U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

NUREG-1814, Rev. 2

Status of the Decommissioning Program

2008 Annual Report

Final Report

Office of Federal and State Materials and
Environmental Management Programs

AVAILABILITY OF REFERENCE MATERIALS IN NRC PUBLICATIONS

NRC Reference Material

As of November 1999, you may electronically access NUREG-series publications and other NRC records at NRC's Public Electronic Reading Room at http://www.nrc.gov/reading-rm.html. Publicly released records include, to name a few, NUREG-series publications; *Federal Register* notices; applicant, licensee, and vendor documents and correspondence; NRC correspondence and internal memoranda; bulletins and information notices; inspection and investigative reports; licensee event reports; and Commission papers and their attachments.

NRC publications in the NUREG series, NRC regulations, and *Title 10, Energy*, in the Code of *Federal Regulations* may also be purchased from one of these two sources.

1. The Superintendent of Documents
   U.S. Government Printing Office
   Mail Stop SSOP
   Washington, DC 20402-0001
   Internet: bookstore.gpo.gov
   Telephone: 202-512-1800
   Fax: 202-512-2250
2. The National Technical Information Service
   Springfield, VA 22161-0002
   www.ntis.gov
   1-800-553-6847 or, locally, 703-605-6000

A single copy of each NRC draft report for comment is available free, to the extent of supply, upon written request as follows:

Address: U.S. Nuclear Regulatory Commission
Office of Administration
Mail, Distribution and Messenger Team
Washington, DC 20555-0001
E-mail: DISTRIBUTION@nrc.gov
Facsimile: 301-415-2289

Some publications in the NUREG series that are posted at NRC's Web site address http://www.nrc.gov/reading-rm/doc-collections/nuregs are updated periodically and may differ from the last printed version. Although references to material found on a Web site bear the date the material was accessed, the material available on the date cited may subsequently be removed from the site.

Non-NRC Reference Material

Documents available from public and special technical libraries include all open literature items, such as books, journal articles, and transactions, *Federal Register* notices, Federal and State legislation, and congressional reports. Such documents as theses, dissertations, foreign reports and translations, and non-NRC conference proceedings may be purchased from their sponsoring organization.

Copies of industry codes and standards used in a substantive manner in the NRC regulatory process are maintained at—

The NRC Technical Library
Two White Flint North
11545 Rockville Pike
Rockville, MD 20852-2738

These standards are available in the library for reference use by the public. Codes and standards are usually copyrighted and may be purchased from the originating organization or, if they are American National Standards, from—

American National Standards Institute
11 West 42nd Street
New York, NY 10036-8002
www.ansi.org
212-642-4900

Legally binding regulatory requirements are stated only in laws; NRC regulations; licenses, including technical specifications; or orders, not in NUREG-series publications. The views expressed in contractor-prepared publications in this series are not necessarily those of the NRC.

The NUREG series comprises (1) technical and administrative reports and books prepared by the staff (NUREG-XXXX) or agency contractors (NUREG/CR-XXXX), (2) proceedings of conferences (NUREG/CP-XXXX), (3) reports resulting from international agreements (NUREG/IA-XXXX), (4) brochures (NUREG/BR-XXXX), and (5) compilations of legal decisions and orders of the Commission and Atomic and Safety Licensing Boards and of Directors' decisions under Section 2.206 of NRC's regulations (NUREG-0750).

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

NUREG-1814, Rev. 2

Status of the Decommissioning Program

2008 Annual Report

Final Report

Manuscript Completed: February 2009
Date Published: February 2009

Prepared by
R. Chang
G. Gnugnoli

Office of Federal and State Materials and
Environmental Management Programs

ABSTRACT

This report provides a comprehensive overview of the Decommissioning Program of the U.S. Nuclear Regulatory Commission (NRC). Its purpose is to provide a stand-alone reference document that describes the decommissioning process and summarizes the status of decommissioning activities, under NRC and Agreement State jurisdiction, from October 1, 2007, through September 30, 2008.

PAPERWORK REDUCTION ACT STATEMENT

The information collections contained in this NUREG are covered by the requirements of Title 10 of the Code of Federal Regulations, Parts 19, 20, 30, 33, 34, 35, 36, 39, 40, 51, 70, 72, and 150, which the Office of Management and Budget (OMB) has approved, approval numbers 3150-0044, 0014, 0017, 0015, 0007, 0010, 0158, 0130, 0020, 0021, 0009, 0132, and 0032.

PUBLIC PROTECTION NOTIFICATION

If a means used to impose an information collection does not display a currently valid OMB control number, NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

CONTENTS

ABSTRACT iii
ACKNOWLEDGEMENTS vi
ABBREVIATIONS vii
1. Introduction 1
2. Decommissioning Sites 3
    2.1 Nuclear Power Reactor Decommissioning 3
        2.1.1 Decommissioning Process 4
        2.1.2 Summary of Fiscal Year 2008 Activities 6
    2.2 Research and Test Reactor Decommissioning 9
        2.2.1 Decommissioning Process 9
        2.2.2 Summary of Fiscal Year 2008 Activities 11
    2.3 Complex Material Facility Decommissioning 13
        2.3.1 Decommissioning Process 13
        2.3.2 Summary of Fiscal Year 2008 Activities 16
    2.4 Uranium Recovery Facility Decommissioning 22
        2.4.1 Uranium Recovery Title II Facility Decommissioning Process 23
        2.4.2 Summary of Fiscal Year 2008 Activities 26
    2.5 Fuel Cycle Facility Decommissioning 30
        2.5.1 Fuel Cycle Facility Decommissioning Process 30
        2.5.2 Summary of Fiscal Year 2008 Activities 30
3. Guidance and Rulemaking Activities 31
4. Research Activities 33
5. International Activities 35
6. Program Integration 37
7. Agreement State Activities 39
8. Resources 47
9. Fiscal Year 2009 Planned Programmatic Activities 49

