



IAEA

International Atomic Energy Agency

Atoms for Peace and Development

Arrangements for the Termination of a Nuclear or Radiological Emergency

Adapting and Lifting Protective Actions

Lecture 06

Introduction.

GSR Part 7, Requirement 18

“Adjustment of protective actions and other response actions and of other arrangements that are aimed at enabling the termination of an emergency shall be made by a formal process that includes consultation of interested parties.”



IAEA Safety Standards for protecting people and the environment

Preparedness and Response for a Nuclear or Radiological Emergency

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General Safety Requirements No. GSR Part 7

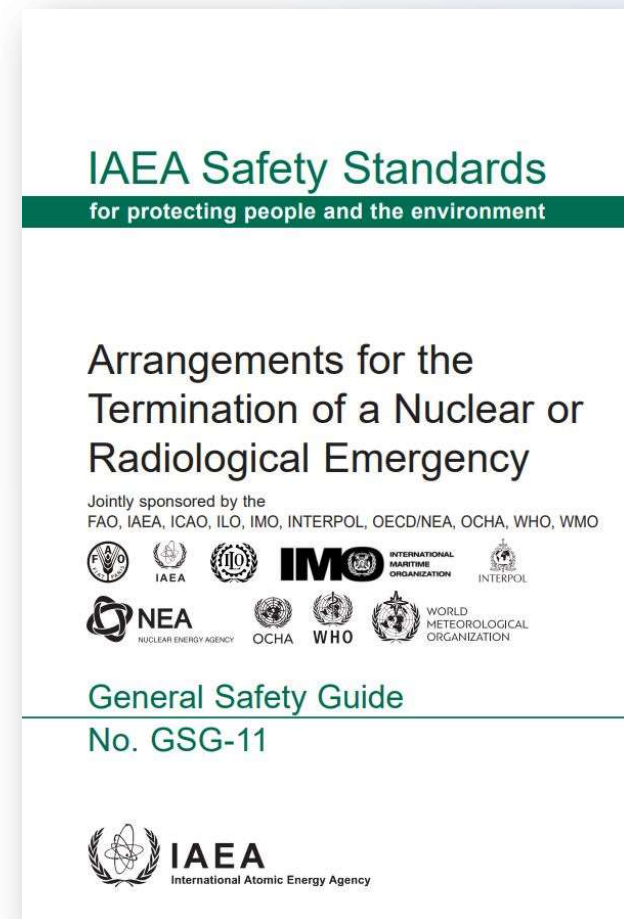


Introduction.

GSG-11, Section 3, General prerequisites



“A nuclear or radiological emergency should not be terminated until the necessary urgent protective actions and early protective actions have been implemented.”

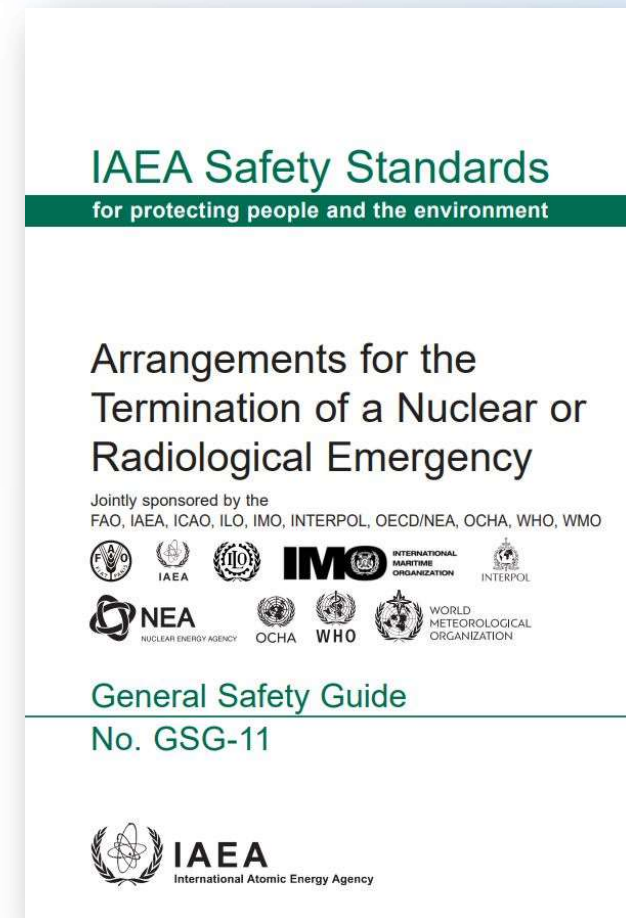


Introduction.

GSG-11, Section 3, General prerequisites (cont'd)



- Urgent and early protective actions and other response actions might be already under consideration for adapting or lifting during the transition phase.
- Any such change should be discussed and communicated with all concerned parties.



Purpose

- Present and discuss considerations for adapting and lifting protective actions during the transition phase.

Learning objectives

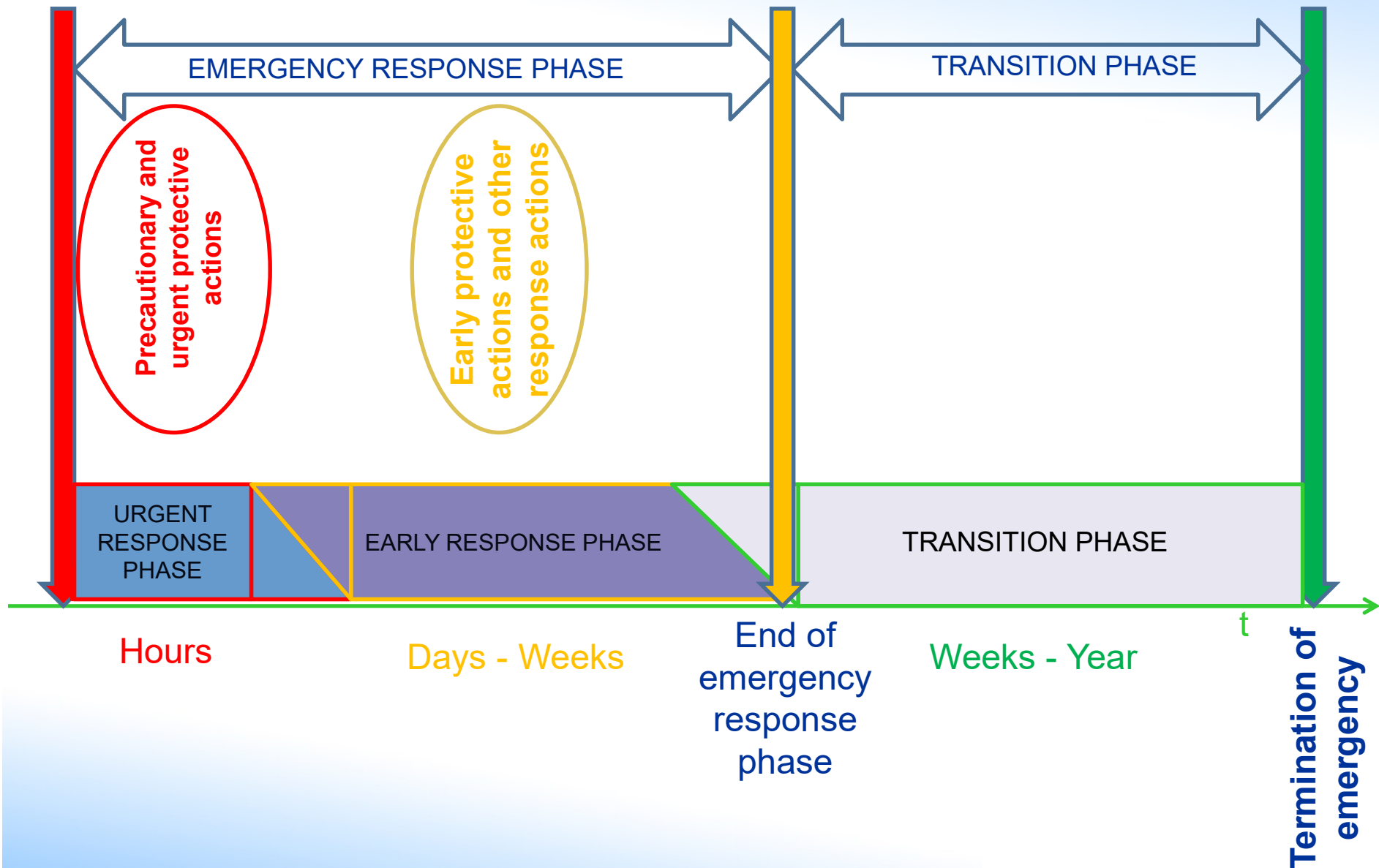
- Recognize when and how protective actions can be adapted and lifted during the transition phase.

