ON-SITE EMERGENCY PREPAREDNESS PLAN FOR NUCLEAR POWER PLANT

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AGENDA

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- Emergency Response Principles
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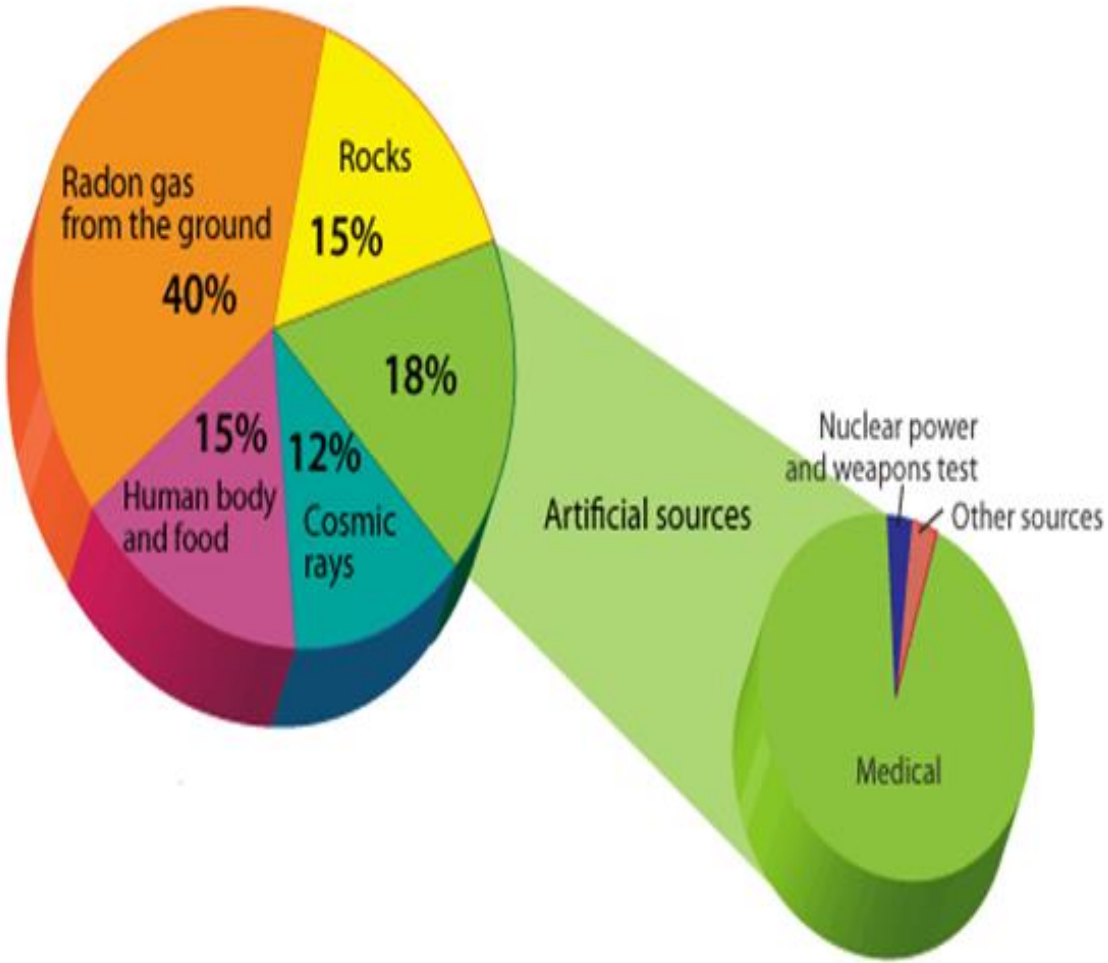
INTRODUCTION

What Is Radiation?

Radiation is any form of energy propagated as rays, waves or energetic particles that travel through the air or a material medium.

People receive some natural or background radiation exposure each day from the sun, radioactive elements in the soil and rocks, household appliances (like television sets and microwave ovens), and medical and dental x-rays.



