From: Francis X. Cameron (FXC)
To: PAB, LJC2, SXF, SFG, MSL, TJM, JCM, JCM1, MGM, RAM2,...
Date: Monday, January 4, 1993 4:23 pm
Subject:

This is a reminder of the site cleanup workshops preparatory session that we will be holding on January 11 and 12, 1993 for NRC and EPA staff. We will be meeting in the Pennsylvania Room at the Holiday Inn in Bethesda, MD, 8120 Wisconsin Avenue, from 8:30 to 5:00pm. The facilitators from the Keystone Center will be here to assist us in our efforts. The objectives of this preparatory session are:

o to review the draft agenda for the workshops

oto "preview" the NRC presentations that will be made at the workshops

oto anticipate the types of questions that the various participants may raise at the workshops and to discuss possible NRC responses to these questions (note: although we will devote time to the discussion of what types of comments to anticipate from the various interests represented, we will not be developing this information through "role playing.")

o to identify any region-specific information that we should be aware of in preparation for the workshops

o to familiarize NRC and EPA staff with workshop groundrules and dynamics

o generally, to ensure that we are prepared to handle any of the logistical, substantive or process issues that may arise in connection with the workshops

I have enclosed a draft workshop agenda and a list of questions that we can anticipate being raised at the workshops. I look forward to seeing you on Monday. Call me at 301-504-1642 if you have any questions. Thanks for your continued assistance on this project.

A final note for those planning to attend the Chicago workshop - the Keystone Center is making all the hotel reservations for those who plan to stay at the Park Hiatt - please let me know asap if you're planning to go, so that we can get word to keystone.

CC: CFA

Files: G:\AGENDA.FXC, G:\QUESTION.FXC

A-3

NRC SITE CLEANUP CRITERIA WORKSHOP
Draft Agenda
January 6, 1993

Day 1

9:00 Coffee

9:30 Welcome and Background

Enhanced Participatory Rulemaking and the Establishment of Site Cleanup Criteria -- Chip Cameron, NRC

- What is the Enhanced Participatory Rulemaking Process and why has NRC selected it?
- Why does NRC want to develop cleanup criteria?

9:50 Workshop Format -- Michael Lesnick, Barbara Stinson and Connie Lewis, The Keystone Center

- What are the goals and objectives?
- What is the agenda?
- What are the groundrules for conducting the workshop and what is the role of the facilitators?

10:00 Participant Introductions

- Name, affiliation, and location
- Two important issues for discussion in the workshop

10:45 Break

11:00 Brief Review of the Issues Paper and International Standards -- Don Cool, NRC

- What are the issues?
- What decommissioning approaches are other countries using?

11:30 Decommissioning Process and Case Studies -- Michael Weber, NRC

- What is decommissioning?
- What practical lessons has NRC learned?

12:00 Break

12:15 Working Lunch Introductory Discussion

- The Rulemaking Issues Paper identifies four possible fundamental objectives which could serve as the basis for a regulatory approach to site cleanup standards. In terms of the alternative regulatory approaches reflected in the four fundamental objectives, what are the relative advantages and disadvantages of developing and using generic site cleanup standards as opposed to using site-specific approaches?

1:15 Cross-Cutting Issues Discussion - A discussion of the cross-cutting issues that can be used to compare and contrast the alternative regulatory approaches for developing cleanup standards

- To what extent do the alternative regulatory approaches protect human health and the environment?

  -- What population(s) should be protected, in what locations, and over what timeframe? What are the relative merits of each alternative regulatory approach?

  -- What level(s) is sufficient to ensure protection of population(s)? What are the relative merits of each alternative regulatory approach in terms of achieving this level?

  -- Should human standards be used to protect natural systems?

3:00 Public comment

3:15 Break

3:30 Cross-Cutting Issues Discussion (Continued)

- How should cost and other practical considerations be considered in selecting a regulatory approach for the standards?

  -- What are the cost and practical considerations that relate to each of the alternative regulatory approaches?

  -- What weight should be given to these considerations in selecting a regulatory approach?

  -- How do each of the alternative regulatory approaches affect the types and distributions of costs and benefits?

  -- If a cost-benefit approach is used, what costs and benefits should be considered? Should individual or population (or both) doses be considered? If costs are balanced against dose averted, what value should be used in evaluating the ratio (e.g., $1000 per person-rem)?

5:15 Public comment

5:30 Summary and Adjournment

Day 2

8:00 Coffee

8:30 Cross-Cutting Issues Discussion (Continued)

- What technologies are necessary and available for use of each of the alternative regulatory approaches?
  - -- What capabilities would be needed to implement the standards (e.g., remediation, modelling, site characterization, regulatory review, licensee demonstration, monitoring)?
  - -- Are they currently available? Are they expected and, if so, when?
  - -- To what extent do the technologies transfer the hazard to another medium or other populations? Is the net benefit positive (e.g., producing a smaller volume of hazardous waste to reduce a larger volume radioactive waste)?

10:00 Public comment

10:15 Break

10:30 Cross-Cutting Issues Discussion (Continued)

- To what extent are the alternative regulatory approaches compatible with existing regulatory structures?
  - -- Do they need to be compatible? What are the advantages and disadvantages?
  - -- To what extent do the alternative regulatory approaches achieve long-term, regulatory stability?
  - -- Does each alternative regulatory approach promote regulatory compliance? Does each provide sufficient incentives for timely and effective decommissioning?
  - -- How easily can the alternative regulatory approach be integrated with the existing nuclear regulatory framework? other relevant federal and state legislation and regulations?

12:00 Public Comment

12:15 Break

12:30 Working Lunch - Cross-Cutting Issues Discussion (Continued)

- What are the waste management implications of each alternative regulatory approach?

  -- How do each of the alternative regulatory approaches relate to the quantity and types of wastes produced? Is sufficient capacity available or expected to be available?

  -- To what extent does each alternative regulatory approach merely transfer the risk to another population?

  -- How should each alternative regulatory approach apply to former waste disposals under 10 CFR 20.304 and 302?

  -- To what extent does each alternative regulatory approach address other options for waste management, including recycling and reuse?

2:15 Public Comment

2:30 Break

2:45 Other Key Issues (Remainder of issues not already covered)

  -- Should the standards consider the effects of radon releases? If so, how should this be done?

  -- Should criteria be established for protecting specific pathways or resources (e.g., groundwater)?

  -- Will there be cases where release for "unrestricted use" may not be feasible? How should these situations be addressed?

3:45 Public Comment

4:00 Summary of Workshop Issues

4:30 Adjourn

SITE CLEANUP WORKSHOPS-ANTICIPATED QUESTIONS TO NRC STAFF

- What is the relationship of the site cleanup rulemaking to the BRC Policy/Isn't this an attempt to sneak through a BRC Policy?
- What are the implications of the BRC provision in the National Energy Policy Act for the site cleanup rulemaking?
- How and when will the NRC address the issues of the disposal of waste and the recycle of radioactive material from site cleanup efforts?
- How and when will the issue of state compatibility in the site cleanup area be addressed?
- What is the EPA-NRC risk harmonization program and what are the implications for the site cleanup rulemaking?
- How will the public be involved in efforts to establish the compliance methodologies, models, environmental impact statements, and other actions that are necessary supplements to the rulemaking?
- Will the NRC develop a draft text of the proposed rule for participant review? Will the draft proposed rule that is submitted to the Commission for review be provided to workshop participants?
- Why isn't the EPA developing these rules?
- In what way, if any, will these rules be applicable to DOE sites?

NRC Radiological Criteria Workshop
Preparatory Meeting Agenda
January 11, 1993

I. Welcome, Introduction, and Overview - Chip Cameron

II. Preparatory Meeting Goals and Agenda Review - Michael Lesnick and Barbara Stinson, The Keystone Center

III. Overview of Key Workshop Components - Lesnick and Stinson

A. Review of Discussion of Overall Workshop Goals

B. Workshop Schedule and General Design

C. Types of Participants (including NRC, EPA, other agencies)

D. Role of The Keystone Center

E. Role of NRC, EPA and other agencies

F. Workshop Summaries

G. Participant Support and Interviews

H. Public Attendance and Comment

I. Hotel Logistics and Food Arrangements

IV. Discussion of NRC and EPA Participants' Roles - Lesnick and Stinson

Listening / Problem solving

A. Role of NRC participants (those "at the table" and those attending as observers)

B. Role of EPA participants (those "at the table" and those attending as observers)

V. Detailed, Item-by-Item Review and Discussion of Draft Workshop Agenda - Lesnick, Stinson and presenters

A. Discussion of content, style, and tone of all presentations

B. Critical analysis of issues to anticipate, responses to issues, and agency staff likely to respond for the interactive agenda items

VI. Discussion of Next Steps

A. Prior to Chicago meeting

B. During Chicago meeting

C. Between meetings

D. At conclusion of all meetings

A-4

POLICY ISSUE

(Information)

January 25, 1993 SECY-93-011

For: The Commissioners

From: Francis X. Cameron
Special Counsel for Public Liaison
and Waste Management
Office of General Counsel

Subject: STATUS REPORT ON THE ENHANCED PARTICIPATORY RULEMAKING ON THE RADIOLOGICAL CRITERIA FOR DECOMMISSIONING

Purpose: To inform the Commission of the status of the enhanced participatory rulemaking to establish the radiological criteria for decommissioning

Summary: In its Staff Requirements Memorandum of October 28, 1992, the Commission approved the staff's recommendations in SECY-92-249 for conducting an enhanced participatory rulemaking to establish the radiological criteria for decommissioning. The basic approach outlined in SECY-92-249 was to conduct a series of workshops to solicit the advice and recommendations of affected interests on the fundamental approaches and issues that must be addressed to establish the site cleanup criteria. This paper describes the progress that the staff has made towards implementing this approach, including the revision of relevant documents such as the Rulemaking Issues Paper; the preparation of background documents for workshop participants; the activities of the facilitation team from the Keystone Center; the NRC and Environmental Protection Agency (EPA) staff preparation for the workshops; the development of the workshop agenda; the status of workshop participation; and the schedule for the rulemaking.

Discussion: In the Staff Requirements Memorandum that approved the enhanced participatory rulemaking, the Commission directed the staff to revise the Federal Register Notice which would announce the workshops and the Rulemaking Issues Paper which would provide the framework for workshop discussions. The revised documents were mailed to all potential workshop participants and are provided for the Commission's information at Enclosure A (Federal Register Notice) and Enclosure B (Rulemaking Issues Paper).

FT 9301220143 AA

Contact:
F.X. Cameron, OGC
504-1642

D. Cool, RES
492-3785

NOTE: TO BE MADE PUBLICLY AVAILABLE IN 10 WORKING DAYS FROM THE DATE OF THIS PAPER

Release

A-5

96 pages

The Federal Register Notice was published on December 11, 1992, and among other things, announced the availability of the Rulemaking Issues Paper upon request to the Commission. Approximately 100 copies have been requested, in addition to those sent to potential participants. The staff will also publish a Federal Register Notice containing information about individual workshops in advance of each workshop (Enclosure C).

In addition to the Rulemaking Issues Paper, the Commission directed the staff to prepare case studies of actual decommissioning projects and a summary of international activities in regard to site cleanup criteria. These documents were intended to serve as background material to prepare the participants for the workshop discussions. These documents are provided for the Commission's information at Enclosure D (case studies) and Enclosure E (international activities). They will be distributed to participants in advance of the workshops and public attendees at each workshop.

As noted in SECY-92-249, the NRC has procured the services of The Keystone Center of Keystone, Colorado, to provide facilitation services and other support for the enhanced participatory rulemaking. The services of Keystone have been obtained through an interagency agreement with the Environmental Protection Agency and its facilitation contractor, Resolve. Two facilitators from The Keystone Center will facilitate each of the workshops.

In preparation for the workshops the facilitators have met with each Commissioner and the senior management of the agency. They have also contacted invited participants to discuss the workshop process and the substantive issues that the participants believe are important for discussion at the workshops. The facilitators also coordinated the development of a workshop agenda that would provide for an effective and productive discussion of the issues in the Rulemaking Issues Paper. The agenda is provided for the Commission's information at Enclosure F.

In preparation for the workshops, the NRC and EPA staffs, with assistance from the facilitators, completed a two-day preparatory session on January 11 and 12, 1992. All relevant NRC offices were represented, as well as representatives from each NRC Regional Office and the EPA staff that will participate in the workshops. The EPA participants are from the EPA Office of Radiation and Indoor Air. They will also coordinate EPA participation in the enhanced rulemaking process with other relevant EPA offices, such as the Office of Solid Waste and Emergency Response, and the EPA Regions.

In addition to the general preparatory session, the key NRC and EPA headquarters and regional staffs will meet the day before each workshop at the workshop site to go over any final details. The NRC and EPA staffs have also been meeting on a regular basis to discuss and develop a coordinated approach on the technical underpinnings in support of both the NRC rulemaking and the EPA efforts to develop site cleanup criteria for Federal facilities. These technical underpinnings include radiological survey techniques, site characterization guidance, modelling guidance, and cost-benefit analysis. EPA and NRC also are involving the Department of Energy in these activities as part of a coordinated Federal effort.

In addition to providing facilitation services for the workshops, the Keystone Center is also making all the logistical arrangements for the workshops. This includes arranging for specific workshop locations, securing hotel accommodations, ensuring that participants have the necessary materials and information for the workshops, arranging for audiovisual equipment and other supplies, and administering the travel funds for those individuals who meet the criteria for funding. The first workshop will be held in Chicago, Illinois, at the Park Hyatt Hotel, on January 27 and 28, 1993.

Approximately 140 invitations to participate in the workshops were extended to individuals and organizations representing the broad spectrum of interests that might be affected by the rulemaking. This spectrum of interests includes state, local, and tribal governments; federal agencies; citizens and environmental groups; the nuclear industry; and professional societies. Based on information from the facilitators, we expect between twenty and twenty-five participants at each workshop. Although the participant lists for most of the workshops have not yet been finalized, the overall response from potential participants has been positive. We have included the participant list for the Chicago workshop at Enclosure G. The participant list for the San Francisco workshop will be provided to the Commission in advance of that workshop, scheduled for February 23 and 24, 1993. Participant lists for the other workshops will be provided to the Commission with the next status report, which will be submitted in the beginning of March, 1993.

At the conclusion of each workshop, the facilitators will prepare and circulate a meeting summary to all participants for review. Transcripts of all workshops will be placed in the NRC and EPA headquarters and regional Public Document Rooms and will also be made available upon request.

The NRC staff will issue a summary of workshop comments at the conclusion of the entire workshop process. This will also

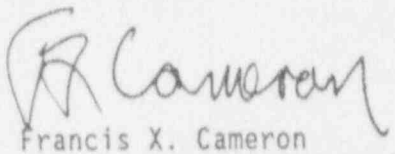
include any written comments that were submitted on the Rulemaking Issues Paper. The comment period ends on May 28, 1993.

The staff intends to issue a Notice of Intent to prepare a Generic Environmental Impact Statement (GEIS) after the workshops have concluded. The Notice of Intent will begin the scoping process for the preparation of the GEIS. The scoping process will also include a public meeting to be held in Washington D.C. in June 1993.

The staff anticipates submitting the draft proposed rule and supporting documents, such as the draft GEIS, to the Commission in April 1994. The final rule would be published in the Federal Register in May 1995. Counting from the completion of the last workshop in May 1993, the time period to complete this rulemaking conforms to the Executive Director for Operation's guidelines for completing rulemakings within two years after initiation. The entire process for the enhanced participatory rulemaking, including the workshops, will extend beyond two years due to the enhancement of the process provided by the workshops. The complete schedule for the rulemaking is described in Enclosure H.

The next status report will be submitted to the Commission following the second workshop, to be held in San Francisco, California on February 23 and 24, 1993. In the interim, we will keep the Commission apprised of any significant developments that may arise from the workshops.

Coordination: This paper has been coordinated with the Executive Director for Operations.



Francis X. Cameron
Special Counsel for Public Liaison
and Waste Management
Office of the General Counsel

Enclosures:

A. Federal Register Notice, December 11, 1992
B. Rulemaking Issues Paper
C. Federal Register Notice, January 14, 1993
D. Decommissioning case studies
E. International experience
F. Workshop Agenda
G. Participants for the Chicago, Illinois workshop
H. Rulemaking Schedule

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Proposed Rules

Federal Register

Vol. 57, No. 239

Friday, December 11, 1992

This section of the FEDERAL REGISTER contains notices to the public of the proposed issuance of rules and regulations. The purpose of these notices is to give interested persons an opportunity to participate in the rule making prior to the adoption of the final rules.

NUCLEAR REGULATORY COMMISSION

10 CFR Chapter I

NRC Program for Elimination of Requirements Marginal to Safety; Public Workshop

AGENCY: Nuclear Regulatory Commission.

ACTION: Notice of Rescheduling of Public Workshop.

SUMMARY: On November 24, 1992, a notice was published (57 FR 55156) announcing a public workshop on January 26–27, 1993 for the NRC Program for Elimination of Requirements Marginal to Safety. This workshop is being rescheduled to expand the scope and include other aspects of the staff plans to improve the efficiency of the regulatory process. A notice providing further details will be published in the near future.

DATES: The rescheduled dates of the public workshop will be published in the near future.

ADDRESSES: The location of the public workshop will be published in the near future.

FOR FURTHER INFORMATION CONTACT: Dr. Moni Dey, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Phone (301) 492–3730.

Dated at Rockville, Maryland, this 4th day of December 1992.

For the Nuclear Regulatory Commission.

Warren Minners,

Director, Division of Safety Issue Resolution, Office of Nuclear Regulatory Research.

[FR Doc. 92–30127 Filed 12–10–92; 8:45 am]

BILLING CODE 7590–01–M

10 CFR Part 20

Radiological Criteria for Decommissioning of NRC-Licensed Facilities; Workshops

AGENCY: Nuclear Regulatory Commission.

ACTION: Notice of workshops.

SUMMARY: The Nuclear Regulatory Commission (NRC) is preparing to initiate an enhanced participatory rulemaking on establishing the radiological criteria for the decommissioning of NRC-licensed facilities. The Commission intends to enhance the participation of affected interests in the rulemaking by soliciting commentary from these interests on the rulemaking issues before the staff develops the draft proposed rule. The Commission plans to conduct a series of workshops to solicit commentary from affected interests on the fundamental approaches and issues that must be addressed in establishing the radiological criteria for decommissioning. The workshops will be held in various locations throughout the United States beginning in January, 1993 and will be open to the public.

DATES: The schedule for the workshops is as follows:

January 27 and 28, 1993—Chicago, IL
February 23 and 24, 1993—San Francisco, CA
March 12 and 13, 1993—Boston, MA
March 23 and 24, 1993—Dallas, TX
April 13 and 14, 1993—Philadelphia, PA
April 29 and 30, 1993—Atlanta, GA
May 6 and 7, 1993—Washington, DC (National Workshop)

As discussed later in this notice, the workshop discussions will focus on the issues and approaches identified in a Rulemaking Issues Paper prepared by the NRC staff. The Commission will accept written comments on the Rulemaking Issues Paper from the public, as well as from workshop participants. Written comments should be submitted by May 28, 1993.

ADDRESSES: Send written comments on the Rulemaking Issues Paper to: Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Attn: Docketing and Service Branch. Hand deliver comments to 11555 Rockville Pike, Rockville, Maryland between 7:45 a.m. and 4:15 p.m. on Federal workdays. The Rulemaking Issues Paper is available from Francis X. Cameron (See **FOR FURTHER INFORMATION CONTACT**).

FOR FURTHER INFORMATION CONTACT: Francis X. Cameron, Special Counsel for Public Liaison and Waste Management, Office of the General Counsel, Washington, DC 20555, Telephone: 301–504–1642.

SUPPLEMENTARY INFORMATION:

Background

The NRC has the statutory responsibility for protection of health and safety related to the use of source, byproduct, and special nuclear material under the Atomic Energy Act. The NRC believes that one portion of this responsibility is to ensure the safe and timely decommissioning of nuclear facilities which it licenses and to provide guidance to licensees on how to plan for and prepare their sites for decommissioning. Once licensed activities have ceased, licensees are required to decommission their facilities so that their licenses may be terminated. This requires that the radioactivity in land, groundwater, buildings, and equipment resulting from the licensed operation be reduced to levels that allow the property to be released for unrestricted use. Licensees must then demonstrate that all facilities have been properly decontaminated and that radioactive material has been transferred to authorized recipients. Confirmatory surveys are conducted by NRC, where appropriate, to verify that sites meet NRC radiological criteria for decommissioning.

The types of nuclear fuel cycle facilities that will require decommissioning include nuclear power plants; non-power (research and test) reactors; fuel fabrication plants, uranium hexafluoride production plants, and independent spent fuel storage installations. In addition there are currently about 24,000 materials licensees. About one third of these are NRC licensees, while the remainder are licensed by Agreement States acting under the authority of the Atomic Energy Act, section 274. These licensees include universities, medical institutions, radioactive source manufacturers, and companies that use radioisotopes for industrial purposes. About 50% of NRC's 7,500 materials licensees use either sealed radioactive sources or small amounts of short-lived radioactive materials. Decommissioning of these facilities should be relatively simple because there is usually little or no residual radioactive contamination. Of the remaining 50%, a small number (e.g. radioactive source manufacturers, radiopharmaceutical producers, and

radioactive ore processors) conduct operations that could produce substantial radioactive contamination in portions of the facility. These facilities, like the fuel cycle facilities identified above, must be decontaminated before they can be safely released for unrestricted use.

Several hundred NRC and Agreement State licenses are terminated each year. The majority of these licenses involve limited operations, produce little or no radioactive contamination, and do not present complex decommissioning problems or potential risks to public health or the environment from residual contamination. However, as the nuclear industry matures, it is expected that more and more of the larger nuclear facilities that have been operating for a number of years will reach the end of their useful lives and be decommissioned. Therefore, both the number and complexity of facilities that will require decommissioning is expected to increase.

The Commission believes that there is a need to incorporate into its regulations radiological criteria for termination of licenses and release of land and structures for unrestricted use. The intent of this action would be to provide a clear and consistent regulatory basis for determining the extent to which lands and structures must be decontaminated before a site can be decommissioned. The Commission believes that inclusion of criteria in the regulations would result in more efficient and consistent licensing actions related to the numerous and frequently complex site decontamination and decommissioning activities anticipated in the future. A rulemaking effort would also provide an opportunity to reassess the basis for the residual contamination levels contained in existing guidance in light of changes in basic radiation protection standards and decommissioning experience obtained during the past 15 years.

The new criteria would apply to the decommissioning of power reactors, non-power reactors, fuel reprocessing plants, fuel fabrication plants, uranium hexafluoride production plants, independent spent fuel storage installations, and materials licenses. The criteria would apply to nuclear facilities that operate through their normal lifetime, as well as to those that may be shut down prematurely. The proposed criteria would not apply to uranium (other than source material) mines and mill tailings, high-level waste repositories, or low-level waste disposal facilities.

Until the new criteria are in place, the Commission intends to proceed with the decommissioning of nuclear facilities on a site-specific basis as the need arises considering existing criteria. Case and activity-specific risk decisions will continue to be made as necessary during the pendency of this process.

The Enhanced Participatory Rulemaking

The Commission believes it is desirable to provide for early and comprehensive input from affected interests on important public health and safety issues, such as the development of radiological criteria for decommissioning. Accordingly, the Commission is initiating an enhanced participatory rulemaking to establish these criteria. The objective of the rulemaking is to enhance the participation of affected interests in the rulemaking by soliciting commentary from these interests on the rulemaking issues before the NRC staff develops the draft proposed rule. The NRC staff will consider this commentary in the development of the draft proposed rule, as well as document how these comments were considered in arriving at a regulatory approach. The Commission believes that this will be an effective method for illuminating the decisionmaking process on complex and controversial public health and safety issues. This approach will ensure that the important issues have been identified; will assist in identifying potential information gaps or implementation problems; and will facilitate the development of potential solutions to address the concerns that affected interests may have in regard to the rulemaking.

The early involvement of affected interests in the development of the draft proposed rule will be accomplished through a series of workshops. A workshop format was selected because it will provide representatives of the affected interests with an opportunity to discuss the rulemaking issues with one another and to question one another about their respective positions and concerns. Although the workshops are intended to foster a clearer understanding of the positions and concerns of the affected interests, as well as to identify areas of agreement and disagreement, it is not the intent of the workshop process to attempt to develop a consensus agreement on the rulemaking issues. In addition to the commentary from the workshop participants, the workshops will be open to the public and the public will be provided with the opportunity to comment on the rulemaking issues and the workshop discussions at discrete intervals during the workshops.

The normal process for conducting Commission rulemakings is NRC staff development of a draft proposed rule for Commission review and approval, publication of the proposed rule for public comment, consideration of the comments by the NRC staff, and preparation of a draft final rule for Commission approval. In the enhanced participatory rulemaking, not only will comments be solicited before the NRC staff prepares a draft proposed rule, but the mechanism for soliciting these early comments will also provide an opportunity for the affected interests and the NRC staff to discuss the issues with each other, rather than relying on the traditional one-to-one written correspondence with the NRC staff. After Commission review and approval of the draft proposed rule that is developed using the workshop commentary, the general process of issuing the proposed rule for public comment, NRC staff evaluation of comments, and preparation of a draft final rule for Commission approval, will occur.

