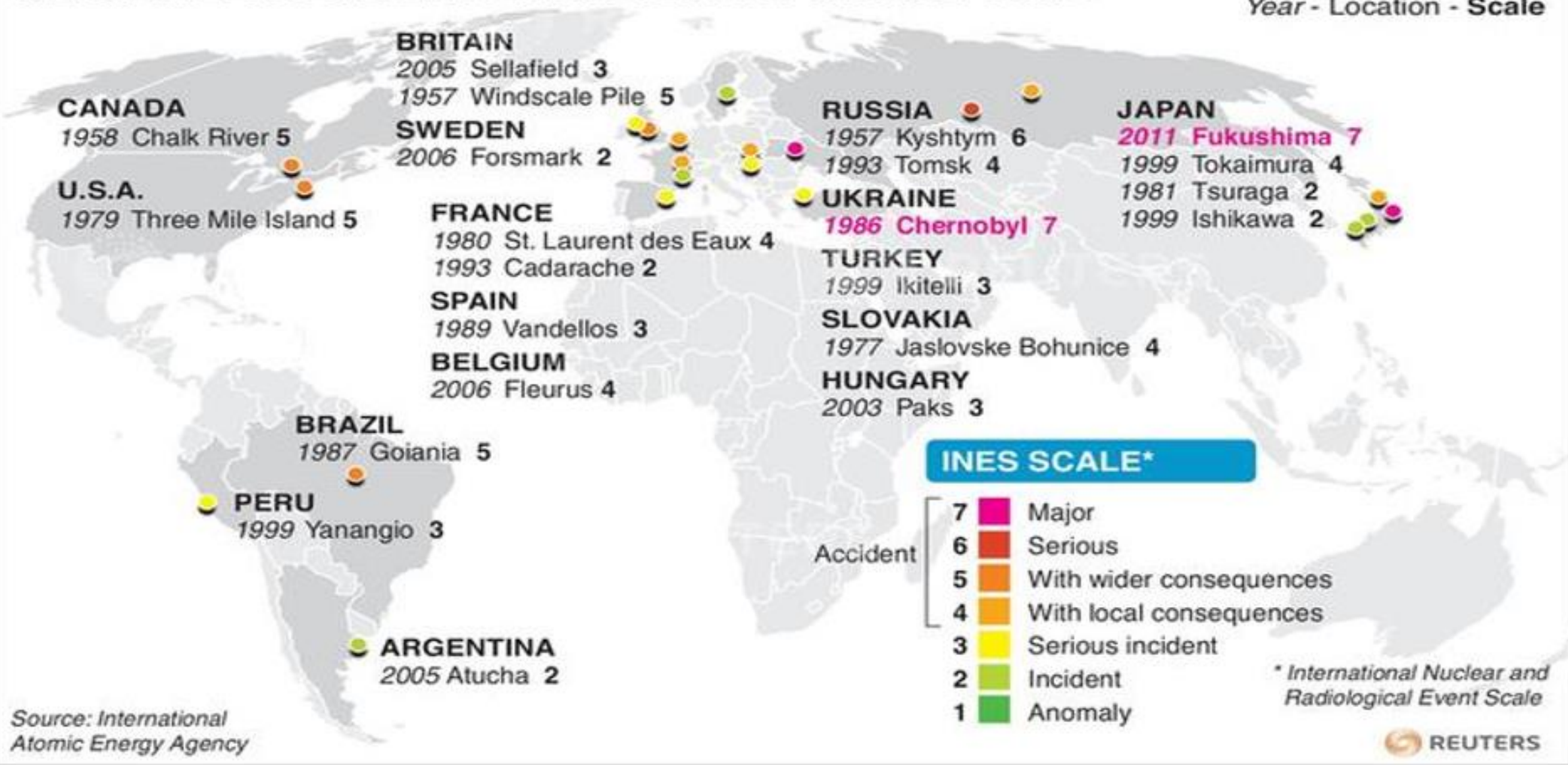
NEWS - The public channel for information on nuclear and radiological events...