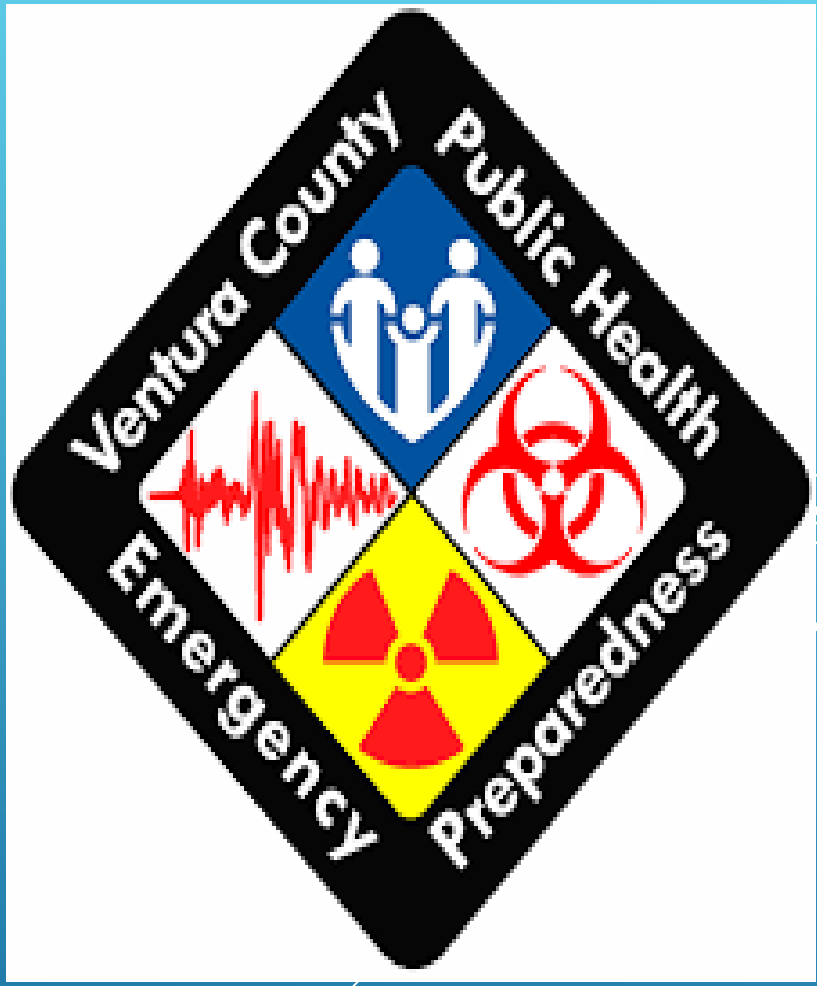
EMERGENCY PLAN

- **Emergency**

an event resulting in an actual release, or substantial probability of a release, requiring implementation of urgent protective actions on/off-site.

- **Emergency Preparedness**

involves actions taken prior to an emergency to ensure an effective response including, but not limited to, public education, emergency information, training and exercises, preparing plans and operation centres, and establishing communications systems.



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- Emergency Preparedness planning aims to reduce the effect of destruction caused by unexpected situations like accidents, fire, sabotage, spills, explosions, natural disasters, and terrorist activities
- It includes a series of actions to be taken in the case of such emergencies. It shows the preventive actions, preparation to meet adverse situations, how to mitigate them and how to have positive controls during that situation to save lives and reduce property damage.

CONTINUE

- Off-site emergency plan

the Plan of public protection in the event of radiation accident in NPP, according to which the off-site emergency response is managed.

- On-site Emergency Plan

The On-Site Emergency Plan defines the planned measures for the nuclear facility area and the connection to the Off-site Emergency Plan (the Plan of Population Protection) in case of emergency event occurrence on the nuclear facility.