Participants

In order to have a manageable discussion among the workshop participants, the number of participants in each workshop must be limited. Based on discussions with experts on workshop facilitation, the NRC staff believes that the optimum size of the workshop group is fifteen to twenty participants. Due to differing levels of interest in each region, the actual number of participants in any one workshop, as well as the number of participants that represent a particular interest in any one workshop, may vary. Invitations to attend the workshops will be extended by the NRC staff using several selection criteria. First, to ensure that the Commission has the benefit of the spectrum of viewpoints on the issues, the NRC staff is attempting to achieve the participation of the full range of interests that may be affected by the rulemaking. The NRC staff has identified several general interests that will be used to select specific workshop participants—state governments, local governments, tribal governments, Federal agencies, citizens groups, nuclear utilities, fuel cycle facilities, and non-fuel cycle facilities. In addition to these interests, the staff also plans to invite representatives from the contracting industry that performs decommissioning work and representatives from professional societies, such as the Health Physics Society and the American Nuclear Society. The NRC anticipates that most of the participants will be

representatives of organizations. However, it is also possible that there may be a few participants who, because of their expertise and influence, will participate without any organizational affiliation.

The second selection criterion is the ability of the participant to knowledgeably discuss the full range of rulemaking issues. The NRC staff wishes to ensure that the workshops will elicit informed discussions of options and approaches, and the rationale for those options and approaches, rather than simple statements of opinion. The NRC staff's identification of potential participants has been based on an evaluation of such factors as the extent of a potential participant's experience with a broad range of radiation protection issues and types of nuclear facilities, specific experience with the decommissioning issue, and the extent of a potential participant's substantive comment and participation on previous Commission regulatory or licensing actions.

The third criterion emphasizes participation from organizations within the region encompassed by the workshop. As much as practicable, those organizations that primarily operate within the region, as opposed to regional units of national organizations, will have priority in terms of participating in the corresponding regional workshops. Organizations with a national standing will be part of the "national" workshop to be held in Washington, DC.

Wherever possible, the NRC staff plans to arrange the participation of individual organizations in the workshops through national organizations such as the Organization of Agreement States, and the Conference of Radiation Control Program Directors (CRCPD). There will also be some flexibility to later include organizations who were not originally identified in the staff survey of potential participants. In order to provide the public with information on the types of organizations that may eventually participate in the workshops, the Commission has provided the following summary:

• State governments. The Organization of Agreement States and the CRCPD are willing to coordinate the participation of individual states in the regional workshops. The NRC staff has also notified the National Governors's Association, the Western Governors' Association, the National Conference of State Legislatures, and the National Association of Attorneys General of the upcoming workshops.

• Local governments. The NRC staff has contacted the National Association of Counties and the county associations in each state to identify potential local government participants.

• Tribal governments. The NRC staff has contacted three national tribal organizations—Native Americans for a Clean Environment, the National Congress of American Indians, and the Council of Energy Resource Tribes—in regard to the participation of tribal Governments in the regional workshops.

• Citizens groups. The NRC staff has contacted several citizens groups at the national level in regard to their general interest in participating in the national workshop. The groups contacted include the Sierra Club, the Natural Resources Defense Council, the Nuclear Information Resource Service, Public Citizen, U.S. Public Interest Research Group, the League of Women Voters, the National Aububon Society, the Union of Concerned Scientists, and Physicians for Social Responsibility.

In regard to local and regional citizens groups, the NRC staff has had extensive discussions with the NRC regional personnel, state radiation protection control officials, and others, on potential citizen group participation at the regional level. Based on these discussions, the NRC staff has contacted a number of citizens groups about their potential interest in the enhanced participatory rulemaking.

• Nuclear utilities. The Nuclear Management and Resources Council (NUMARC) will coordinate the participation of utilities in the workshops.

• Fuel cycle facilities. The United States Council on Energy Awareness (USCEA) and the Fuel Cycle Facilities Forum will coordinate the participation of fuel cycle companies in the workshops.

• Non-fuel cycle facilities. The NRC staff has contacted a number of organizations in this category about potential participation in the workshops, including regional radioisotope users groups. The USCEA Committee on Radionuclides and Radiopharmaceuticals assisted in coordinating the participation of the members of these and other non-fuel cycle entities in the workshops. Participants will be drawn from radiopharmaceutical manufacturers, biomedical research radionuclide manufacturers, the medical profession, sealed source manufacturers, and the university research community.

• Decommissioning contractors. In order to ensure that information on decommissioning costs and methods are presented in the workshops, the NRC staff has contacted several of the companies that perform decommissioning work in regard to workshop participation.

• Federal agencies. The NRC staff has contacted several Federal agencies about participation in the workshops. The Environmental Protection Agency (EPA), because of its expertise and responsibilities, will not only participate in the workshops, but also has been consulted by the NRC staff on the development of the Rulemaking Issues Paper and will be consulted in the evaluation of the workshop comments. EPA has been very supportive of the Commission's enhanced participatory rulemaking and has already provided the NRC staff with assistance on this effort. EPA will be fully involved in the workshops and in providing comments to the NRC staff on the rulemaking issues. It is anticipated that the EPA will also later use the workshop commentary in the development of its regulatory approach for decommissioning. The Commission believes that this consultative approach with EPA will be an efficient way to utilize Federal resources in developing an effective and consistent federal approach to decommissioning standards.

The NRC staff has also had several discussions with the Department of Energy (DOE) about the enhanced participatory rulemaking process and potential DOE participation in the workshops. DOE has indicated a preliminary interest in participating in the national workshop. Although the Commission's decommissioning standards will generally not be directly applicable to DOE facilities, DOE possesses substantial expertise in the decommissioning area that will be a useful source of information in the national workshop. It should be noted that under the Formerly Utilized Site Remedial Action Program (FUSRAP), and in some other circumstances, DOE may take title to a licensee's or former licensee's site for cleanup and long term care, including monitoring. The NRC staff has also discussed the new rulemaking initiative with several other Federal agencies and interagency coordinating committees. The NRC staff anticipates that Federal agency participation will occur in the national workshop.

• Professional societies. The NRC staff has contacted the Health Physics Society, the American Nuclear Society, and other professional societies in regard to their potential interest in participating in the national workshop.

Workshop Location, Schedule, and Format

The Commission intends to conduct the workshops on a regional basis. Although, there will be one national workshop in Washington, DC, for organizations with a national focus, the rest of the workshops will be held at various locations throughout the United States. The national workshop is not intended to be a summary of the other workshops, and the NRC staff does not intend to give any greater weight to comments made during that workshop than to any other workshop. The regional framework will allow the Commission to hear from as many knowledgeable organizations at the local level as possible. These local organizations will bring a unique perspective to the discussion of the rulemaking issues, and the regional workshops will also give the NRC an opportunity to interact with organizations with which it has not previously had the opportunity to do so.

The existing NRC regional framework was used to select the workshop locations, with slight adjustments made to accommodate areas with a heightened interest in decommissioning activities, as well as to maximize participation in the workshops. Notification of the specific meeting locations in each of the cities that have been selected as a workshop site will be announced through publication in the **Federal Register** and letters to individual participants.

To assure that each workshop addresses the issues in a consistent manner, the workshops will have a common pre-defined scope and agenda focused on the Rulemaking Issues Paper discussed below. However, the workshop format will be sufficiently flexible to allow for the introduction of any additional issues that the participants may want to raise. At each workshop, the NRC staff will begin each discussion period with a brief overview of the rulemaking issues to be discussed and the remainder of the workshop will be devoted to a discussion of the issues by the participants. The workshop commentary will be transcribed and made available to participants and to the public.

Personnel from The Keystone Center, a nonprofit organization located in Keystone, Colorado, will serve as neutral facilitators for each workshop. The facilitators will chair the workshop sessions and ensure the participants are given an opportunity to express their viewpoints, assist participants in articulating their interests, ensure that participants are given the opportunity to question each other about their respective viewpoints, and assist in keeping the discussion moving at a pace that will allow all major issue areas to be addressed.

Rulemaking Issues Paper

The NRC staff has prepared a Rulemaking Issues Paper to be used as a focal point for the workshop discussions. This paper, which will be distributed to participants in advance of the workshop, sets forth in neutral terms the issues that must be addressed in the rulemaking, as well as background information on the nature and extent of the problem to be addressed. In framing the issues and approaches discussed in the Rulemaking Issues Paper, the NRC staff has attempted to anticipate the variety of views that exist on these approaches and issues. The paper will provide assistance to the participants as they prepare for the workshops, suggest the workshop agenda, and establish the level of technical discussion that can be expected at the workshops. The workshop discussions are intended to be used by the staff in developing the draft proposed rule. Prior to the workshops, no staff positions will be taken on the rulemaking approaches and issues identified in the Rulemaking Issues Paper. As noted earlier, to the extent the Rulemaking Issues Paper fails to identify a pertinent issue, this may be corrected at the workshop sessions.

The discussion of issues is divided into two parts. First are two primary issues dealing with: (1) The objectives for developing radiological criteria; and (2) application of practicality considerations. The objectives constitute the fundamental approach to the establishment of the radiological criteria, and the NRC staff has identified four distinct possibilities including: (1) Risk Limits, which is the establishment of limiting values about which the risks to the public are deemed unacceptable, but allows for criteria to be set below the limit using practicality considerations; (2) Risk Goals, where a goal is selected and practicality considerations are used to establish criteria as close to the goal as practical; (3) Best Effort, where the technology for decontamination considered to be the best available is applied; and (4) Return to Preexisting Background, where the decontamination would continue until the radiological conditions were the same as existed prior to the licensed activities.

Following the primary issues are several secondary issues that are related to the discussions of the primary issues, but which the NRC staff believe warrant separate presentations and discussions. These secondary issues include the time frame for dose calculation, the individuals or groups to be protected, the use of separate criteria for specific exposure pathways such as groundwater, the treatment of radon, and the treatment of previously buried materials.

The Rulemaking Issues Paper will be provided to each potential workshop participant. Additional copies will be available to members of the public in attendance at the workshop. Copies will also be available from the NRC staff contact identified above. In addition to the comments on the Rulemaking Issues Paper provided to the workshops, the Commission is also receptive to the submittal of written comments on the rulemaking issues, as noted under the heading "**DATES**".

Dated at Rockville, MD, this 2nd day of December, 1992.

For the Nuclear Regulatory Commission.

Samuel J. Chilk,

Secretary of the Commission.

[FR Doc. 92-29710 Filed 12-10-92; 8:45 am]

BILLING CODE 7590-01-M

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10 CFR Part 54

Standard Design Certification Rulemaking Procedures; Notice of Availability

AGENCY: Nuclear Regulatory Commission.

ACTION: Notice of availability.

SUMMARY: The Nuclear Regulatory Commission (NRC) is making available to the public a paper, SECY 92-381 (November 10, 1992), prepared by the Office of the General Counsel (OGC) which provides final recommendations to the Commission on design certification rulemaking procedures for the initial design certification rulemaking.

ADDRESSES: Requests for copies of SECY 92-381 should be sent to Geary S. Mizuno, Office of the General Counsel, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Copies of SECY 92-381 may be examined, along with comments received on the draft OGC paper (SECY-92-170), and the transcript of a July 20, 1992 workshop on design certification procedures, at the NRC Public Document Room at 2120 L Street, NW, (Lower Level), Washington, DC between the hours of 7:45 a.m. and 5:15 p.m. on Federal workdays.

FOR FURTHER INFORMATION CONTACT: Geary S. Mizuno, Office of the General Counsel, U.S. Nuclear Regulatory

PROPOSED RULEMAKING TO ESTABLISH RADIOLOGICAL CRITERIA FOR DECOMMISSIONING

ISSUES FOR DISCUSSION AT WORKSHOPS

SUMMARY

The Commission proposes to revise 10 CFR Part 20 to include radiological criteria for termination of licenses and release of land and structures for unrestricted use. It is the Commission's intent that the criteria developed in this rulemaking would apply to almost all licensed facilities and sites.[1] However, it would not apply to sites already covered by a Commission approved decommissioning plan. An estimate of the numbers and types of facilities expected to be covered by this rulemaking is provided in the BACKGROUND section of this paper. A discussion of how the Commission proposes to implement the criteria can be found in the section entitled PROPOSED COMMISSION ACTIONS. There may be a small number of sites where cleanup to criteria for unrestricted release developed in this rulemaking may not be practical. The approach to handling such cases is an issue for discussion.

The purpose of this issues paper is to describe the background and issues that would be associated with a rulemaking to establish radiological criteria for decommissioning, and to focus discussions in a series of public workshops on rulemaking issues. The format for each issue is arranged by first describing the general issue to be considered, then providing a background discussion of the issue with potentially useful information for the workshop discussions. A list of sub-issues is also provided.

The description of issues is divided into two parts. First are two primary issues dealing with: 1) the objectives for developing radiological criteria; and 2) the application of practicality considerations. The objectives constitute the fundamental approach to the establishment of the radiological criteria, and the NRC staff has identified four distinct alternatives including: 1) Risk Limits, where a limiting value is selected and criteria are

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[1] The criteria would not apply to the disposition of uranium mill tailings, low-level waste disposal facilities, or high level waste repositories since these have already been addressed in separate regulatory actions. They would apply, however, to uranium mills and ancillary facilities that support radioactive waste disposal (e.g., surface facilities for the high level waste repository).

established below the limit using practicality considerations; 2) Risk Goals, where a goal is selected and practicality considerations are used to establish criteria as close to the goal as possible; 3) Best Effort, where the technology for decontamination considered to be the best available is applied; and 4) Return to Preexisting Background, where the decontamination would continue until the radiological conditions were the same as existed prior to the licensed activities.

Following the primary issues are several secondary issues that are related to the primary discussions, but which were believed to warrant separate presentations and discussions. These include additional considerations such as the time frame for dose calculation, the individuals or groups to be protected, the use of separate criteria for specific exposure pathways such as groundwater, the treatment of radon, and the treatment of previously buried materials.

BACKGROUND

The Nuclear Regulatory Commission (NRC) has the statutory responsibility for protection of health and safety related to the use of source, byproduct, and special nuclear material under the Atomic Energy Act. The NRC believes that one portion of this responsibility is to assure safe and timely decommissioning of nuclear facilities which it licenses, and to provide guidance to licensees on how to plan for and prepare their sites for decommissioning. Decommissioning, as defined by the NRC, means to remove nuclear facilities safely from service and to reduce residual radioactivity to a level that permits release of the property for unrestricted use and termination of the license.[2]

Once licensed activities have ceased, licensees are required to decommission their facilities so that their licenses can be terminated. This requires that radioactivity in land, groundwater, surface water, buildings, and equipment

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[2] A glossary of other terms generally used by the NRC can be found in Appendix A.

resulting from the licensed operation be reduced to levels that allow the property to be released for unrestricted use. Licensees must then demonstrate that all facilities have been properly decontaminated and that, except for any residual radiological contamination found to be acceptable to remain at the site, radioactive material has been transferred to authorized recipients. Confirmatory surveys are conducted by NRC, where appropriate, to verify that sites meet NRC radiological criteria for decommissioning.

There are currently about 24,000 licensees in the United States. About one third of these are NRC licensees, while the remainder are licensed by Agreement States through an agreement entered into under the Atomic Energy Act, Section 274. These licensees include universities, medical institutions, radioactive source manufacturers, and companies that use radioisotopes for industrial purposes. About 50% of NRC's 7,500 materials licensees use either sealed radioactive sources or small amounts of short-lived radioactive materials. Decommissioning of these facilities should be relatively simple since there is usually little or no residual radioactive contamination to be cleaned up and disposed of. Of the remaining 50%, a small number (e.g. radioactive source manufacturers, radiopharmaceutical producers, and radioactive ore processors) conduct operations which could produce substantial radioactive contamination in portions of the facility. The population of nuclear fuel cycle facilities which will require decommissioning includes 112 nuclear power plants (at 75 sites); 74 non-power (research and test) reactors; 14 fuel fabrication plants, 2 uranium hexafluoride production plants, 49 uranium mill facilities, and 9 independent spent fuel storage installations. These facilities will have to be decontaminated to acceptable levels before they can be safely released for unrestricted use.

The facilities listed in the NRC's Site Decommissioning Management Plan (SDMP), discussed later in this issues paper, provide an illustration of how a facility or equipment might become contaminated through the use of radioactive material in forms which are not encapsulated to prevent the spread or dispersal of material. Sealed sources, including items such as check sources, do not pose a contamination problem unless the encapsulation is broken. When radioactive material in unsealed forms is used, such as in the nuclear fuel

fabrication industry, in production of radiopharmaceutical medicines, or in research the equipment used to process and handle the material becomes contaminated by the small quantities of material that adhere to surfaces of valves, piping, etc. If material is spilled, then the area of the spill becomes contaminated.

Essentially everything which comes in contact with the radioactive material must be considered as contaminated and checked for the presence of residual radioactive material. Thus areas surrounding facilities could become contaminated by the movement of materials, equipment, and people into and out of the areas containing the radioactive material. NRC requires that contamination control procedures be used to minimize or prevent the movement of radioactive materials into other areas. Nevertheless, some areas may become contaminated over the course of time due to breakdowns in the control procedures. Contamination may also be spread by the movement of water or other fluids containing the radioactive materials through or along piping, equipment, walls, floors, sumps, drains, etc. In some cases, this has resulted in significant quantities of radioactive material in the ground under or around buildings and facilities.

In addition to contamination, some licensed operations can produce radioactive materials through the process of activation. Examples of such operations are nuclear reactors. These activated materials can also lead to the need to decontaminate or dispose of the radioactivity during decommissioning.

Several hundred NRC and Agreement State licenses are terminated each year. The majority of these licenses involve limited operations, produce little or no radioactive contamination, and do not present complex decommissioning problems or potential risks to public health or the environment from residual contamination. However, as the nuclear industry matures, it is expected that more and more of the larger nuclear facilities which have been operating for a number of years will reach the end of their useful lives and have to be decommissioned. Thus both the number and complexity of facilities that will require decommissioning is expected to increase.

The NRC has a program underway to effect timely decommissioning of about 40 problem sites which either have not been decommissioned properly or have been engaged in the decommissioning process for an extended time. The Commission has established a Site Decommissioning Management Plan (SDMP) for effecting timely decommissioning of these problem facilities. Sites being handled under the SDMP vary in degree of radiologic hazard, cleanup complexity, and cost. Some sites comprise tens of acres that require assessment for radiological contamination, whereas other sites have contamination known to be limited to individual buildings or discrete piles of tailings or contaminated soil. Many sites involve active licenses, but some sites involve formerly licensed sites, or sites where the responsible party is unable or unwilling to perform cleanup. These sites also vary in degree of completion of decommissioning. At some sites, little or no decontamination work has been done, whereas at other sites, decommissioning plans have been submitted or license termination is in the offing.

The effort to have these SDMP sites cleaned up and decommissioned has been hampered in part because licensees view the absence of definitive decontamination criteria as an incentive to defer decommissioning pending issuance of formal NRC requirements. The General Accounting Office (GAO), which has been critical of the Commission's inability to effect timely decommissioning of these sites, has recommended that NRC enhance its decommissioning efforts by reconsidering its radiological criteria for decommissioning[3].

Until new criteria are in place, the Commission intends to proceed with decommissioning nuclear facilities on a site-specific basis as the need arises considering existing criteria coupled with the concept that residual radioactivity be as low as is reasonably achievable (ALARA). Case and activity-specific decisions concerning decommissioning of sites will continue to be made as necessary during the pendency of this process. Since the SDMP sites could pose unnecessary environmental and public risk or financial burden

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[3] GAO Report to Congress, "NRC's Decommissioning Procedures and Criteria Need to Be Strengthened", GAO/RCED-89-119, May 1989

if they are not cleaned up and decommissioned in a timely manner, the Commission's effort to effect timely decommissioning of these sites is proceeding in parallel with this proposed rulemaking action. The NRC published an Action Plan to ensure timely remediation of sites listed in the SDMP in the Federal Register.[4] It should be noted that as a matter of current policy the NRC does not plan to require additional cleanup of sites in response to criteria established in this rulemaking, provided that the licensee or responsible party cleaned up the site, or was in the process of cleaning up the site in full accordance with an NRC-approved decommissioning plan at the time of promulgation.

Internationally, most efforts have been focussed upon derivation of criteria for waste and recycle, using guidance published by the International Atomic Energy Agency. Decommissioning criteria have generally been established on a case specific basis, and the NRC staff is not aware of other international efforts similar to this rulemaking to define radiological criteria for decommissioning.

NEED FOR RULEMAKING

The Commission believes that there is a need to incorporate into its regulations radiological criteria for termination of licenses and release of land and structures for unrestricted use. The intent of such an action would be to provide a clear and consistent regulatory basis for determining the extent to which lands and structures must be decontaminated before a site can be decommissioned. The Commission believes that inclusion of criteria in the regulations would result in more efficient and consistent licensing actions related to the numerous and frequently complex site decontamination and decommissioning activities anticipated in the future. In addition, a rulemaking effort would also provide an opportunity to reassess the basis for the residual contamination levels contained in existing guidance in light of

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[4]57 FR 13389, April 16, 1992.

changes in basic radiation protection standards[5] and decommissioning experience obtained during the past 15 years.

Current regulations do not explicitly address radiological criteria for decommissioning.[6] Pending NRC rulemaking on generic radiological criteria for decommissioning, the NRC continues to use its current criteria and practices.[7] The NRC could continue to decommission on a site-specific basis using existing guidance. However, the Commission believes that codifying radiological criteria for decommissioning in the regulations would: (1) result in more efficient use of NRC and licensee resources; (2) lead to more consistent and uniform application across all types of licenses; (3) provide a more stable basis for decommissioning planning; and (4) eliminate protracted delays in decommissioning which results as licensees wait for generic regulatory criteria before proceeding with decommissioning of their facilities.

The criteria would apply to the decommissioning of all types of NRC licensed facilities, including materials licensees, power reactors, non-power reactors, fuel reprocessing plants, fuel fabrication plants, uranium hexafluoride

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[5] As codified in the May 21, 1991 revision of 10 CFR Part 20 [56 FR 23360]

[6] In June 1988 the Commission published a final rule on General Requirements for Decommissioning Nuclear Facilities (53 FR 24018, 27 June 1988). However, this rule did not specifically address radiological criteria for decommissioned sites.

[7] Regulatory guidance, criteria, and practices include the following with emphasis on contamination levels that are ALARA: "Disposal or On-site Storage of Thorium or Uranium from Past Operations" Branch Technical Position, October 23,1981, 46 FR 52061; "Termination of Byproduct, Source, and Special Nuclear Materials Licenses", Policy and Guidance Directive FC 83-23, November 4, 1983; Termination of Operating Licenses for Nuclear Reactors" Regulatory Guide 1.86, June 1974 ; letter to Stanford University from James R. Miller, Chief, Standardization and Special Projects Branch, Division of Licensing, Office of Nuclear Reactor Regulation, NRC, Docket No. 50-141, April 21, 1982; "National Primary Drinking Water Standards," 40 CFR 141; "Radiation Dose Guidelines for Protection Against Transuranium Elements Present in the Environment as a Result of Unplanned Contamination," 42 FR 60956, November 30, 1977. Guidance is specified in terms of acceptable levels of residual contamination at decommissioned sites.

production plants, and independent spent fuel storage installations.[8] They would apply to nuclear facilities that operate through their normal lifetime, as well as to those that may be shut down prematurely. There may be a small number of sites where cleanup to criteria for unrestricted release developed in this rulemaking may not be practical. The approach to handling such cases is an issue for discussion.

On July 3, 1990, the Commission published a Below Regulatory Concern (BRC) Policy Statement in the Federal Register. The BRC Policy was intended to guide a broad range of Commission actions, including exemptions from Commission regulations, as well as the development of generic health and safety standards such as those involved in this rulemaking. Subsequent to the publication of the BRC Policy, the Commission placed an indefinite moratorium on the implementation of the BRC Policy because of the broad public concern expressed over the new Policy.[9] After the Commission placed the indefinite moratorium on the implementation of the BRC Policy, it decided to initiate this rulemaking to address the critical need for generic site cleanup and decommissioning standards for NRC-licensed facilities. The Commission determined that it should proceed with a fresh approach to the development of these standards that is independent of the now defunct BRC Policy.

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[8] The criteria would not apply to the disposition of uranium mill tailings, low-level waste disposal facilities, or high level waste repositories since these have already been addressed in separate regulatory actions. They would apply, however, to uranium mills and ancillary facilities that support radioactive waste disposal (e.g., surface facilities for the high level waste repository).

[9] Section 2901 of the recently enacted National Energy Policy Act of 1992 (H.R. 776) revoked the Commission's July, 1990, BRC Policy Statement. Section 2901 also revoked the Commission's policy statement of August 29, 1986 that established criteria to guide Commission exemption decisions on specific low-level radioactive waste streams. This latter policy was developed in order to comply with Section 10 of the Low-level Radioactive Waste Policy Amendments Act of 1985. The Commission will be issuing a formal withdrawal of these two policy statements in the Federal Register in January, 1993.