INES International Nuclear and Radiological Event Scale

GLOBAL NUCLEAR INCIDENTS SINCE 1956

COUNTRY
Year - Location - Scale



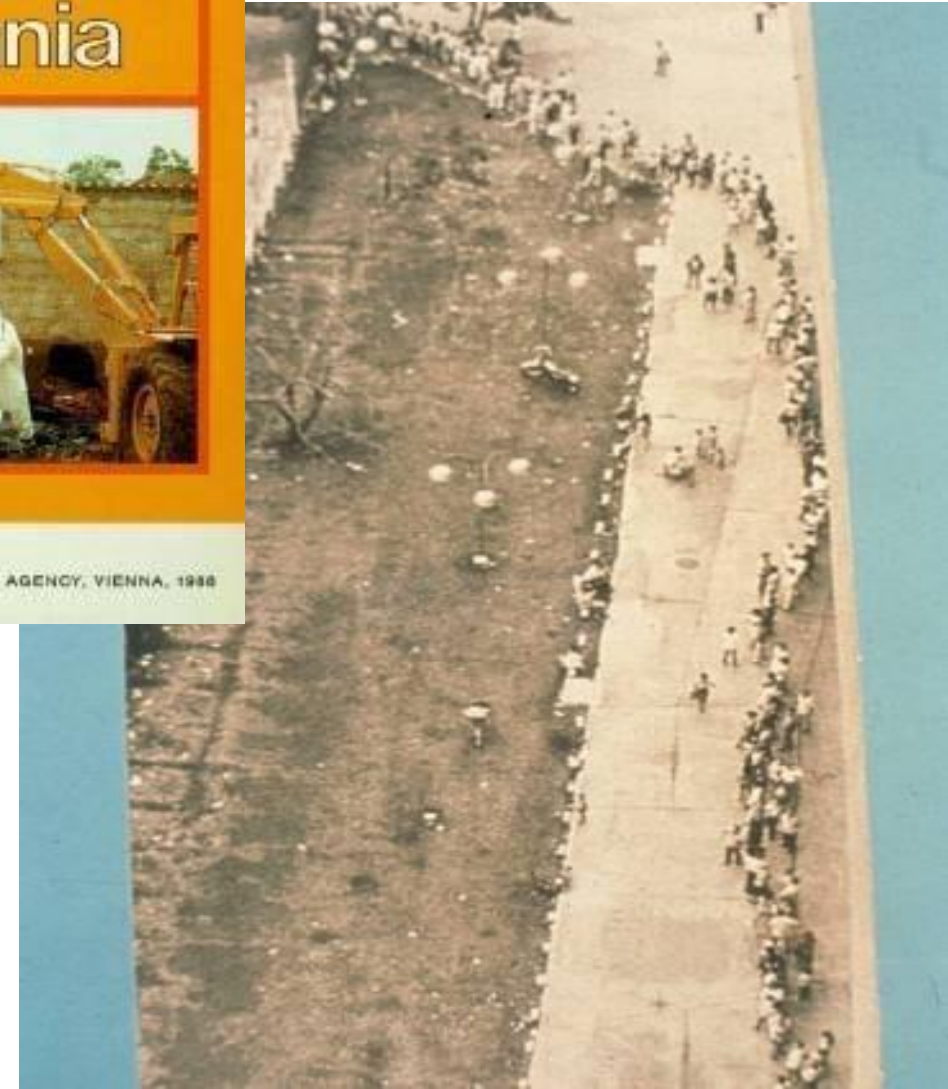
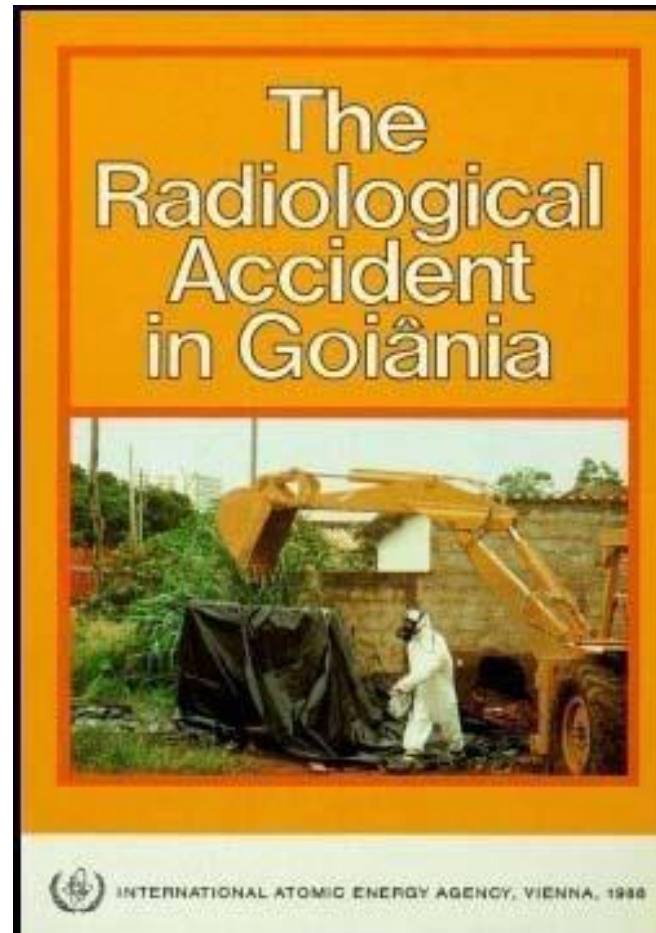
Goiania, Brazil - September 1987