WHY ON-SITE EMERGENCY PLAN

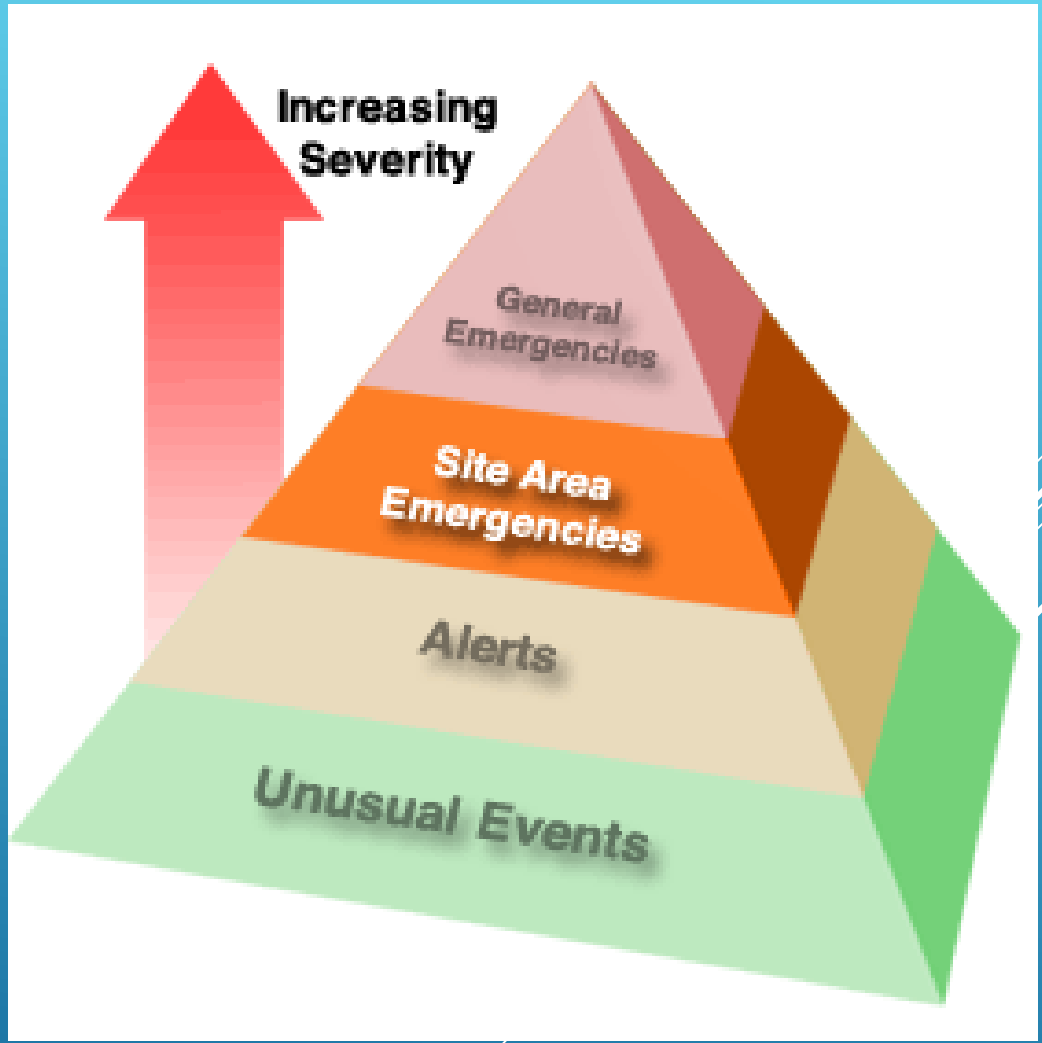
- Literature Review
- Preparing On-site plan in order to:
  - secure; personally, technically, and documentary staff preparedness of the NPP;
  - Decrease of risk, or to degrade their consequences on NPP;
  - Prevent severe direct health damages;
  - Reduce risk for occurrence probabilistic of stochastic influence on health damages in the rate as it is reasonably reachable.
- The study of Emergency Preparedness Plan (EPP) is nowadays in effervescence.
- Traditionally, the substantiality of organizations against accidents is based on several pillars: personnel training, equipment and facilities, organization and, especially, planning. All of these dimensions are endeavored at increasing the preparedness and recovery of facilities against accidents.

- Emergency classification
- Threat category

EMERGENCY CLASSIFICATION

Emergency Classification is a set of plant conditions which indicate a level of risk to the employee

- unusual event,
- alert,
- site area emergency,
- general emergency.



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- **Unusual event:**

Under this category, events are in process or have occurred which indicate potential degradation in the level of safety of the plant.

- **Alert:**

If an alert is declared, events are in process or have occurred that involve an actual or potential substantial degradation in the level of safety of the plant

CONTINUE

Site Area Emergency

A site area emergency involves events in process or which have occurred that result in actual or likely major failures of plant functions needed for protection of the public.

General Emergency

A general emergency involves actual or imminent substantial core damage or melting of reactor fuel with the potential for loss of containment integrity.

THREAT CATEGORY

- **Threat category:**
  - Threat category I
  - Threat category II
  - Threat category III
  - Threat category IV
  - Threat category V

CONTINUE

Before any planning can begin, the practices and activities for which emergency response planning is necessary must be identified.

