



IAEA

International Atomic Energy Agency

Atoms for Peace and Development

Arrangements for the Termination of a Nuclear or Radiological Emergency

Primary Objective of and Prerequisites for Terminating the Emergency

Lecture 03

Introduction

- The situation faced in the aftermath of an emergency, once all actions to protect the public and to bring the source under control have been implemented, may be characterized by:
 - **Active emergency response organization (24/7)** that gradually integrates additional organizations that assume roles in the longer term.
 - **Disrupted:**
 - Practices involving nuclear or radioactive material and radiation technologies;
 - Public services and possibly infrastructure;
 - Businesses.

Introduction (cont'd)

- The situation faced in the aftermath of an emergency, once all actions to protect the public and to bring the source under control have been implemented, may be characterized by:
 - A protection strategy in place that **might not be suitable for implementation in the longer term**;
 - **Displaced populations**;
 - **Increased interest** by affected populations in ongoing activities to provide for their protection, safety and well-being.

Introduction (cont'd)

- Such a situation may not be suitable and sustainable in the longer term and may, therefore, call for preparations for the timely resumption of normal social and economic activity:
 - Ensure the continuation of activities that provide for public protection, safety and well-being **on a routine basis**.
- These preparations will be governed by activities during the transition phase that will allow the decision to end the emergency to be formally made.

Purpose



- Present and discuss the primary objective of the termination of a nuclear or radiological emergency as well as the prerequisites to be considered in planning and decision making regarding the termination of the emergency.

Learning objectives



- Recognize the primary objective of the termination
- Identify prerequisites that need to be met for the emergency to be declared ended and the transition from an emergency exposure situation to a planned exposure situation or an existing exposure situation to take place

Discussion





- Can you name some conditions that may need to be fulfilled before an emergency can be formally ended?

WHAT and HOW



Section 3, GSG-11:

- WHAT  Primary Objective
- HOW  Prerequisites

Contents



- Primary objective
- General prerequisites
- Specific prerequisites
 - Transition to a planned exposure situation
 - Transition to an existing exposure situation
- Timeframes for the termination of an emergency
- Additional considerations

WHAT?

Primary objective



- The primary objective of the termination of the emergency is **to facilitate the timely resumption** of social and economic activity



Goal of emergency response, para. 3.2 (i) of GSR Part 7:

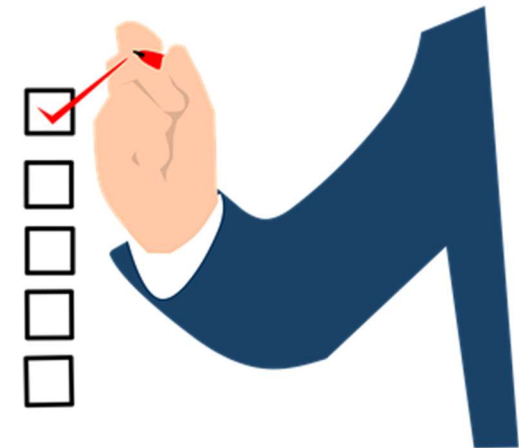
“To prepare, to the extent practicable, for the resumption of normal social and economic activity.”

HOW?

Prerequisites



- General prerequisites:
 - Applicable for any type of emergency.
- Specific prerequisites:
 - Applicable for transition to either an existing exposure or a planned exposure situation.



General prerequisites

- Let's look closely at what needs to be accomplished prior to the termination of any nuclear or radiological emergency to achieve the primary objective.



General prerequisites (cont'd)



- Implement **all necessary urgent and early protective actions**;
- Bring the source of exposure under **control and ensure that no further significant releases or exposures are expected**;
- **Understand well the future development** of the situation.

General prerequisites (cont'd)

- **Characterize the radiological situation:**
 - Identify exposure pathways;
 - Assess doses for affected populations.
- **Assess** the radiological situation **against** (as appropriate):
 - Reference levels;
 - Generic criteria;
 - Operational criteria;
 - Dose limits.