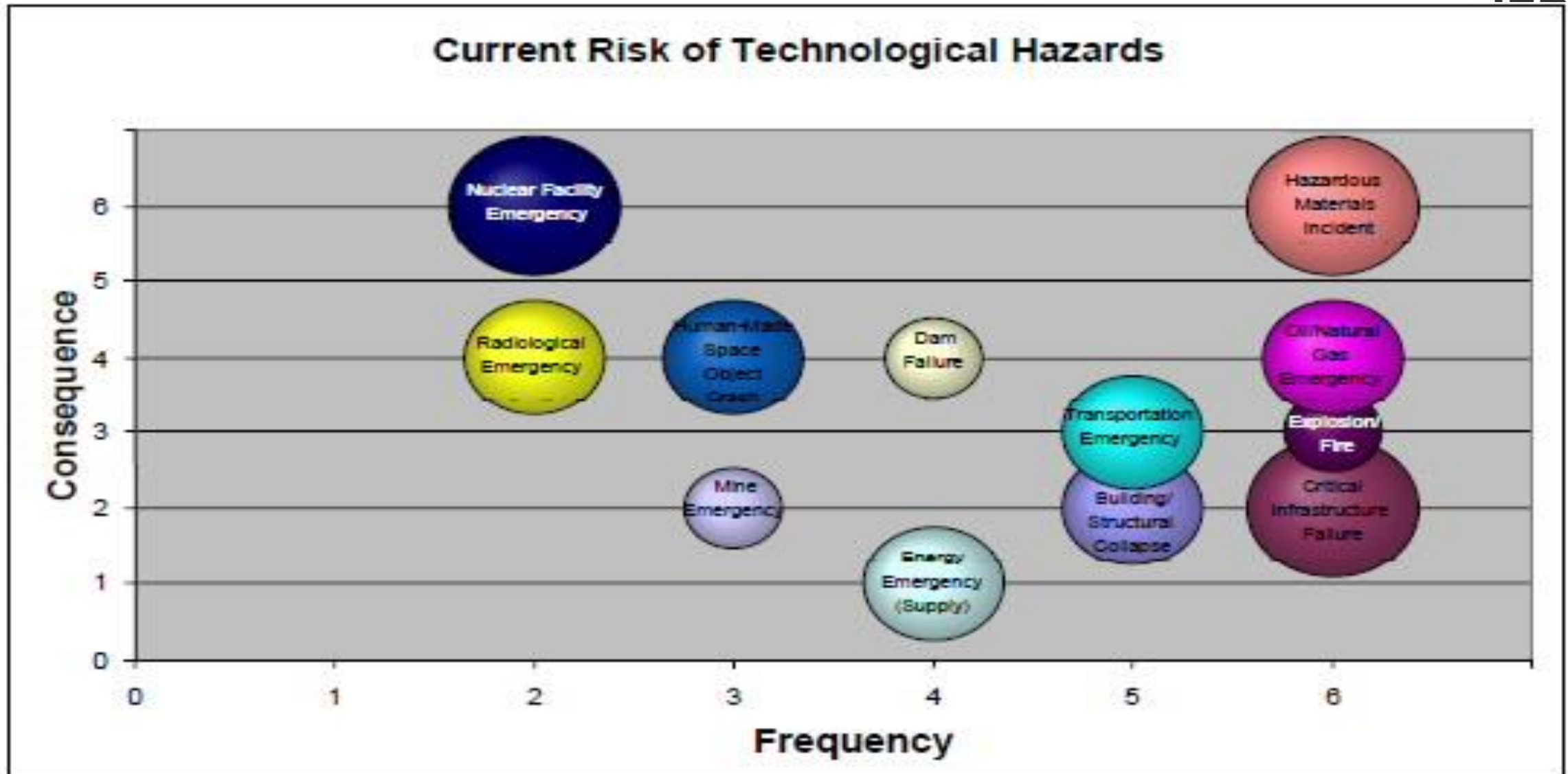
- Abandoned Cancer Clinic discarded canisters from radiotherapy machine
- Junkyard worker opened canisters revealing blue powder
- Citizens contaminated with radioactive Cesium-137