- **Threat category I**: Facilities, such as nuclear power plants

on-site planning for:

- Mitigatory actions,
- Protective actions on the site,
- formulating recommendations for urgent protective actions within PAZ, UPZ

CONTINUE

- **Threat category II:** Facilities, such as some types of research reactors

  on-site planning for:

  - Mitigatory actions,
  - Protective actions on the site,
  - formulating recommendations for urgent protective actions within PAZ, UPZ

- **Threat category III:** Facilities, such as industrial irradiation facilities,

  on-site planning for:

  - Mitigatory actions,
  - Urgent protective actions on the site,
  - Notification of local authorities
  - Public information

CONTINUE

- **Threat category IV:** Activities that could give rise to a nuclear or radiological emergency

on-site planning (operators, first responders) for:

- Recognizing the emergency
- Mitigatory actions,
- Urgent protective actions on the site,
- Notification of local authorities
- Public information

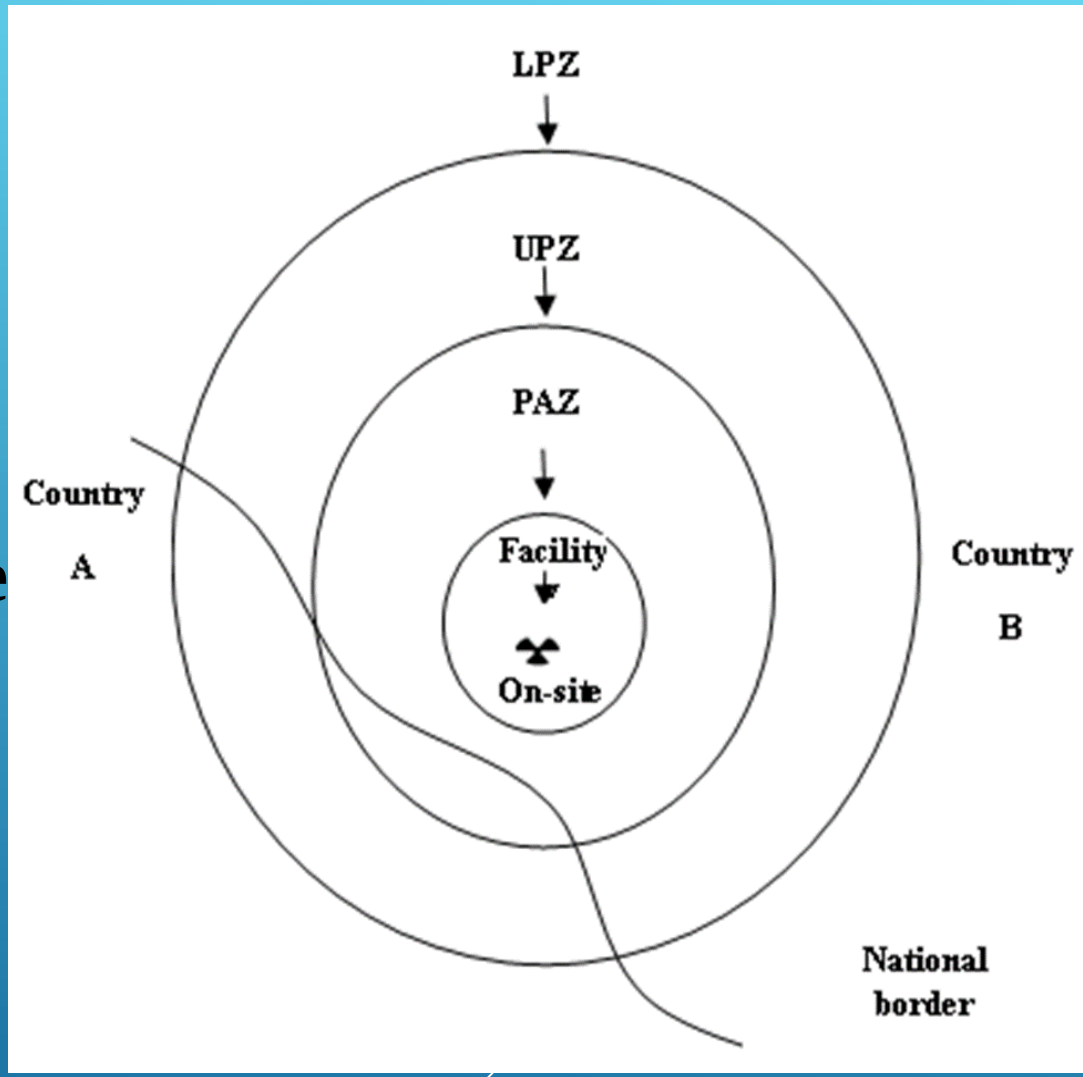
- **Threat category V:** Activities not normally involving sources of ionizing radiation,

Local planning for:

- recognizing the emergency
- Notification and exchange of information with the State where the facility is located.
- Urgent protective actions within UPZ
- Actions for agricultural and ingestion control

PLANNING AREAS AND ZONES

- On-site area
- Off-site area
- Precautionary Action Zone (PAZ)
- Urgent Protective Action Planning Zone (UPZ)
- Longer term protective action planning zone (LPZ)



- 1st Degree -”the alert state” - it is an event in progress or has happened, including actual or potential substantial degradation of the safety level.
- 2nd Degree -”On-site emergency” - it is a condition, leads to radioactive material release outside of buildings of the nuclear facility.

