

International Experts' Meeting on Assessment and Prognosis in Response to a Nuclear or Radiological Emergency

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Criteria for decision making regarding food, milk and drinking water restrictions in a nuclear or radiological emergency

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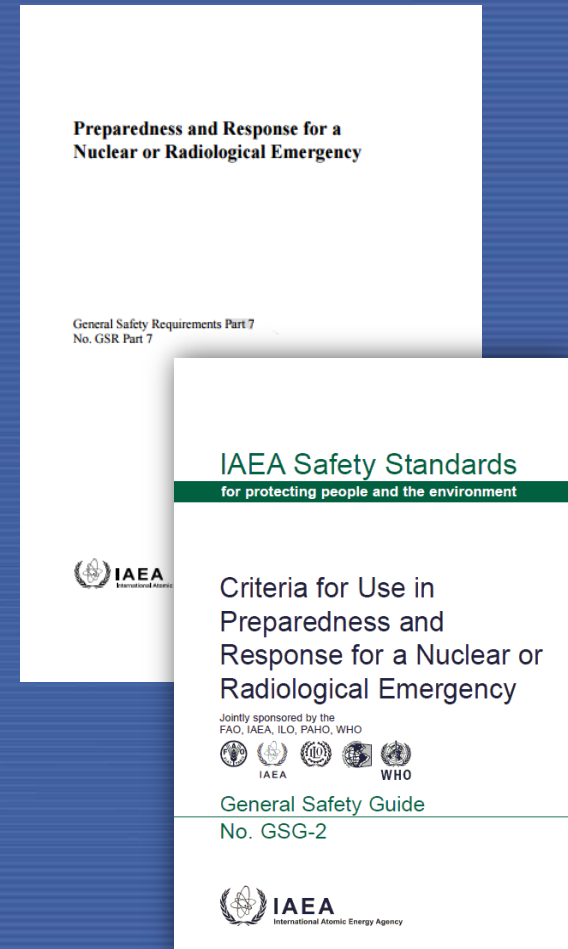


IAEA

International Atomic Energy Agency

As covered by ...

- The most recent Safety Standards in EPR
 - Safety Requirements No. GSR Part 7, *Preparedness and Response for a Nuclear or Radiological Emergency*, approved by BoG in 2015
 - Safety Guide No. GSG-2, *Criteria for use in Preparedness and Response for a Nuclear or Radiological Emergency*, published in 2011
- Cosponsored by a number of international organizations (e.g. FAO and WHO)



Part of ...

- Comprehensive set of criteria established in GSR Part 7 and GSG-2 for
 - Developing a **protection strategy** for nuclear or radiological emergency
 - **Decision making** to implement protective actions and other response actions in an emergency

Preparedness and Response for a
Nuclear or Radiological Emergency

General Safety Requirements Part 7
No. GSR Part 7

IAEA Safety Standards
for protecting people and the environment



Criteria for Use in
Preparedness and
Response for a Nuclear or
Radiological Emergency

Jointly sponsored by the
FAO, IAEA, ILO, PAHO, WHO

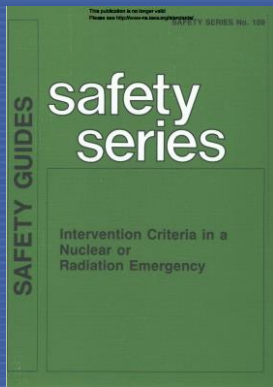


General Safety Guide
No. GSG-2



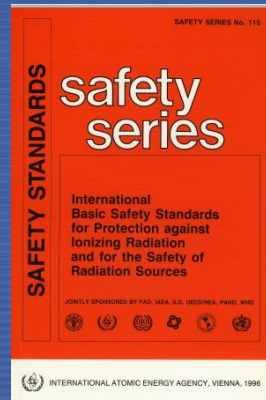
Criteria supersede ...