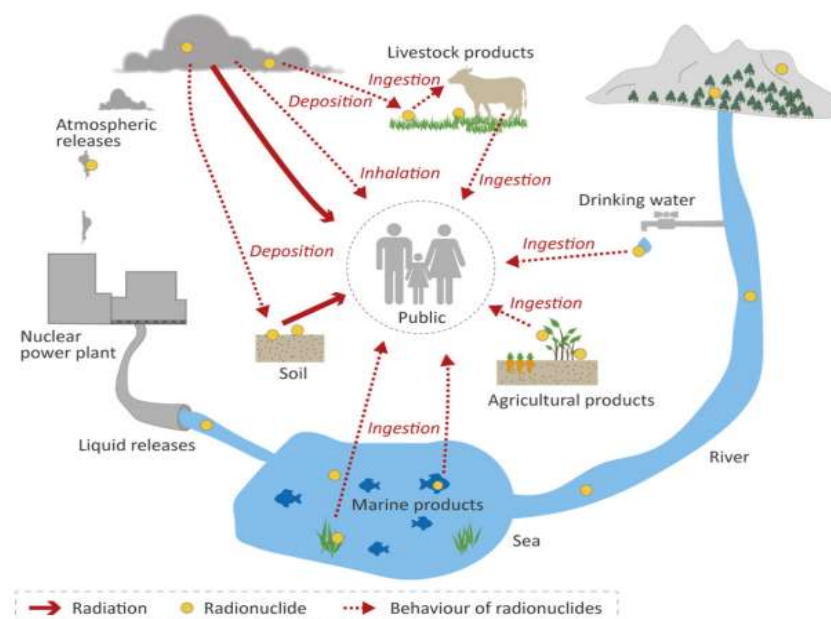
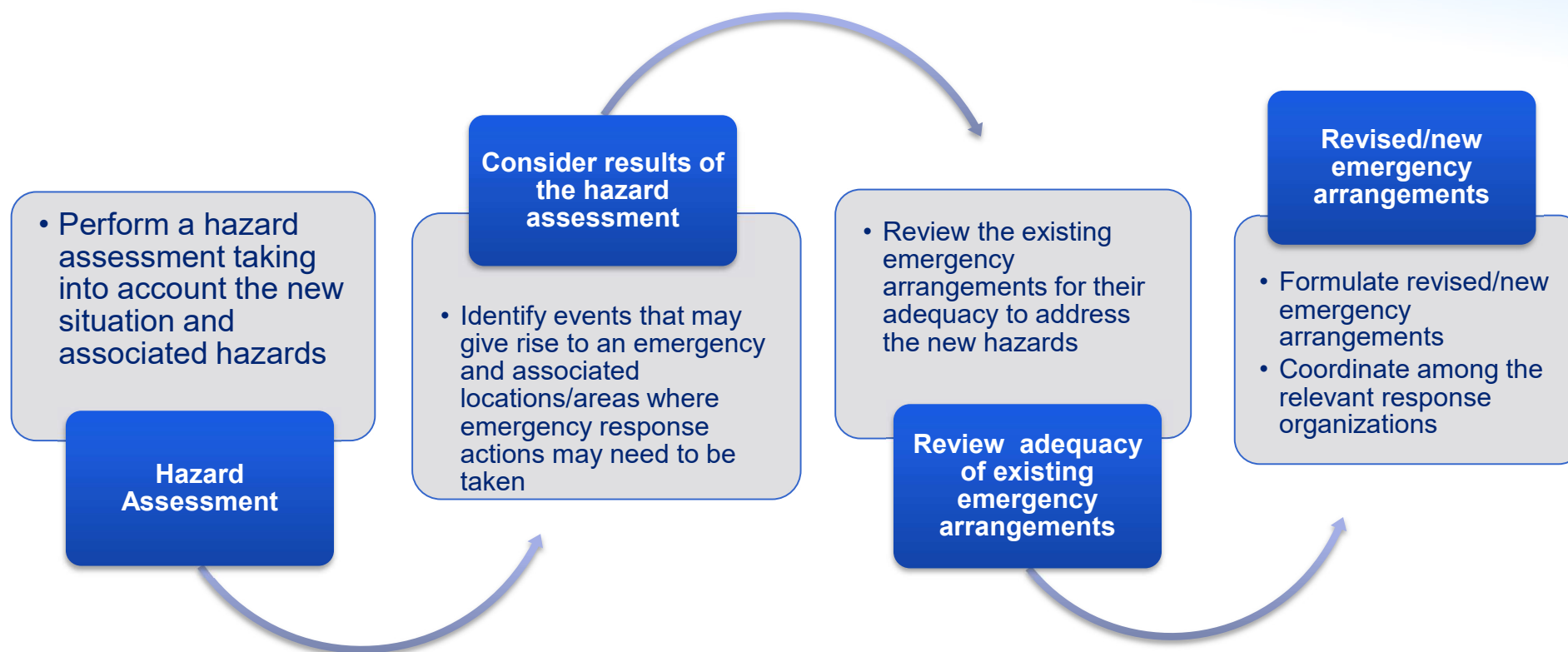