Concurrent with the NRC rulemaking on site cleanup standards, the Environmental Protection Agency (EPA) is proceeding to develop standards and guidance for Federal agencies in the area of radiation protection, including standards for the cleanup of contaminated sites. The NRC and EPA plan to coordinate their efforts in this area in order to ensure that effective and consistent site cleanup standards are established, while minimizing duplication of effort. Accordingly, the EPA will not only be an important participant in the NRC rulemaking workshops but the NRC also plans to consult extensively with EPA throughout the rulemaking process. It is anticipated that the information gathered during the workshops on the NRC standards will also be relevant and useful to the EPA efforts in the area of site cleanup standards. The NRC will also participate in EPA efforts in this area, such as the activities of the EPA Interagency Working Group on Radiation Protection. The objective of the NRC and EPA cooperative efforts is to attempt to reach an agreement that the NRC standards established in the enhanced participatory rulemaking are sufficient to provide adequate protection to the public health and safety for NRC-licensed sites. The EPA efforts could then focus on the site clean-up standards for non-NRC licensed sites, such as DOE and DOD facilities. This is consistent with the principles and procedures set forth in a recent Memorandum of Understanding between the NRC and EPA to guide each agency's actions in areas of mutual regulatory concern.[10]

PROPOSED COMMISSION ACTIONS

The normal pattern for NRC rulemaking is the development of a proposed rule by the NRC staff for Commission consideration, publication of the proposed rule for public comment, consideration of the comments by the NRC staff, and preparation of a final rule, as appropriate, for Commission approval. As directed and approved by the Commission, the NRC staff plans to enhance

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[10] Federal Register, Vol. 57, 54127, November 16, 1992, "Memorandum of Understanding Between the Nuclear Regulatory Commission and the Environmental Protection Agency"

participation in this process through a series of workshops for interested parties. The workshops are planned to elicit informed discussions of options and approaches, and the rationale for options and approaches. While these workshops are not designed to seek "consensus" in the sense that there is agreement (or at least a lack of disagreement) on the issues, the workshops are to be conducted at a very early stage of rulemaking to enhance participation of interested parties and the public with the following objectives: a) to ensure that the relevant issues have been identified; b) to exchange information on these issues; and c) to identify underlying concerns and areas of disagreement, and, where possible, approaches for resolution. It is the Commission's hope that the interactions that will take place among the participants in the workshop environment will foster a clearer understanding of the positions and concerns of the participants.

The proposed rulemaking activities, if pursued, are expected to result in publication of a proposed rule and a draft Generic Environmental Impact Statement (GEIS). It is the Commission's intent that the criteria developed in this rulemaking would apply to almost all licensed facilities and sites.[11] However, it would not apply to sites already covered by a Commission approved decommissioning plan. An estimate of the numbers and types of facilities expected to be covered by this rulemaking can be found in the BACKGROUND section of this paper.

The Commission intends to publish a Notice of Intent to prepare a GEIS for this rulemaking effort. Separate meetings will be held with interested Federal, state, and local agencies and organizations to discuss the scope of the GEIS. However, information, comments, and suggestions from the discussion of the issues in this paper would be taken into account by the NRC in preparing the GEIS. In addition, one or more Regulatory Guides would be

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[11] The criteria would not apply to the disposition of uranium mill tailings, low-level waste disposal facilities, or high level waste repositories since these have already been addressed in separate regulatory actions. They would apply, however, to uranium mills and ancillary facilities that support radioactive waste disposal (e.g., surface facilities for the high level waste repository).

published to provide licensees with guidance on how licensees could demonstrate compliance with the regulation.

The Commission's plan for implementing the rule is described below. The Commission would issue supporting documents concurrent with the rule which provide guidance on implementation of the residual contamination criteria in the rule. These documents would include a "Guidance Manual for Conducting Radiological Surveys in Support of License Termination" (NUREG/CR-5849) and a Technical Basis Document, "Residual Radioactive Contamination from Decommissioning: Technical Basis for Translating Contamination Levels to Annual TEDE" (NUREG/CR-5512). The Guidance Manual for Conducting Radiological Surveys is intended to provide licensees with specific guidance on planning, conducting, and documenting site surveys which could be used to demonstrate that the site has been decontaminated to a level consistent with the Commission's criteria. The Technical Basis Document would provide an acceptable method for translating residual radioactivity levels (measurable quantities) to doses to individuals. Generic dose rate conversion factors are being developed for screening. In addition, the technical basis is expected to include a computer model which can be used for conducting a screening scenario/pathway analyses with site-specific parameters so that site-specific dose rate conversion factors can be calculated. The NRC anticipates that in most cases these dose rate conversion factors could be used to determine compliance with criteria resulting from the rulemaking action.

Work on the supporting documents is already underway, and drafts are available for information. However, these documents are not intended to constrain the approach taken by the Commission in developing radiological criteria. Instead, they are intended to provide a technical underpinning which would be useful irrespective of the approach or the criteria finally adopted by the Commission. These documents will be revised as necessary to conform to the final criteria.

In addition to the activities directly supporting a rulemaking action on decommissioning criteria, the NRC has a number of other related activities in progress in the general area of decommissioning. These activities include:

(1) rulemaking to define the timeliness of decommissioning, and (2) rulemaking to require licensees to list in one location all land, buildings, and equipment involved in licensed operations. These activities will not be specifically considered as part of the discussions on radiological criteria for decommissioning.

ISSUES FOR DISCUSSION

Before the Commission formally proposes to proceed with rulemaking as described above, it is prepared to consider a wide range of alternative approaches, including maintaining the status quo. The basic question before the Commission is, "What level or levels of risk, dose, residual radioactivity, or other decommissioning criteria, would provide acceptable protection of health and safety and the environment?" The answer to this question must be reasonable and practical to implement and to enforce for the broad range of facilities which require decommissioning.

The Commission believes that the key issues and sub-issues discussed below are at the foundation of the basic question posed above. Therefore, the Commission solicits comments and information on these issues before proceeding with a proposed rulemaking. These issues, and other relevant and substantial issues identified by interested parties, will serve as the basis of discussion at a series of workshops. Workshop participants will be expected to present the rationale for their preferences and positions in the workshop setting. The workshop discussions will be used by the NRC staff in developing a proposed rule or, if considered appropriate, pursuing an alternative strategy for decommissioning.

The discussion of issues is divided into two parts. First are two primary issues dealing with the objectives for developing radiological criteria, and the application of practicality considerations. Following these issues are several secondary issues that are related to the primary discussions, but which were believed to warrant separate presentations and discussions. The format of discussion for each issue is arranged by first describing the general issue to be considered, then providing a background discussion of the

issue with potentially useful information for the workshop discussions. A list of sub-issues is also provided to focus the discussions. It is important to recognize that the Commission does not regulate natural background or fallout from weapons or other sources beyond its authority. Therefore, the following decommissioning issues are to be considered as they apply to radioactivity that is both attributable to licensed operations and is above background levels.

The Commission does not intend to include the issue of Agreement State compatibility with NRC requirements as a topic for discussion in the workshops. The Commission has a concurrent process to establish a general policy on compatibility and does not believe it would be efficient to have two separate forums focussing on the same subject. The Commission believes that the ongoing process to establish the general policy on compatibility would be the more appropriate forum to discuss all compatibility issues. In addition, parties will be afforded the opportunity to comment on compatibility issues at the time of the publication of a proposed decommissioning rulemaking. This approach will allow the workshops to focus upon the central technical issues and approaches to the radiological criteria for decommissioning.

PRIMARY ISSUES FOR DISCUSSION

Issue I: What objective(s) should serve as the basis for establishing radiological criteria for decommissioning?

Discussion:

There are four fundamental kinds of objectives that could serve as the starting point for developing radiological criteria for decommissioning (i.e., release for unrestricted use). They are described briefly below.

1. RISK LIMITS--Establishment of limits above which the risks to the public are deemed unacceptable. The objective in this case would be to find a limit above which risks would be unacceptable, and then establish

additional criteria to further reduce exposures to levels below the unacceptable to the extent practical. With this objective, a site could be released for unrestricted use if there were reasonable assurance or demonstration that members of the public would not be exposed to an unacceptable risk from radioactivity remaining at the site.

In practical terms this objective would mean that the radioactivity remaining at the site must be below some upper limit established by the NRC as representing the boundary of unacceptable exposure to an individual or group of individuals. Below this upper limit, exposures would be further reduced to levels which are "As Low As Reasonably Achievable" (ALARA) taking into account various factors of practical implementation (cost versus benefit), and socioeconomic considerations. (See Issue 2)

2. RISK GOAL--Establishment of risk goals below which the risks to the public are deemed trivial. This objective would be to find a level of public and environmental risk below which risks are considered trivial, and then require decontamination to levels which are either below the goal, or as close to those goals as practical. Using this objective, a site would be released for unrestricted use if the radioactivity remaining at the site were as close as practical to the goals selected. If the decontamination goals were met or exceeded, then no further consideration of decontamination would be required.

In practical terms, residual radioactivity levels greater than the corresponding risk goals would be accepted provided they are as close as reasonably achievable to the risk goals. If the levels of radioactivity were below the levels corresponding to the goals, then no decontamination would be required, regardless of feasibility.

3. BEST EFFORT -- Best effort emphasizing use of available technology. The objective in this case would be to establish criteria representing what is achievable using the "best" available technology. A site would be released for unrestricted use if the only residual radioactivity

remaining at the site is that material which cannot be removed using the best available technology. This objective is technologically driven. Theoretically, it could lead to removal of all radioactivity attributable to licensed activities or to an undefined level limited by the efficiency of the technology. Cost can be a factor, but is not taken into consideration on the basis of cost versus benefit balancing.

4. RETURN TO BACKGROUND LEVELS. This objective would be to remove all radioactivity attributable to licensed activities. A site would be released for unrestricted use only if all radioactivity attributable to licensed activity were removed. This objective could be difficult to implement either because of the costs associated in reducing residual radioactivity to background levels or because of the difficulty in demonstrating that a return to background levels had been achieved. Demonstrating a return to background levels could be especially difficult at sites where the background levels were not recorded prior to beginning licensed operations, or at facilities licensed to use nuclides such as uranium or thorium which already exist in varying degrees in the natural background.

The following information is provided to aid discussion and is focused first on the Risk Limits and Risk Goals objectives and secondly on the Best Effort and the Return to Background objectives:

The fundamental principle underlying all NRC regulations and activities has been that radiation doses to members of the public from licensed activities must be reduced to levels established as limits (Risk Limits objective).[12] The limits pose the boundary of unacceptable public risk regardless of the cost required to achieve such reduction, and risks should be further reduced to levels which are ALARA. This principle is articulated in 10 CFR Part 20, and the Commission currently uses this principle as the basis for decommissioning nuclear facilities. For example, the typical practice in

[12]Although NRC regulations are designed to limit risk, not all limits in the regulations were established on the basis of risk.

decontaminating an area is to remove contamination through sweeping, washing, chemical stripping, scabbling thin layers of concrete, etc. The area is then surveyed and the results compared to the appropriate established criteria. If the area does not meet the criteria, then further steps are taken to reduce the level of radioactivity remaining. Once the levels are met, then further steps are considered to lower the remaining levels, but the decision to use these steps take into account the costs of the step and the reduction that is anticipated. This principle is also the basis for certain actions by the Environmental Protection Agency in the area of radiation protection, and is a fundamental principle outlined in both national and international recommendations.

In its recent recommendations on radiation protection, the International Commission on Radiological Protection (ICRP) has introduced the concept of a "constraint" in establishing the appropriate level of protection for any particular source of radiation exposure such as a decommissioned facility.[13] A constraint is a selected level, below the dose limit (the dose limit corresponds to an acceptable risk), to provide assurance that any given individual would not receive a dose in excess of the dose limit, even if that individual were to be exposed to several sources simultaneously. As described by the ICRP, the concept of ALARA would be applied after the constraint was met. This approach is similar to the approach already utilized by the NRC in establishing criteria for effluents from nuclear power plants in 10 CFR Part 50 Appendix I and by the Environmental Protection Agency in the generally applicable environmental standards such as 40 CFR Part 190 and in 40 CFR Part 61, the regulations implementing the Clean Air Act.

The Risk Goals objective was recently applied by the Environmental Protection Agency in the selection of values for radionuclides in drinking water. In its proposal, the EPA established maximum contaminant level goals (MCLGs) for radionuclide levels, then established maximum contaminant levels (MCLs) which were greater than the goals in recognizing factors such as availability of

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[13]International Commission on Radiation Protection, ICRP Publication 60, November 1990.

technology, costs to remove radionuclides, and numbers of individuals involved. This is an extreme application of the risk goal principle, because the risk goal was legislatively set equal to zero. It is recognized that these goals may not be literally achievable. Furthermore, confusion has resulted from failure to distinguish between levels and goals.

In addition, several national and international agencies and organizations, including the NRC, have adopted or proposed numerical risk or dose levels for public exposure from activities and practices involving radioactive materials. These risk levels may provide a basis for initiating a dialogue on numerical levels of risk or dose which would provide an acceptable basis for establishing radiological criteria for decommissioning. In addition, EPA has established or proposed other risk objectives that should be considered, such as EPA standards related to the Clean Air Act, the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA also known as "Superfund") which may need to be considered in establishing criteria. For example, the EPA has established health based limits for numerous chemicals under RCRA. On May 20, 1992, (57 FR 21450) the EPA published a proposed rulemaking on the identification of hazardous waste which included, as an option, the use of multiples of these health based limits in determining the appropriate approach to management of the waste as hazardous or other solid waste. Although The proposed approach has been withdrawn, EPA plans to continue assessing the merits of approaches used by others (57 FR 49280, October 30, 1992).

The Commission's current radiological criteria for decommissioning, are stated in terms of acceptable levels of residual contamination and external dose rates at one meter from contaminated surfaces. These criteria have been conservatively estimated, considering the most highly exposed population group of individuals, to result in potential doses ranging between one and several

tens of millirem per year Total Effective Dose Equivalent (TEDE/y) (exclusive of doses from radon and its daughter products).[14]

The EPA Clean Air Act and regulations provide practical examples of the application of the Best Effort regulatory principle. Among other things, the Clean Air Act requires the EPA Administrator to set new standards for emission of air pollutants based on the best, adequately demonstrated, technological system, taking into account the cost of achieving emission reduction, energy requirements, and any non-air impacts on the quality of health and the environment. Another section of the Clean Air Act permits the EPA Administrator, based on the same considerations as listed above, to set standards based on a design, equipment, work practice, or operational standard, or combination of these.[15] The EPA uses several implementing concepts in promulgating Clean Air Act regulations, including maximum achievable control technology (MACT), generally available control technologies (GACT), and best demonstrated technology (BDT), and each of these concepts include considerations of cost and other factors listed in the Clean Air Act.[16] These terms are defined in Appendix B.

The Return to Background objective for clean-up of facilities has been applied particularly for chemical hazards which do not normally exist in nature, and the approach often taken is to establish the clean-up objective at zero contaminants. In situations where some type of background, or natural concentrations of chemicals already exist, such as contaminants in a groundwater aquifer, the objective is sometimes expressed in terms of non-

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[14] For some radioisotopes (e.g., ^{238}U), acceptable residual levels may be based on non-radiological effects (e.g., the chemical toxicity of uranium) if the non-radiological effects are potentially more hazardous than the radiological effects.

[15] Public Law 101-549 (104 STAT. 2399) November 15, 1990, (Clean Air Act Amendments of 1990, Sections 111 and 112).

[16] For examples, see 56 FR 64382, December 9, 1991, "National Emission Standards for Hazardous Air Pollutants for Source Categories: Perchloroethylene Emissions From Dry Cleaning Facilities," (Proposed Rule), and 55 FR 26953, June 29, 1990, "Standards of Performance for New Stationary Sources; Volatile Organic Compound (VOC) Emissions From the Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes" (Proposed Rule).

degradation of the existing situation, meaning that no additional materials should be present beyond those already existing.

There may be some sites where the cost of meeting the selected criteria would be exorbitant. Consideration should be given to the disposition of such sites. Such sites could be handled in a manner similar to, or reflect elements of, the way the Commission deals with uranium mill tailings sites under the provisions of the Uranium Mill Tailings Radiation Control Act of 1978, As Amended (UMTRCA). Under the provisions of UMTRCA, mill tailings sites are partially decontaminated, stabilized, and subject to requirements for restricted use and long-term care and are not released for unrestricted use. EPA's CERCLA/Superfund Program also allows cost to be a consideration in site cleanup; however, cost is typically not a primary consideration in setting environmental levels under RCRA or the Clean Water Act (CWA). Implementation under these programs is primarily focussed on "Best Demonstrated Available Technology" (BDAT).

The NRC has several possible approaches to codifying radiological criteria for decommissioning. One approach is to establish limits in terms of dose in the regulation and then provide listings of specific residual radioactivity levels for different radionuclides either as an appendix to the regulation or as a Regulatory Guide. This is the approach of 10 CFR Part 20 for the dose limits, where the values in Appendix B of Part 20 serve as a method for demonstrating compliance with the dose limit, rather than being a limit themselves. Alternatively, the Commission could codify specific values for residual radioactivity for each radionuclide of concern as part of the regulation. Similarly, a Risk Goal could be codified in terms of a dose or a risk, or alternatively, as specified levels of radioactivity. If the chosen decommissioning objective were Best Effort, then the method of determining the appropriate technology could be codified or the technology itself could be codified. For the Return to Natural Background objective, the method for determining background and accuracy of determinations could be the substance of the regulation or quantitative levels of radioactivity could be codified.

The terms of the regulation could be important to the extent that they could affect the Commission's flexibility in applying the regulation and also the flexibility the licensees would have in demonstrating compliance. If objectives were codified in terms of specific measurable quantities such as concentrations of radioactive materials, neither the Commission nor the licensees would have flexibility to take site specific factors into account when trying to demonstrate compliance. However, if the objective were codified, individual licensees could conduct a site specific analysis to demonstrate to the Commission that their site would meet the objective with different residual radioactivity levels than those determined by the Commission based on a generic, conservative analysis.

Past experience has shown that changes to the regulations containing specific criteria are much more difficult to complete and require more resources than if the criteria are contained in a Regulatory Guide. However, past experience has also shown that enforcement of specific, measured values is unambiguous, direct, and unencumbered by lengthy litigation.

Sub-issues:

1. At what numerical level would the regulatory objective for decommissioning provide an acceptable basis for protection of the public health and safety and the environment?

   a. If the Commission chooses a Risk Limit objective, should the Commission use the public dose limits in 10 CFR 20 (100 mrem/y) as the limit on doses from residual radioactivity at decommissioned sites or establish separate constraints for decommissioning? If separate constraints are set, what should be the basis for these constraints?

   b. If the Commission chooses a Risk Goal objective as its basis for establishing criteria, on what basis should the goal be established?

   c. If the Commission chooses a Best Effort objective as its basis for establishing criteria, what level of technological availability should

be used? How often should the applicable areas of technology be updated for this criteria? What criteria should govern the number of applications of the technology to achieve lower levels of residual radioactivity, i.e., how would the point of diminishing returns be established? Recognizing that application of technology could result in widely varying levels of residual radioactivity, should an additional limit be placed on the level of residual radioactivity? If new technologies become available that are significantly more efficient in decontaminating a site, should these new technologies be applied to previously decommissioned sites? If so, what criteria should require the reopening of a site for decontamination?

d. If the Commission chooses the Return to Background objective as a basis for establishing criteria, how should background levels of radiation and radioactive material be established? For example, should a single level be chosen for each naturally occurring radionuclide, or should the local level of background be used, or some other criterion? How should the chosen approach, single or local level, be measured and to what accuracy?

2. What other alternatives should be considered as a general framework for establishing objectives? Should the Commission consider combinations of the fundamental objectives and if so, which combinations and on what basis?

3. What role should EPA initiatives play in setting objectives? For example, the EPA used about a 10^{-4} lifetime risk of fatal cancer for members of the most highly exposed population group and a general lifetime risk level on the order of 10^{-6} as a basis for National Emission Standards for Hazardous Air Pollutants.[17] Are there other established or proposed risk objectives that should be considered?

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[17] 40 CFR Part 61, "National Emission Standards for Hazardous Air Pollutants; Radionuclides." Final Rule and Notice of Consideration, 54 FR 51654, December 15, 1989

4. What consideration should be given to standards or objectives proposed or adopted by other groups (e.g. International Atomic Energy Agency, (IAEA))?

5. What should be done in those cases where sites cannot reasonably be decontaminated to the point where they are appropriate for unrestricted use?

6. How p escriptive should the regulation on radiological criteria for decommissioning be? For example, should the Commission codify the decommissioning objective(s) and provide details (e.g., residual radioactivity concentration, etc.) of a method of compliance elsewhere, such as in a Regulatory Guide, or should the regulation be more prescriptive?

Issue II. How should practicality considerations be applied,particularly if the Commission were to adopt either the Risk Limit objective or the Risk Goal objective in its radiological criteria for decommissioning rule?

Discussion:

ALARA is an acronym for as low as is reasonably achievable and means making every reasonable effort to reduce or maintain exposures to radiation as far below established dose limits as is practical taking into account the state of technology, the economics of improvements in relation to the state of technology, the economics of improvement in relationship to the benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to the utilization of nuclear energy and licensed material in the public interest. This covers a broad spectrum of actions and activities including cost-benefit analysis of procedures and proposals, availability and application of measurement technologies, and availability of disposal facilities. The same factors that have been traditionally used in radiation protection (Risk Limit objective based) are also the factors that would be used in determining how close practical criteria can be made to a Risk Goal objective. Thus, in the present context, the term ALARA can be used to represent the practical process (that is, cost versus benefit evaluation process) of reaching either the lowest acceptable

risk below an Risk Limit or the lowest risk above a Risk Goal as discussed in Issue I.

The employment of practicality considerations, including costs, availability of technology, etc., has been recognized as valid in a number of contexts, both in the area of radiation protection and in the regulation of hazardous chemicals and wastes. For example, in recommendations approved by the President on Radiation Protection Guidance to Federal Agencies for Occupational Exposure, the concept of ALARA was specifically included.[18] Likewise, the EPA has acknowledged the validity of considering costs and benefits in determining levels for regulation of chemicals in various arenas, as illustrated by the EPA response to a petition requesting revocation of food additive regulations.[19] The NRC rulemaking is being conducted under the Atomic Energy Act, which allows consideration of ALARA, provided the public health and safety are protected.

There are a variety of ways the principle of ALARA can be applied. In both the Risk Limit and Risk Goal objectives, ALARA can be applied on a case-by-case basis with a site-specific analysis required for each site. Alternatively, generic ALARA criteria could be established which would be applicable to all sites or to categories of sites. This latter alternative is equivalent to combining both the Risk Limit and the Risk Goal objectives.

A credible ALARA analysis must consider all of the costs and benefits associated with decontaminating a site to different residual radioactivity levels and must be carefully documented to demonstrate that all reasonable alternatives and technologies have been considered. It should take into account: (1) radiation doses (public and occupational) and environmental impacts both from the process of decommissioning the site and from the residual radioactivity which will remain at the site after it has been decommissioned, and (2) all of the costs and other risks (e.g. occupational,

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[18]52 FR 2822, January 27, 1987.

[19]56 FR 7750, February 25, 1991.

transportation) associated with the decontamination and decommissioning the site. It should also include an analysis which clearly demonstrates how overall costs and benefits change with changing residual radioactivity levels. The analysis must be properly documented. This should include documentation of the methodology and the sources of data used in the analysis, and include an assessment of the uncertainties associated with the results of the analysis. ALARA analyses can be carried out on either a generic or site specific basis. Generic analyses by their very nature will produce results with higher uncertainty than those that can be obtained from a site specific analysis. Therefore, a more conservative approach would have to be adopted when conducting a generic analysis to assure that the results of the analysis are appropriate to all of the sites and activities to which the analysis is expected to apply.

Sub-issues:

1. Should the Commission require that ALARA be determined on a site-specific basis for each site to be decommissioned? If not, how should ALARA be applied? Should the Commission establish generic ALARA criteria (i.e., Meeting the generic criteria would be considered ALARA for any site without need for further site specific cost versus benefit analysis.)? If generic ALARA criteria are used, should a single ALARA criterion be established for all sites, or should different ALARA criteria be established for different categories of sites or facilities. If ALARA criteria are established for different categories of sites, on what basis should the different categories be established?

2. Irrespective of whether ALARA is applied on a site-specific basis or generically, on what basis should the ALARA analysis rest? What level of review by the NRC staff should be required to evaluate this basis? For example, if a cost versus benefit analysis were to be used, what monetary value per averted collective dose (i.e. dollars/person-rem) should the Commission use as a basis for making the determination? How should the level of difficulty in measuring certain radionuclides in some circumstances be

handled? How should the staff address societal and socioeconomic aspects of the ALARA analysis?

SECONDARY ISSUES FOR DISCUSSION

Secondary Issue A.: What additional considerations should be taken into account when establishing radiological criteria for decommissioning?

Discussion:

In developing criteria, there is often a question of exactly who the standard is designed to protect. For example, the criteria may be established to protect a theoretical, maximally exposed individual, regardless of whether such an individual could actually exist. Alternatively, the criteria could be established on the basis of providing protection for more realistically exposed individuals, and could include consideration of a so called "critical group" which would be a small number of individuals that are representative of that population likely to receive the greatest dose. A "critical group" approach would often mean that it would be possible for the exposure of some single individual to be greater than the average of the group, and therefore experience a dose or risk in excess of the criteria.

Related to the question of the characteristics of the individual to be protected is the question of whether protecting individuals assures that the population, as a whole, that might be exposed is adequately protected. Various positions have been advanced on this subject, with some indicating that protection of each individual automatically assures protection of the population as a whole, and others indicating that additional criteria might be needed to protect the population. The hypothesis usually used for the regulation of radiation dose is a linear relationship between dose and risk, implying that an increment of dose, no matter how small, and no matter when delivered, will have an equal impact. This reasoning has been used to support

the position, in some cases, that an additional criterion should be applied to the collective dose from a particular facility or source. On the other hand, each decommissioned facility can only expose a limited number of people.

In developing criteria for decommissioning, the codified definition of decommissioning, i.e. to reduce radioactive materials levels to a point where the site is suitable for unrestricted use, becomes important. Once a site has been released, an individual or group could use the property and any structures on the property in any legally acceptable way they wished, including renovating the structures for other purposes, excavation or other property modifications, and removal of materials from the site for use in other locations or for other purposes. Thus, when considering the appropriate criteria for unrestricted use, consideration may also need to be given to the potential for reuse, recycling, or disposal of structures or materials remaining on the site.