Contents

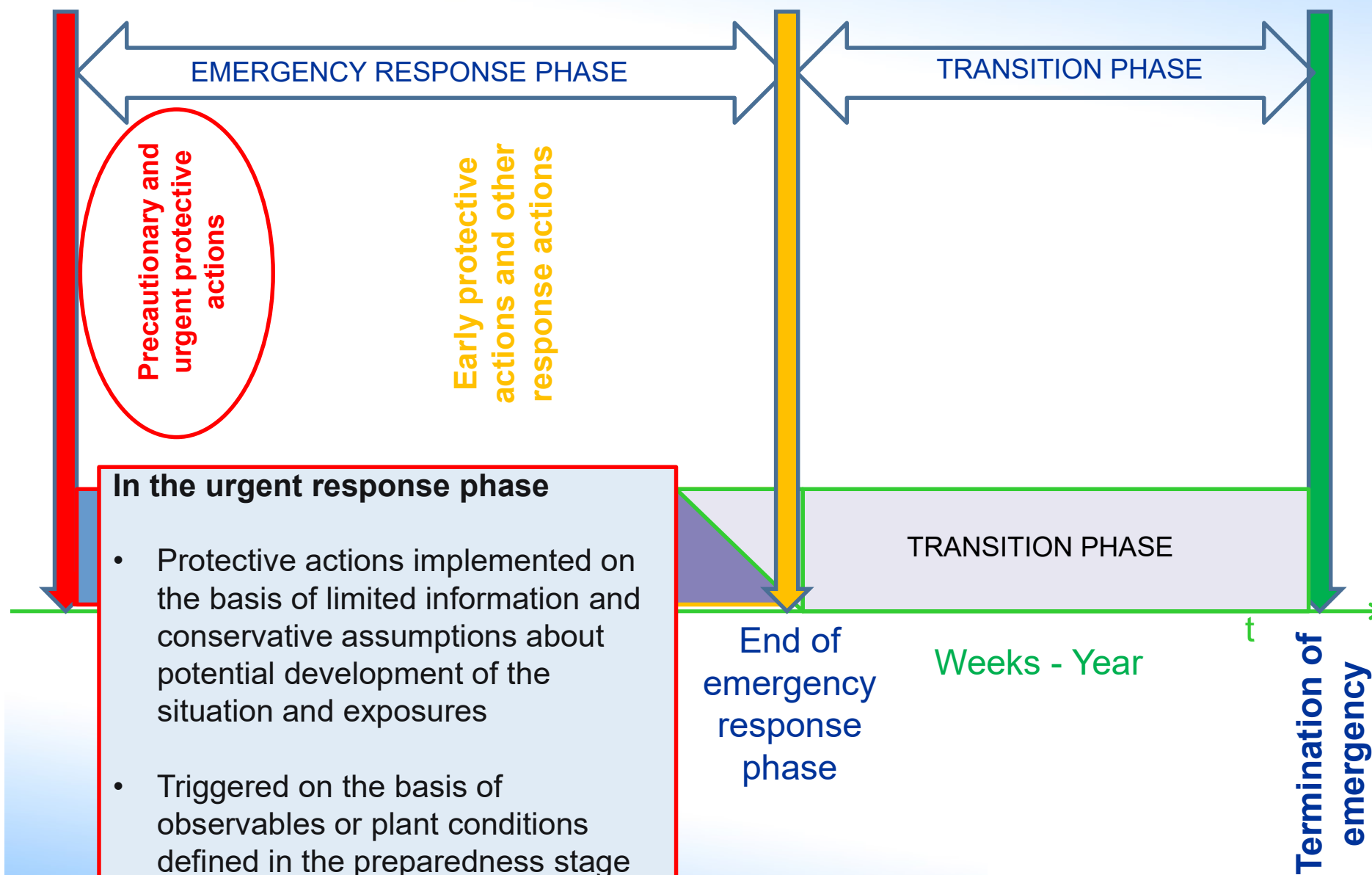


- Refresher: approaches in different phases and associated protective actions
- General considerations for lifting or adapting protective actions:
 - Practical considerations including the use of OILs and the reference level
- Specific considerations for adapting and lifting the most common protective actions
- Other considerations:
 - Dose reduction measures appropriate for the transition phase
 - Delineation of areas