EMERGENCY RESPONSE PRINCIPLES

Element	Facility
Classify the emergency	< 15 min
Notify local authorities after classification	< 30 min
Fully activate emergency organization	< 2 h
Initiate mitigation actions	< 15 min
Activate Technical Support Centre	< 1 h
Recommend urgent protective actions for the public based on emergency classification	< 30 min
Make decisions on urgent protective actions	< 30 min
Conduct environmental monitoring near the facility	< 1 h

Data source from Updating IAEA-TECDOC-953, Method for Developing Arrangements for Response to a Nuclear or Radiological Emergency

ON-SITE EMERGENCY PLAN

- During accident:

- Shift supervisor will lead the on-site emergency plan where he classify the event, call emergency team, and notify Emergency Response Organization and the regulatory body.

- After that the Technician of radiation safety start his mission as he prepare and recommend the protective measures, sending monitoring group, and estimate the dose.

- Also the Mobile monitoring group surround the Nuclear power plant for estimation dose.

MAIN ACTIVITIES

- Classify event if the alert is a 1st degree or 2nd degree. This classification happens by shift supervisor during ongoing of event,
- Call Emergency team directly by shift supervisor after classification,
- Notify Emergency Response Organization (ERO) during 15 min after classification by shift supervisor,
- Notify the regulatory body after classification through the shift supervisor,
- Notify local authorities if it is a 2nd degree by the shift supervisor within 30 min after classification.
- Protective measures immediately after classification if it is 2nd degree by technician of radiation safety,
- Within 30 min after classification, Estimate of doses by technician of radiation safety,
- Mobile monitoring group surrounds the plant within one hour for estimating of doses.

ACTIVITIES SUPPORTING

- include activities such as coordination and management of emergency response, protective action decision-making, plant system repair and correct actions, and accident assessment.
- Drills and exercise scenarios are developed to provide a method to test and evaluate the plant Emergency Program, and shall include, as appropriate:
  - Basic objective of each drill and exercise,
  - Description of arrangements for and advance materials to be provided to official observers.

PROTECTION OF NPP PERSONNEL

- protect the NPP personnel in case of the event
- Shelters, will provide partial protection from radioactive contamination and irradiation.

Gathering Points, to concentrate Employees who are not considered to be directly applied to emergency response or accident mitigation for evacuation.

- Corporate Health Centre, for providing medical help in case of injuries or radiological accidents.

THE EMERGENCY CONTROL CENTRE

- Emergency Control Centre [ECC] that takes over the management of EPR team from the shift supervisor and consists of:
- Technical Support Group [TSG]: would fix the first evaluation of the core damage and size of the source term, provide in-depth diagnostic,
- TSG consists of the safety engineer, technological engineer, TSC coordinator, radiological assessment coordinator and representative of Instrumentation &Control [I&C].

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- Logistic Support Group [LSG]: adjust the on-site protective actions and send emergency response teams for on- and off-site radiological monitoring.
- The LSG includes Fire brigade representative, LSG coordinator, and emergency maintenance coordinator.
- Radiation Monitoring and Dosimeter Group [RMDG]: present data from radiation and meteorological measurement
- The RMDG consist of the radiological controls coordinator, health physic technician, and dosimeters service.

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- Information Group [IG]: support timely communications and information to the employees, media, and public after permission by the Head of EC NPP.
- IG includes Information Centre of Emergency Response Organization [IC] coordinator and Communications coordinator.

SUMMARY

- The on-site plan specifies how plant personnel will respond to an incident on plant property, classify the event, notify state and local emergency response officials, and manage communications.
- The emergency response training program is provided to personnel who may be called upon to respond to an emergency.

SUMMARY

- When an event will be announced, start to perform protective measures for employees of nuclear facility and personnel in the area of the NPP.
- The Recovery Plan shall provide the general sequence of steps from On-site or Off-site emergency to stabilized and safe condition of NPP. The sequence shall be sufficiently flexible to enable it to be used more in existing or postulated conditions.

Future study:

- My future planning work is to prepare an integrated emergency plan including on-site and off-site emergency plan to protect the employee, public and environment.

Thank you