An additional consideration in the selection of radiological criteria is the time frame over which the criteria should be applied. There have been a number of different values suggested and used in various standards of the NRC and EPA, ranging from 100 years to over 10,000 years. For radionuclides with relatively short half-lives, decay negates the need for evaluations in the distant future. However, for long-lived radionuclides, and particularly for chains of radionuclides where daughter products will gradually increase until equilibrium is reached (e.g., uranium and thorium), the time frame for considerations is potentially important. Time periods are also important when certain pathways, such as a groundwater pathway, are considered, since the movement of radionuclides through the pathway may be very slow under certain circumstances.

Sub-issues:

1. Should the Commission base its considerations on a theoretical, maximally exposed individual, or upon some type of "critical group" approach? What endpoint(s), such as cancer fatalities or cancer incidence, genetic effects, etc., should be used in establishing the radiological criteria?

2. Should the Commission include consideration of an exposed population in addition to providing criteria for individuals? If so, how should this influence the criteria?

3. Should the Commission consider the potential, after release for unrestricted use, for reuse of building structures and the removal of soil from a site in determining the appropriate criteria? If so, how should these factors be included? Should the removal of materials lead to a different standard than if materials were to remain on the site? If so, what is the rationale or basis? Should consideration be given to consistency or linkage with waste disposal regulations, particularly in situations where large quantities of material may require removal during the decommissioning process?

4. How far into the future should calculations be carried out when making estimates and determining the applicability of criteria? Should the Commission place a maximum value on the time frame to be considered, or should the criteria be applicable irrespective of time as which a maximum exposure could occur? For low levels of radioactivity should other changes in the environment, such as global warming and ice age cycles, geologic changes, etc., be factored into considerations of the applicability of the criteria?

Secondary Issue B.: If the objective the Commission adopts is either the Risk Limit or the Risk Goal, how should the regulation be structured with respect to exposure pathways? Should the rule apply comprehensively to all major pathways (routes) of exposure to the public or should the rule have criteria to limit specific exposure pathways, such as radionuclides in groundwater?

Discussion:

This issue arises because, over long periods of time residual radioactivity from decommissioned sites could contaminate groundwater that would later be used for drinking or irrigation. Furthermore, groundwater could be contaminated from more than one decommissioned site if another site were

nearby. The Environmental Protection Agency has established limits for radioactivity in drinking water[20] and, under the authority of RCRA and CERCLA, applies these limits to most potable ground water, but there are no Federal standards for groundwater contamination at decommissioned facilities.

In 10 CFR Part 20, the Commission has adopted the International Commission on Radiation Protection (ICRP) recommendations to accourt for doses from all pathways in one term. The Commission combines the doses from external exposures, ingestion and inhalation into the term, "Total Effective Dose Equivalent" (TEDE). That is, there is an internationally recognized methodology for weighing the doses and combining them into a single number. TEDE, that enables comparison of doses regardless of the pathway of exposure--external, ingestion or inhalation.[21]

Conceptually, the NRC could establish an overall limit or goal for a site, and allow the contribution (dose or risk) from each pathway of exposure (e.g. air, water, direct radiation, food) to vary so long as the total remained consistent with the overall limit or goal. Alternatively, a secondary limit or goal in addition to the overall criterion could be established to limit the extent to which a particular pathway could contribute to the total. A third possibility is that separate criteria could be established for each particular exposure pathway, independent from each of the other pathways.

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[20] 40 CFR Part 141. EPA regulations are applied to public water systems and not individual users. For beta and/or gamma emitters the dose to the whole body or an organ is limited to 4 mrem/y, while for alpha emitters Maximum Contaminant Levels are set in terms of pCi/l and exclude radon and uranium. The EPA has published a proposed revision of these regulations, expressed in terms of a 4 rem/y effective dose equivalent (see 56 FR 33050). The proposed revision also includes specific limits on radon and uranium.

[21] For example, the technical basis document translating radioactivity in the environment to dose (PROPOSED COMMISSION ACTIONS section above, p. 9) accounts for radiation doses from major sources originating in soil, air, and water and combines the respective pathway doses into a conversion factor for TEDE.

If a separate limit or goal were chosen for groundwater, then details of the method for estimating doses or risk due to water use at future times after decommissioning would be required. One method could be to establish Generic Site Inventory Levels[22], as a screening criterion based upon an analysis for a generic site. The basis for this approach could be that residual radioactivity from sites meeting these generic screening levels would not be expected to contaminate drinking water supplies in excess of EPA standards under any reasonably foreseeable circumstances regardless of the type of facility, or size, location, or hydrogeologic features of the site. Such an approach would also need to consider the possibility that building structures remaining onsite at the time of unrestricted release could be demolished and become part of the overall site inventory available to the groundwater. It is noted that Generic Site Inventory Levels that provide a reasonable margin of safety for all sites are likely be extremely restrictive and thus impractical for some sites. Potential impracticality could be addressed by providing licensees who demonstrate that Generic Site Inventory Levels are unnecessarily restrictive for their particular site with the option of conducting a site specific analysis to project compliance with EPA drinking water standards or other criteria specified in the rule.

Sub-issues:

1. What consideration should be given to the potential for cumulative drinking water contamination from two or more decommissioned sites in the same general area?

2. If specific exposure pathway criteria were chosen, which pathways should have specific criteria and on what basis should these criteria be established?

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[22] A Generic Site Inventory Level would be total amount of radioactive material from the licensed operation which could be left at a decommissioned site without having to conduct a site specific analysis to determine whether allowing this radioactive material to remain at the site might result in unacceptable contamination of drinking water supplies.

3. If the Commission chooses specific criteria for groundwater or water use, should it establish Generic Site Inventory Levels for screening residual radioactivity at decommissioned sites? Should the basis for such levels be to provide reasonable assurance that EPA drinking water standards will not be exceeded? Should a single Generic Site Inventory Level be established for all sites, or should levels be tailored to specific class of decommissioned sites (e.g., all nuclear power plant sites)? If so, on what basis should sites be categorized? Alternatively, should the Commission require that a site specific assessment of drinking water contamination potential be carried out for each site or a combination of the above?

Secondary Issue C.: For sites where uranium, radium or thorium contamination may have resulted from licensed activities, how should exposures from radon (^{222}Rn and ^{220}Rn) and its decay products be considered when the facility is decommissioned?

Discussion:

Small quantities of uranium, radium and thorium are present in all soil types throughout the United States. These naturally occurring materials are responsible for part of the natural background radiation exposure to members of the public, and are precursors for radon gas--the single greatest contributor to natural background exposures. Because radium occurs naturally in the environment, accurate determinations of doses from radon resulting from licensed operations can be very difficult. First, radium from licensed operations contaminating building structures will produce radon within the structure. This radon will be in addition to radon present due to naturally occurring radium within or under the building. Radon concentrations from natural sources in buildings are known to be variable, and may be subject to variations due to factors such as building ventilation, weather, etc. Secondly, a fraction of the radium in the soil of the site could be from licensed operations and could contribute to indoor radon levels of any building later constructed on the site. The correlation between soil concentrations of uranium, radium or thorium have been shown to be not well

correlated with the eventual levels of radon within a building. Given the above factors, approximate estimates of the amounts of uranium and thorium and their decay products (including radium) on site as a result of licensed operations might be made by taking direct measurements at a site in conjunction with offsite measurements to establish background levels. However, the estimation of indoor radon concentrations attributable to licensed operations for the present and future structures appears elusive.[23]

Based on information available to the NRC, there appears to be no practical way, using current technology, to distinguish between small amounts of radon from licensed operations and that radon resulting from natural background. This inability appears to be due to (1) the natural background levels of radium in rocks and soils and the resulting concentrations of radon[24], (2) the variability of doses at a given site from naturally occurring radon[25], and (3) the difficulty in correlating indoor radon levels with the concentrations of radon in the soil outside the structures.[26] There are some who believe it may be virtually impossible to demonstrate that doses from

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[23]Radon may also be a problem for a licensee that has never possessed materials containing uranium or thorium if they are located in an area of elevated natural radon levels. In these cases an individual in the structure could receive doses in excess of the criteria for decommissioning from sources outside the original responsibility of the licensee.

[24] Soil radium concentrations in the U.S. average about 1.5 pCi/g. The average indoor radon concentration is about 1.5 pCi/l which produces an estimated dose to a resident (assuming 75% occupancy) of about 150 mrem/y. EPA Radon Reference Manual, EPA 520/1-87-20, September, 1987, pp.3-5 and 7-2.

[25] The transport of radon through the environment is subject to considerable uncertainty and variability. In the case of indoor radon, variables such as highly localized geology, structural features, and changing weather, among others, combine to make accurate prediction of doses very difficult.

[26] As is the case for transport of radon through the environment, there are considerable uncertainties in the modeling of the movement of radon into a structure and the concentrations of radon that will exist at any given time. Numerous studies have shown that seemingly identical structures in similar environments can nevertheless have considerably different radon concentrations.

radon which result from licensed operations have been reduced to levels much below the EPA suggested action level of 4 pCi/l for indoor radon.[27]

Sub-issues:

1. For sites where licensed activities have involved uranium, thorium, or other materials which decay to radon, are there practical and reliable ways to distinguish between radon and its daughter products attributable to residual radioactivity from licensed operations at a site and that radon attributable to natural background? Are there methods for estimating such doses with reasonable assurance using modelling techniques, direct measurements, or some combination of the two? At what dose levels can these distinctions be made?

2. If there is no way of distinguishing doses from radon resulting from licensed operations at levels well below the 100 mrem annual limit for public doses (10 CFR Part 20.1301), what alternatives would be considered acceptable? For example, would it be acceptable to require the licensee to demonstrate the site had been cleaned up to levels approaching ambient background levels measured at nearby representative sites or buildings? Would this alternative be acceptable even when these background levels would result in doses which are a large fraction of, or even exceed 10 CFR Part 20 limits for the public (100 mrem/y)?

3. Should the Commission consider criteria similar to existing EPA guidelines and standards even though these doses may be higher than the public dose limits in the revised 10 CFR Part 20 (100 mrem/y)? Alternatively, should the Commission require licensees to reduce doses from radon and its daughter products as far below the EPA standard as reasonably achievable? How would compliance with such a requirement be judged (see Issue II)?

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[27] The level at which EPA suggests action be taken to reduce radon concentrations in homes. See "A Citizen's Guide to Radon, 2nd Edition - "The Guide to Protecting Yourself and Your Family from Radon", 402-K92-0001, Office of Air and Radiation; U.S. Environmental Protection Agency, June,1992.

4. How should the Commission handle radon exposures in excess of EPA guidelines in facilities of licensees that have never possessed uranium, radium, or thorium materials?

Secondary Issue D.: How should the Commission regard materials previously buried on-site under disposal provisions in 10 CFR Part 20 in the context of decommissioning?

Discussion:

Under certain conditions, licensees may dispose of radioactive wastes by burial on their own property. Before 1981, NRC regulations (10 CFR 20.304) allowed disposal, without prior approval, of limited quantities of specified nuclides under prescribed conditions. On July 28, 1981, 10 CFR 20.304 was revoked. However, onsite disposal can still be undertaken by individual licensees under 10 CFR 20.302, provided the disposal is specifically approved by the NRC or an Agreement State.

NRC requirements in 10 CFR 20.302 and 20.2002 allow licensees to request specific approval to dispose of licensed radioactive material in a manner not otherwise authorized by the regulations. In accordance with 10 CFR 20.2002, any such request must be accompanied by specific data and analyses necessary for the staff to determine whether such disposal would have an adverse effect on the health and safety of the public or the environment. The radioactive material involved in the requests is generally very low activity waste contained in large volumes of material, such as sludge from sanitary sewers and storm drains, soils contaminated by spills and leaks, and dredged material from discharge canals and settling ponds.

The requirements in 10 CFR Part 20 do not explicitly limit the quantity or concentration of the radioactive material. Past practices have limited approvals to small concentrations of radioactive material and correspondingly low to very low potential doses to members of the public and the environment.

Maximum potential doses have generally been less than a few millirem per year.

Sub-issues:

1. When preparing their sites for decommissioning, should licensees be required to consider radioactive materials disposed of on-site in accordance with provisions of NRC or Agreement State regulations as part of the total inventory of residual radioactivity that must be considered when preparing a site for decommissioning?

2. Should a site specific analysis of the risks, costs, and benefits be performed before a decision is made to take any remedial action (e.g. exhumation and removal of buried radioisotopes, or delaying release of a site to allow decay of short lived buried radioisotopes) involving radioactive material previously disposed of at a site?

APPENDIX A

A GLOSSARY OF GENERAL TERMS USED BY THE NRC[28]

Activity (Radioactivity) is the rate of disintegration (transformation) or decay of radioactive material. The units of activity are the curie (Ci) and the becquerel (Bq).

ALARA (acronym for "as low as is reasonably achievable") means making every reasonable effort to maintain exposures to radiation as far below the dose limits in this part as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest.

Background radiation means radiation from cosmic sources; naturally occurring radioactive materials, including radon (except as a decay product of source or special nuclear material) and global fallout as it exists in the environment from the testing of nuclear explosive devices. "Background radiation" does not include radiation from source, byproduct, or special nuclear materials regulated by the Commission.

Byproduct material means --

(1) Any radioactive material (except special nuclear material) yielded in, or made radioactive by, exposure to the radiation incident to the process of producing or utilizing special nuclear material; and

(2) The tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes. Underground ore bodies depleted by these solution

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[28] 10 CFR Part 20.1003 [56 FR 24018, May 21, 1991]

extraction operations do not constitute "byproduct material" within this definition.

Collective dose is the sum of the individual doses received in a given period of time by a specified population from exposure to a specified source of radiation.

Commission means the Nuclear Regulatory Commission or its duly authorized representatives.

Committed dose equivalent ($H_{T,50}$) means the dose equivalent to organs or tissues of reference (T) that will be received from an intake of radioactive material by an individual during the 50-year period following the intake.

Committed effective dose equivalent ($H_{E,50}$) is the sum of the products of the weighting factors applicable to each of the body organs or tissues that are irradiated and the committed dose equivalent to these organs or tissues ($H_{E,50} = \Sigma\, w_T H_{T,50}$).

Dose or radiation dose is a generic term that means absorbed dose, dose equivalent, effective dose equivalent, committed dose equivalent, committed effective dose equivalent, or total effective dose equivalent, as defined in other paragraphs of this section.

Dose equivalent (H_T) means the product of the absorbed dose in tissue, quality factor, and all other necessary modifying factors at the location of interest. The units of dose equivalent are the rem and sievert (Sv).

Effective dose equivalent (H_E) is the sum of the products of the dose equivalent to the organ or tissue (H_T) and the weighting factors (w_T) applicable to each of the body organs or tissues that are irradiated ($H_E = \Sigma w_T H_T$).

Exposure means being exposed to ionizing radiation or to radioactive material.

External dose means that portion of the dose equivalent received from radiation sources outside the body.

Generally applicable environmental radiation standards means standards issued by the Environmental Protection Agency (EPA) under the authority of the Atomic Energy Act of 1954, as amended, that impose limits on radiation exposures or levels, or concentrations or quantities of radioactive material, in the general environment outside the boundaries of locations under the control of persons possessing or using radioactive material.

Government agency means any executive department, commission, independent establishment, corporation wholly or partly owned by the United States of America, which is an instrumentality of the United States, or any board, bureau, division, service, office, officer, authority, administration, or other establishment in the executive branch of the Government.

Individual means any human being.

Internal dose means that portion of the dose equivalent received from radioactive material taken into the body.

License means a license issued under the regulations in Title 10, Code of Federal Regulations, Parts 30 through 35, 39, 40, 50, 60, 61, 70, or 72.

Licensed material means source material, special nuclear material, or byproduct material received, possessed, used, transferred or disposed of under a general or specific license issued by the Commission.

Licensee means the holder of a license.

Limits (dose limits) means the permissible upper bounds of radiation doses.

Member of the public means an individual in a controlled or unrestricted area. However, an individual is not a member of the public during any period in which the individual receives an occupational dose.

Monitoring (radiation monitoring, radiation protection monitoring) means the measurement of radiation levels, concentrations, surface area concentrations or quantities of radioactive material and the use of the results of these measurements to evaluate potential exposures and doses.

Nonstochastic effect means health effects, the severity of which varies with the dose and for which a threshold is believed to exist. Radiation-induced cataract formation is an example of a nonstochastic effect (also called a deterministic effect).

NRC means the Nuclear Regulatory Commission or its duly authorized representatives.

Occupational dose means the dose received by an individual in a restricted area or in the course of employment in which the individual's assigned duties involve exposure to radiation and to radioactive material from licensed and unlicensed sources of radiation, whether in the possession of the licensee or other person. Occupational dose does not include dose received from background radiation, as a patient from medical practices, from voluntary participation in medical research programs, or as a member of the general public.

Public dose means the dose received by a member of the public from exposure to radiation and to radioactive material released by a licensee, or to another source of radiation either within a licensee's controlled area or in unrestricted areas. It does not include occupational dose or doses received from background radiation, as a patient from medical practices, or from voluntary participation in medical research programs.

Radiation (ionizing radiation) means alpha particles, beta particles, gamma rays, x-rays, neutrons, high-speed electrons, high-speed protons, and

other particles capable of producing ions. Radiation, as used in this part, does not include non-ionizing radiation, such as radio- or microwaves, or visible, infrared, or ultraviolet light.

Restricted area means an area, access to which is limited by the licensee for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials. Restricted area does not include areas used as residential quarters, but separate rooms in a residential building may be set apart as a restricted area.

Site boundary means that line beyond which the land or property is not owned, leased, or otherwise controlled by the licensee.

Source material means--

(1) Uranium or thorium or any combination of uranium and thorium in any physical or chemical form; or

(2) Ores that contain, by weight, one-twentieth of 1 percent (0.05 percent), or more, of uranium, thorium, or any combination of uranium and thorium. Source material does not include special nuclear material.

Special nuclear material means--

(1) Plutonium, uranium-233, uranium enriched in the isotope 233 or in the isotope 235, and any other material that the Commission, pursuant to the provisions of section 51 of the Act, determines to be special nuclear material, but does not include source material; or

(2) Any material artificially enriched by any of the foregoing but does not include source material.

Stochastic effects means health effects that occur randomly and for which the probability of the effect occurring, rather than its severity, is assumed to be a linear function of dose without threshold. Hereditary effects and cancer incidence are examples of stochastic effects.

Survey means an evaluation of the radiological conditions and potential hazards incident to the production, use, transfer, release, disposal, or pre-

sence of radioactive material or other sources of radiation. When appropriate, such an evaluation includes a physical survey of the location of radioactive material and measurements or calculations of levels of radiation, or concentrations or quantities of radioactive material present.

Total Effective Dose Equivalent" (TEDE) means the sum of the deep-dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures).

Unrestricted area means an area, access to which is neither limited nor controlled by the licensee.

Uranium fuel cycle means the operations of milling of uranium ore, chemical conversion of uranium, isotopic enrichment of uranium, fabrication of uranium fuel, generation of electricity by a light-water-cooled nuclear power plant using uranium fuel, and reprocessing of spent uranium fuel to the extent that these activities directly support the production of electrical power for public use. Uranium fuel cycle does not include mining operations, operations at waste disposal sites, transportation of radioactive material in support of these operations, and the reuse of recovered non-uranium special nuclear and byproduct materials from the cycle.

Whole body means, for purposes of external exposure, head, trunk (including male gonads), arms above the elbow, or legs above the knee.

APPENDIX B

TERMS AND CONCEPTS ASSOCIATED WITH THE BEST EFFORT (TECHNOLOGY-BASED) APPROACH PUT FORTH IN THE CLEAN AIR ACT[29]

Best Available Control Technology (BACT) - An emission limitation based on the maximum degree of emission reduction which (considering energy, environmental, and economic impacts and other costs) is achievable through application of production processes and available methods, systems, and techniques. In no event does BACT permit emissions in excess of those allowed under any applicable Clean Air Act provisions. Use of the BACT concept is allowable on a case by case basis for major new or modified emissions sources in attainment areas and applies to each regulated pollutant.[30]

Best Demonstrated Technology (BDT) - The technology on which the EPA will base the standards, i.e., application of the best technological system of continuous emission reduction which (taking into account the cost of achieving such emission reduction, and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated.[31]

Generally Available Control Technologies (GACT) - The EPA Administrator may elect under certain circumstances to promulgate standards or requirements which provide for the use of generally available control technologies or management practices to reduce emissions of hazardous air pollutants.[32]

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[29] Public Law 101-549 (104 STAT. 2399) November 15, 1990, (Clean Air Act Amendments of 1990).

[30] "EPA Glossary of Environmental Terms and Acronym List", OPA-87-017, August 1988.

[31] Clean Air Act Amendments of 1990, Section 111(a)(1)

[32] Clean Air Act Amendments of 1990, Section 112(d)(5)

Maximum Achievable Control Technology (MACT) - Emissions limitations based on the best demonstrated control technology or practices in similar sources to be applied to major sources emitting one or more of the listed toxic pollutants.[33]

Residual Risk - The quantity of health risk remaining after application of the MACT (Maximum Achievable Control Technology).[34]

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[33] Glossary of Terms - Clean Air Act Amendments of 1990

[34] Glossary of Terms - Clean Air Act Amendments of 1990

SUPPLEMENTARY INFORMATION:

Background

The regulations in 9 CFR part 92 (referred to below as the regulations) contain, among other things, provisions concerning the importation of birds and poultry into the United States. These provisions are designed to prevent the introduction of exotic Newcastle disease and other communicable diseases of poultry into the United States.

Section 92.102(a) lists special ports designated for the importation of pet birds imported under the provisions of § 92.101(c)(3). Section 92.203(d) designates limited ports available for the entry of poultry and poultry products, such as poultry test specimens, or hatching eggs and day old chicks, which do not appear to require restraint and holding facilities. In accordance with § 92.101(f), performing or theatrical birds may be imported at the ports of entry listed in § 92.102(a) or § 92.203(d). And, in accordance with § 92.201(c), performing or theatrical poultry may be imported at the ports listed in § 92.203(d).

Pet birds, performing or theatrical birds, and performing or theatrical poultry are generally imported in small numbers and in carrying cases or cages, and do not require restraint and holding facilities. It appears that Port Canaveral, FL, could be used for the importation of these birds and poultry, and for certain other poultry and poultry products that do not require restraint and holding facilities. Therefore, we propose to add Port Canaveral, FL, to the list of ports in §§ 92.102(a) and 92.203(d).

Executive Order 12291 and Regulatory Flexibility Act

We are issuing this proposed rule in conformance with Executive Order 12291, and we have determined that it is not a "major rule." Based on information compiled by the Department, we have determined that this proposed rule would have an effect on the economy of less than $100 million; would not cause a major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions; and would not cause a significant adverse effect on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This proposed rule, if adopted, would affect owners of pet birds, performing or theatrical birds, performing or theatrical poultry and certain other poultry and poultry products, imported into the United States. This proposed rule would benefit them by providing an alternative port of entry. The convenience this alternative port would provide would not result in any significant economic benefit. Further, we do not expect that this proposed rule, if adopted, would result in any increase in the number of these birds and poultry, and poultry products, imported into the United States.

Under these circumstances, the Administrator of the Animal and Plant Health Inspection Service has determined that this action would not have a significant economic impact on a substantial number of small entities.

Executive Order 12778

This proposed rule has been reviewed under Executive Order 12778, Civil Justice Reform. If this proposed rule is adopted:

(1) All State and local laws and regulations that are inconsistent with this rule will be preempted;

(2) No retroactive effect will be given to this rule; and

(3) Administrative proceedings will not be required before parties may file suit in court challenging this rule.

Paperwork Reduction Act

This proposed rule contains no new information collection or recordkeeping requirements under the Paperwork Reduction Act of 1980 (44 U.S.C., 3051 *et seq.*).

Regulatory Reform: Less Burdensome or More Efficient Alternatives

The Department of Agriculture is committed to carrying out its statutory and regulatory mandates in a manner that best serves the public interest. Therefore, where legal discretion permits, the Department actively seeks to promulgate regulations that promote economic growth, create jobs, are minimally burdensome, and are easy for the public to understand, use, or comply with. In short, the Department is committed to issuing regulations that maximize net benefits to society and minimize costs imposed by those regulations. This principle is articulated in President Bush's January 28, 1992, memorandum to agency heads, and in Executive Orders 12291 and 12498. The Department applies this principle to the full extent possible, consistent with law.

The Department has developed and reviewed this regulatory proposal in accordance with these principles. Nonetheless, the Department believes that public input from all interested persons can be invaluable to ensuring that the final regulatory product is minimally burdensome and maximally efficient. Therefore, the Department specifically seeks comments and suggestions from the public regarding any less burdensome or more efficient alternative that would accomplish the purposes described in the proposal. Comments suggesting less burdensome or more efficient alternatives should be addressed to the agency as provided in this notice.

List of Subjects in 9 CFR Part 92

Animal diseases, Imports, Livestock, Poultry and poultry products, Quarantine, Reporting and recordkeeping requirements.

Accordingly, 9 CFR Part 92 would be amended as follows:

PART 92—IMPORTATION OF CERTAIN ANIMALS AND POULTRY AND CERTAIN ANIMAL AND POULTRY PRODUCTS; INSPECTION AND OTHER REQUIREMENTS FOR CERTAIN MEANS OF CONVEYANCE AND SHIPPING CONTAINERS THEREON

1. The authority citation for part 92 would continue to read as follows:

Authority: 7 U.S.C. 1622; 19 U.S.C. 1306; 21 U.S.C. 102–105, 111, 134a, 134b, 134c, 134d, 134f and 135; 31 U.S.C. 9701; 7 CFR 2.17, 2.51 and 371.2(d).