- Generic intervention levels for implementing actions on basis of doses that are actually avertable by intervention
- Generic action levels for foodstuff

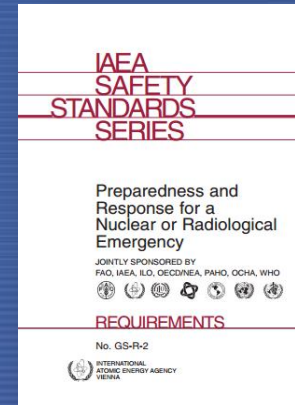


1994

1996



2002



Generic criteria (GC)

Generic criteria

Projected dose

Basis to
implement
protective actions

Generic criteria

Received dose

Basis to
implement
medical actions

**Dose quantities that are indicative
to radiation induced health hazards**

GC to reduce risk of stochastic effects (1)

| Dosimetric quantity | Projected dose in the first week and set of urgent actions within protection strategy |
|--|--|
| Effective dose | 100 mSv |
| Equivalent dose in fetus or embryo | 100 mSv Sheltering, evacuation, decontamination, restrictions on food, milk and drinking water... |
| Dosimetric quantity | Projected dose in the first year and set of early actions within protection strategy |
| Effective dose | 100 mSv |
| Equivalent dose in fetus or embryo (for period of <i>in utero</i> development) | 100 mSv Temporary relocation, decontamination, restrictions on food, milk and water ... |

GC to reduce risk of stochastic effects (2)

- Basis for implementing urgent and early protective actions
- All exposure pathways
- For use within affected areas
 - Restrictions on food, milk and drinking water using these generic criteria are to be applied before sampling and analysis is carried out

GC to reduce risk of stochastic effects (3)

| Dosimetric quantity | Projected dose in the first year for food, milk and drinking water restrictions | |
|--|---|---|
| Effective dose | 10 mSv | |
| Equivalent dose in fetus or embryo (for period of <i>in utero</i> development) | 10 mSv | Restrictions on non-essential food, milk and water |

- Only for ingestion
- Use within affected areas
- Applicable once sampling and analysis is carried out
 - Providing also a basis for discontinuing restrictions imposed on food, milk and drinking water as a precaution on basis of generic criteria for urgent and early protective actions