Image reproduced from 'The Fukushima Daiichi Accident', IAEA, Vienna (2015)

General prerequisites (cont'd)



General prerequisites (cont'd)

- Confirm that the requirements for occupational exposure for a planned exposure situation can be applied to all workers to be engaged in recovery activities;
- Confirm that the source is secure;
- Establish a registry for those identified who require longer term medical follow-up.



General prerequisites (cont'd)

- Identify relevant **non-radiological consequences** and factors and **consider actions to address them**:
 - Psychosocial and economic;
 - Technology, land use options, availability of resources and social service, community resilience.
- **Consider activities to manage any radioactive waste** arising from the emergency.

General prerequisites (cont'd)

- **Involve and consult interested parties:**
 - To allow for **public trust** in and **public acceptance** of decisions but without unduly impeding the timely and effective decision making to terminate the emergency.



General prerequisites (cont'd)

- **Discuss with and communicate to the public** and other interested parties relevant information, e.g.:
 - The basis and rationale for the termination of the emergency;
 - The need for adjusting imposed restrictions
 - Necessary modification in people's personal behaviours and habits;
 - Available options for the implementation of self-help actions;
 - The need for continued monitoring and activities to restore services and workplaces;
 - Associated radiological health hazards.

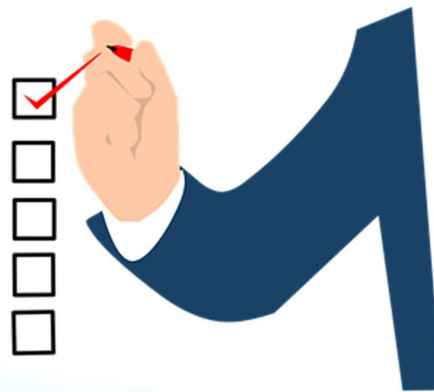
Discussion



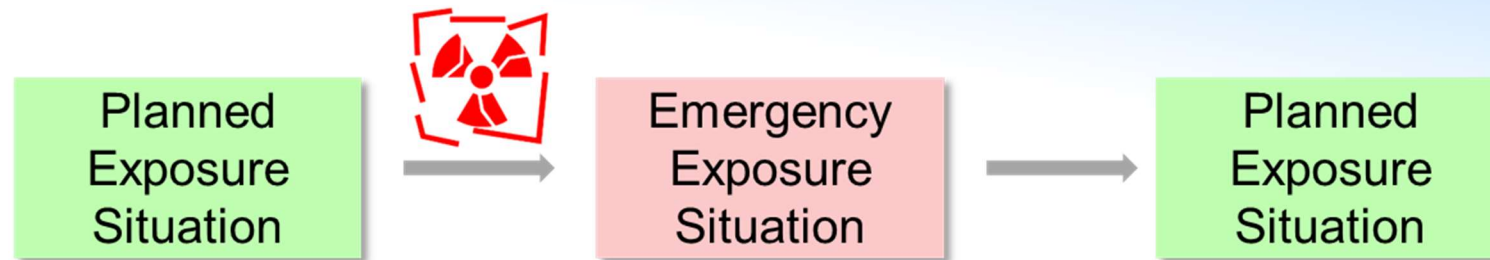
- Have you considered any of these prerequisites currently in your national EPR framework?

Specific prerequisites

- In addition to the general prerequisites:
 - Let's look closely at what needs to be accomplished during the transition phase to allow for the transition to either a planned or an existing exposure situation for the primary objective to be achieved.



Transition to a planned exposure situation



- **Analyze the circumstances** that led to the emergency and **identify corrective actions**:
 - Develop an **action plan** for the implementation of corrective actions.