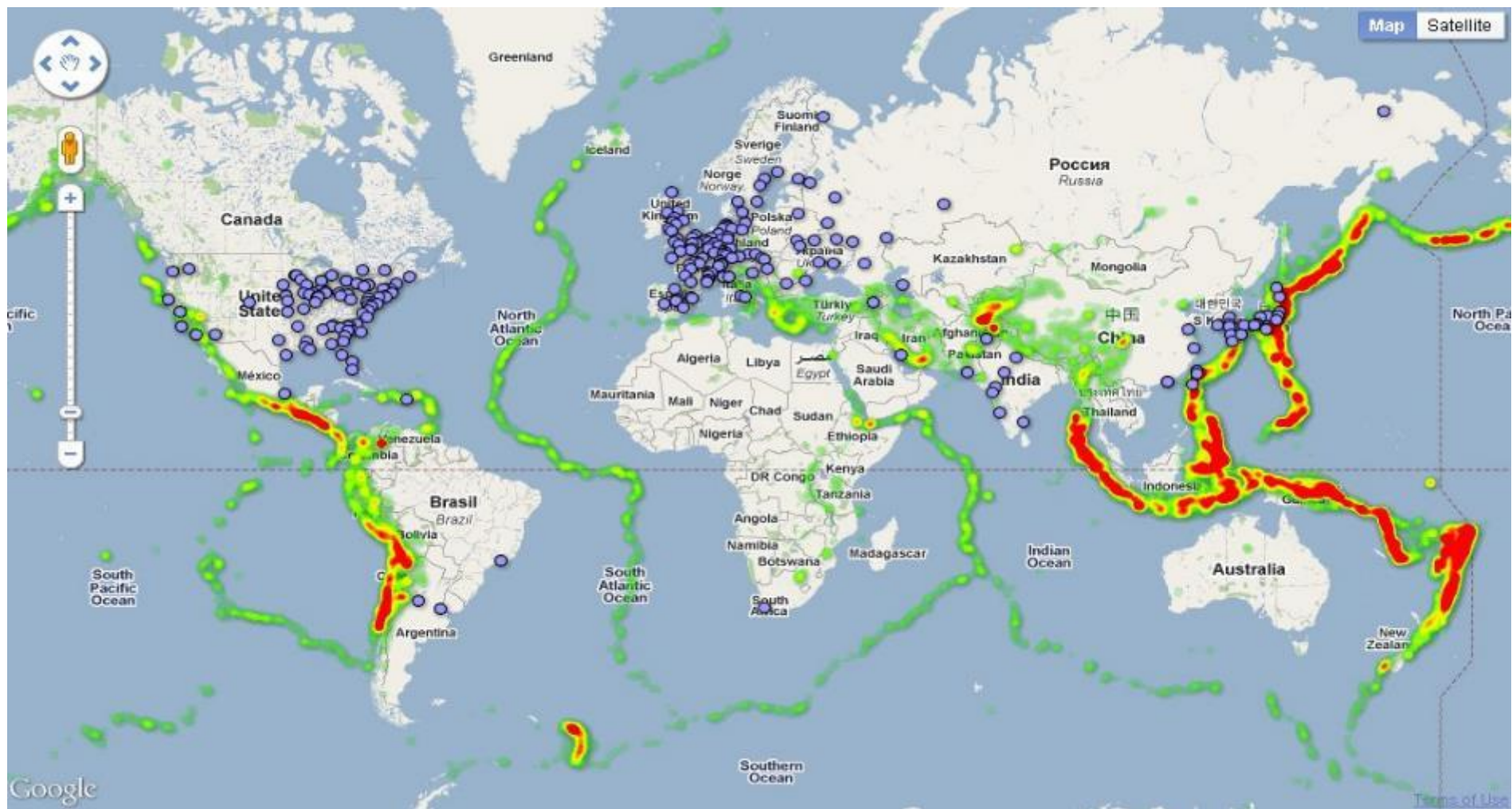


Consequences

- 5 deaths (including 6-year-old girl internally contaminated)
- 28 with radiation burns
- 49 hospitalized
- 151 contaminated internally and externally
- 249 people contaminated
- Required monitoring of **112.000 persons** for contamination (10% of local population)









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Fiction or Reality.....



signal bars Vodafone HU 19:09 56%

<  Robert Ray ▸ American Red Cross Volunteers
1 hr · 

In light of what happened yesterday in Hawaii, we need to seriously think about adding 'nuclear attack' to our disaster preparedness programs. No one in Hawaii knew what to do or where to go when that false alarm sounded. What if it had been real? Think of the consequences. — 🙄 feeling concerned.

 Like

 Comment

   26

[View previous comments...](#)



Michael S Green

Just for the conversation does anyone live near or have access to a hardened nuclear shelter? It will be hard to protect ourselves from a direct nuclear missile attack. There are things that can be done to mitigate the effects. Those living in Hawaii and the western US might and I stress might need to look into this some more.

1 h Like Reply

What to do in case of a **nuclear, chemical or radiological** event?



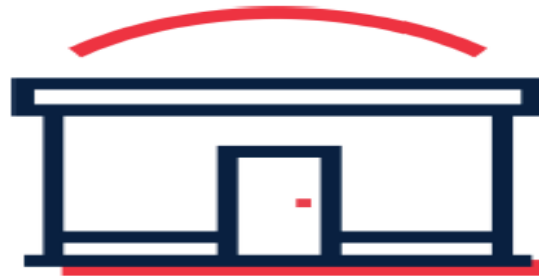
IMMEDIATE RESPONSE

GET INSIDE



**Go to the
basement or the
middle of a
building.**

STAY INSIDE



**Plan on 12 - 14
hours unless
provided updated
guidance.**

STAY TUNED



**AM/FM radio is
best, cellular
and Internet if
available.**

Be prepared!

[ifrc.org](https://www.ifrc.org)