GC for restricting international trade

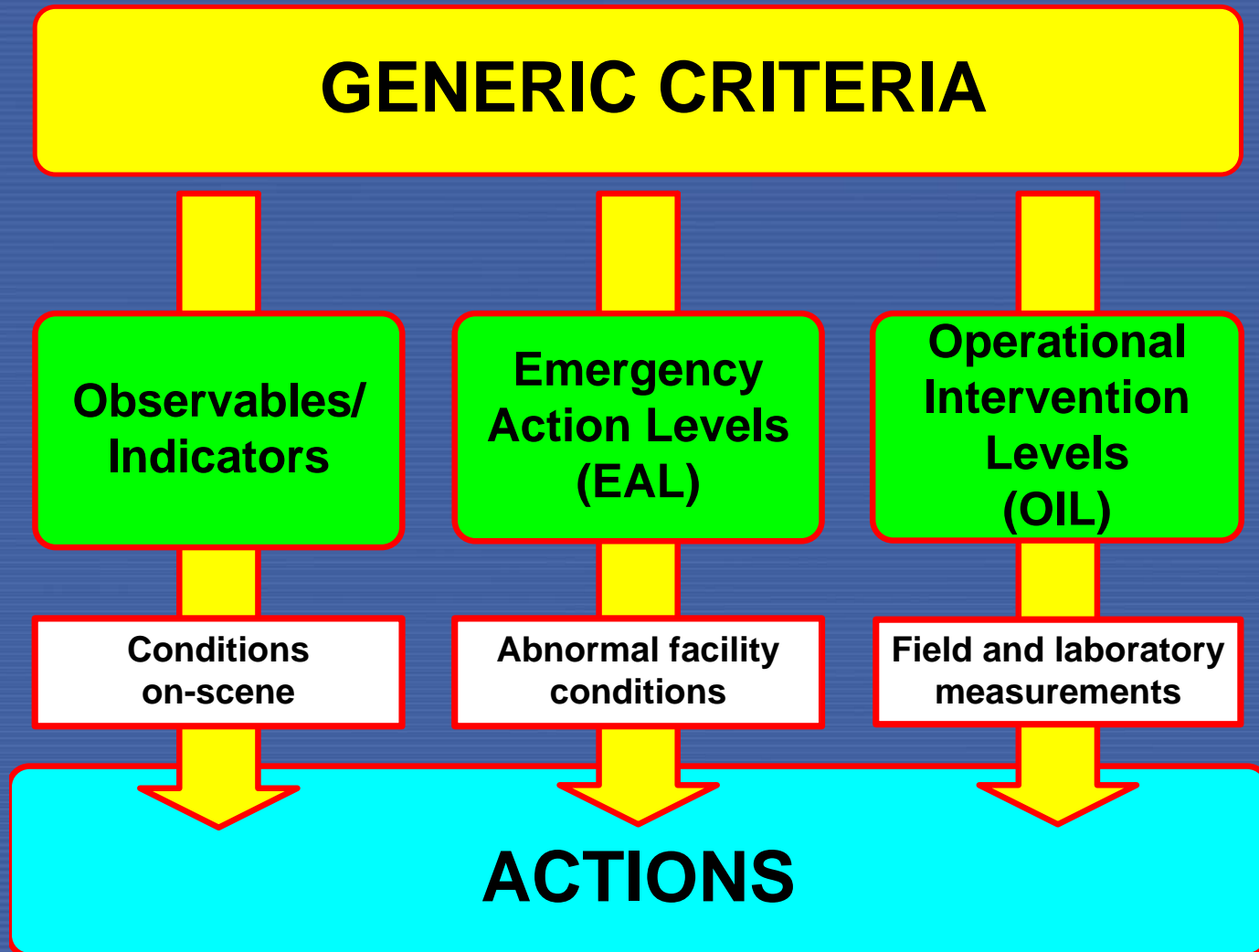
| Dosimetric quantity | Projected dose in the first year for food, milk and drinking water intended for international trade | |
|--|---|---|
| Effective dose | 1 mSv | Restrictions on food, milk and water intended for international trade |
| Equivalent dose in fetus or embryo (for period of <i>in utero</i> development) | 1 mSv | |

- Consistent with Codex Alim. Commission guidance

Important notice

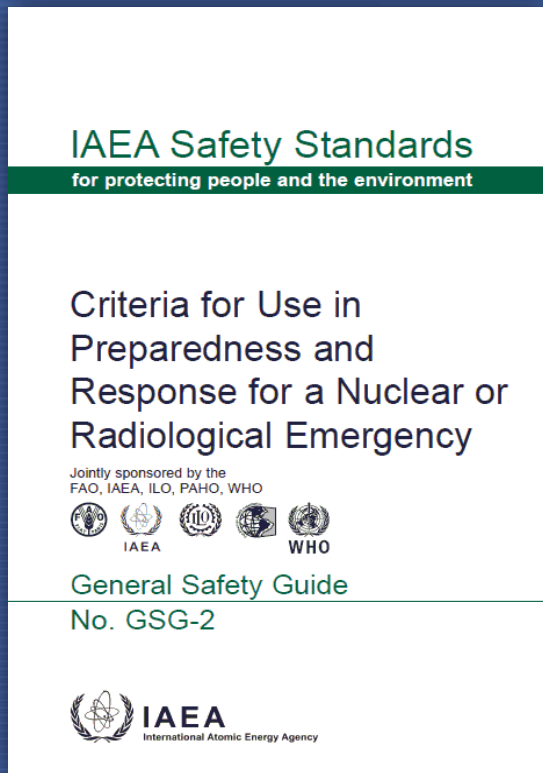
- Restrictions on food, milk and drinking water based on GC are implemented only if they are **non-essential** and if replacements or other alternatives are available

Operational Criteria



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Operational Intervention Levels (OILs)