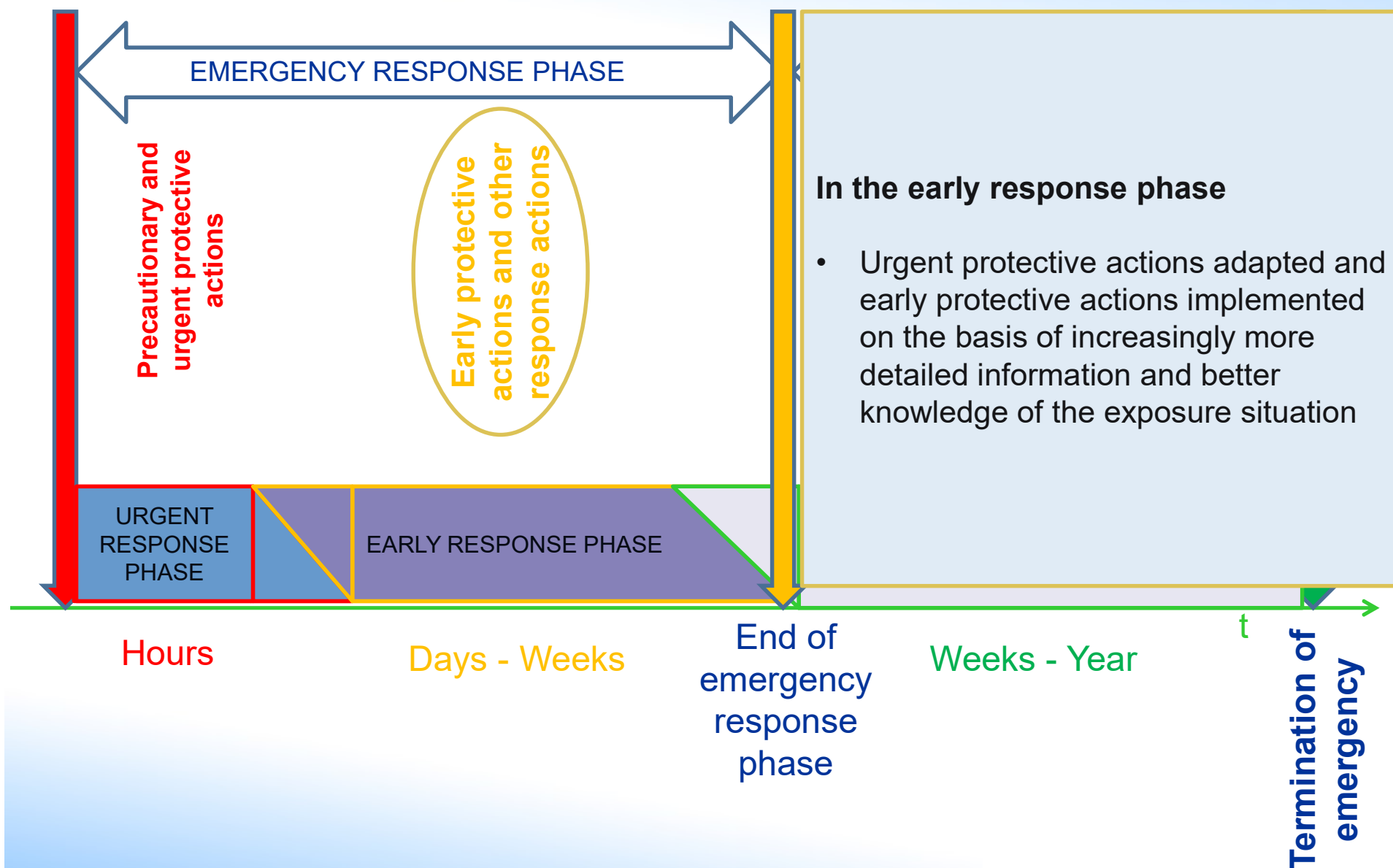
Phases and protective actions



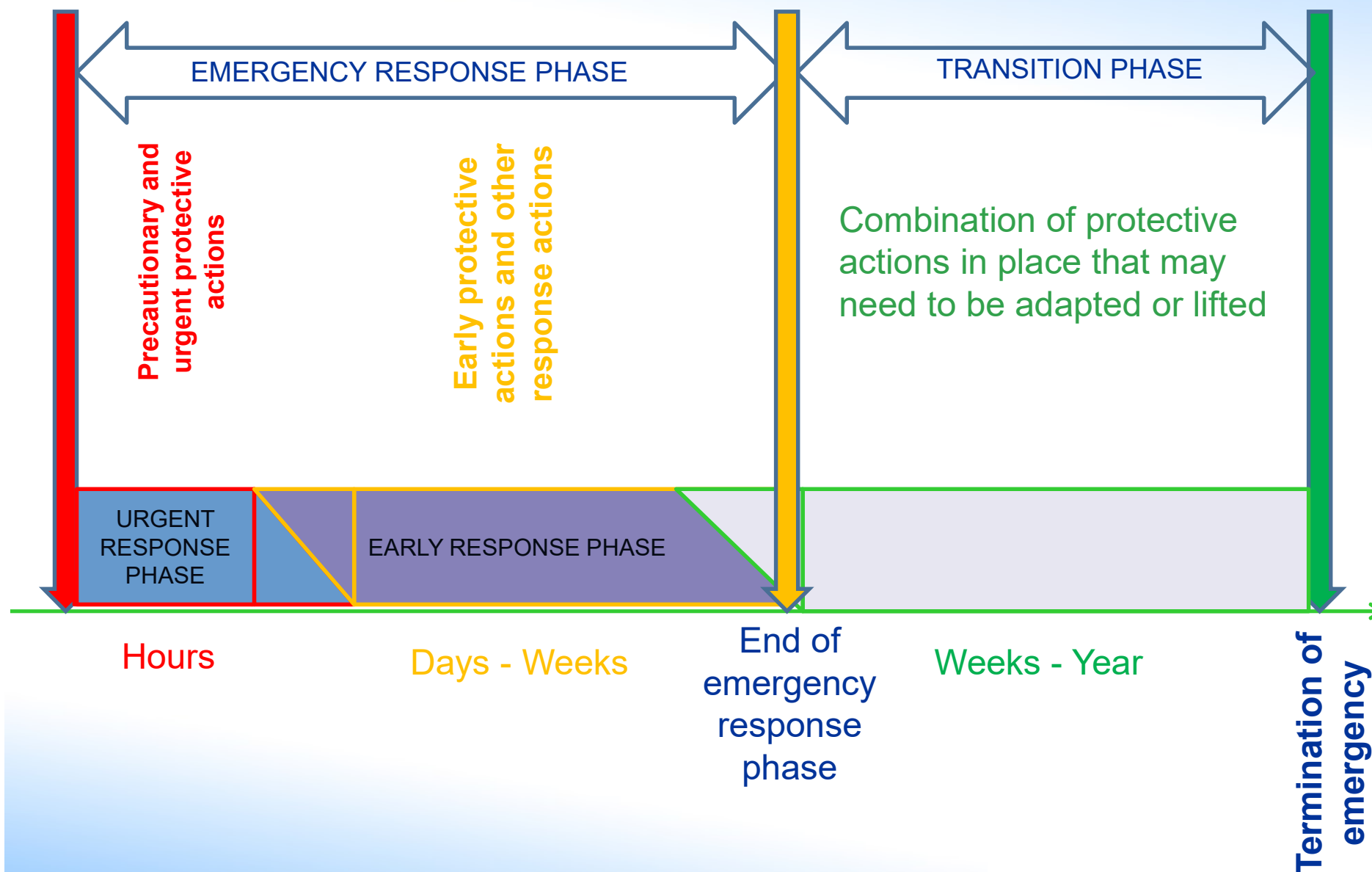
Phases and protective actions (cont'd)