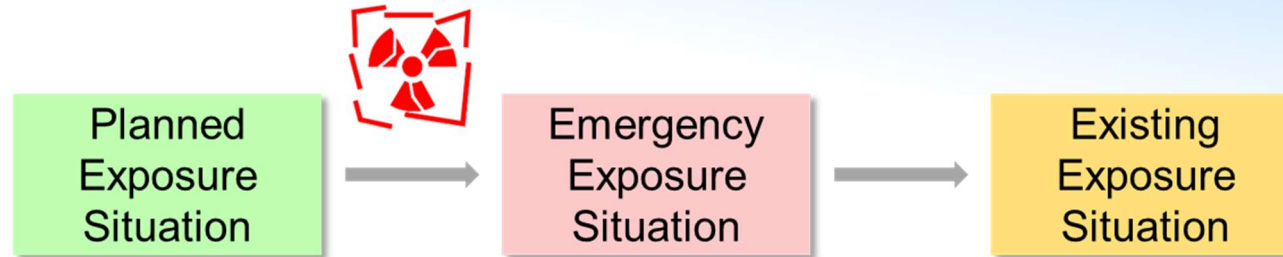
In case this is a lengthy process, consider establishing administrative procedures to limit or prevent further use or handling of the source until the circumstances are better understood

Transition to a planned exposure situation (cont'd)



- Assess the conditions to ensure compliance with national requirements for the **safe and secure handling of the source** as applicable for a planned exposure situation.
- **Confirm compliance** with the requirements for:
 - Dose limits for public exposure in planned exposure situations;
 - Requirements for medical exposure, as appropriate.

Transition to an existing exposure situation



- Justified and optimized actions have been implemented to:
 - Comply with national generic criteria for enabling the transition to an existing exposure situation;
 - Ensure that the residual doses approach the lower bound of the reference level for an emergency exposure situation (~ 20 mSv effective dose in a year).

Transition to an existing exposure situation (cont'd)



- **Delineate areas:**
 - Areas that are not permitted to be inhabited;
 - Areas where it is not feasible to carry out social and economic activity.
- **Establish administrative and other provisions to monitor compliance** with any restrictions imposed in relation to the delineated areas.

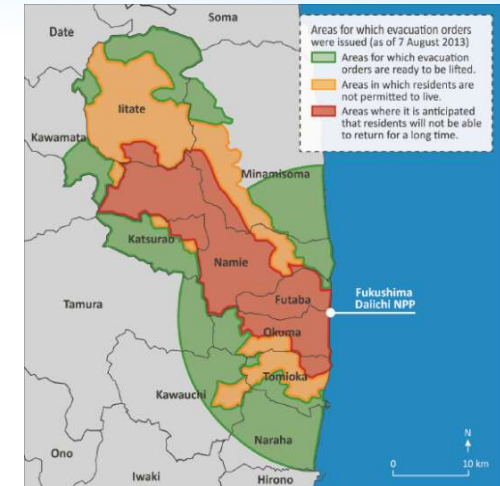


Image reproduced from 'The Fukushima Daiichi Accident', IAEA, Vienna (2015)

Transition to an existing exposure situation (cont'd)



- Develop a strategy for the restoration of infrastructure, workplaces and public services necessary to support normal living conditions in the affected areas.
- Complete any change or transfer of authority and responsibilities:
 - From the emergency response organization to organizations responsible for the long term recovery operations.

Transition to an existing exposure situation (cont'd)



- Put in place a mechanism and means for **continued communication and consultation with all interested parties.**
- Organize the **sharing of any information and data** germane to long term planning among the relevant organizations and authorities.
- Initiate the **development of a long term monitoring strategy** in relation to residual contamination.

Transition to an existing exposure situation (cont'd)



- Develop a programme for longer term medical follow-up for the registered individuals.
- Develop a strategy for mental health and psychosocial support for the affected population.
- Give consideration to the compensation of victims for damage due to the emergency.
- Put in place administrative arrangements, legal provisions and regulatory provisions for the management of the existing exposure situation.

Transition to an existing exposure situation (cont'd)



- No individual monitoring of members of the public for radiation protection purposes following the termination of the emergency is needed.
 - However:
 - Doses received by individuals can differ considerably depending on their individual habits, and therefore they will need to be assessed, and
 - Protection of these individuals may still need to be addressed in the long term protection strategy.

Transition to an existing exposure situation (cont'd)



Exceptional circumstances:

- If the circumstances do not allow to meet the generic criteria for enabling the transition to an existing exposure situation, a decision to terminate the emergency may still be taken as long as:
 - It is confirmed that no further justified and optimized actions are feasible, and
 - The generic criteria for taking early protective actions and other response actions provided in GSR Part 7 are not exceeded.