- GSG-2 provides OILs for triggering food, milk and drinking water restrictions within affected areas
- GSG-2 does not contain OILs for restrictions on international trade
 - CAC Guideline values can be used as OILs regarding food restrictions in international trade ultimately (GSR Part 7)

Default OILs in GSG-2

OIL1

Measured value for ground contamination to indicate where urgent protective actions (e.g. evacuation) are warranted

OIL2

Measured value for ground contamination to indicate where early protective actions (e.g. relocation) are warranted

OIL3

Measured value of ground contamination to indicate where immediate restrictions on food, milk and drinking water are warranted

OIL4

Measured value of skin contamination to indicate when decontamination or providing instructions for self-decontamination and for limiting inadvertent ingestion are warranted

OIL5

Measured values of radionuclide concentration in food, milk or drinking water to indicate where restrictions on food, milk and

OIL6

drinking water are warranted

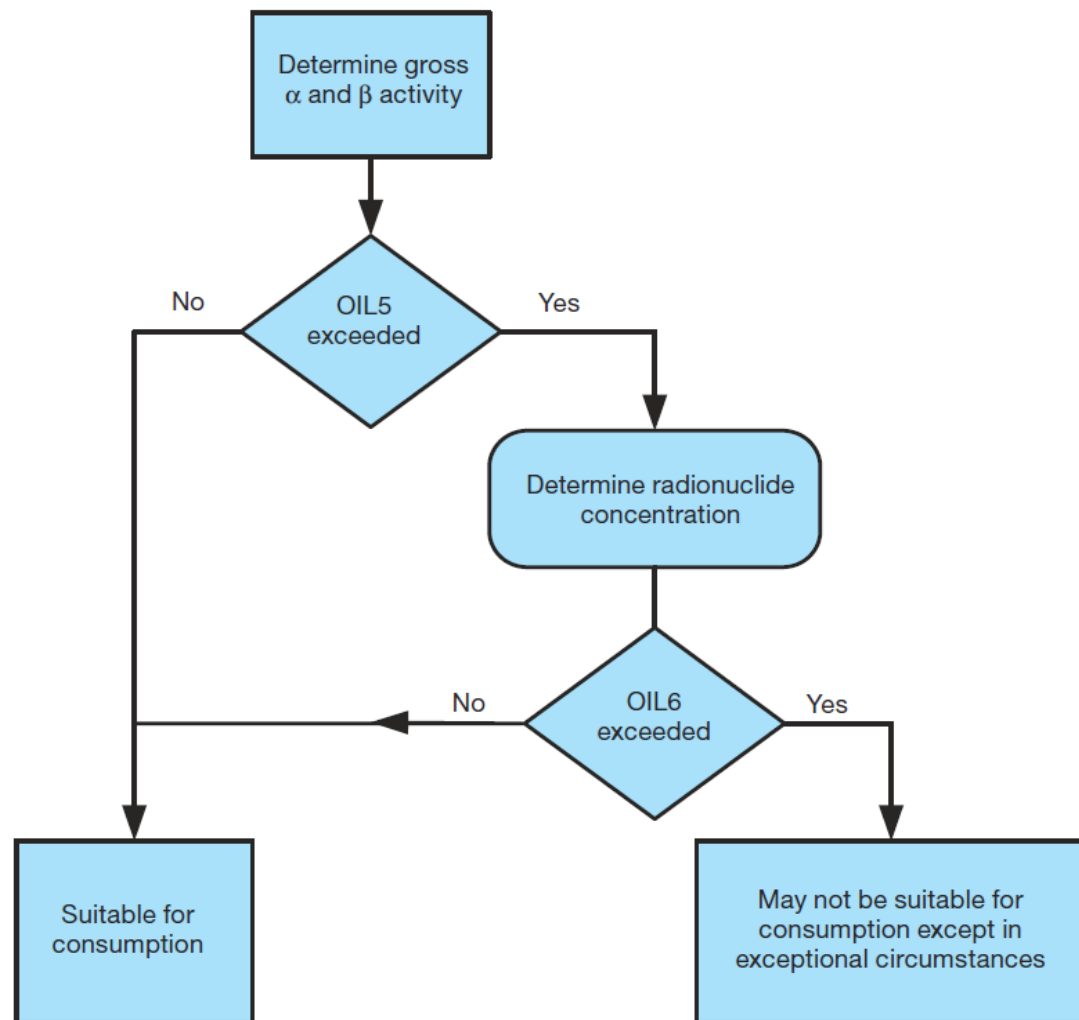


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Default OILs based on ground contamination (OIL3)

- Assessing immediate need to restrict food, milk and drinking water before any sampling and analysis is possible
 - Ambient gamma dose rate [$\mu\text{Sv/h}$] at 1m above ground
 - Beta and alpha surface contamination measurements