§ 92.102 [Amended]

2. In § 92.102, paragraph (a) would be amended by adding "and Port Canaveral" immediately after "Miami".

§ 92.203 [Amended]

3. In § 92.203, paragraph (d) would be amended by adding "Port Canaveral," immediately after "Jacksonville,".

Done in Washington, DC, this 8th day of January 1993.

Lonnie J. King,

Acting Administrator, Animal and Plant Health Inspection Service.

[FR Doc. 93–924 Filed 1–13–93; 8:45 am]

BILLING CODE 3410–34–M

NUCLEAR REGULATORY COMMISSION

10 CFR Part 20

Radiological Criteria for Decommissioning of NRC-licensed Facilities; Workshop

AGENCY: Nuclear Regulatory Commission.

ACTION: Notice of workshop.

SUMMARY: The Nuclear Regulatory Commission (NRC) is preparing to initiate an enhanced participatory rulemaking on establishing the

radiological criteria for the decommissioning of NRC-licensed facilities. The Commission intends to enhance the participation of affected interests in the rulemaking by soliciting commentary from these interests on the rulemaking issues before the staff develops the draft proposed rule. The Commission plans to conduct a series of workshops to solicit commentary from affected interests on the fundamental approaches and issues that must be addressed in establishing the radiological criteria for decommissioning. The first workshop will be held in Chicago, Illinois on January 27 and 28, 1993 and will be open to the public.

DATES: January 27, 1993 for 9 a.m. to 5 p.m.; January 28, 1993 from 8:30 a.m. to 4:30 p.m.

As discussed later in this notice, the workshop discussions will focus on the issues and approaches identified in a Rulemaking Issues Paper prepared by the NRC staff. The Commission will accept written comments on the Rulemaking Issues Paper from the public, as well as from workshop participants. Written comments should be submitted by May 28, 1993.

ADDRESSES: The workshop will be held at the Park Hyatt Hotel, 800 North Michigan Avenue, Chicago, Illinois.

Send written comments on the Rulemaking Issues Paper to: Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555. ATTN: Docketing and Service Branch. Hand deliver comments to 11555 Rockville Pike, Rockville, Maryland between 7:45 a.m. and 4:15 p.m. on Federal workdays. The Rulemaking Issues Paper is available from Francis X. Cameron (See FOR FURTHER INFORMATION CONTACT).

FOR FURTHER INFORMATION CONTACT: Francis X. Cameron, Special Counsel for Public Liaison and Waste Management, Office of the General Counsel, Washington, DC 20555, Telephone: 301-504-1642.

SUPPLEMENTARY INFORMATION:

Background

The NRC has the statutory responsibility for protection of health and safety related to the use of source, byproduct, and special nuclear material under the Atomic Energy Act. The NRC believes that one portion of this responsibility is to ensure the safe and timely decommissioning of nuclear facilities which it licenses and to provide guidance to licensees on how to plan for and prepare their sites for decommissioning. Once licensed activities have ceased, licensees are required to decommission their facilities so that their licenses may be terminated. This requires that the radioactivity in land, groundwater, buildings, and equipment resulting from the licensed operation be reduced to levels that allow the property to be released for unrestricted use. Licensees must then demonstrate that all facilities have been properly decontaminated and that radioactive material has been transferred to authorized recipients. Confirmatory surveys are conducted by NRC, where appropriate, to verify that sites meet NRC radiological criteria for decommissioning.

The types of nuclear fuel cycle facilities that will require decommissioning include nuclear power plants; non-power (research and test) reactors; fuel fabrication plants, uranium hexafluoride production plants, and independent spent fuel storage installations. In addition there are currently about 24,000 materials licensees. About one third of these are NRC licensees, while the remainder are licensed by Agreement States acting under the authority of the Atomic Energy Act, section 274.

These licensees include universities, medical institutions, radioactive source manufacturers, and companies that use radioisotopes for industrial purposes. About 50% of NRC's 7,500 materials licensees use either sealed radioactive sources or small amounts of short-lived radioactive materials. Decommissioning of these facilities should be relatively simple because there is usually little or no residual radioactive contamination. Of the remaining 50%, a small number (e.g. radioactive source manufacturers, radiopharmaceutical producers, and radioactive ore processors) conduct operations that could produce substantial radioactive contamination in portions of the facility. These facilities, like the fuel cycle facilities identified above, must be decontaminated before they can be safely released for unrestricted use.

Several hundred NRC and Agreement State licenses are terminated each year. The majority of these licenses involve limited operations, produce little or no radioactive contamination, and do not present complex decommissioning problems or potential risks to public health or the environment from residual contamination. However, as the nuclear industry matures, it is expected that more and more of the larger nuclear facilities that have been operating for a number of years will reach the end of their useful lives and be decommissioned. Therefore, both the number and complexity of facilities that will require decommissioning is expected to increase.

The Commission believes that there is a need to incorporate into its regulations radiological criteria for termination of licenses and release of land and structures for unrestricted use. The intent of this action would be to provide a clear and consistent regulatory basis for determining the extent to which lands and structures must be decontaminated before a site can be decommissioned. The Commission believes that inclusion of criteria in the regulations would result in more efficient and consistent licensing actions related to the numerous and frequently complex site decontamination and decommissioning activities anticipated in the future. A rulemaking effort would also provide an opportunity to reassess the basis for the residual contamination levels contained in existing guidance in light of changes in basic radiation protection standards and decommissioning experience obtained during the past 15 years.

The new criteria would apply to the decommissioning of power reactors, non-power reactors, fuel reprocessing plants, fuel fabrication plants, uranium hexafluoride production plants, independent spent fuel storage installations, and materials licenses. The criteria would apply to nuclear facilities that operate through their normal lifetime, as well as to those that may be shut down prematurely. The proposed criteria would not apply to uranium (other than source material) mines and mill tailings, high-level waste repositories, or low-level waste disposal facilities.

Until the new criteria are in place, the Commission intends to proceed with the decommissioning of nuclear facilities on a site-specific basis as the need arises considering existing criteria. Case and activity-specific risk decisions will continue to be made as necessary during the pendency of this process.

The Enhanced Participatory Rulemaking

The Commission believes it is desirable to provide for early and comprehensive input from affected interests on important public health and safety issues, such as the development of radiological criteria for decommissioning. Accordingly, the Commission is initiating an enhancing participatory rulemaking to establish these criteria. The objective of the rulemaking is to enhance the participation of affected interests in the rulemaking by soliciting commentary from these interests on the rulemaking issues before the NRC staff develops the draft proposed rule. The NRC staff will consider this commentary in the

development of the draft proposed rule, as well as document how these comments were considered in arriving at a regulatory approach. The Commission believes that this will be an effective method for illuminating the decision making process on complex and controversial public health and safety issues. This approach will ensure that the important issues have been identified; will assist in identifying potential information gaps or implementation problems; and will facilitate the development of potential solutions to address the concerns that affected interests may have in regard to the rulemaking.

The early involvement of affected interests in the development of the draft proposed rule will be accomplished through a series of workshops. A workshop format was selected because it will provide representatives of the affected interests with an opportunity to discuss the rulemaking issues with one another and to question one another about their respective positions and concerns. Although the workshops are intended to foster a clearer understanding of the positions and concerns of the affected interests, as well as to identify areas of agreement and disagreement, it is not the intent of the workshop process to attempt to develop a consensus agreement on the rulemaking issues. In addition to the commentary from the workshop participants, the workshops will be open to the public and the public will be provided with the opportunity to comment on the rulemaking issues and the workshop discussions at discrete intervals during the workshops.

The normal process for conducting Commission rulemakings is NRC staff development of a draft proposed rule for Commission review and approval, publication of the proposed rule for public comment, consideration of the comment by the NRC staff, and preparation of a draft final rule for Commission approval. In the enhanced participatory rulemaking, not only will comments be solicited before the NRC staff prepares a draft proposed rule, but the mechanism for soliciting there early comments will also provide an opportunity for the affected interests and the NRC staff to discuss the issues with each other, rather than relying on the traditional one-to-one written correspondence with the NRC staff. After Commission review and approval of the draft proposed rule that is developed using the workshop commentary, the general process of issuing the proposed rule for public comment, NRC staff evaluation of comments, and preparation of a draft final rule for Commission approval, will occur.

Participants

In order to have a manageable discussion among the workshop participants, the number of participants in each workshop must be limited. Based on discussions with experts on workshop facilitation, the NRC staff believes that the optimum size of the workshop group is fifteen to twenty participants. Due to differing levels of interest in each region, the actual number of participants in any one workshop, as well as the number of participants that represent a particular interest in any one workshop, may vary. Invitations to attend the workshops will be extended by the NRC staff using several selection criteria. First, to ensure that the Commission has the benefit of the spectrum of viewpoints on the issues, the NRC staff is attempting to achieve the participation of the full range of interests that may be affected by the rulemaking. The NRC staff has identified several general interests that will be used to select specific workshop participants—State governments, local governments, tribal governments, Federal agencies, citizens groups, nuclear utilities, fuel cycle facilities, and non-fuel cycle facilities. In addition to these interests, the staff also plans to invite representatives from the contracting industry that performs decommissioning work and representatives from professional societies, such as the Health Physics Society and the American Nuclear Society. The NRC anticipates that most of the participants will be representatives of organizations. However, it is also possible that there may be a few participants who, because of their expertise and influence, will participate without any organizational affiliation.

The second selection criterion is the ability of the participant to knowledgeably discuss the full range of the rulemaking issues. The NRC staff wishes to ensure that the workshops will elicit informed discussions of options and approaches, and the rationale for those options and approaches, rather than simple statements of opinion. The NRC staff's identification of potential participants will be based on an evaluation of such factors as the extent of a potential participant's experience with a broad range of radiation protection issues and types of nuclear facilities, specific experience with the decommissioning issue, and the extent of a potential participant's substantive comment and participation on previous Commission regulatory or licensing actions.

The third criterion emphasizes participation from organizations within the region encompassed by the workshop. As much as practicable, those organizations that primarily operate within the region, as opposed to regional units of national organizations, will have priority in terms of participating in the corresponding regional workshops. Organizations with a national standing will be part of the "national" workshop to be held in Washington, DC.

Workshop Format

To assure that each workshop addresses the issues in a consistent manner, the workshops will have a common pre-defined scope and agenda focused on the Rulemaking Issues Paper discussed below. However, the workshop format will be sufficiently flexible to allow for the introduction of any additional issues that the participants may want to raise. At each workshop, the NRC staff will begin each discussion period with a brief overview of the workshop will be devoted to a discussion of the issues by the participants. The workshop commentary will be transcribed and made available to participants and to the public.

Personnel from The Keystone Center, a nonprofit organization located in Keystone, Colorado, will serve as neutral facilitators for each workshop. The facilitators will chair the workshop sessions and ensure that participants are given an opportunity to express their viewpoints, assist participants in articulating their interests, ensure that participants are given the opportunity to question each other about their respective viewpoints, and assist in keeping the discussion moving at a pace that will allow all major issue areas to be addressed.

Rulemaking Issues Paper

The NRC staff has prepared a Rulemaking Issues Paper to be used as a focal point for the workshop discussions. This paper, which will be distributed to participants in advance of the workshops, sets forth in neutral terms the issues that must be addressed in the rulemaking, as well as background information on the nature and extent of the problem to be addressed. In framing the issues and approaches discussed in the Rulemaking Issues Paper, the NRC staff has attempted to anticipate the variety of views that exist on these approaches and issues. The paper will provide assistance to the participants as they prepare for the workshops, suggest the

workshop agenda, and establish the level of technical discussion that can be expected at the workshops. The workshop discussions are intended to be used by the staff in developing the draft proposed rule. Prior to the workshops no staff positions will be taken on the rulemaking approaches and issues identified in the Rulemaking Issues Paper. As noted earlier, to the extent that the Rulemaking Issues Paper fails to identify a pertinent issue, this may be corrected at the workshop sessions.

The discussion of issues is divided into two parts. First are two primary issues dealing with: (1) The objectives for developing radiological criteria; and (2) application of practicality considerations. The objectives constitute the fundamental approach to the establishment of the radiological criteria, and the NRC staff has identified four distinct possibilities including:

(1) Risk Limits, which is the establishment of limiting values above which the risks to the public are deemed unacceptable, but allows for criteria to be set below the limit using practicality considerations;

(2) Risk Goals, where a goal is selected and practicality considerations are used to establish criteria as close to the goal as practical;

(3) Best Effort, where the technology for decontamination considered to be the best available is applied; and

(4) Return to Preexisting Background, where the decontamination would continue until the radiological conditions were the same as existed prior to the licensed activities.

Following the primary issues are several secondary issues that are related to the discussions of the primary issues, but which the NRC staff believe warrant separate presentations and discussions. These secondary issues include the time frame for dose calculation, the individuals or groups to be protected, the use of separate criteria for specific exposure pathways such as groundwater, the treatment of radon, and the treatment of previously buried materials.

The Rulemaking Issues Paper will be provided to each potential workshop participant. Additional copies will be available to members of the public in attendance at the workshop. Copies will also be available from the NRC staff contact identified above. In addition to the comments on the Rulemaking Issues Paper provided at the workshops, the Commission is also receptive to the submittal of written comments on the rulemaking issues, as noted under the heading DATES.

Dated at Rockville, MD this 9th day of January, 1993.

For the Nuclear Regulatory Commission.

Samuel J. Chilk,

Secretary of the Commission.

[FR Doc. 93-850 Filed 1-13-93; 8:45 am]

BILLING CODE 7590-01M

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 92-CE-20-AD]

Airworthiness Directives; Avions Mudry & Cie Model CAP 10B Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: This notice proposes to supersede Airworthiness Directive (AD) 80-24-51, which currently requires inspecting both the center wing lower skin and main spar upper flange at the wing root areas for cracks on certain Avions Mudry & Cie Model CAP 10B airplanes, and repairing any cracked part. An accident investigation has revealed cracking and failure of the wing main spar in the vicinity of a bolt hole at the wing root area on one of the affected airplanes that was in compliance with the existing AD. The proposed action would require installing an inspection opening in the wing, repetitively inspecting the upper and lower wing spar caps for cracks, and repairing any cracks. The actions specified by the proposed AD are intended to prevent fatigue failure of the wing spar, which could lead to loss of control of the airplane.

DATES: Comments must be received on or before March 26, 1993.

ADDRESSES: Submit comments in triplicate to the Federal Aviation Administration (FAA), Central Region, Office of the Assistant Chief Counsel, Attention: Rules Docket No. 92-CE-20-AD, room 1558, 601 E. 12th Street, Kansas City, Missouri 64106. Comments may be inspected at this location between 8 a.m. and 4 p.m., Monday through Friday, holidays excepted.

Service information that is discussed in the proposed AD may be obtained from Avions Mudry & Cie, B.P. 214, 27300 Bernay, France; Telephone (33) 32 43 47 34; Facsimile (33) 32 43 47 90. This information may also be examined at the Rules Docket at the address above.

FOR FURTHER INFORMATION CONTACT: Mr. Raymond A. Stoer, Program Officer, Brussels Aircraft Certification Office, FAA, Europe, Africa, and Middle East Office, c/o American Embassy, B-1000 Brussels, Belgium; Telephone (322) 513.38.30 ext. 2710; Facsimile (322) 230.68.99; or Mr. William Timberlake, Project Officer, Small Airplane Directorate, Airplane Certification Service, FAA, 1201 Walnut, suite 900, Kansas City, Missouri 64106; Telephone (816) 426-6932; Facsimile (816) 426-2169.

SUPPLEMENTARY INFORMATION:

Comments Invited

Interested persons are invited to participate in the making of the proposed rule by submitting such written data, views, or arguments as they may desire. Communications should identify the Rules Docket number and be submitted in triplicate to the address specified above. All communications received on or before the closing date for comments, specified above, will be considered before taking action on the proposed rule. The proposals contained in this notice may be changed in light of the comments received.

Comments are specifically invited on the overall regulatory, economic, environmental, and energy aspects of the proposed rule. All comments submitted will be available, both before and after the closing date for comments, in the Rules Docket for examination by interested persons. A report that summarizes each FAA-public contact concerned with the substance of this proposal will be filed in the Rules Docket.

Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must submit a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. 92-CE-20-AD." The postcard will be date stamped and returned to the commenter.

Availability of NPRMs

Any person may obtain a copy of this NPRM by submitting a request to the FAA, Central Region, Office of the Assistant Chief Counsel, Attention: Rules Docket No. 92-CE-20-AD, room 1558, 601 E. 12th Street, Kansas City, Missouri 64106.

Discussion

AD 80-24-51, Amendment 39-4119, currently requires inspecting both the center wing lower skin and main spar upper flange in the wing root areas for cracks on certain Avions Mudry & Cie Model CAP 10B airplanes, and repairing any cracked part.

Decommissioning Case Studies

A Sampling of Actual Decommissioning Case Studies for Review by the Participants in the Workshops that Support the U.S. Nuclear Regulatory Commission's Enhanced Participatory Rulemaking on Radiological Criteria for Decommissioning

January 1993
U.S. Nuclear Regulatory Commission

Decommissioning Case Studies

Introduction

The Nuclear Regulatory Commission recently initiated an Enhanced Participatory Rulemaking to develop radiological criteria for decommissioning for NRC-licensed facilities. NRC is enhancing opportunities for participation of affected interests on the rulemaking issues before the NRC staff develops the proposed rule. Consistent with this objective, NRC is conducting a series of workshops to solicit commentary from affected interests on the fundamental approaches and issues that must be addressed in establishing radiological criteria for decommissioning. As announced in the *Federal Register* on December 11, 1992 (57 *FR* 58727), the workshops will be held in January through May 1993 at seven locations throughout the United States.

In approving the plan for the Enhanced Participatory Rulemaking to develop Radiological Criteria for Decommissioning, the Commission directed the NRC staff to prepare summaries of actual decommissioning cases and provide them to workshop participants as background information. The Commission intended the cases to include several types of facilities and cover a range of sites. The objective of providing the cases to the workshop participants was to illustrate the practical aspects of decommissioning facilities with radiological contamination, including examples of cases where decommissioning was hampered by technical, cost, administrative, or other factors.

This paper presents a suite of six case studies to illustrate "real world" decommissioning experiences and make tangible the abstract concepts, such as radiation dose, risk, and monitoring limitations, that lie at the root of the discussions at the workshops. The case studies represent a range of facilities, including a research power reactor, two fuel cycle facilities, two nuclear materials facilities, and a nuclear missile accident site. Two of the facilities primarily involved naturally occurring radioactive materials; the other four primarily involved artificially produced radionuclides. The sites are also distributed geographically in the States of Connecticut, New Hampshire, New Jersey, New York, Oklahoma, South Dakota. The sites are summarized in Table 1.

Although not all of the facilities were licensed under the Atomic Energy Act by NRC or an Agreement State, they all illustrate practical aspects of decommissioning nuclear facilities. Three of the facilities are currently licensed by NRC. One of the facilities was licensed by an Agreement State prior to decommissioning, after which the license was terminated. One site was licensed by an Agreement State, but is currently being remediated under the Environmental Protection Agency's (EPA's)

Superfund Program under the Comprehensive Environmental Response, Compensation, and Liability Act. One of the facilities was not licensed and is being remediated under the Installation Restoration Element of the Defense Environmental Restoration Program by the Air Force. Cleanup activities at this site are being monitored by EPA as if the site was in the Superfund program.

For each case study, NRC staff has assembled summary information that illustrates specific decommissioning issues. The summaries include brief descriptions of the facility, nature and extent of contamination, decommissioning criteria, decommissioning approach, current status, and lessons learned. Where appropriate, maps and diagrams have been included to provide the reader with a visual image of the extent and nature of decommissioning action. Although more detailed information is available for each site, the case studies have been intentionally kept brief and focused to illustrate generic issues and avoid undue attention during the workshops to individual cases.

Table 1. Summary of Decommissioning Case Studies

Name	Location	Facility Type	Principal Radionuclides	Regulatory Status
UNC-Naval Products	Montville, CT	Fuel Facility	High Enriched Uranium	Active NRC License
Kerr-McGee Cimarron	Crescent, OK	Fuel Facility	Low Enriched Uranium, Plutonium	Active NRC License
Pathfinder Atomic Power Plant	Sioux Falls, SD	Research Power Reactor	Activation Products (^{60}Co, ^{63}Ni, ^{55}Fe)	Active NRC License
GTE-Sylvania	Manchester, NH	Materials Facility	Thorium	Terminated NH License
Radium Chemical Company	Woodside, NY	Materials Facility	Radium	Terminated NY License; Superfund Site
BOMARC Missile Accident Site	Ocean County, NJ	Nuclear Weapons Site	Plutonium	Defense Installation Restoration Program

The decommissioning case studies follow. Readers with questions should contact Michael Weber, NRC, Mail Stop 5E4, Washington, DC 20555 or (301) 504-1298.

UNC-Naval Products
Septic Leach Field
Montville, CT

Decommissioning Issues

- Technical basis for translating residual contamination into radiological dose and/or risk
- Averaging of residual contamination concentrations over clean soil due to heterogeneous nature of contamination

Facility Description

The UNC Incorporated (UNC) Naval Products Facility fabricated nuclear fuel for naval reactors at a facility in Montville, CT. Beginning in 1974, the Montville facility made operational discharges of small concentrations of highly enriched uranium to an onsite septic field as an effluent from the liquid radioactive waste treatment facility. These effluents were discharged in accordance with the license for the UNC-Montville facility. Discharge of enriched uranium to the leach field terminated in November 1987, when NRC authorized discharge of the waste water directly to the sanitary sewer system of Montville, CT, which was acceptable because of the low concentrations of the enriched uranium in the effluent.

In March 1990, UNC announced plans to decommission the Montville facility and terminate their license. UNC-Montville submitted a plan for decommissioning the facility on June 1, 1990. One part of this plan specifically addressed the decommissioning of the formerly used septic leach field. The final revision of the septic leach field decommissioning plan was submitted on May 22, 1992. The site also contains numerous buildings. These are being decommissioned in accordance with the June 10, 1991 decommissioning plan.

Nature and Extent of Contamination

The septic leach field consisted of two parts. Septic field 1 consisted of 43 4-inch diameter perforated pipes of varying lengths, arranged in parallel 2.5 feet wide by 2.5 feet deep stone-filled trenches, each separated by 5.5 feet of clean soil and buried 3 to 8 feet below the soil surface. Septic field 2 consisted of 2 groups of 6 six-foot diameter perforated concrete drywells spaced in a polygonal pattern approximately 40 feet apart and each surrounded by 2 feet of crushed rock. The size and orientation of septic leach field 1 is illustrated in Figure 1 and septic leach field 2 in Figure 2. Gross alpha concentrations averaged >100 pCi/g for samples of the fine-grained material between the stones in the trenches in septic field 1. When averaged over the mass of the stones as well as the fine grained material between the stones, this activity concentration was about 38 pCi/g. Ingrowth of decay products was not significant due to their virtual absence in the original enriched uranium and the limited amount of time since discharge.

Decommissioning Criteria

The major regulatory criteria applied to cleanup of the septic leach field included the following:

1. Option 1 Concentration Criteria from the 1981 NRC Branch Technical Position (BTP) on *Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations* (46 *FR* 52061; October 23, 1981) - 30 pCi/g for enriched uranium.

2. The dose via the groundwater-drinking water pathway was limited to a maximum of 2.3 millirem/yr Total Effective Dose Equivalent (TEDE), consistent with the dose basis for Option 1 concentrations for enriched uranium in NRC's 1981 BTP (in lieu of EPA's proposed drinking water standard of 4 millirem/yr EDE or limit of 20 μg/l for uranium (30 pCi/l)).

UNC proposed a value of $25,000 per person-rem averted be used in calculations to show that residual contamination would be as low as reasonably achievable (ALARA), if above the Option 1 concentrations. UNC concluded, however, that the Option 1 criterion in the 1981 BTP would be applied to the site. Therefore, no additional effort was necessary to reduce contamination levels below the Option 1 criterion.

Decommissioning Approach

UNC removed, packaged, and shipped for off-site disposal all distribution and service pipes, distribution boxes, sludges, and drywell cylinders. UNC also removed the residually contaminated materials in excess of the decommissioning criteria described below. UNC verified compliance with the cleanup criteria using a biased survey of the leach field with samples taken every 10 m along the centerline of the exposed trenches. Hotspots were identified and surveyed in a manner consistent with the approach described in NUREG/CR-5849. In determining compliance with the hotspot criteria, the licensee averaged samples along a single horizontal planar surface and not vertically over the trench depths.

To demonstrate compliance with the groundwater protection criteria, the licensee will use the RESRAD dose assessment computer code to estimate potential doses to hypothetical future onsite residents, who could consume potentially contaminated groundwater. The modeling done in support of the groundwater pathway assessment assumed that the total activity in the septic field was distributed over the mass of the septic field (including the clean soil between trenches and drywells).

The decommissioning project for the entire leach field cost approximately $2,000,000 dollars and was completed in 12 months.

Current Status of Site

The licensee has completed decontamination of the septic field to BTP option 1 levels. The licensee has also completed its termination survey for the leach field. NRC's contractor has performed a confirmatory survey, but the results of this survey have not been received.