Discussion



- How much time do you think it would take for all these prerequisites to be fulfilled after a large scale emergency (such as the Chernobyl accident or Fukushima Daiichi accident)?

Time frames for the termination of an emergency



- At the preparedness stage, a strategy should be developed for coping with specific aspects of the termination within a reasonable time frame:
 - Assess the time frames anticipated in which an emergency will be terminated for a range of postulated nuclear or radiological emergencies:
 - On the basis of a hazard assessment;
 - Account for unforeseen circumstances that would be difficult to take into account in the decision making.

Time frames for the termination of an emergency (cont'd)



- Proposed time frames for the termination of the emergency on the basis of the study of past emergencies:
 - In the range of **several weeks to one year** for terminating a large scale emergency;
 - In the range of **a day to a few weeks** for terminating a small scale emergency.

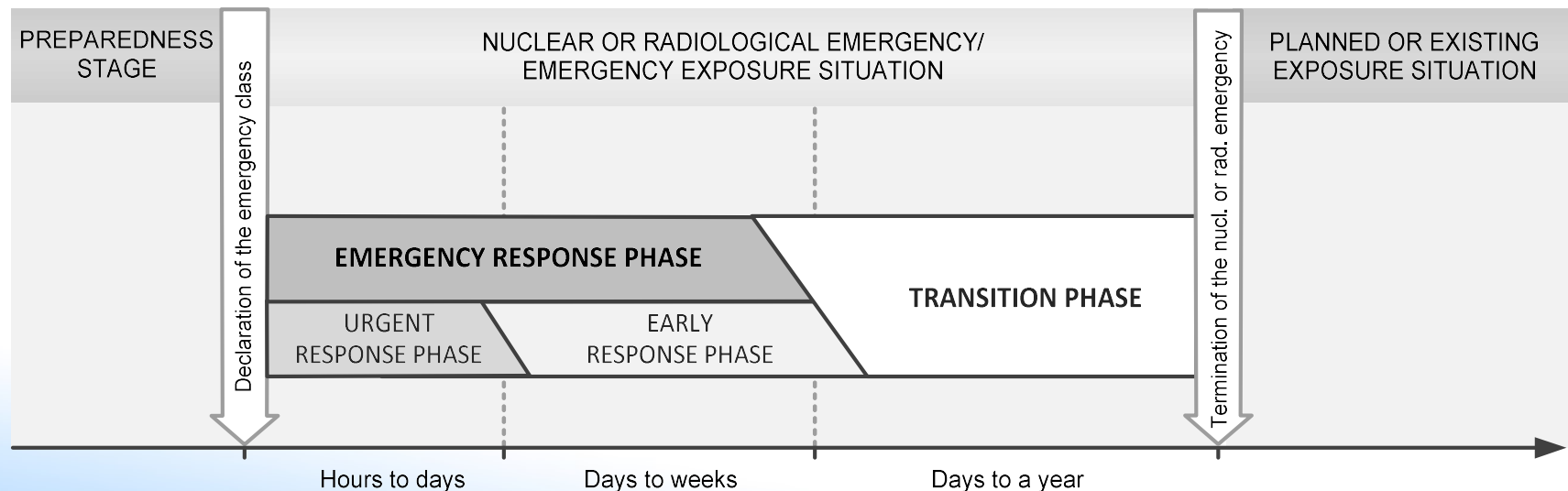
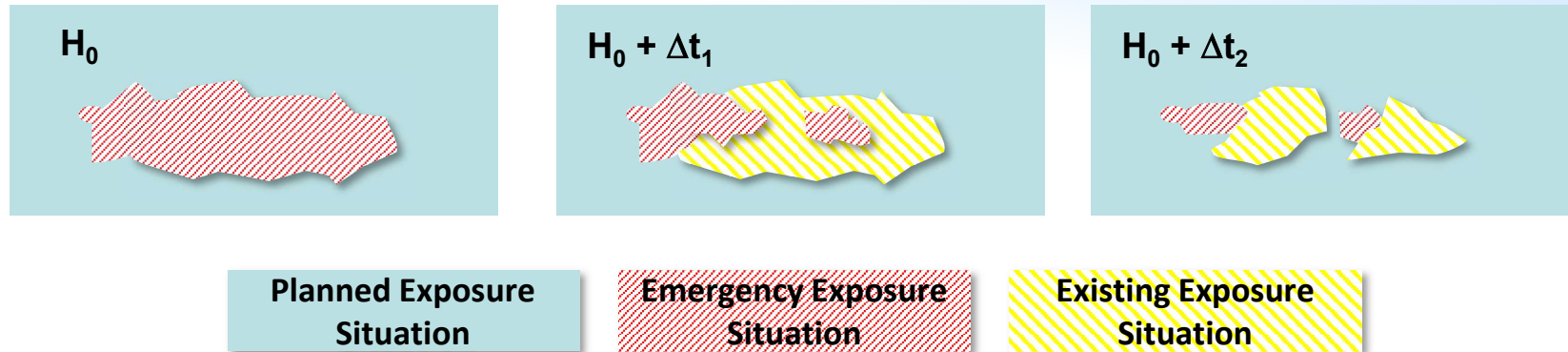