Pickering / Toronto, Canada

12 Jan 2020



8:33

! EMERGENCY ALERTS

1h ago

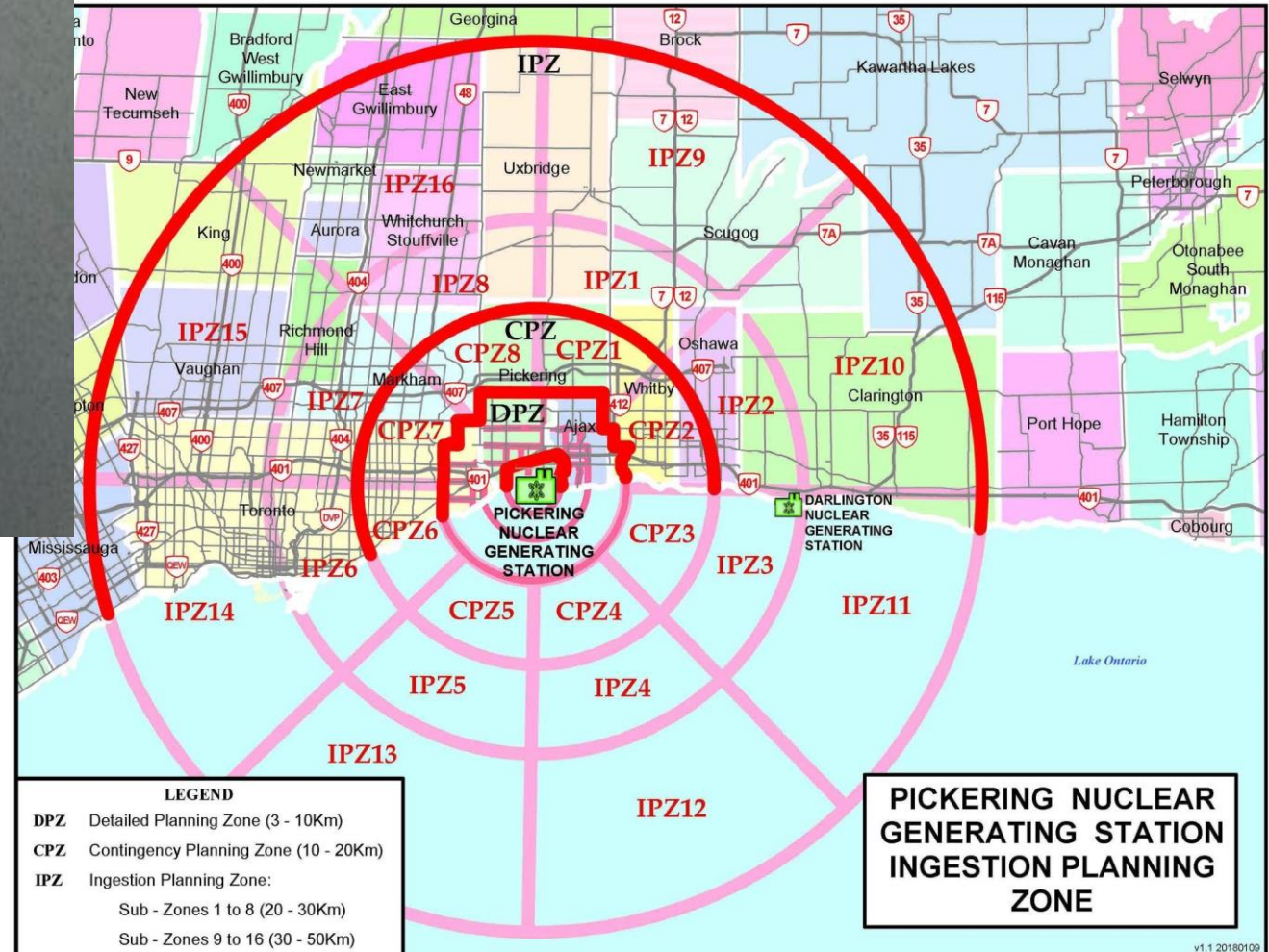
EMERGENCY ALERT / ALERTE D'URGENCE

This is a Province of Ontario emergency bulletin which applies to people within ten (10) kilometres of the Pickering Nuclear Generating Station. An incident was reported at the Pickering Nuclear Generating Station. There has been NO abnormal release of radioactivity from the station and emergency staff are responding to the situation. People near the Pickering Nuclear Generating Station DO NOT need to take any protective actions at this time. Remain tuned to local media for further information and instructions.

! EMERGENCY ALERTS

EMERGENCY ALERT / ALERTE D'URGENCE

There is NO active nuclear situation taking place at the Pickering Nuclear Generating Station. The previous alert was issued in error. There is no danger to the public or environment. No further action is required.