Default OILs based on sample's analysis (OIL5 and OIL6)



Based on 10 mSv GC

- **OIL5:** Gross beta and alpha measurements of samples [Bq/kg]
 - Table 9, GSG-2
- **OIL6:** Radionuclide specific measurement of samples [Bq/kg]
 - Table 10, GSG-2
 - More 300 radionuclides

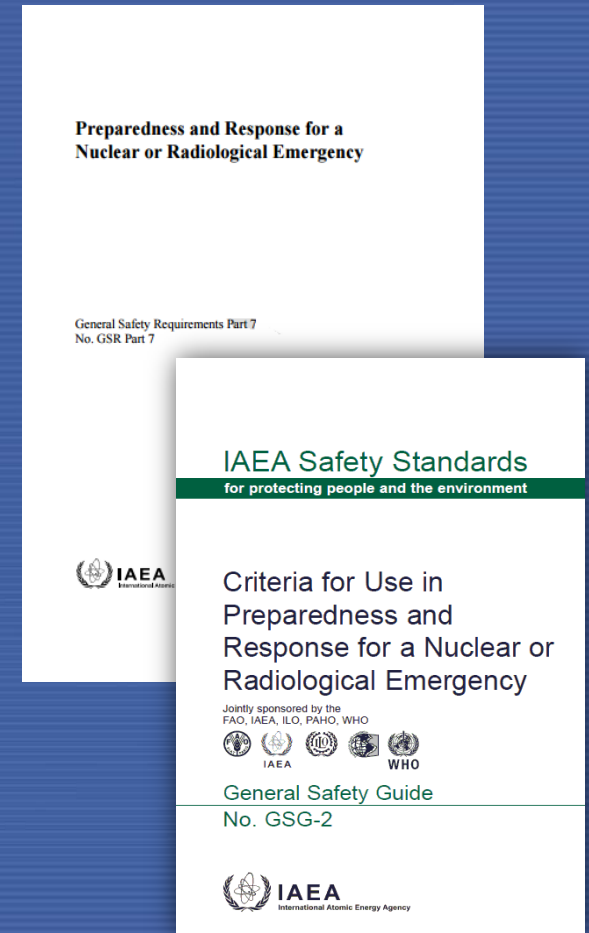
FIG. 5. Process of assessing radionuclide concentrations in food, milk and water:

Exceeding OIL6:

- ✓ Stop consumption and distribution of non-essential food, milk or drinking water
- ✓ Replace essential food, milk and drinking water as soon as possible or relocate people if replacements are not available
- ✓ For iodine contamination consider providing iodine thyroid blocking if replacement of essential food, milk or water is not immediately available
- ✓ Estimate dose of those who may have consumed food, milk and drinking water from the area where restrictions were implemented to determine if medical actions are warranted

Plain language explanations

- Necessity for plain language explanations on how criteria and associated response actions provide for safety of all members of the public
- GSG-2 contains example plain language explanations to complement to GC and OILs and set of response actions to be implemented



What to expect in future...

- OILs to cover all GC contained in GSR Part 7
- Methodology to derive and revise OILs

Thank you for your attention...



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