Lessons Learned

The contamination in the leach field existed in a fine-grained matrix between or on the 1.5-inch diameter stone used in the leach field. This raised an issue about whether to allow the stone to constitute part of the mass of the soil samples taken in the field because the interior of the stone was not contaminated. Resolution of this question affected the calculations that translate residual radiological contamination into dose to an potential site resident. In response to the licensee's proposal, NRC decided that the stone should be included in the mass of the sample (thus reducing the concentration of each sample) because it was not reasonable to assume that the fine-textured material would be separated from the stone to any significant degree in reasonable exposure scenarios.

The licensee initially attempted to correlate gross alpha data from the field to uranium concentrations. This did not work because natural background gross-alpha measurements were too variable. In addition, the chemical form of the uranium in the field did not lend itself to the type of gross alpha analytical technique attempted on these samples. Further, the laboratory chosen by the licensee for analysis of soil samples generated gross-alpha values that were consistently lower than measured uranium concentrations, whereas the gross-alpha values should have been greater than uranium concentrations. The licensee expended considerable effort trying to resolve the apparent disparities between the gross-alpha values and the uranium concentrations. Consequently, the licensee wasted time, money, and effort trying to evaluate the adequacy of the septic field decommissioning using gross-alpha analysis. The licensee ultimately selected alternative laboratories and analytical techniques to determine uranium concentrations directly.

Based on this experience, the licensee and NRC learned the following lessons:

- The hotspot criteria in NUREG/CR-5849 are applicable to heterogenous contamination.
- Licensees can complete ALARA analyses in planning decommissioning for various levels of clean-up.
- The adequacy of licensee or contract laboratory Quality Assurance/Quality Control programs for radiological analysis should be confirmed by the licensee, in consultation with NRC, before radiological surveys to ensure that compatible and proper techniques will be used.

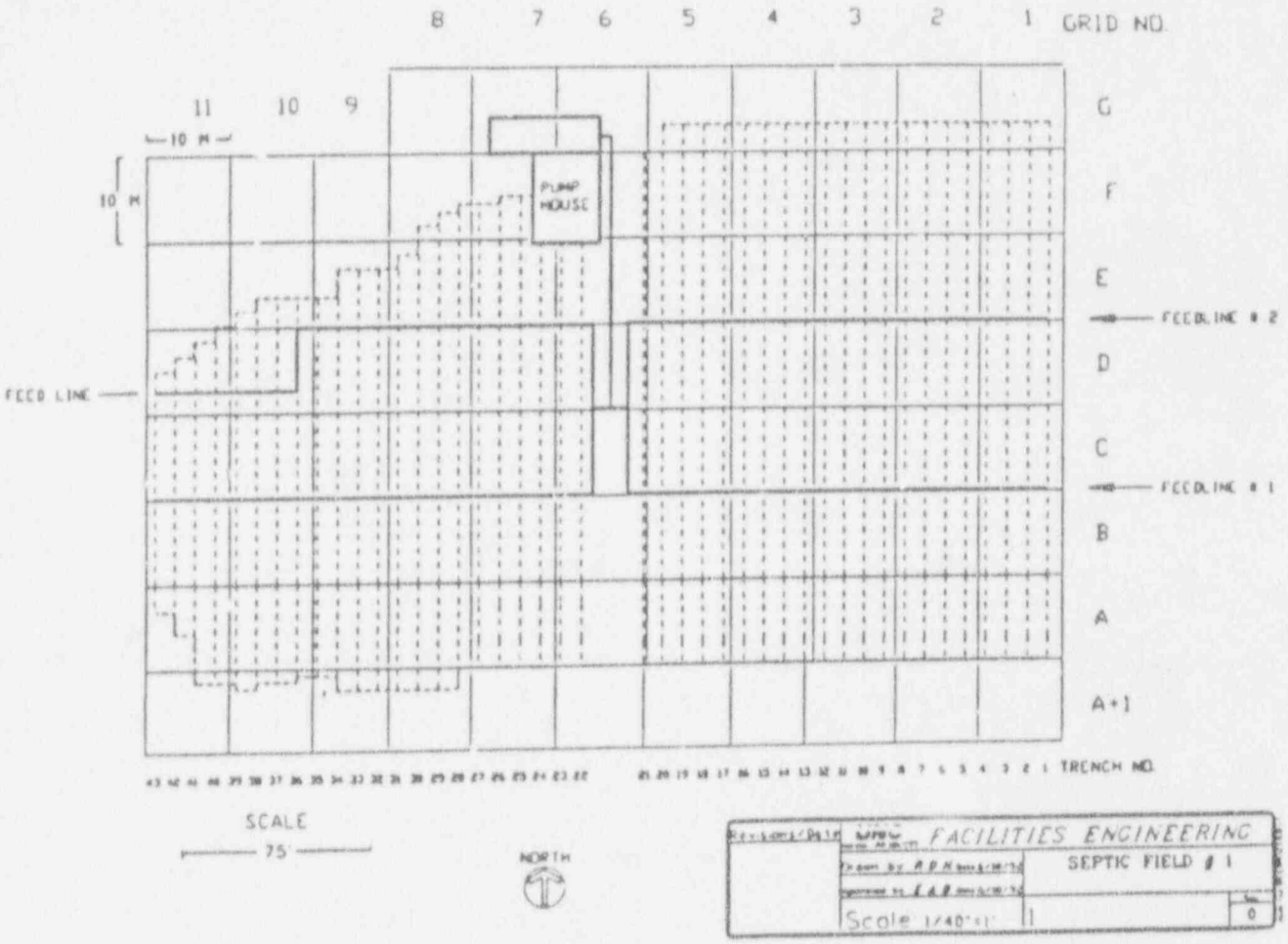

Figure 1. Size and Orientation of Septic Leach Field 1

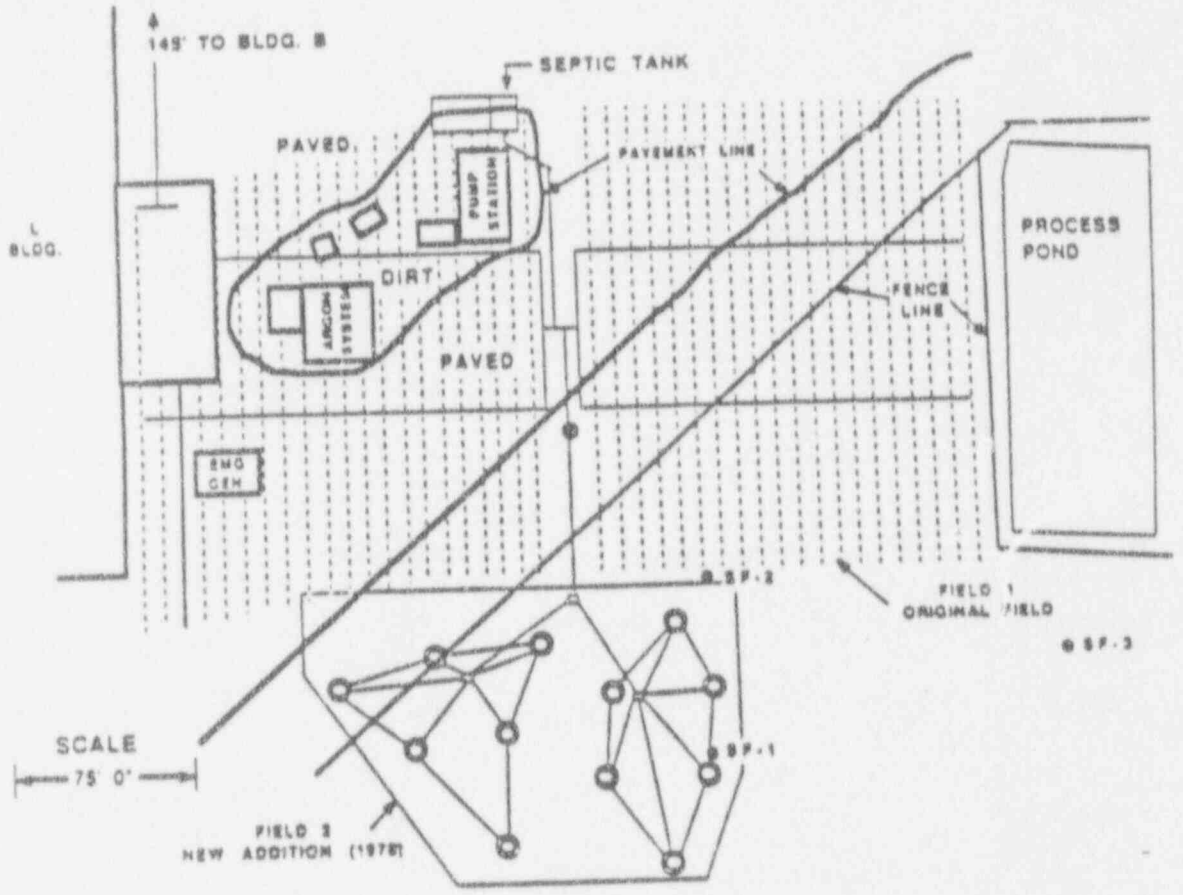

Figure 2. Size and Orientation of Septic Leach Field 2

Kerr-McGee, Cimarron Plants
Crescent, Oklahoma

Decommissioning Issues

- Technical basis for allowing on-site burials of uranium contaminated soils
- Approach to termination of multiple licenses
- Appropriate time period for dose calculations

Facility Description

Kerr-McGee operated two fuel fabrication plants, one for mixed-oxide fuels and one for low-enriched uranium fuels, near Crescent, Oklahoma. The 1100-acre site is located in a rural part of central Oklahoma, 30 miles north of Oklahoma City, in a farming area. The Cimarron site is listed in the NRC's Site Decommissioning Management Plan.

In addition to the two fuel fabrication plants on the site, the licensee operated several waste-water treatment settling ponds and a burial area (for burials previously allowed under 10 CFR 20.304), which were licensed as part of the uranium plant. Both buildings were contaminated with uranium and plutonium. The settling ponds are contaminated with uranium, while the burial areas (two additional areas recently discovered) contain uranium and trace amounts of thorium from waste disposals associated with offsite activities. Fuel fabrication operations at both plants were terminated in 1975. Major contaminated facilities include the plutonium plant (~26,000 ft^2), the uranium plant (~60,000 ft^2), 3 waste-water treatment settling ponds, and waste burial areas. There were also five previous waste water treatment ponds; these ponds were closed in 1977 and 1978.

Nature and Extent of Contamination

Decontamination of the mixed oxide facility began in 1979, and in 1989, an NRC contractor completed a confirmatory survey that demonstrated that this facility met decommissioning guidelines. No plutonium contamination has been identified outside of the mixed oxide building. The yard outside this facility is contaminated with small concentrations of uranium from the nearby uranium plant. Cimarron Corporation submitted a request for license termination for this facility in August 1990, followed by a request in November 1990 to allow renovations in order to facilitate non-nuclear operations, which NRC approved.

The soil around the uranium plant and the uranium plant building are contaminated with low-enriched uranium (ranging from 2 to 9.1 percent ^{235}U). Soil in the settling ponds and the burial grounds are also contaminated with uranium with concentrations generally in the range of 30 to 100 pCi/g of about

1.3 percent average enrichment. Although a known burial area was exhumed and resulting wastes shipped offsite for disposal, other apparent 10 CFR 20.304 burials exist at the site. In addition, elevated uranium concentrations were documented in samples taken during the closure of the five former waste water ponds at the site. The waste-water treatment lagoons also contain chemical contamination (primarily nitrate contamination (NO_3)). Groundwater in one area of the site is also contaminated with uranium and non-radiological constituents (e.g., NO_3).

About 400,000 ft^3 of soil contaminated with enriched uranium with concentrations averaging 70 pCi/g in the top 1 to 2 feet of the ground surrounding the processing buildings. Samples from the closed ponds indicated that appreciable portions of the bottoms of two ponds consisted of contaminated soils in the range of 300 to 400 pCi/g uranium prior to tilling, which occurred at the time of closure of the ponds. Consequently, concentrations of uranium in the bottom sediments would now be expected to be lower due to mixing of the contaminated material with clean sediments during tilling.

Decommissioning Criteria

The major regulatory criteria applied during decommissioning include the following:

1. *Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material*, July 1982 (An Enclosure to Policy and Guidance Directive FC 83-23)

2. Acceptable Soil Contamination Levels, Enclosure 3 to Policy and Guidance Directive FC 83-23, November 4, 1983

3. Option 2 Concentration Criteria from the 1981 NRC Branch Technical Position (BTP) on *Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations* (46 *FR* 52061; October 23, 1981) -- for enriched uranium, the criterion is 100 pCi/g (soluble), 250 pCi/g (insoluble)

The first group of criteria defined acceptable surface contamination levels on building surfaces; the second group of criteria were applied to the soils surrounding the buildings. The soil criteria were consistent with the criteria in the 1981 BTP and included a value of 25 pCi/g for total plutonium. The BTP was applied to a proposed onsite burial of soil contaminated with uranium in accordance with 10 CFR 20.302.

Decommissioning Approach

Kerr-McGee has finished decontaminating the plutonium plant under an NRC-approved decommissioning plan. At the uranium plant, Kerr-McGee has excavated and shipped for disposal the contents of the initially-identified burial area and has continued decontaminating the building. The licensee has surveyed the soil around the building to detect uranium contamination and submitted a

request for authorization (pursuant to 10 CFR 20.302) to dispose of 400,000 ft^3 of uranium-contaminated soil onsite under Option 2 of the 1981 BTP. Staff has estimated that an on-site disposal would reduce decommissioning costs by $10 million or more due to the avoidance of costs for disposing of the contaminated soil offsite. The proposed burial also has the advantage of reducing radiation exposure to remediation workers. The licensee's evaluation of the potential for future groundwater contamination beneath the site concluded that it was unlikely for any uranium to reach groundwater in a well located immediately adjacent to the burial area within 1000 years due primarily to the retardation of the uranium by the bedrock at the site.

Current Status

- NRC termination of the license for the mixed oxide facility is pending
- Termination of the license for the uranium fuel facility is dependent upon proper completion of the following steps:
  - Adequate site characterization
  - Authorization of onsite disposal in accordance with 10 CFR 20.302
  - Decontamination of the building and adjacent soils in accordance with existing criteria

Lessons Learned

- Limited characterization of the extent and distribution of contaminated material at the site complicated decommissioning
- Prudent measures to reduce the likelihood of human exposure to the contamination and other prescribed conditions on disposal of contaminated soil may be perceived as being inconsistent with the "unrestricted use" standard for decommissioning

Northern States Power
Pathfinder Atomic Power Supply
Sioux Falls, South Dakota

Decommissioning Issues

- Technical basis for the release of residual contamination on building surfaces containing gamma-emitting radionuclides
- Advantages and disadvantages of phased decommissioning approaches

Facility Description

The Pathfinder Atomic Power Plant was a 66 Megawatt-electric (~200 Megawatt-thermal) boiling water reactor operated by Northern States Power (NSP) on a site 5.5 miles northeast of Sioux Falls, South Dakota. The plant ceased operations in September 1967. The fuel was removed from the site and the facility was placed in a Safe Storage (SAFSTOR) condition in 1971. At that time, NSP decontaminated portions of the facility by reducing surface activity and filling the reactor vessel with gravel. About 3,000 ft^3 (400 drums) of radioactive waste were generated in this decontamination effort and shipped offsite for disposal. NSP stored contaminated equipment and piping that was too large to be drummed in the reactor building and spent fuel pool. As a part of the SAFSTOR program, contaminated equipment and material was transferred to a byproduct materials license in August 1972 and the operating reactor license was terminated. NSP installed non-nuclear boilers in the facility and continued to generate electricity until the present using the plant's turbine generator.

Nature and Extent of Contamination

Because of Pathfinder's limited operating history (e.g., about 80 days) and lack of any identifiable nuclear fuel leaks during operation, radioactive contamination levels were relatively low and caused only by neutron activation. The primary radionuclides were ^{60}Co, ^{63}Ni, and ^{55}Fe; ^{60}Co dominated in terms of radiological significance. Total activity prior to removal of the reactor pressure vessel was about 563 Curies (Ci), all but 0.044 Ci of which was contained in the pressure vessel and its internal hardware. Decommissioning generated about 34,450 ft^3 of waste containing essentially all of the 563 Ci. Figure 1 depicts a cross-section of the reactor and fuel handling buildings. Figures 2 and 3 depict the extent of surface contamination within the reactor and fuel handling buildings, respectively.

Decommissioning Criteria

The criteria used for unrestricted release of the reactor building and fuel handling building were the acceptable surface contamination levels stated in Table 1 of Regulatory Guide 1.86, *Termination of Operating Licenses for Nuclear Reactors*. The NRC applied an additional criterion that gamma exposure

rates measured one meter from the building surfaces shall not exceed 5 μR/hr above background.

Decommissioning Approach

NSP initiated final dismantlement and decontamination activity in the late 1980s. In 1990, NSP removed and shipped the reactor vessel intact along with other waste to the low-level radioactive waste disposal facility in Richland, Washington by rail and truck. Dismantlement also included partial demolition of the reactor building (the lower portion of the concrete containment structure will be buried in place) and decontamination of portions of the fuel handling building. The project caused a total estimated exposure to workers of about 4 person-rem and required about one year to complete. Total cost of the decommissioning action was about $13 million.

NSP set action levels for contamination below the criteria in Regulatory Guide 1.86 during the radiological survey. Any scan exceeding the criteria triggered additional direct contamination measurements. Those areas exceeding the criteria were decontaminated and resurveyed. Final survey of the site showed that nearly all the areas were remediated to levels less than the "best estimate" of local background radiation.

Some contamination remains in the turbines that are still being used to generate electricity at the plant in conjunction with the non-nuclear boilers. This contaminated equipment will remain at the site under the control of the licensee until it has been properly removed and disposed of or decays below acceptable contamination criteria.

Current Status

- NRC approved release of the Reactor Building, Fuel Handling Building, and Waste Storage Building for unrestricted use in November 1992

Lessons Learned

- Remediation and measurement technology for surface contamination is readily available and implementable

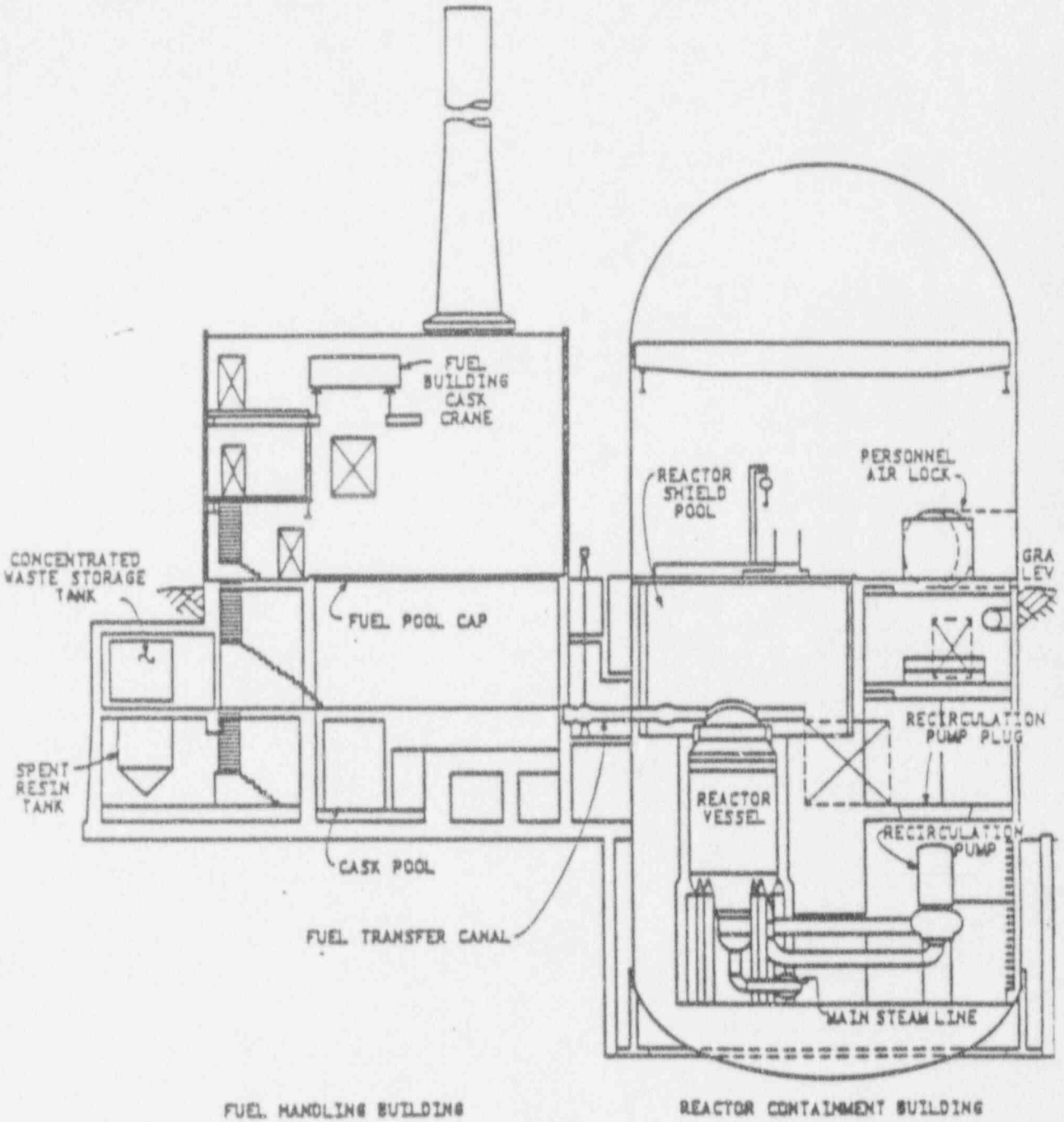

Figure 1. Cross-Section of the Reactor and Fuel Handling Buildings (Ref: *Pathfinder Plant Decommissioning Plan*, Northern States Power, 1989)

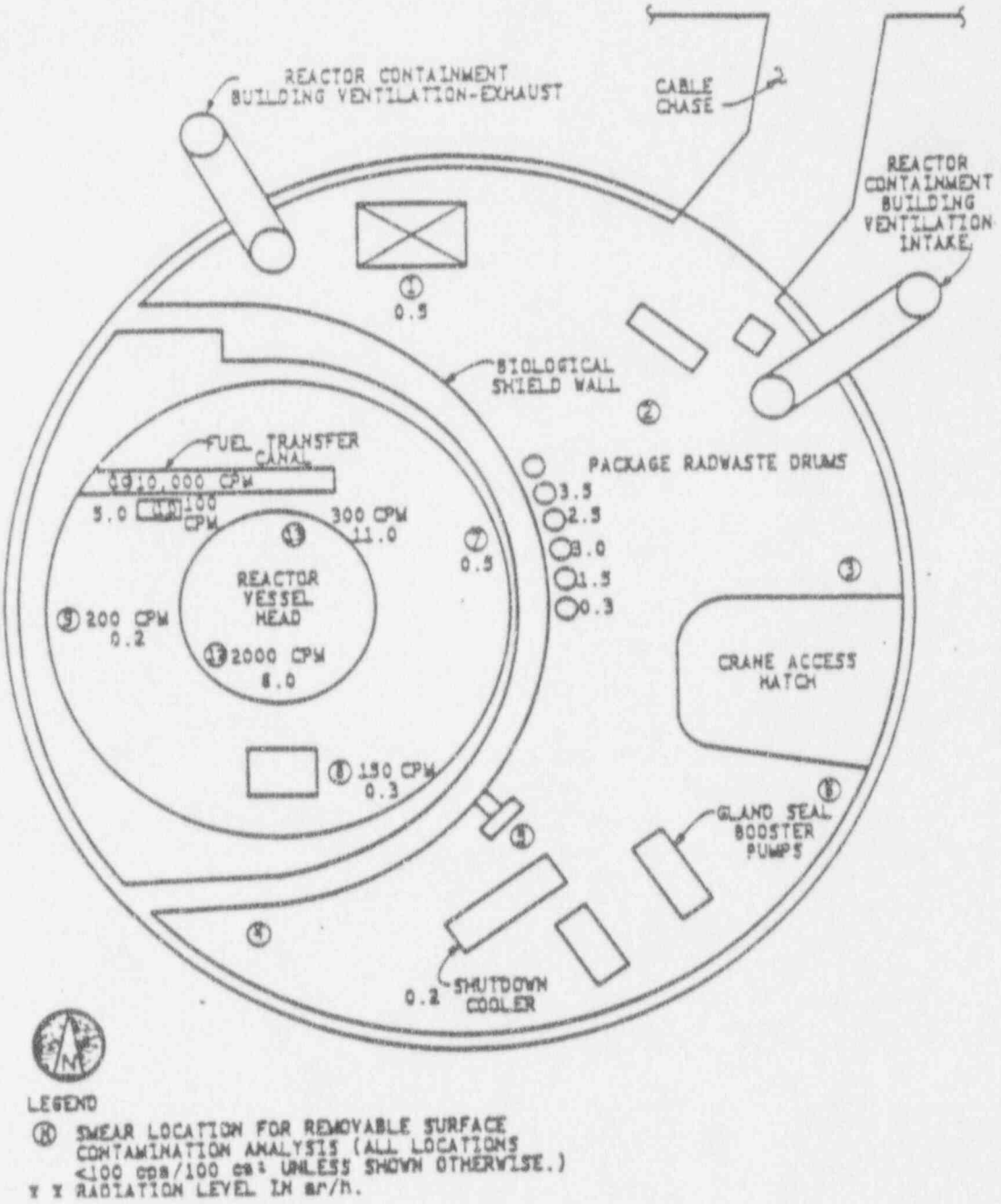

Figure 2. Contamination survey of the Reactor Building at the Equipment Floor Level (Ref: *Pathfinder Plant Decommissioning Plan*, Northern States Power, 1989)