Technological hazards

Self-protection



When a technological or biological hazard happens, take the following actions:

TIME



Spend the shortest amount of time in contaminated areas

DISTANCE



Take greater distance from the source of harm and contamination

SHIELDING

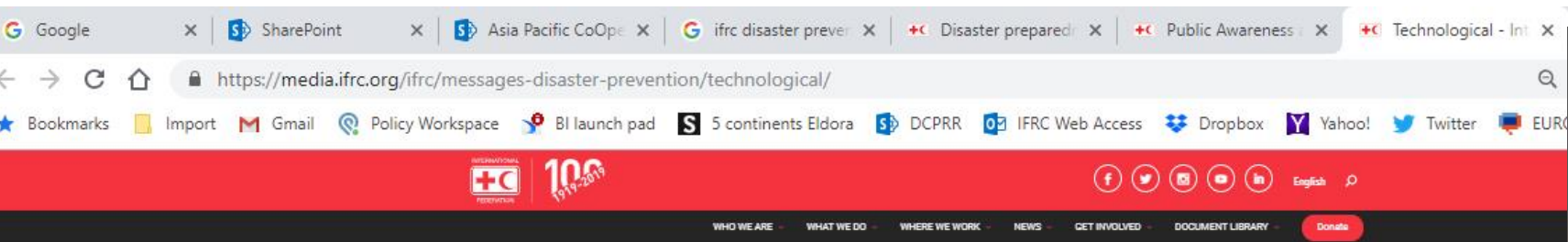


Maintain significant physical barriers and shielding

Be prepared!

[ifrc.org](https://www.ifrc.org)

Preparedness messages



Technological

In collaboration with



Main page

Hazard-specific messages

Child protection

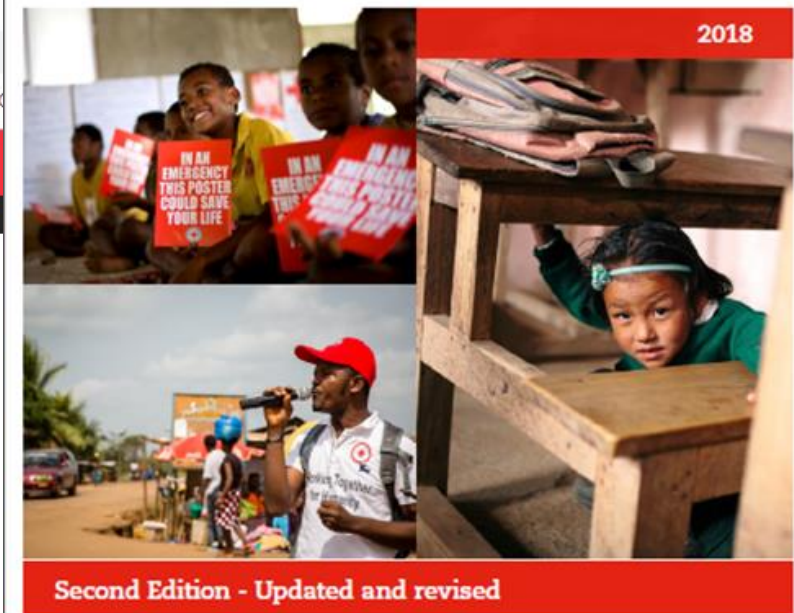
School safety

Key documents



Chemical, biological, radiological, and nuclear hazards

Technological hazards originate from technological or industrial conditions, dangerous procedures, infrastructure failures or specific human activities. Chemical, biological, radiological and/or nuclear (CBRN)



Public awareness and public education for disaster risk reduction:

Action-oriented risk reduction and resilience messages for households and schools

RCRC Nuclear & Radiological scope of Interventions



Preparedness

- General Information to the public
- Preparedness plans -Linking with national and local authorities
- Establishing a trust relationship with communities with regard to nuclear issues
- Establishing partnerships
- Information on specific health impact and preparedness issues, etc.
- Joint messages specifically about preparedness in NR Accidents / Technological accidents
- Business continuation

Response

- General needs resulting from displaced population (e.g. food, water, shelter, livelihoods)
- Specific needs (e.g. contamination),
- general and specific medical needs (burns, injuries etc),
- Preventive health interventions
- Protection of staff and volunteers
- Information for the population, etc.

