U.S.NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

Reg Guide 4.21 - Life Cycle Planning for Decommissioning

(guidance for implementation of 10 CFR 20.1406)

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How are Reg. Guides 4.21 and 4.22 related?

- **Reg. Guide 4.21, the subject of this talk, applies to license applications and design certifications submitted after August 20,1997** [10 CFR 20.1406 (a) & (b)]
- **Reg. Guide 4.22, subject of James Shepherd's talk, is directed toward operating facilities** [10 CFR 20.1406 (c)]

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Later in this session

- **Later in this session Kathy Yip of NEI & Southern California Edison will be giving industry's perspective.**
- **RG 4.21 has been out there since 2008 later in the session we will have an opportunity to hear how it is being applied, and the issues and questions that have arisen.**

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10 CFR 20.1406

- For license applications and design certifications after August 20,1997 the application must describe how facility design and operation will:

Facilitate decommissioning

Minimize

- **Contamination of the facility**
- **Contamination of the environment**
- **Generation of waste**

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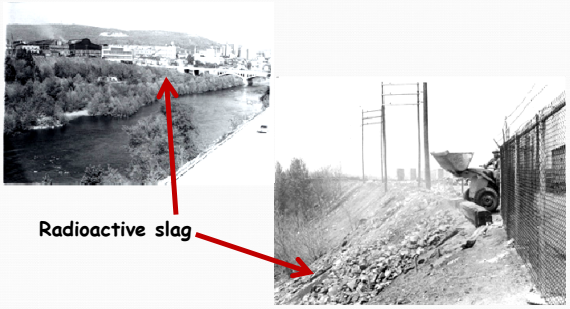
The intent is to avoid legacy sites



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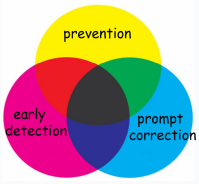
Principles embodied in the draft guide

- **Prevent** -- unintended release,
- **Detect** -- early detection if there is unintended release of radioactive contamination,
- **Correct** -- unintended release of radioactive contamination by prompt and aggressive action when warranted [risk should be considered].



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Questions we've been asked

- I'm a small user of sealed sources. Do I have to do everything in the guide?
- How do I know when I'm done?
  (This is a question of demonstrating compliance)

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Answer to the 1st question

If this is an application for a commercial power plant use the guide.

If this is an application for use of sealed sources at a hospital focus on inventory control.

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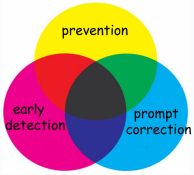
The 2nd question: Demonstrating Compliance

- By using "sound" engineering and science
- By application of the guiding principles in the guide.



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Structure of Reg. Guide 4.21

- The Regulatory Position parallels the organization of 10 CFR 20.1406 (a) & (b)
  - **Minimize contamination of the facility**
  - **Minimize contamination of the environment**
  - **Facilitate decommissioning**
  - **Minimize waste generation**
- Some measures which applicants should consider to achieve compliance are found in an appendix. The appendix is not a check list.

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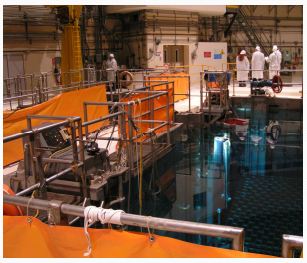
1. Minimization of facility contamination



- **Prevention**
  - **design**
  - **inspection**
  - **maintenance**
- **Detection**
- **Correction**

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1. Minimization of Facility Contamination

(Prevent, Detect, Correct)

- **Design to limit leakage and to control spread of contamination**
- **Prevent through inspection and maintenance programs**
- **Provide for early detection of leaks**
- **Prepare follow-up corrective measures**

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2. Minimization of Environmental Contamination
(Prevent, Detect, Correct)

- Conceptual Site Model

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2. Minimization of Environmental Contamination

- Some examples of prevention through design.....

  - the site and foundation backfill could be engineered to control ground-water flow

  - buried piping should be considered
    (e.g. is it accessible for inspection, leak detection?)

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3. Facilitate Decommissioning

- Begin at design stage. Design and operate facilities to support efficient decommissioning and reduce generation of radioactive waste.
- Develop operating procedures throughout the life of the facility to minimize the amount of residual radioactivity that will require remediation at time of decommissioning.

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4. Minimize waste generation

Minimize waste generation through design and operations. Take a life-cycle approach.

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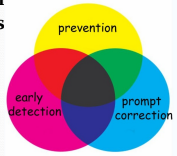
Summary and conclusion

- **RG 4.21 applies to license applications and design certifications submitted after August 20, 1997.**
- **RG 4.22 applies during operations**
- **Demonstration of compliance with 10 CFR 20.1406 (a) & (b) can be achieved by:**
  - **using "sound" engineering and scien**
  - **application of the guiding principles**
    - **-- prevention**
    - **-- early detection**
    - **-- prompt correction**



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