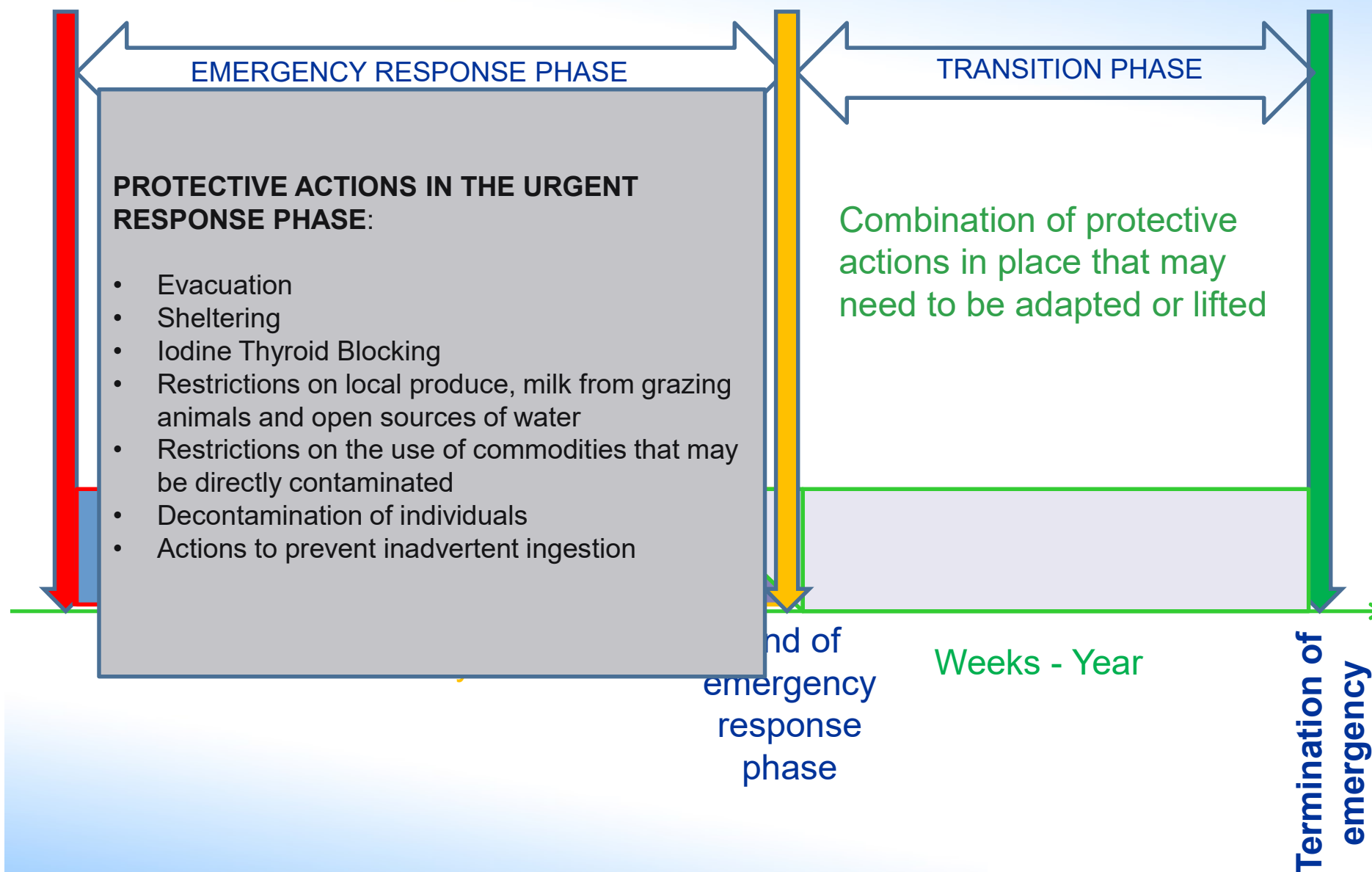
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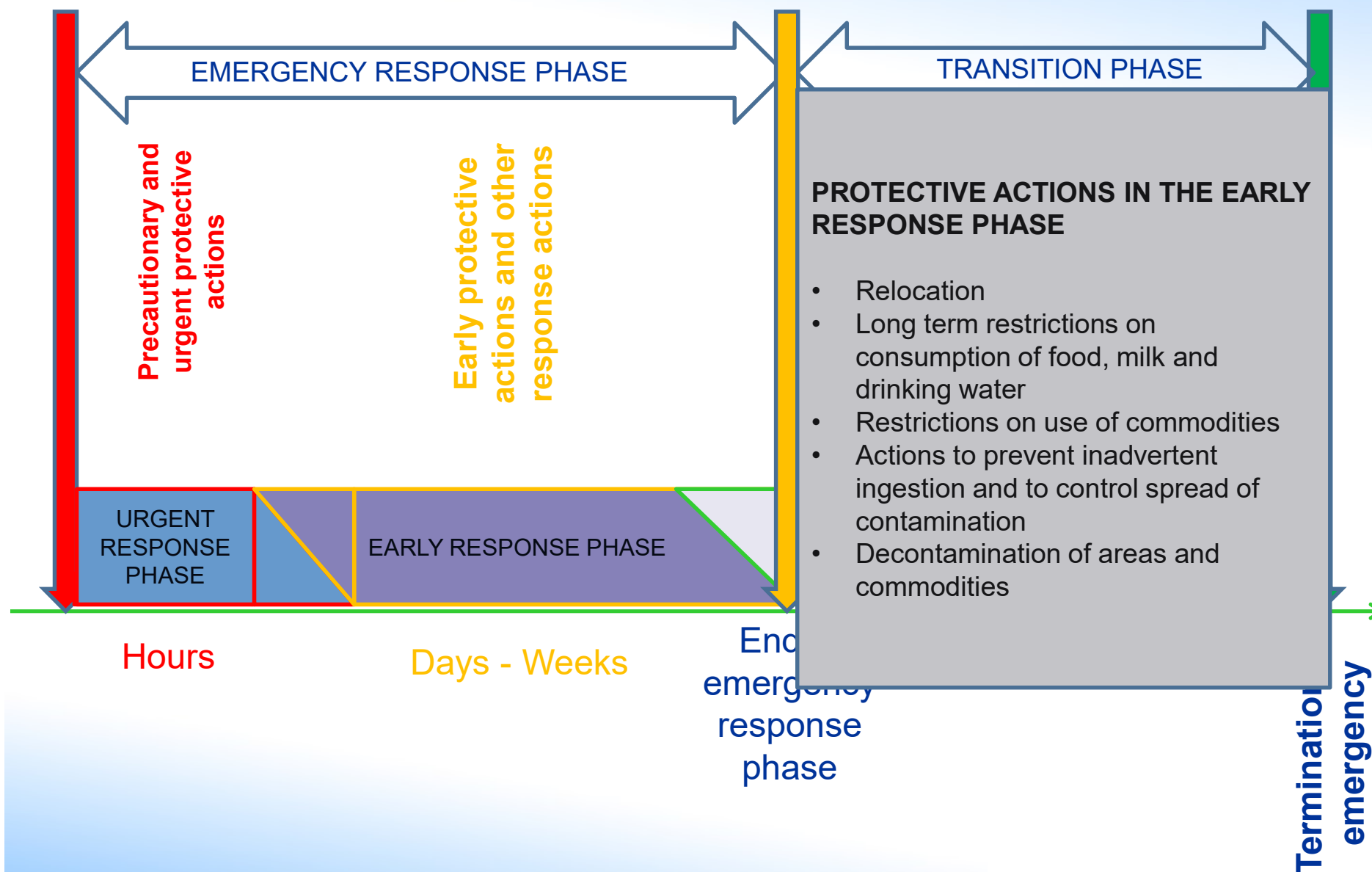
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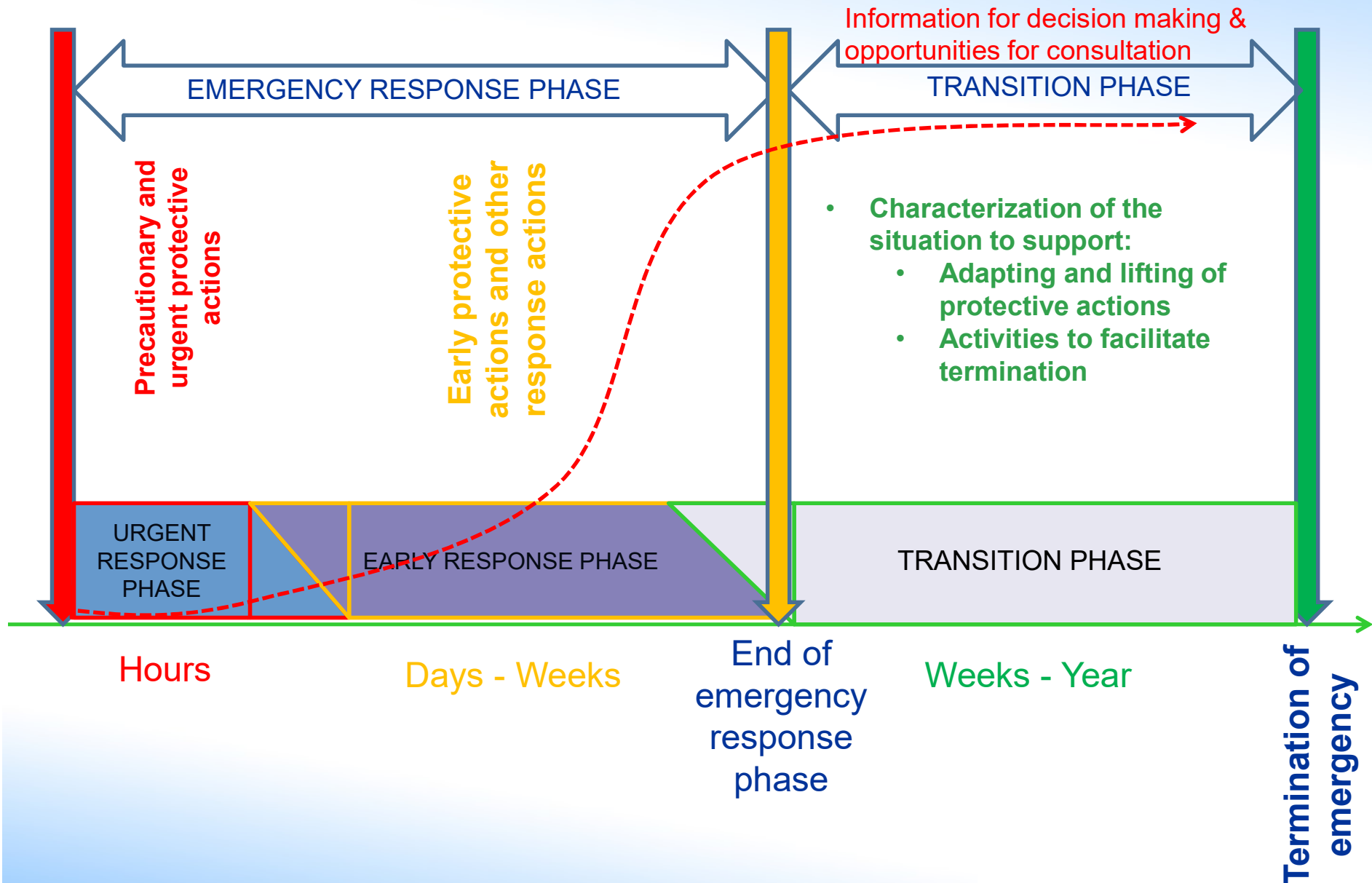
Phases and protective actions (cont'd)