Recovery

- Psychosocial needs specific to nuclear crises
- Social needs (livelihoods, education, resettlement),
- Ongoing health needs, etc.
- Lessons learned from Chernobyl & Fukushima and similar events

Awareness & Comms



Technological Hazard Preparedness The Basics of Self-Protection



In all technological emergency situations, closely monitor and follow responsible civil authority warnings and instructions on accessing and leaving contaminated areas. Also follow any personal precaution advisories and personal protective measures issued by public health officials.

Much of the standard guidance and training for responding and reacting to hazardous material incidents builds on **three basic concepts** of time, distance and shielding.

Time

All individuals should spend the **shortest amount of time** as possible in contaminated areas to minimize exposure to the hazard. Residents should evacuate contaminated areas while emergency responders should only spend the time necessary to complete mission critical tasks.

Distance

Generally, the **greater the distance** from the source of harm and contamination, the less the degree of exposure and risk. Whenever possible distance yourself from the hazardous material source. Obey evacuation orders and advisories whenever issued by responsible civil authorities.

Shielding

While time and distance can be effective in reducing risk exposure, maintaining **significant physical barriers** between the hazardous materials provides added protection. Depending on the nature of the hazardous material shielding can take various forms: vehicles, buildings, walls, personal protective equipment etc. However, no matter how much shielding is available always take into consideration additional benefits also provided by time and distance



Technological & Biological Hazard Preparedness



WHAT ARE TECHNOLOGICAL & BIOLOGICAL HAZARDS?

Man-made hazards are defined as those "induced entirely or predominantly by human activities and choices". Technological Hazards like industrial spills, transport accidents, factory explosions are a subset of man-made hazards. They can also be triggered by natural hazards (NATECH events).

Bio-hazards include bacteria, viruses, fungi and parasites or parts thereof. Exposure in sufficient quantities and over a given duration may result in illness or injury to human health, and this can happen through natural exposure or release (intentional or unintentional) of microorganism.

WHAT IS OUR GOAL?

- Address **humanitarian consequences** of technological hazards
- Increase **knowledge** and enhance readiness and resilience
- Enhance humanitarian response following extreme events
- Raise awareness** in communities
- Pursue greater international **cooperation for emergency planning, preparedness and response**
- Advocate for humanitarian issues** in International radiation preparedness and response frameworks.

In the last 50 years...

124

Countries experienced industrial accidents.

+ 8,400

Technological hazards have happened due to industrial, transportation or diverse accidents.

3.6 MILLION

People have been affected by technological and biological hazards.

EM-DAT The Emergency Events Database

Technological & Biological Hazard Preparedness



MULTI-HAZARD APPROACH

The Red Cross Red Crescent National Societies addresses Technological & Biological Hazards through a multi-hazard approach.

Technological Hazards like industrial spills, transport accidents, factory explosions are a subset of man-made hazards.

Natural Hazards (NATECH) are climate related hazards that impact industrial areas, building structures, and could cause toxic waste.

Biological Hazards include bacteria, viruses, fungi and parasites or parts thereof.



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OBJECTIVES

- Address humanitarian consequences
- Raise awareness in communities
- Increase expertise and knowledge
- Pursue greater international cooperation
- Advocate for humanitarian purposes
- Enhance humanitarian response

PREPAREDNESS



Protection
Use Personal Protective Equipment



Time
Spend the shortest amount of time in contaminated areas



Distance
Take greater distance from the source of harm and contamination



Shielding
Maintain significant physical barriers from hazardous materials

Contact details

Martin Krottmeier, Sr. Officer Tech hazards preparedness
martin.krottmeier@ifrc.org

<https://media.ifrc.org/ifrc/techbiohazards/>



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Thank You!

Contact: martin.krottmayr@ifrc.org

DISASTERS ARE NOT NATURAL



UNDERSTANDING DISASTER RISK= HAZARD × EXPOSURE × VULNERABILITY