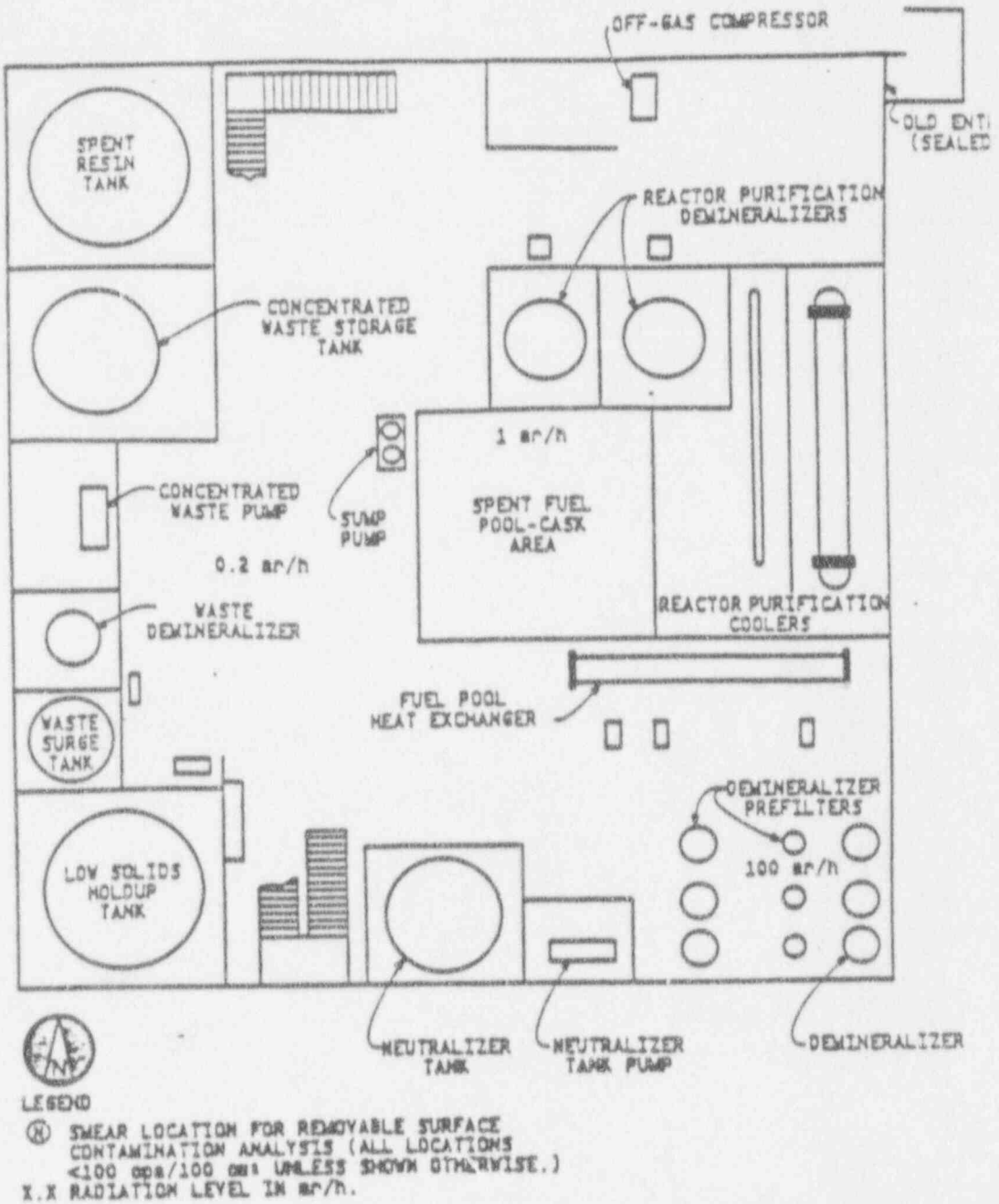

Figure 3. Contamination survey of the Fuel Handling Building at the Basement Level (Ref: *Pathfinder Plant Decommissioning Plan*, Northern States Power, 1989)

GTE/Sylvania
Manchester, New Hampshire

Decommissioning Issues

- Long-term reliance on institutional controls for limiting exposure to residual radioactive materials

Facility Description

GTE/Sylvania was licensed by the Atomic Energy Commission in 1965 to use thorium dioxide in coating electrodes for high-intensity light bulbs. These operations were conducted at a manufacturing plant in an industrial area in Manchester, New Hampshire. The thorium was suspended in methanol and vacuum-deposited on the electrodes, which were then cleaned and fired at high temperatures to fuse the coating into a ceramic solid. The electrodes were then encapsulated in gas-tight, fused, silica capsules. GTE/Sylvania continued this process until February 1986, when the facility initiated decommissioning of the thorium operation. The site was licensed by the State of New Hampshire from 1966 until the license was terminated at the conclusion of decommissioning in July 1991.

Nature and Extent of Contamination

Prior to decommissioning, contamination consisted of processed thorium oxide dust (^{232}Th, ^{228}Th, and some decay products) distributed throughout three rooms (light room, chemistry laboratory, and high temperature furnace room (with two high temperature furnaces)). Other contaminated areas included soil beneath a waste storage area, an underground settling tank, and electrical cables and five conduits inside an underground electrical vault. The settling tank was 7.5 feet high with a diameter of about 8 feet and contained about 1 foot of thorium sludge in the bottom. The electrical vault was 5 x 5 x 8 feet and contained about 1.5 feet of thorium sludge on the bottom. Contamination in the settling tank and electrical vault was discovered late in the process of decommissioning; contamination within the electrical vault was not anticipated because it was not involved in the processing or application of the thorium.

About 600 millicuries of thorium was removed during decommissioning; the decommissioning project generated a total of about 3800 ft^3 of low-level radioactive waste, which was sent offsite to a licensed low-level waste disposal facility. Contamination on the surface of the electrical cables three feet underground feeding the electrical vault was about 22,000 disintegrations per minute (dpm) beta-gamma per 100 cm^2. After covering with plastic to contain any removable contamination, the surface activity was lowered to about 14,000 dpm/100 cm^2. The conduit entrances measured up to 9600 dpm direct beta-gamma/100 cm^2. Soils beneath the waste storage area are contaminated with thorium up to 500 pCi/g.

economical to remove the contaminated soils during decommissioning, NRC indicated that *in situ* disposal of the thorium-contaminated soils would be acceptable under existing NRC guidance. NRC's 1981 Branch Technical Position (BTP) on *Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations* (46 *FR* 52061; October 23, 1981) allowed disposal of contaminated soils under Option 4 up to 500 pCi/g for natural thorium with appropriate deed restrictions in areas zoned for industrial use only.

Consistent with Option 4 of the 1981 BTP, the licensee amended the deed to prohibit (1) excavation below 1 foot without prior approval and (2) construction or occupation of residential or industrial structures or for agricultural purposes. The restricted area has a surface area of approximately 1.3 million ft^2 and includes (1) contaminated subsurface soils outside the building in the waste storage area, (2) contaminated subsurface soils surrounding the buried settling tank, and (3) contaminated electrical cables and conduits in the buried electrical vault. The licensee estimated a worst case annual dose to an inadvertent intruder of about 770 millirem whole body dose above background in the event the person disregarded the area markers and deed restrictions and occupied the site of the contaminated soil for about 19 hours per day.

Current Status

- The State of New Hampshire terminated the license for the site on July 30, 1991

Lessons Learned[1]

- Non-radiological hazards (high voltage) and excavation impacts sometimes may preclude decontamination efforts
- The decommissioning process was hampered by a lack of specific guidance and regulations for acceptable soil contamination limits
- Smaller Agreement State programs may not have sufficient technical expertise to regulate complicated decommissioning projects
- Use of surrogate radionuclide (^{228}Ac for ^{232}Th) in situations where secular equilibrium does not exist needs to be validated on a site-specific basis

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[1]Based on "Decontamination and Decommissioning of Thorium Dioxide Manufacturing Plant," Dennis P. O'Dowd, New Hampshire Department of Public Health Services, Presentation to the Conference of Radiation Control Program Directors Annual Conference, May 1988.

Radium Chemical Company[6]
Woodside, New York

Decommissioning Issues

- Radon exposures associated with residual radioactive material
- Disposal of low activity waste from decommissioning in sanitary landfills

Facility Description

The Radium Chemical Company site consists of a one-story brick building located in a light industrial section of Woodside, Queens County, New York. The Radium Chemical Company (RCC) produced luminous paint containing ^{226}Ra beginning in 1913 and later manufactured, leased, and sold ^{226}Ra sources to hospitals, medical centers, and research laboratories. The radium sources were stored on-site in lead containers in a poured concrete vault. Following closure of operations in 1983, RCC abandoned the building leaving behind radium sources, contaminated containers and labware, along with building and soil contamination. From 1988 to 1989, EPA undertook limited emergency removal actions under Superfund to secure the facility and remove radioactive sources.

The site was added to the National Priorities List for remediation under Superfund based on a health advisory issued by the Agency for Toxic Substances and Disease Registry in November 1989. The primary current radiological concern involves radium-contaminated building surfaces and components, hazardous wastes, and soil. Present and future potential exposures are primarily associated with direct gamma exposure and exposure via ingestion/inhalation within the facility.

Nature and Extent of Contamination

The one-acre site houses a one-story brick building with a floor area of 10,000 ft^2. RCC leased about 7220 ft^2 of the building. A detailed survey indicated 19 hotspots with elevated dose rate readings, including 15 hotspots in the source vault. A hotspot is defined in this project as an area that measures more than:

(1) 10 millirem/hr at a distance of 1 cm from the surface,

(2) 100,000 disintegrations per minute (dpm) per 100 cm^2 of removable alpha contamination, or

(3) 250,000 dpm per 100 cm^2 removable beta contamination.

The highest hotspot inside the source vault measures 200 millirem/hr at 1 cm. The maximum surface contamination within the source vault was 847,000 dpm/100 cm^2 of removable beta contamination. The highest removable beta contamination outside the source vault was 483,000 dpm/100 cm^2.

Decommissioning Criteria

The objective of the remediation is to reduce contamination to a level that will permit release of the site for unrestricted use without generating an excessive amount of radium waste in the process. The criteria to be applied in this remediation include the following:

(1) EPA's 5 pCi ^{226}Ra/g standard for contaminated soils and materials (based on EPA standards for uranium mill tailings cleanup in 40 CFR Part 192),

(2) EPA's 4 pCi/l action level for ^{222}Rn in indoor air,

(3) Gamma exposure rate no greater than 20 μR/hr above background (based on 40 CFR Part 192 and EPA guidance), and

(4) Acceptable surface contamination levels from NRC's Regulatory Guide 1.86 for removable, and maximum and average surface activity.

Decommissioning Approach

EPA considered 4 alternative remedies to cleanup the contamination at the RCC site, including: (1) no action, (2) total decontamination of the facility (e.g., building surfaces, underground piping, sewer lines, and soil) and disposal of radioactive waste offsite, (3) complete dismantling and removal of the contaminated material and its disposal at a radioactive waste disposal facility, and (4) partial decontamination and dismantling of the facility. EPA selected Alternative 4 with the objective of releasing the site for unrestricted use. This alternative provides the best balance of time for completion, volume of contaminated waste, risk to workers, state and public acceptance, and cost.

EPA conducted partial decontamination by first removing hot spots contaminated with ^{226}Ra to reduce worker exposure and the risk of spreading contamination during dismantling. Building masonry with ^{226}Ra concentrations less than 5 pCi/g was disposed of in a sanitary landfill to reduce the volume and cost of waste disposal in a radioactive waste disposal facility. Although the New York State Department of Labor prohibits disposal of wastes containing more than 0.1 pCi/g ^{226}Ra in a sanitary landfill or as *in situ* soil, the agency agreed to waive the requirement due to the technical difficulty in achieving this level because of background levels and the substantial increase in cost associated with disposal of such wastes at licensed disposal facilities.

EPA then dismantled and removed contaminated material, in sequence, from (1) the building interior; (2) roof, windows, and doors; and (3) residual masonry. Contaminated soil above the criter. as excavated and shipped to the Envirocare facility in Tooele County, Utah, or acceptable alternative facility. The projected cost to remediate the site was $18,699,000 and required more than two years to complete.

GTE/Sylvania
Manchester, New Hampshire

Decommissioning Issues

- Long-term reliance on institutional controls for limiting exposure to residual radioactive materials

Facility Description

GTE/Sylvania was licensed by the Atomic Energy Commission in 1965 to use thorium dioxide in coating electrodes for high-intensity light bulbs. These operations were conducted at a manufacturing plant in an industrial area in Manchester, New Hampshire. The thorium was suspended in methanol and vacuum-deposited on the electrodes, which were then cleaned and fired at high temperatures to fuse the coating into a ceramic solid. The electrodes were then encapsulated in gas-tight, fused, silica capsules. GTE/Sylvania continued this process until February 1986, when the facility initiated decommissioning of the thorium operation. The site was licensed by the State of New Hampshire from 1966 until the license was terminated at the conclusion of decommissioning in July 1991.

Nature and Extent of Contamination

Prior to decommissioning, contamination consisted of processed thorium oxide dust (^{232}Th, ^{228}Th, and some decay products) distributed throughout three rooms (light room, chemistry laboratory, and high temperature furnace room (with two high temperature furnaces)). Other contaminated areas included soil beneath a waste storage area, an underground settling tank, and electrical cables and five conduits inside an underground electrical vault. The settling tank was 7.5 feet high with a diameter of about 8 feet and contained about 1 foot of thorium sludge in the bottom. The electrical vault was 5 x 5 x 8 feet and contained about 1.5 feet of thorium sludge on the bottom. Contamination in the settling tank and electrical vault was discovered late in the process of decommissioning; contamination within the electrical vault was not anticipated because it was not involved in the processing or application of the thorium.

About 600 millicuries of thorium was removed during decommissioning; the decommissioning project generated a total of about 3800 ft^3 of low-level radioactive waste, which was sent offsite to a licensed low-level waste disposal facility. Contamination on the surface of the electrical cables three feet underground feeding the electrical vault was about 22,000 disintegrations per minute (dpm) beta-gamma per 100 cm^2. After covering with plastic to contain any removable contamination, the surface activity was lowered to about 14,000 dpm/100 cm^2. The conduit entrances measured up to 9600 dpm direct beta-gamma/100 cm^2. Soils beneath the waste storage area are contaminated with thorium up to 500 pCi/g.

Decommissioning Criteria

The major regulatory criteria applied to cleanup of the GTE/Sylvania included the following:

1. Acceptable surface contamination levels from New Hampshire's "Permissible Levels of Surface Contamination" of 170 dpm/100 cm^2 (removable), 850 dpm/100 cm^2 (average fixed) contamination, and 2450 dpm/100 cm^2 (maximum fixed) surface contamination.

2. Option 4 Concentration Criteria from the 1981 NRC Branch Technical Position (BTP) on *Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations* (46 *FR* 52061; October 23, 1981) - 500 pCi/g for natural thorium.

Decommissioning Approach

When decommissioning of this site began in June 1986, it was expected to be a routine, short-term project. The original goal of the project was to release the site for unrestricted use (i.e., remove and dispose of all thorium contamination to release the site without restriction because of the presence of radioactive material). Decommissioning was significantly complicated, however, by the discovery of the contaminated settlement tank and electrical vault and by proposed reliance on institutional controls to restrict long-term access to contaminated soil beneath the waste storage area. Most of the excavation and radiological survey work was completed by April 1988. The license for the facility was terminated in July 1991.

Decommissioning activities included the following: a detailed characterization survey; removal and packaging of contaminated equipment; dismantling and packaging of entire section of the plant (two chemistry labs, a hallway, two exterior walls, and roof); removal of High Efficiency Particulate (HEPA) filter; cleanup of the surface of the waste storage area; removal of over 100 feet of contaminated pipe; decontamination of the settling tank and electrical vault; decontamination of two high temperature furnaces; soil sampling; entombment of contaminated soil; shipping all waste to low-level radioactive waste disposal facility; final termination survey; and amendment of property deed placing restrictions on long-term use of the contaminated waste storage area.

The licensee stabilized the contaminated soil in place, posted area markers warning of the radioactive contamination, and placed restrictions in the deed rather than to excavate and dispose of the thorium-contaminated soil in the waste storage area and adjacent to the settling tank. A portion of the contaminated land extends beneath the floor of a machine shop. The licensee argued that removal of the contaminated tank and adjacent soils would have been nearly impossible and would have required the demolition of a load-bearing wall and foundation slab. Such demolition and associated waste disposal would have been prohibitively expensive for the licensee. In response to a technical assistance request from the State of New Hampshire, NRC reviewed the proposal to stabilize the soil *in situ*. Although NRC indicated that it would be more protective and, in the long run, more

economical to remove the contaminated soils during decommissioning, NRC indicated that *in situ* disposal of the thorium-contaminated soils would be acceptable under existing NRC guidance. NRC's 1981 Branch Technical Position (BTP) on *Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations* (46 *FR* 52061; October 23, 1981) allowed disposal of contaminated soils under Option 4 up to 500 pCi/g for natural thorium with appropriate deed restrictions in areas zoned for industrial use only.

Consistent with Option 4 of the 1981 BTP, the licensee amended the deed to prohibit (1) excavation below 1 foot without prior approval and (2) construction or occupation of residential or industrial structures or for agricultural purposes. The restricted area has a surface area of approximately 1.3 million ft^2 and includes (1) contaminated subsurface soils outside the building in the waste storage area, (2) contaminated subsurface soils surrounding the buried settling tank, and (3) contaminated electrical cables and conduits in the buried electrical vault. The licensee estimated a worst case annual dose to an inadvertent intruder of about 770 millirem whole body dose above background in the event the person disregarded the area markers and deed restrictions and occupied the site of the contaminated soil for about 19 hours per day.

Current Status

- The State of New Hampshire terminated the license for the site on July 30, 1991

Lessons Learned[1]

- Non-radiological hazards (high voltage) and excavation impacts sometimes may preclude decontamination efforts
- The decommissioning process was hampered by a lack of specific guidance and regulations for acceptable soil contamination limits
- Smaller Agreement State programs may not have sufficient technical expertise to regulate complicated decommissioning projects
- Use of surrogate radionuclide (^{228}Ac for ^{232}Th) in situations where secular equilibrium does not exist needs to be validated on a site-specific basis

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[1]Based on "Decontamination and Decommissioning of Thorium Dioxide Manufacturing Plant," Dennis P. O'Dowd, New Hampshire Department of Public Health Services, Presentation to the Conference of Radiation Control Program Directors Annual Conference, May 1988.

Radium Chemical Company[6]
Woodside, New York

Decommissioning Issues

- Radon exposures associated with residual radioactive material
- Disposal of low activity waste from decommissioning in sanitary landfills

Facility Description

The Radium Chemical Company site consists of a one-story brick building located in a light industrial section of Woodside, Queens County, New York. The Radium Chemical Company (RCC) produced luminous paint containing ^{226}Ra beginning in 1913 and later manufactured, leased, and sold ^{226}Ra sources to hospitals, medical centers, and research laboratories. The radium sources were stored on-site in lead containers in a poured concrete vault. Following closure of operations in 1983, RCC abandoned the building leaving behind radium sources, contaminated containers and labware, along with building and soil contamination. From 1988 to 1989, EPA undertook limited emergency removal actions under Superfund to secure the facility and remove radioactive sources.

The site was added to the National Priorities List for remediation under Superfund based on a health advisory issued by the Agency for Toxic Substances and Disease Registry in November 1989. The primary current radiological concern involves radium-contaminated building surfaces and components, hazardous wastes, and soil. Present and future potential exposures are primarily associated with direct gamma exposure and exposure via ingestion/inhalation within the facility.

Nature and Extent of Contamination

The one-acre site houses a one-story brick building with a floor area of 10,000 ft^2. RCC leased about 7220 ft^2 of the building. A detailed survey indicated 19 hotspots with elevated dose rate readings, including 15 hotspots in the source vault. A hotspot is defined in this project as an area that measures more than:

(1) 10 millirem/hr at a distance of 1 cm from the surface,

(2) 100,000 disintegrations per minute (dpm) per 100 cm^2 of removable alpha contamination, or

(3) 250,000 dpm per 100 cm^2 removable beta contamination.

The highest hotspot inside the source vault measures 200 millirem/hr at 1 cm. The maximum surface contamination within the source vault was 847,000 dpm/100 cm^2 of removable beta contamination. The highest removable beta contamination outside the source vault was 483,000 dpm/100 cm^2.

Decommissioning Criteria

The objective of the remediation is to reduce contamination to a level that will permit release of the site for unrestricted use without generating an excessive amount of radium waste in the process. The criteria to be applied in this remediation include the following:

(1) EPA's 5 pCi $^{226}Ra/g$ standard for contaminated soils and materials (based on EPA standards for uranium mill tailings cleanup in 40 CFR Part 192),

(2) EPA's 4 pCi/l action level for ^{222}Rn in indoor air,

(3) Gamma exposure rate no greater than 20 μR/hr above background (based on 40 CFR Part 192 and EPA guidance), and

(4) Acceptable surface contamination levels from NRC's Regulatory Guide 1.86 for removable, and maximum and average surface activity.

Decommissioning Approach

EPA considered 4 alternative remedies to cleanup the contamination at the RCC site, including: (1) no action, (2) total decontamination of the facility (e.g., building surfaces, underground piping, sewer lines, and soil) and disposal of radioactive waste offsite, (3) complete dismantling and removal of the contaminated material and its disposal at a radioactive waste disposal facility, and (4) partial decontamination and dismantling of the facility. EPA selected Alternative 4 with the objective of releasing the site for unrestricted use. This alternative provides the best balance of time for completion, volume of contaminated waste, risk to workers, state and public acceptance, and cost.

EPA conducted partial decontamination by first removing hot spots contaminated with ^{226}Ra to reduce worker exposure and the risk of spreading contamination during dismantling. Building masonry with ^{226}Ra concentrations less than 5 pCi/g was disposed of in a sanitary landfill to reduce the volume and cost of waste disposal in a radioactive waste disposal facility. Although the New York State Department of Labor prohibits disposal of wastes containing more than 0.1 pCi/g ^{226}Ra in a sanitary landfill or as *in situ* soil, the agency agreed to waive the requirement due to the technical difficulty in achieving this level because of background levels and the substantial increase in cost associated with disposal of such wastes at licensed disposal facilities.

EPA then dismantled and removed contaminated material, in sequence, from (1) the building interior; (2) roof, windows, and doors; and (3) residual masonry. Contaminated soil above the criteria was excavated and shipped to the Envirocare facility in Tooele County, Utah, or acceptable alternative facility. The projected cost to remediate the site was $18,699,000 and required more than two years to complete.

Current Status of Site

Decontamination and dismantlement of the site is essentially complete. EPA is currently investigating contamination of a sewer line at the site and assessing the associated extent of contamination and risk. If the risk is excessive and removal can be justified, EPA may excavate the sewer line and any associated contamination soil and dispose of it consistent with the criteria used in the rest of the project. EPA may also consider applying supplemental standards in evaluating the contaminated sewer line.

Lessons Learned

- It was difficult to identify and select appropriate cleanup criteria for the site that satisfied all parties; the delays caused by this difficulty significantly complicated conduct of the remedial action

- Selection of cleanup criteria was complicated by the fact that the lifetime cancer risk from background radiation at the site (in excess of 10^{-3}) exceeded EPA's acceptable risk range in the Superfund Program (10^{-4} to 10^{-6}, with 10^{-6} as the point of departure)

- Selection of cleanup criteria was complicated because a suitable methodology did not exist for translating acceptable cleanup criteria for groundwater contamination to soil concentrations

- NRC Regulatory Guide 1.86 has only limited applicability in the remediation because it applies to surface contamination only and its values were not determined on a consistent dose or risk basis

BOMARC Missile Accident Site
McQuire Air Force Base
Ocean County, New Jersey

Decommissioning Issues

- Dependence of preferred remedial action on the availability of affordable waste disposal capacity
- Relationship between the volume of contamination and the cost of the decommissioning action
- Viability of long-term institutional controls to restrict access to contaminated materials

Facility Description

Boeing Michigan Aeronautical Research Center (BOMARC) Missile Site was an active defensive nuclear missile installation from 1958 until 1972. The facility housed missiles equipped with nuclear warheads on a 218 acre site in south-central New Jersey about 18 miles southeast of Trenton (see Figure 1). On June 7, 1960, a fire occurred in one of the onsite shelters housing a missile. The shelter, missile, missile launcher, and warhead were partially consumed by fire. Weapons grade plutonium (WGP) from the nuclear warhead was dispersed to soils and structures in the immediate vicinity of the missile shelter. The material was dispersed by the fire itself as well as the 30,000 gallons of water applied to control the fire for approximately 15 hours. The Air Force reports that no more than 300 grams of WGP was unaccounted for at the time of the accident. Soon after the accident the Air Force fixed the residual contamination in place by applying fixative paint, concrete, and asphalt over the contaminated areas, including the drainage ditch that conducted contaminated runoff during the accident.

The site is being cleaned up by the Air Force under the Installation Restoration Program Element of the Defense Environmental Restoration Program. The Environmental Protection Agency (EPA) is monitoring cleanup activities at the site in a manner similar to a Superfund site cleanup. The Air Force signed a Record of Decision selecting the preferred remedial action in November 1992.

