Radiation Protection Contexts of Nuclear Decommissioning

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Nuclear Decommissioning Basics

- Nuclear Decommissioning
  - Safe removal of a facility from service and reduction of residual radioactivity to a level that permits termination of the NRC license
  - Removing the spent fuel, dismantling any systems or components containing activation products, and cleaning up or dismantling contaminated materials from the facility
  - Establishing acceptable reentry standards will be a contentious process with numerous stakeholder groups involved.

Radiological Source Characterization

- Radiological Source Characterization: the determination of the nature, location and concentration of radionuclides at a nuclear installation

- General objectives:
  - Identify the extent and nature of contamination
  - Verify activation calculations
  - Support dose modeling to develop dose-based clearance and release criteria
  - Determine waste classification for packaging, shipping, and disposal
  - Radiation protection
  - Support the estimate of decommissioning costs

Environmental Radiation Monitoring

- Contaminated areas during nuclear reactor operation requires remediation after the end of operation with the ultimate goal of reaching greenfield status
- Radiation monitoring should be a key component in the process of reactor dismantlement, decontamination and cleaning of equipment, facilities, and buildings as well as radioactive waste disposal
- Reactors undergoing a decommissioning process should be required to provide the public with real-time, online radiation data
- Radiation monitoring stations can be established on a community-by-community basis.

Environmental Radiation Monitoring

- Questions to be addressed:
    1. How many monitoring stations should be established and where should they be located?
    2. Who should do the monitoring and how should they be selected?
    4. How should the radiation data be presented and disseminated to the public?
    5. How will readings above normal background levels be handled?
    6. What kind of education and training should the communities receive to prepare them to conduct the monitoring?

Emergency Preparedness

- Graded standards for emergency preparedness
  1. The period immediately after cessation of power operations
  2. The period when any spent fuel is still in a wet pool storage
  3. The period when all spent fuel is in dry cask storage
- Emergency planning and physical security requirements should not change until the final tier is achieved.
- In the final tier, emergency preparedness can be re-assessed based on the residual source term.

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