Phases and protective actions (cont'd)



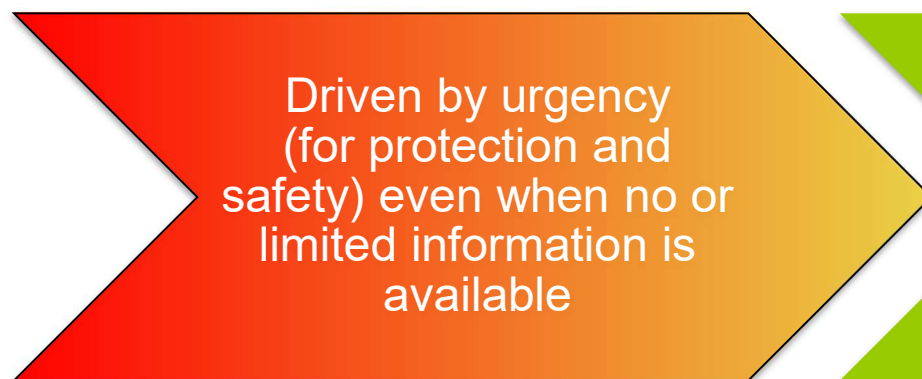
Phases and protective actions (cont'd)



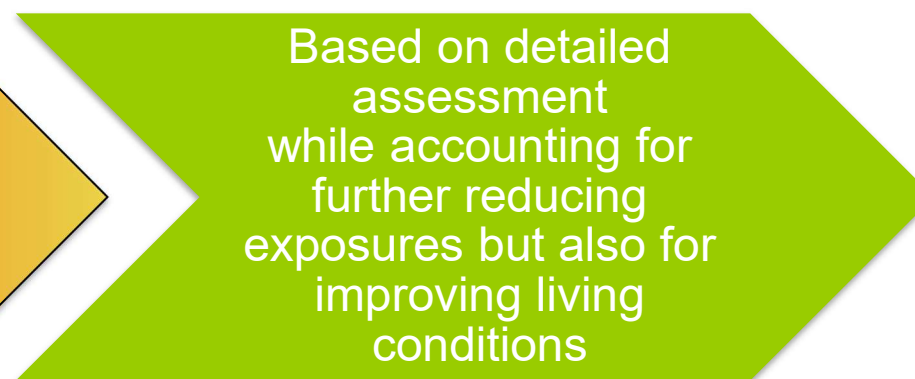
Change of strategy focus during response



Urgent & Early Response Phases



Transition Phase



Discussion



- What means do we use to initiate the implementation of protective actions and other response actions during the emergency response phase?

Default OILs in IAEA Safety Standards Series No. 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 drinking water are warranted
OIL6	

Change of strategy focus during response. Example basis for implementing protective actions during emergency response phase

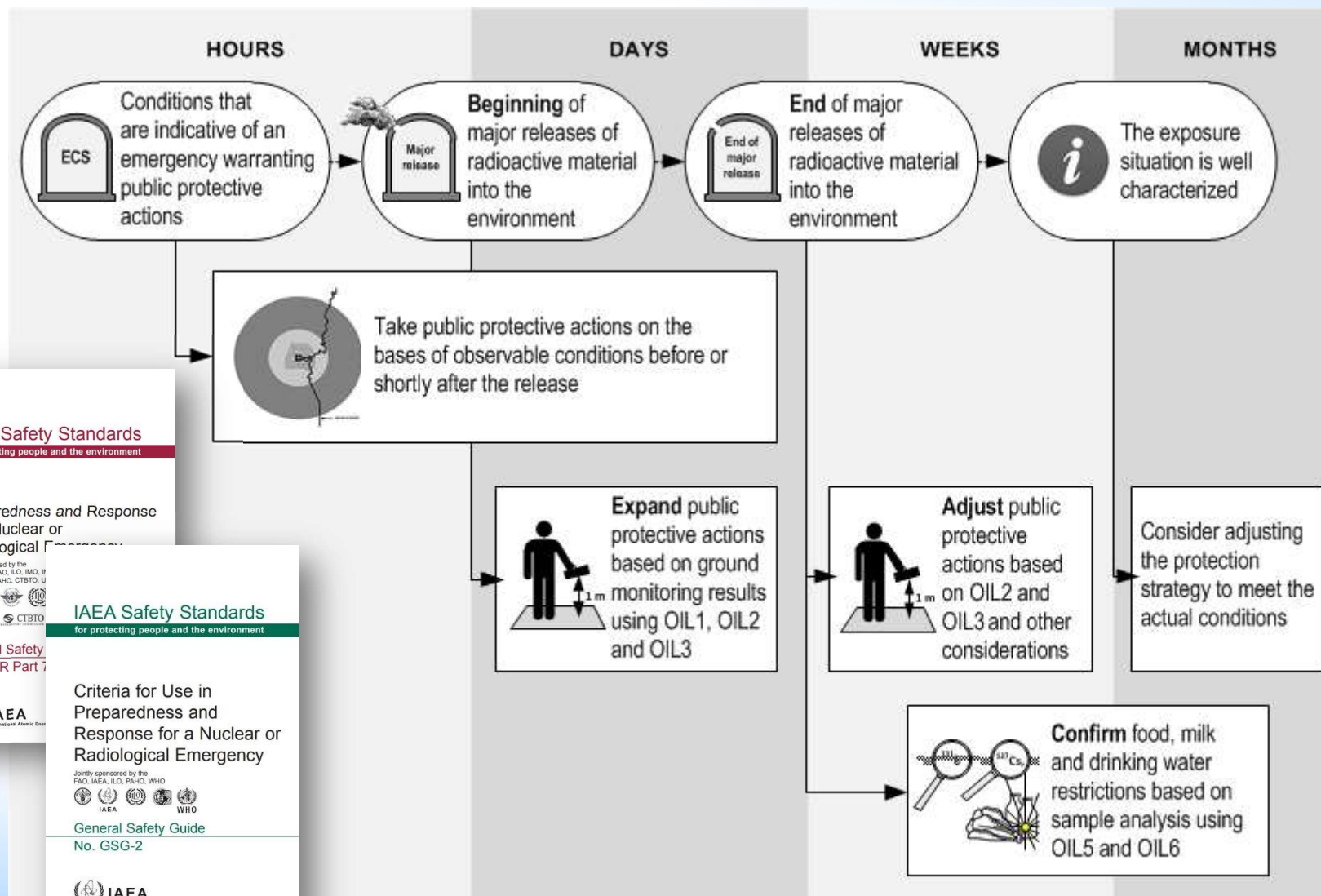


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Adjusting the protection strategy during the transition phase



- Adjustment of the protection strategy already in place to identify **when, where and for whom**:
 - New protective actions are necessary;
 - Protective actions are no longer necessary;
- Some protective actions implemented in the urgent and early response phases may continue to be justified and may need to be continued in the longer term;

Role of Operational Criteria (a reminder).



OIL_T

- OIL_T to be used as a tool to support:
 - Decision making on lifting or adapting protective actions (**what, when, for whom**);
 - Implementation of activities to enable the transition to an existing exposure situation by providing a basis **to guide simple activities aimed at reducing the residual dose**;

Role of Operational Criteria (a reminder).

OILs



- Additional OILs for the transition phase can be used to initiate considerations for adapting or lifting specific protective actions:
 - Related to OILs used to initiate implementation of these protective actions.
- Such OILs are to be implemented not as a trigger (such as the application of OILs during the emergency response phase) but for screening and informing decisions on adapting or lifting of protective actions.

Decisions on adapting and lifting protective actions



- Final decision based on assessment of **residual dose** from all exposure pathways and comparison with pre-set **reference level** while accounting for:
 - Prevailing conditions may vary within an affected area, adapting and lifting protective actions may take place at **different times in different locations**;
 - Loss of public trust in case of too **frequent changes (to be avoided)**;
 - Consulting and informing the public and other **interested parties** (why, when & where).

Discussion



- What protective actions are likely to be adapted and lifted in the transition phase?