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Additional considerations



- In a large scale emergency, the **complexity** of the radiological situation may vary greatly within an affected area and may be transient in nature.
- Various prerequisites will be fulfilled at different times in different areas:
 - Transition will be occurring gradually in specific areas.
- The transition of the final area to an existing exposure situation will denote the **overall termination** of the emergency.

Discussion



- How can these prerequisites be used by a country at the preparedness stage and during the response?

Additional considerations (cont'd)

At the preparedness stage:

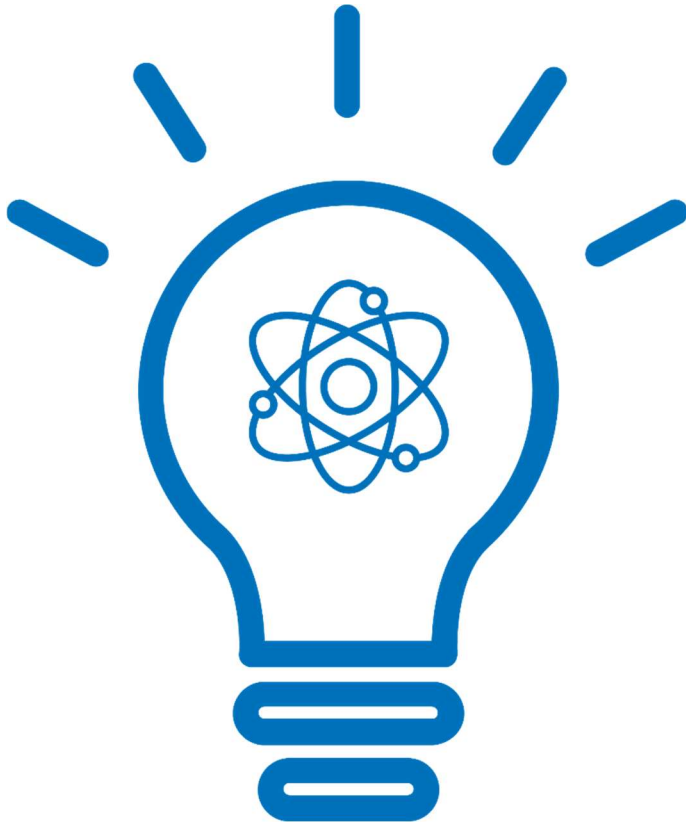
- To identify prerequisites that will need to be fulfilled for postulated emergencies at national level with account taken of the national circumstances to support:
 - Development of the protection strategy for the transition phase;
 - Identification of arrangements that need to be put in place for the transition phase;
 - Determining the time frames in which the prerequisites can be met for postulated emergencies, taking into account available resources and planning accordingly.

Additional considerations (cont'd)

During the response:

- A checklist of relevant prerequisites to be fulfilled so that responsible authority can make a decision to formally end the nuclear or radiological emergency:
 - Any such decision needs to be made public.
- Means to reassess the effectiveness of the protection strategy and the need to adjust to actual circumstances.

Summary



- The primary objective of the termination of an emergency is to facilitate the timely resumption of social and economic activity.
- The emergency should be terminated if the applicable prerequisites set forth in Section 3 of GSG-11 have been fulfilled.
- The primary objective and prerequisites should guide and support:
 - Development of a strategy to protect the affected individuals and to provide for their well-being;
 - Development of emergency arrangements for the transition phase;
 - Decisions for formally declaring an emergency ended.



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Thank you!