Nature and Extent of Contamination

No concentrations of radionuclides attributable to the missile accident were detected in groundwater, surface water, or air at the site. The contaminants of concern (^{239}Pu and ^{241}Am) have been detected in numerous radiological surveys in site soils, sediments, missing missile launcher, and structural materials at the site. ^{240}Pu, ^{241}Pu, and ^{238}Pu will also be present, but at less significant concentrations. The contamination in the soil appears to be limited to the uppermost foot of soil and is concentrated in discrete "hot spots." The soil contamination does not appear to have migrated vertically

downward more than a few inches since the accident. Surface activity surveys of the missile shelter and utility bunkers indicated alpha surface activities up to 80,000 counts per minute per 100 cm^2. Cores through the concrete floor of the missile shelter indicate plutonium levels within the concrete as high as 65 μCi/sample. About 208,000 ft^3 of contaminated soil and material is estimated to be above the applicable cleanup criteria, although additional material may be discovered during the course of excavation and remediation (see Figure 2). For example, the missing missile launcher and shelter doors may have been disposed of onsite and would likely be removed during remediation.

Decommissioning Criteria

The Air Force developed a site-specific cleanup standard for Pu in soil assuming that people may live on the site at some time in the future. The cleanup standard of 8 pCi/g of ^{239}Pu was calculated using the computer code RESRAD based upon a lifetime risk objective of 10^{-4} cancer risk consistent with current EPA guidance for the Superfund program. The Air Force also proposes to apply the criteria for acceptable surface activity from NRC's Regulatory Guide 1.86 for remediation of the missile shelter, utility bunker, and other structures contaminated on their exterior surfaces. For alpha contamination, these criteria would be <20 dpm/100 cm^2 removable activity, <300 dpm/100 cm^2 maximum fixed activity, and <100 dpm/100 cm^2 average fixed activity.

Decommissioning Approach

The Air Force considered five alternative remedial actions for the contamination: (1) unrestricted access, (2) institutional control, (3) institutional control with removal of specific materials (e.g., missile launcher), (3) onsite treatment of soils and structures and disposed of contaminated material off site in a radioactive waste disposal facility, and (5) removal of all contaminated material above criteria for offsite disposal at a radioactive waste disposal facility. The Air Force selected Alternative #5 (Offsite disposal) because it was cost-effective, permanent, and environmentally preferred. This alternative includes

- Excavation of contaminated soils containing greater than 8 pCi/g of Pu
- Excavation and sectioning of contaminated portions of the concrete apron, utility bunkers, and missile shelter
- Excavation and removal (if found) of the missile launcher
- Containerization, transport, and disposal of contaminated materials in an off-site radioactive waste disposal facility operated by the Department of Energy (DOE)
- Restoration of the site by backfilling with clean fill, grading, and revegetation.

The cost of the preferred remedial action is $7 million if disposal is allowed at a DOE disposal facility; commercial disposal would increase the cost to at least $24 million.

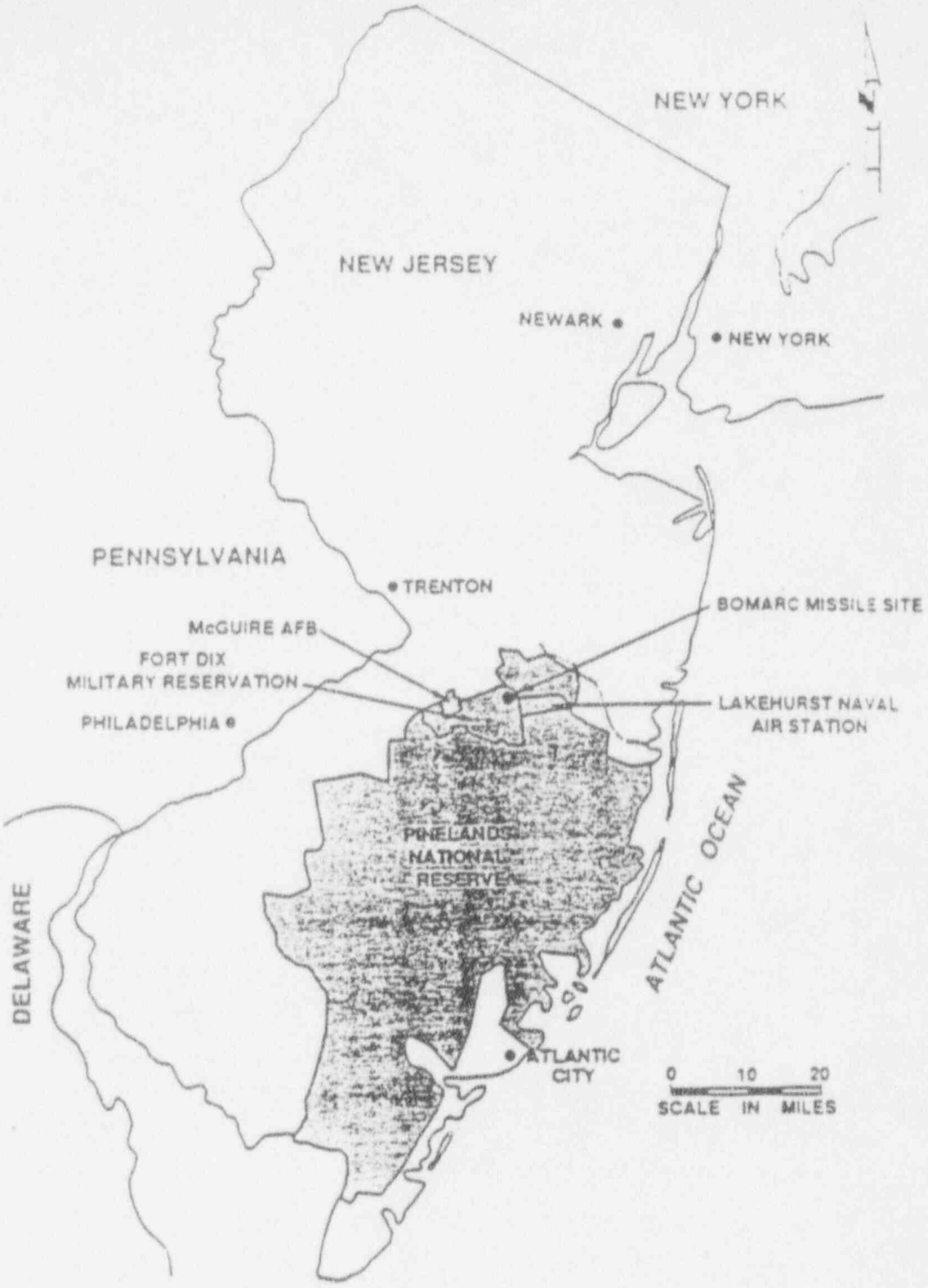
The Air Force's selection of the preferred alternative is contingent on its cost-effectiveness. If it becomes no longer cost-effective, the Air Force proposes to retain institutional control over the contaminated area, thereby eliminating the only significant route of exposure. This alternative includes monitoring, maintenance, and access control actions currently being conducted at the site.

Current Status of Site

The Air Force is presently continuing to monitor the site and restrict access to contaminated portions awaiting resolution of the issues associated with waste disposal.

Lessons Learned

- Limited availability of disposal capacity for low-level radioactive waste after January 1, 1993 and lack of DOE consent to accept waste for disposal has delayed initiation of the remedial action
- Multiple regulatory reviews by government agencies and the public resulted in late-stage comments that could not reasonably be resolved without delaying the project
- Lack of acceptable cleanup criteria for plutonium delayed progress in remediation until the Air Force developed and negotiated a criterion with State and Federal agencies
- The State disagreed with the Federal agencies (Air Force and EPA) on acceptable risk basis for developing the cleanup criterion for Pu; the State preferred 10^{-6}, while the Federal agencies preferred a cleanup standard based on 10^{-4} lifetime risk. Another group, the Pinelands Commission, asserts that the cleanup criterion should be background, unless the Air Force can demonstrate no adverse impacts on surface water or groundwater quality



Source: Battelle, 1988.

Figure 1. Location of the BOMARC Missile Site (Reference: *Record of Decision: BOMARC Missile Accident Site, McQuire Air Force Base, New Jersey*, U.S. Air Force, November 1992, pg. 15)

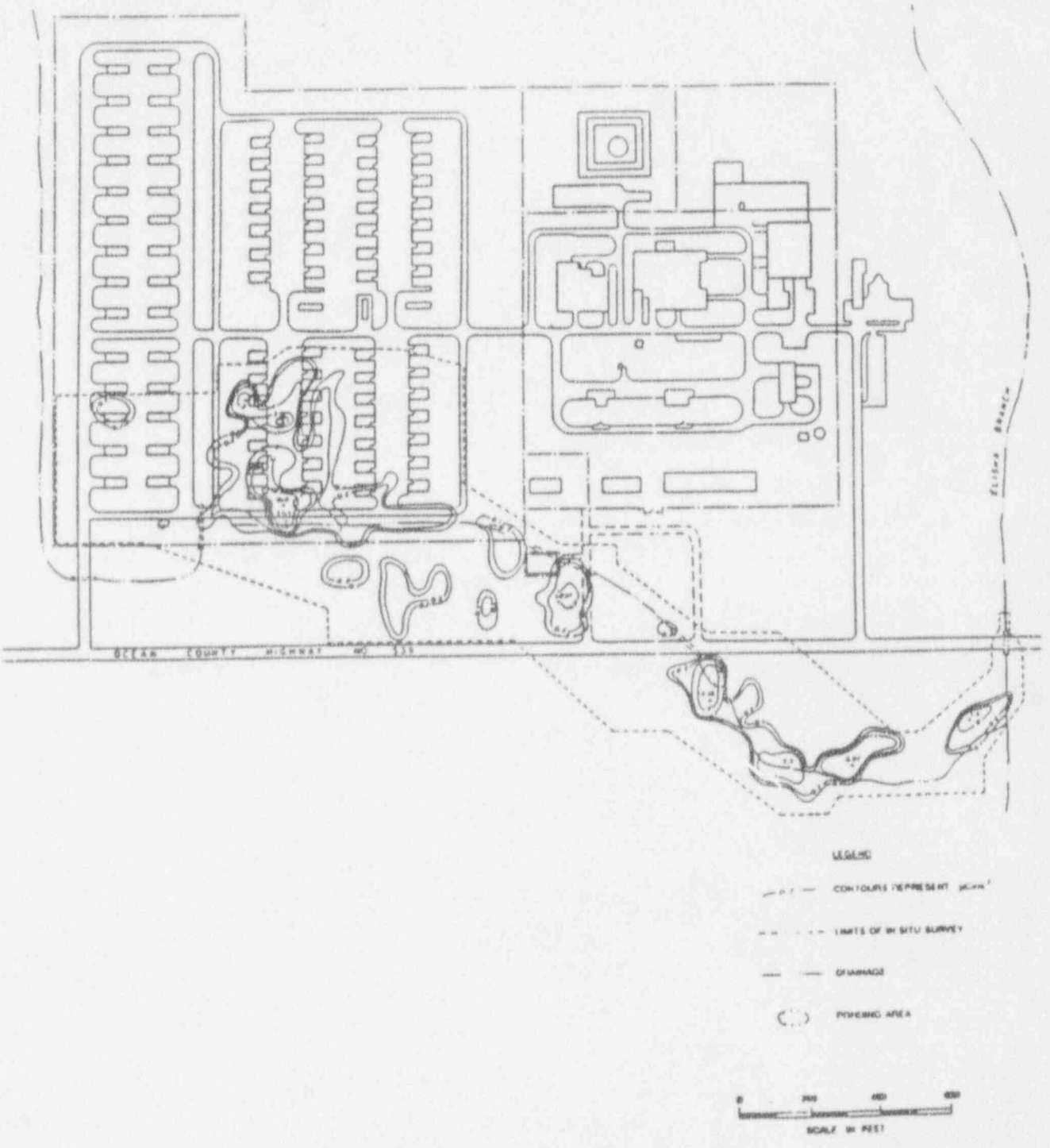


Figure 2. Extent of Radiological Contamination at the BOMARC Site (Reference: *Record of Decision: BOMARC Missile Accident Site, McGuire Air Force Base, New Jersey*, U.S. Air Force, November 1992, p. 32)

INTERNATIONAL DECOMMISSIONING ACTIVITIES

Activities related to radiological criteria for decommissioning are occurring both in other countries and in international forums such as the International Atomic Energy Agency (IAEA). In general, the current practice is to derive decommissioning criteria on a case-by-case basis, usually using the guidance of the IAEA Safety Series No. 89, "Principles for the Exemption of Radiation Sources and Practices from Regulatory Control." The IAEA guidance is risk-based and uses exposure to natural background as a reference level. It concludes that the level of trivial individual effective dose equivalent would be on the order of some 10's of μSv [a few mrem] per year, however in consideration of multiple sources of exposure the recommendation is 10 μSv [1 mrem] in a year from each exempt practice. This assumes the practice selected is considered optimal i.e., As Low As is Reasonably Achievable (ALARA). A practice is assumed to be optimal if the estimated collective dose is less than 1 person-Sievert/y (100 person-rem/y). The IAEA's examples of practices did not include the unrestricted use of lands and structures after decommissioning but did include consumer products, waste, and recycle--reuse of materials.

During November 1990, the IAEA convened a group of consultants to develop a draft Technical Report entitled, "Criteria for Unrestricted Release of Facilities, sites or Materials from Decommissioning." That work is on hold pending the completion of the technical basis and methodology being developed for the publication of NUREG/CR-5512, "Residual Radioactive Contamination From Decommissioning: Technical Basis for Translating Contamination Levels to Annual Dose." Separate IAEA consultants and advisory group meetings in November 1991 and June 1992, and produced a draft document, "National Policies and Regulations for Decommissioning Nuclear Facilities." This latter document is still early in its development and will require further work before it is suitable for distribution as a draft. Another consultants meeting was held in Vienna, Austria in December 1992 to work on the draft.

In a related area, there has been a recent focus upon waste disposal and recycle at the IAEA. The criterion is typically set at 10 μSv [1 mrem] per year based on the IAEA Safety Series No. 89 guidance. This work relates to decommissioning criteria to the extent that materials left on site after decommissioning, at some subsequent time, may be freely disposed or recycled or reused without restriction. An IAEA advisory group, in which the NRC is participating, is currently developing a draft document, "Exemption From Regulatory Control Recommended Unconditional Exempt Levels For Solid Radioactive Materials." This document is also in an early stage of development and is not ripe for general distribution as a draft.

Residual contamination limits for decommissioning have been developed in several European countries based on the guidance in IAEA Safety Series No. 89. The most extensive information in the literature is on decommissioning in the Federal Republic of Germany (FRG) where residual contamination limits have

been incorporated into radiation protection ordinances. However, these ordinances are treated more as guidance to be applied, as appropriate, on a case-by-case basis rather than as regulations. In the FRG approximately 28% of the electrical power is generated by 20 operating nuclear power plants. Thirteen prototype nuclear power plants have been shut down and are in various stages of decommissioning. In addition several research reactors have been taken out of service. Estimates of total decommissioning wastes from all nuclear installations in FRG before unification range from 90,000 to 120,000 m^3. However, by the year 2000 only about 10,000 m^3 of decommissioning waste is expected to accumulate.[1]

Decommissioning in the FRG is being carried out on a case-by-case basis using the following residual contamination guidelines. Surface contamination limits may not exceed 0.37 Bq/cm^2 (10 pCi/cm^2) beta-gamma and 0.037 Bq/cm^2 (1 pCi/cm^2) alpha, and specific activity limits may not exceed 3.7 Bq/g (100 pCi/g).[2,3,4] Recycle of contaminated materials from nuclear installations is encouraged. The preferable option is to recycle this material within the nuclear industry. If this cannot be done for technical or economic reasons, recycle outside the nuclear industry is allowed if, in accordance with the principals in IAEA Safety Series No. 89, individual risks are sufficiently low as not to warrant regulatory concern.

In France most nuclear facilities are owned by the French government through various public companies and organizations. Currently 75% of the electric power is generated by 50 operating nuclear power plants. There are presently no specific regulatory criteria in place for decommissioning of nuclear facilities. However, in practice France has adopted an early CEC recommendation of 100 Bq/g (2700 pCi/g) as a residual contamination limit in cases where only small total quantities of radioactive material have been involved.[5] [The French are developing recommended residual contaminated limits for CEC under contract] Case-by-case determinations are apparently

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[1] G. Wolany, L. Weill, R. Gortz, "Regulatory aspects of Decommissioning in the Federal Republic of Germany", International Seminar on Decommissioning Policies, Paris, October 2-4, 1991.

[2] Meis, H.P., Stang, W., "Decommissioning of Nuclear Power Plant Gundremmingen Unit A," 1987 International Decommissioning Symposium, Pittsburgh, PA, October 1987.

[3] Hoffman, R., Leidenberger, B., "Optimization of Measurement Techniques for very Low Level Radioactive Waste Material," 1989 International Conference on the Decommissioning of Nuclear Installations, Commission of the European Communities, Brussels, October 1989.

[4] Hempelmann, W., "Treatment of Waste Metals from Decommissioning," Pittsburgh, PA, October 1987.

[5] Chapuis, A.M., Guetat, P., Garbay, H.. "Exemption limits for the Recycling of Materials form the Dismantling of Nuclear Installations," 1987 International Decommissioning Symposium, Pittsburgh, PA, October 1987.

made in situations where large total quantities of radioactive materials are involved.

In the United Kingdom residual radioactivity criteria for decommissioning is developed on a case-by-case basis using the general principals set out in IAEA Safety Series No. 89.

In Finland there is a federal guide for disposal or recycle of wastes from nuclear facilities.[6] The guide adopts the dose guidelines from IAEA Safety Series No. 89 and applies the following activity constraints to unrestricted exemption: (a) Total activity concentration of 1 kBq/kg of beta or gamma activity or 100 Bq/kg of alpha activity averaged over a maximum of 1000 kg of waste, and (b) total non-fixed surface contamination (averaged over 0.1 m^2 for accessible surfaces) of 4 kBq/m^2 of beta or gamma activity or 400 Bq/m^2 of alpha activity. The guide does not specifically address whether the guidelines apply to lands and structures.

In general, disposal or recycle in European countries of materials (including lands and structures) containing residual radioactivity is carried out in accordance with the principals for limiting radiation dose to members of the public set out in IAEA Safety Series No. 89. However, specific national guidelines derived from these principles (and expressed in terms of residual radioactivity in materials to be released for unrestricted release) have so far been developed principally for recycle of materials from nuclear power plants. Current practice in most European countries is to derive residual radioactivity criteria for lands and structures on a case-by-case basis using the general principals set out in IAEA Safety Series No. 89.

The Commission of European Communities (CEC) has recommended clearance levels for mass and/or surface activity concentration for recycle of materials from dismantling of nuclear installations, based on generic assessment of individual and collective doses from recycle and use of the material.[7] There are presently no CEC guidelines for unrestricted release of lands and structures. However, the CEC preparing guidelines which are expected to be in place in 1994. Individual member countries would then be expected to adopt these guidelines.

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[6] YVL-Guide 8.2 "Exemption from Regulatory Control of Nuclear Wastes," 2nd Revised Edition, January 5, 1992, Finnish Centre for Radiation and Nuclear Safety, Helsinki, Finland.

[7] Radiation Protection No. 43 "Radiological Protection Criteria for the Recycling of Materials From Dismantling of Nuclear Installations," p 17, Commission of the European Communities", Luxembourg, November 1988.

NRC SITE CLEANUP CRITERIA WORKSHOP
Draft Agenda
(As of January 19, 1993)

WEDNESDAY, JANUARY 27, 1993

9:00 Coffee

9:30 Welcome and Background

Enhanced Participatory Rulemaking and the Establishment of Site Cleanup Criteria -- Chip Cameron, NRC

* What is the Enhanced Participatory Rulemaking Process and why has NRC selected it?

* Why does NRC want to develop cleanup criteria?

9:50 EPA activities regarding the establishment of site cleanup criteria -- Allan Richardson, EPA

* What are the key EPA activities and timeframe?

* In what ways is EPA interacting with NRC?

10:00 Workshop Format -- Michael Lesnick, Barbara Stinson and Connie Lewis, The Keystone Center

* What are the goals and objectives?

* What is the agenda?

* What are the groundrules for conducting the workshop and what is the role of the facilitators?

10:10 Participant Introductions

* Name, affiliation, and location

* Two important issues for discussion in the workshop

11:00 Break

11:15 Decommissioning Process -- Michael Weber, NRC

* What is decommissioning?

* What licensed facilities are affected?

11:30 Brief Review of the Issues Paper and International Standards -- Don Cool, NRC

11:45 Public Comment

12:00 noon Lunch (on your own)

12:45 Introductory Discussion

* The Rulemaking Issues paper identifies four possible fundamental objectives which could serve as the basis for a regulatory approach to site cleanup standards. The four fundamental objectives reflect alternative regulatory approaches to the development of decommissioning standards, either separately or in some combination with one another. What are the relative advantages and disadvantages of developing generic standards through rulemaking as opposed to continuing the present case-by-case approach?

1:45 Cross-cutting Issues Discussion - A discussion of the cross-cutting issues that can be used to compare and contrast the alternative regulatory approaches for developing cleanup standards

* In what ways do the alternative regulatory approaches protect human health, safety and the environment?

  -- How will populations(s) and individuals(s) be protected, in what locations, and over what timeframe? What are the relative merits of each alternative regulatory approach?

  -- What level(s) of health protection should be sought? What are the relative merits of each alternative regulatory approach in terms of achieving this level?

  -- Should a separate set of standards be established to protect natural systems? If so, how?

3:15 Public Comment

3:30 Break

3:45 Cross-Cutting Issues Discussion (continued)

* What technical capabilities are necessary and available for use in the alternative regulatory approaches?

  -- What technical capabilities would be needed to implement the approaches (e.g., remediation, site characterization, modelling, regulatory review, measurement, and monitoring)?

  -- Specifically, what cleanup technologies for lands, structures, and groundwater would be needed to implement the approach?

  -- Are these technological and technical capabilities currently available? Are they expected and, if so, when?

5:15 Public comment

5:45 Summary and Adjournment

THURSDAY, JANUARY 28, 1993

8:00 Coffee

8:30 Cross-Cutting Issues Discussion (continued)

* How do the alternative regulatory approaches relate to existing federal, regional, state and local regulatory frameworks?

  -- To what extent do the alternative regulatory approaches achieve long-term, regulatory stability? What should be the effect of new standards or information on prior decommissioning actions?

  -- Does each alternative regulatory approach facilitate regulatory compliance?

  -- Does each provide sufficient incentives for timely and effective decommissioning?

  -- Will there be cases where release for "unrestricted use" may be difficult to achieve? How should these situations be addressed?

10:00 Public comment

10:15 Break

10:30 Cross-Cutting Issues Discussion (continued)

* To what extent should cost and other implementation considerations, including nonradiological risks and costs, be considered in selecting a regulatory approach for the standards?

  -- What are the implementation considerations, including cost, that relate to alternative regulatory approaches?

  -- What weight should be given to these considerations in selecting a regulatory approach?

  -- How do each of the alternative regulatory approaches affect the types and distributions of costs and benefits?

  -- If a cost-benefit approach is used, what cost and benefits should be considered? Should individual or population (or both) doses be considered? If costs are balanced against dose averted, what value should be used in evaluating the ratio?

12:00 Public Comment

12:15 Lunch (on your own)

1:00 Cross-Cutting Issues Discussion (continued)

* What are the waste management implications of each alternative regulatory approach?

  -- How do each of the alternative regulatory approaches relate to the quantity and types of wastes produced?

  -- To what extent would each alternative regulatory approach transfer the risk to another medium or population?

  -- How should each alternative regulatory approach apply to former waste disposals?

  -- To what extent does each alternative regulatory approach address other options for waste management, including recycling and reuse?

2:30 Public Comment

2:45 Break

3:00 Other Key Issues (remaining issues not already covered)

  -- How should the standards address the effect of radon releases?

  -- Should criteria be established for protecting specific pathways or resources (e.g., groundwater)?

4:00 Public Comment and Summary of Workshop Issues

4:30 Adjourn

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Enclosure G

NRC Site Cleanup Criteria Workshops
January 27-28, 1993
Chicago, Illinois
(As of January 19, 1993)

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ENCLOSURE H - RULEMAKING SCHEDULE

WORKSHOPS AND COMMENT PERIOD COMPLETE -- 5/28/93

NOTICE OF INTENT TO PREPARE GENERIC ENVIRONMENTAL IMPACT STATEMENT (GEIS); REQUEST FOR COMMENTS ON SCOPE OF GEIS -- 6/4/93

PUBLIC SCOPING MEETING ON GEIS -- 6/30/93

SCOPING PROCESS COMPLETE -- 7/15/93

NRC SUMMARY OF WORKSHOP COMMENTS COMPLETE -- 7/1/93

REGULATORY ANALYSIS COMPLETE -- 10/93

DRAFT GEIS COMPLETE -- 10/93

DRAFT REGULATORY GUIDE ON DEMONSTRATING COMPLIANCE WITH THE REGULATION COMPLETE -- 10/93

STAFF REVIEW AND CONCURRENCE ON DRAFT PROPOSED RULE AND SUPPORTING DOCUMENTS -- 11/93

STAFF REVIEW AND CONCURRENCE COMPLETE -- 2/94

DRAFT PROPOSED RULE AND SUPPORTING DOCUMENTS TO EDO -- 3/94

DRAFT PROPOSED RULE AND SUPPORTING DOCUMENTS TO COMMISSION -- 4/94

PROPOSED RULE AND SUPPORTING DOCUMENTS PUBLISHED FOR PUBLIC COMMENT -- 5/94

PUBLIC COMMENT PERIOD ENDS -- 7/94

FINAL RULE AND SUPPORTING DOCUMENTS -- 5/95