Iodine thyroid blocking (ITB)

- A short-term urgent protective action:
 - May be implemented as a **precaution**, usually in combination with other protective actions.
- **Not implemented for prolonged periods:**
 - If needed for longer duration (e.g. days), alternative protective actions need to be considered (e.g. evacuation or relocation).
- **Not generally implemented in the transition phase:**
 - ITB generally adapted or lifted during the emergency response phase.

Sheltering



- Implemented in the urgent response phase even as a precaution:
 - Sheltering may be a transitional action before evacuation can be implemented safely.
- Not appropriate for long periods (more than approximately two days);
- Not appropriate for implementation during transition phase:
 - May be lifted or adapted during this phase.

Aspects to consider in adapting or lifting sheltering



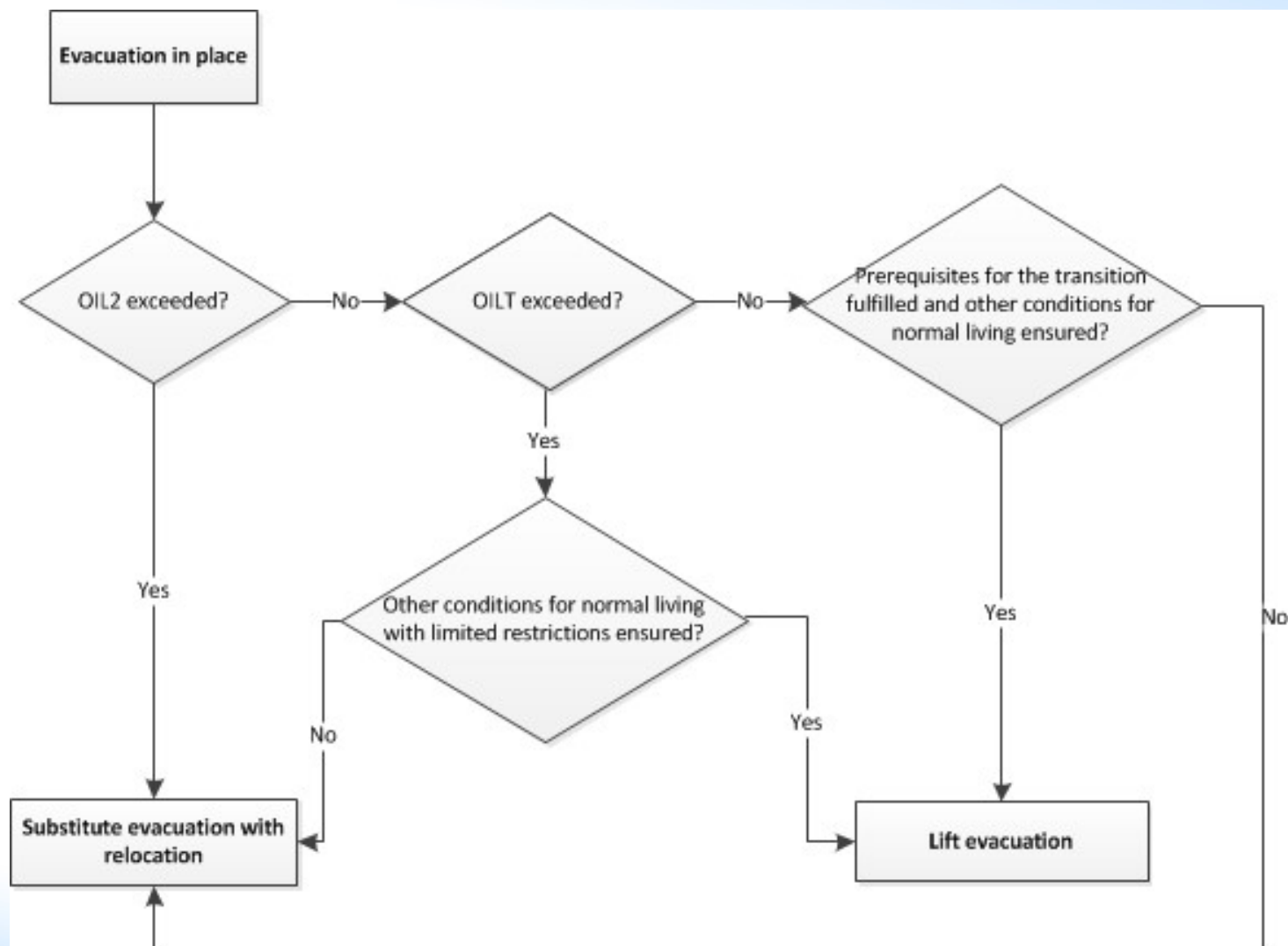
- Level of protection offered by buildings;
- Need for simultaneous ITB;
- Medical care and other needs of the sheltering population;
- Need to gradually increase time spent outdoors;
- The need for further protective actions, based on OILs (e.g. evacuation or relocation).

Evacuation

- Implemented in **urgent response phase** even as a **precaution**;
- Temporary protective action with priority for lifting;
- Considerations for lifting:
 - If monitoring results indicate that **OIL2 is exceeded**, evacuation is to be substituted with **relocation** (to provide for better living conditions);
 - If monitoring results indicate that **OIL2 is not exceeded**, evacuation is to be **lifted** if **no or only limited restrictions** (e.g. on locally produced food or limited access to recreational areas) are necessary for people to live normally in the area;
 - If monitoring results indicate that **OIL2 is not exceeded** but **limited restrictions are not** sufficient to **allow people to live normally** in the area, evacuation is not to be lifted until the area can be **managed as an existing exposure situation**;

Subject to fulfilment of preconditions for allowing people to return to an area

Evacuation (cont'd)



Evacuation (cont'd)

- In allowing people to return, **residual doses from all exposure pathways** (based on actual circumstances) should be considered, taking account of the limited restrictions in place;
- When substituting evacuation with relocation, people should be **granted access** to the evacuated area for a short period of time in a controlled manner to prepare for relocation.

Relocation



- Implemented in the **early response phase**:
 - As initial action for certain people or as a replacement to evacuation for others when a return cannot be envisaged in the short term.
- Protective action intended for **longer duration** (months):
 - Provides better living conditions for those subjected to relocation;
 - Adaptation or lifting less urgent than evacuation, and allows more time for planning.

Relocation (cont'd)



- Lifted under the conditions applicable for evacuation:
 - Comparison of monitoring data with OIL_2 or OIL_T ;
 - Realistic assessment of residual doses if people were to return (taking account of any restrictions);
 - Consideration of the effectiveness of limited restrictions to allow normal life;
 - Fulfilment of specific preconditions for allowing people to return to an area.

Preconditions for return of people to an area



- Infrastructure and public services restored;
- Clear instructions and advice provided on the restrictions still in place and the recommended changes to behaviour and habits;
- Public support centre(s) and information material for reassurance and psychosocial care are available;
- A strategy established for restoration of workplaces and for provision of social support for individuals who worked in the area;
- Information on the likely evolution of the exposure situation and associated health hazards provided to those returning.

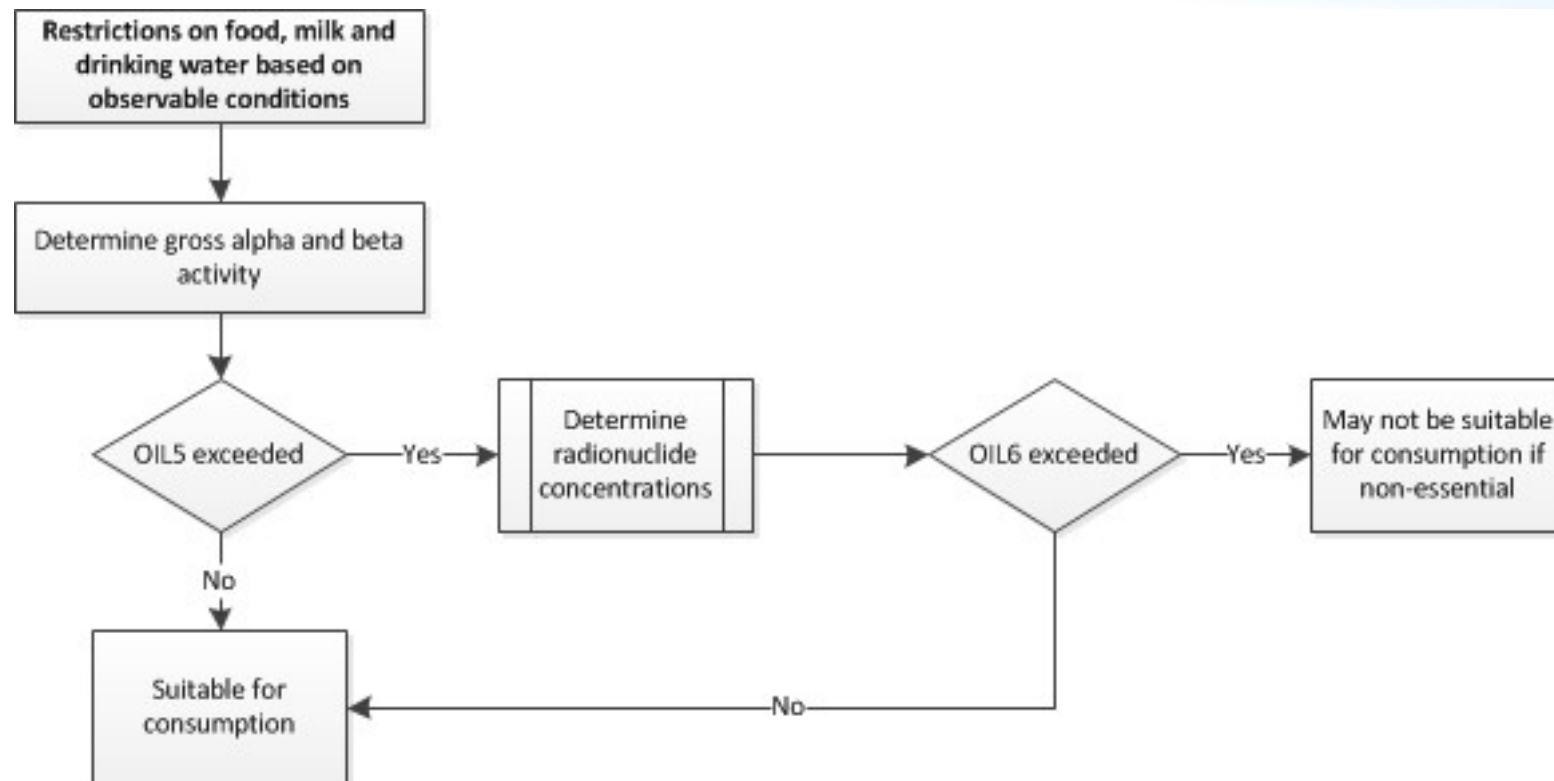
Restrictions on food, milk and drinking water



- Restrictions imposed on food, milk and drinking water often are taken as a precaution on the basis of **observable conditions** and then adjusted based on **OILs**;
- **Detailed characterization** in the transition phase to identify where and for what foods restrictions are either:
 - Justified in the longer term *or*
 - Need to be lifted.



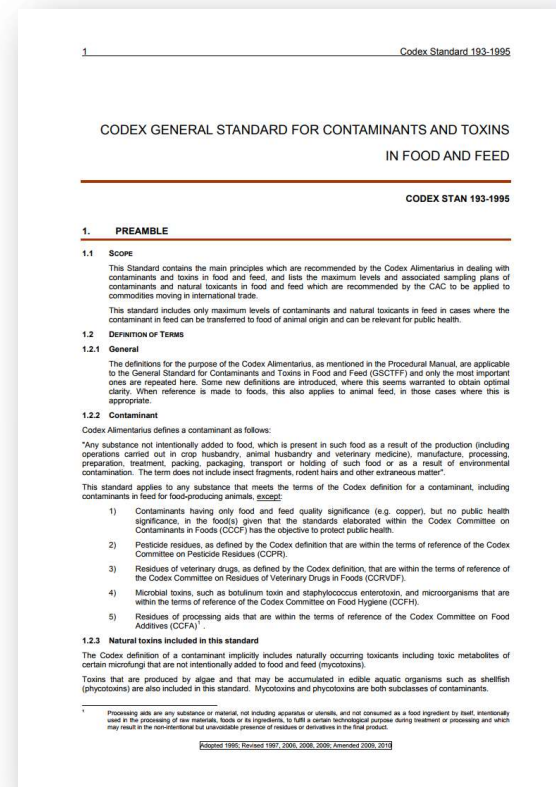
Restrictions on food, milk and drinking water (cont'd)



Restrictions on food, milk and drinking water (cont'd)



- International trade expected to be governed by criteria that take into account Codex Alimentarius Commission (in line with GSR Part 7):
 - Applicable after the emergency irrespective of exposure situation (emergency or existing).



Restrictions on food, milk and drinking water (cont'd)



- Public reassurance calls for evidence in food safety such as:
 - Publishing monitoring results with health hazards being placed in perspective;
 - Certification.

Restrictions on food, milk and drinking water (cont'd)



- Governed by the radiation protection frameworks applicable for existing exposure situation.

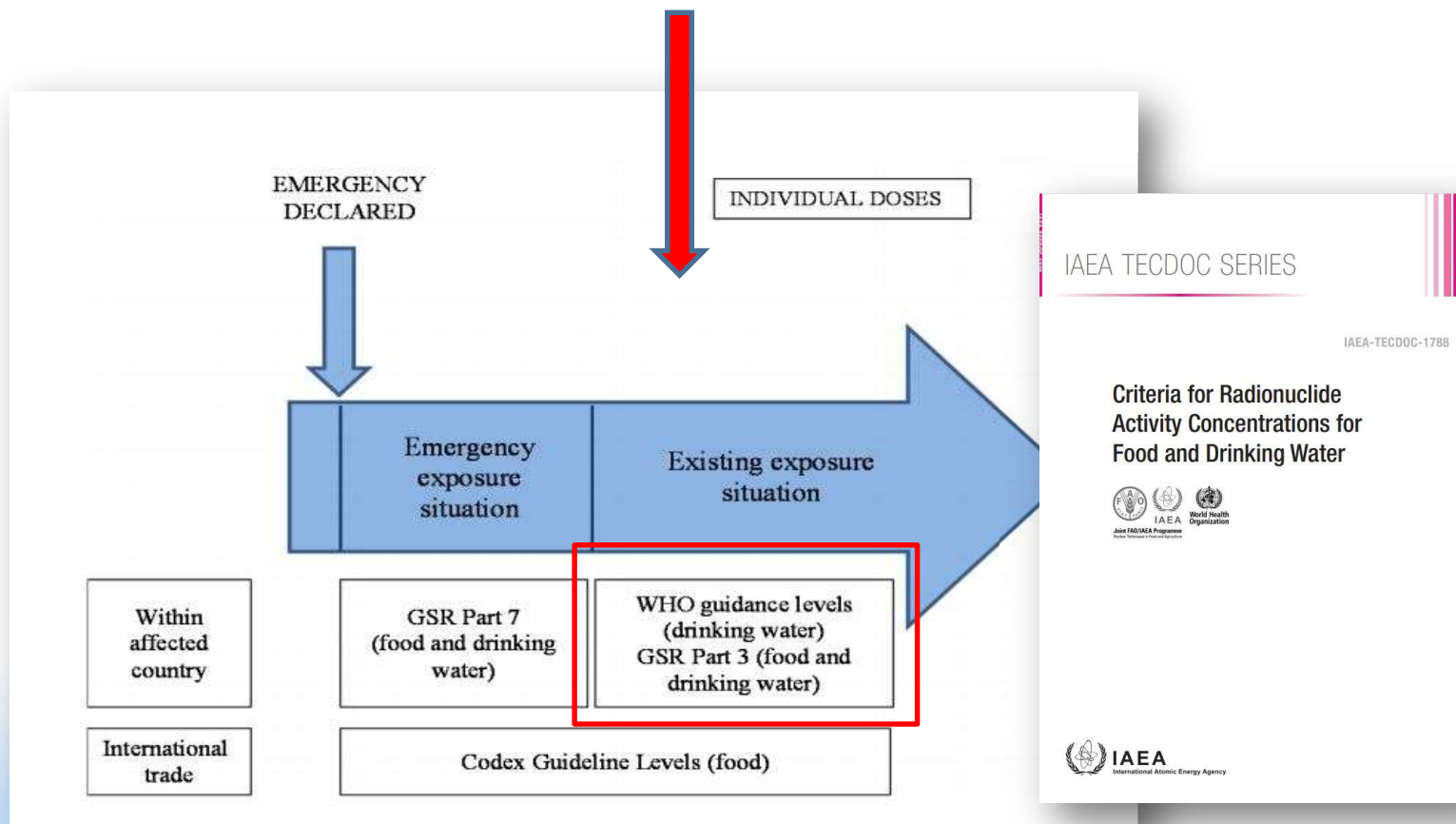


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Restriction on non-food commodities

- Lifting or adapting restrictions on non-food commodities implemented during the emergency response phase, e.g. as precaution, to be based on more comprehensive information and monitoring results;
- In the transition phase, estimates of the actual dose received from non-food commodities and the contribution to residual dose will inform decision making on adaptation and lifting restrictions.

Restrictions on non-food commodities (cont'd)



- Public reassurance calls for evidence of safety of non-food commodities such as:
 - Publishing of monitoring results, with health hazards being placed in perspective;
 - Certification, as appropriate.

Dose estimates for decision making in transition phase



- Estimates on the contribution to residual doses from food or non-food commodities will be used to inform decision making on the adaptation and lifting of restrictions in the transition phase.

Discussion

- Have you established detailed criteria for when and how specific protective actions can be lifted and how this will be done?



Dose reduction considerations in the transition phase

- Actions to **prevent inadvertent ingestion** and **inhalation** of resuspended material are needed to reduce dose among those returning to affected area;
- **Control of access, decontamination** of the area or commodities may be used to enable progressive lifting of protective actions (such as evacuation and relocation).



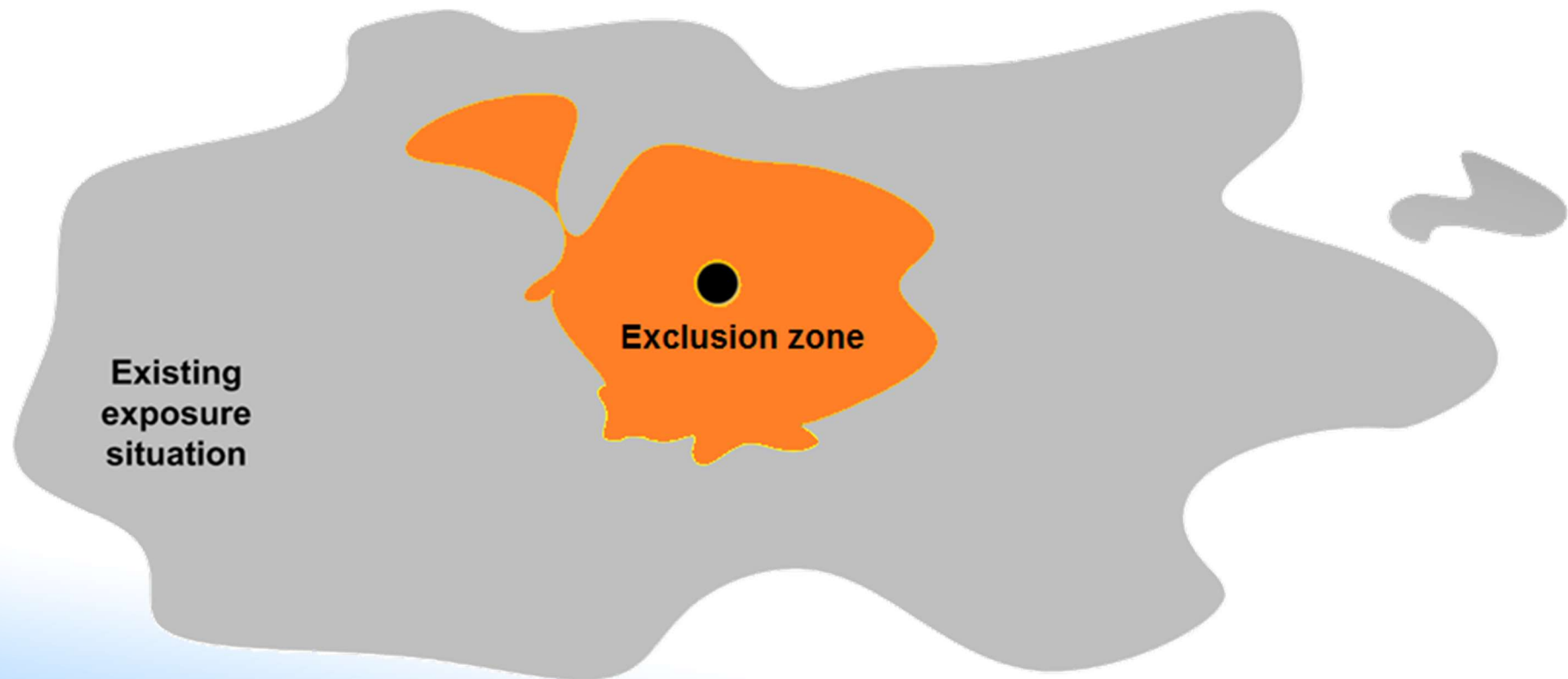
Delineation of restricted areas

- Areas that **cannot be inhabited** and where social and economic activity cannot be resumed should be **delineated** and **access controlled**:
 - Depends on radiological aspects and other prerequisites and public acceptance of return;
 - Delineation may take account of existing geographical or jurisdictional boundaries.
- Information about delineated areas and measures should be clearly communicated.

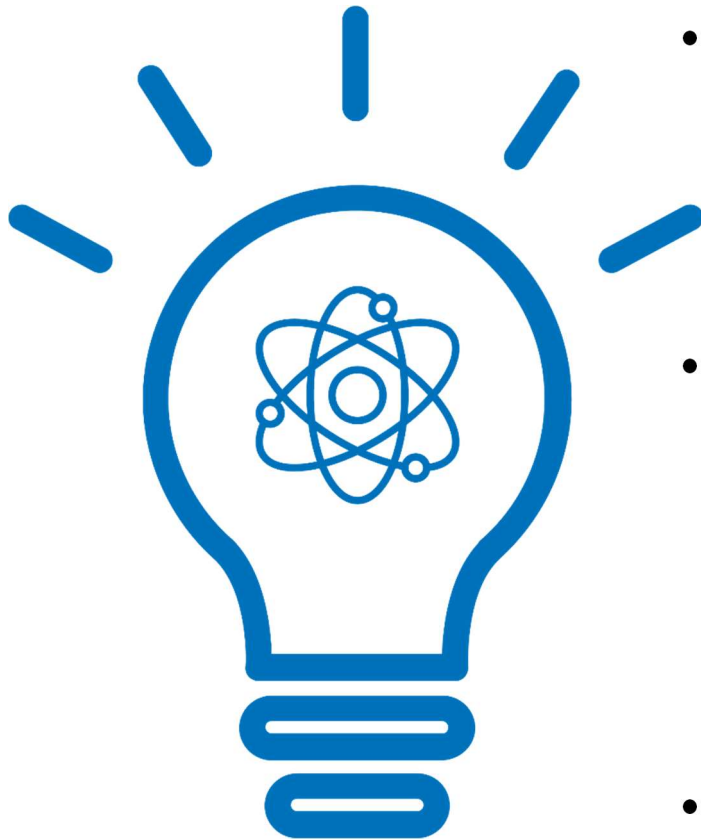
Delineation of restricted areas (cont'd)



Subject to these measures for access control, the delineation of an area as inadequate for inhabitation should not constitute an obstacle to terminating the emergency.



Summary



- In the transition phase, decisions on adapting and lifting protective actions should be based on an understanding of prevailing circumstances.
- OILs may be used as screening levels in the decision making process, but decisions should be based on realistic assessments of the residual doses and comparison with a pre-established reference level.
- Decisions on adapting and lifting protective actions will involve taking account of the primary objective and prerequisites for termination of the emergency.



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Thank you!