Tables

Table 2-1 Power Reactors Undergoing Decommissioning 7
Table 2-2 Research and Test Reactors Undergoing Decommissioning 12
Table 2-3 Complex Decommissioning Sites 19
Table 2-4a Decommissioning Title I Uranium Recovery Sites 27
Table 2-4b Decommissioning Title II Uranium Recovery Sites 29
Table 7-1 Agreement State Decommissioning Sites 40

ACKNOWLEDGEMENTS

This report is a compilation of information from several U.S. Nuclear Regulatory Commission Offices. As such, many individuals provided assistance in the development and review of this NUREG report.

Participants:

Merritt Baker
Larry Camper
Lydia Chang
Randy Erickson
Harry Felsher
John Hull
Donna Janda
Robert Johnson
James Kottan
James Lynch
Keith McConnell
Linda McLean
Dominick Orlando
Kevin O' Sullivan
William Ott
Dennis Sollenberger
Anthony Williams

Agreement State Participants:

David Allard
Karen Beckley
Mike Broderick
Lee Cox
Jack Ferruolo
Aaron Gantt
Stephen M. Gavitt
Johnny Graves
Aubrey Godwin
Dan E. Harman
John Hultquist
Susan Jablonski
George Johns
Twila M. Kenna
Terry D. Lindsey
Ray Manley
Gary McCandless
Chuck McCracken
Matthew W. McKinley
John Parker
Gonzalo Perez
Melanie Rasmusson
Richard Ratliff
Cheryl K. Rogers
Cynthia Sanders
Julia Schmitt
Shawn Seeley
B. J. Smith
Dorothy Stoffel
Steve Tarlton
Jared Thompson
Ann Troxler
Paul Vause
Michael Whalen
Kirksey Whatley
David J. Whitfill

ABBREVIATIONS

ACL	alternate concentration limit
AEC	Atomic Energy Commission
BRAC	Base Realignment and Closure Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	*Code of Federal Regulations*
CRCPD	Conference of Radiation Control Program Directors
DECON	decontamination
DeSa	International Project on Evaluation and Demonstration of Safety for Decommissioning of Nuclear Facilities (IAEA)
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOS	U.S. Department of State
DP	decommissioning plan
DU	depleted uranium
DWMEP	Division of Waste Management and Environmental Protection
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FCSS	Division of Fuel Cycle Safety and Safeguards
FONSI	Finding of No Significant Impact
FSME	Office of Federal and State Materials and Environmental Management Programs
FSSR	Final Status Survey Report
FTE	full-time equivalents
FUSRAP	Formerly Utilized Sites Remedial Action Program
FY	fiscal year
GETR	General Electric-Hitachi Test Reactor
HPS	Hunters Point Shipyard
IAEA	International Atomic Energy Agency
IDIP	Integrated Decommissioning Improvement Plan
ISFSI	independent spent fuel storage installation

ISL	in situ leach
LTP	license termination plan
LTR	License Termination Rule
LTSP	long-term surveillance plan
N/A	not applicable
NARM	naturally occurring and accelerator-produced radioactive material
NASA	National Aeronautics and Space Administration
NEA	Nuclear Energy Agency
NMSS	Office of Nuclear Material Safety and Safeguards
NPL	National Priority List
NRC	U.S. Nuclear Regulatory Commission
OAS	Organization of Agreement States
PSDAR	Post-Shutdown Decommissioning Activities Report
RAI	request for additional information
RES	Office of Nuclear Regulatory Research
ROD	Record of Decision
RP	reclamation plan
RWMC	Radioactive Waste Management Committee
SADA	Spatial Analysis and Decision Assistance
SDMP	Site Decommissioning Management Plan
SER	Safety Evaluation Report
SLDA	Shallow Land Disposal Area
TAG	technical advisory group
TBD	to be determined
TER	technical evaluation report
TRIGA	Training, Research, Isotopes General Atomics
UMTRCA	Uranium Mill Tailings Radiation Control Act
USACE	United States Army Corps of Engineers
VESR	Vallecitos Experimental Superheat Reactor
WVDP	West Valley Demonstration Project

1. INTRODUCTION

This report provides a summary of decommissioning of commercial nuclear facilities in the United States. Its purpose is to provide a reference document that summarizes the decommissioning activities in fiscal year (FY) 2008, including the decommissioning of complex materials sites, commercial reactors, research and test reactors, uranium recovery facilities, and fuel cycle facilities. As such, this report discusses current progress and accomplishments of the U.S. Nuclear Regulatory Commission's (NRC's) Comprehensive Decommissioning Program, provides information supplied by Agreement States on decommissioning in their States, and identifies key Decommissioning Program activities that the staff will undertake in the coming year. The information contained in this report is current as of September 30, 2008.

2. DECOMMISSIONING SITES

The NRC regulates the decontamination and decommissioning of materials and fuel cycle facilities, power reactors, research and test reactors, and uranium recovery facilities. The purpose of the Decommissioning Program is to ensure that NRC-licensed sites, and sites that were, or could be, licensed by the NRC, are decommissioned in a safe, timely, and effective manner so that they can be returned to beneficial use and to ensure that stakeholders are informed and involved in the process, as appropriate. This report summarizes a broad spectrum of activities associated with the Program's functions.

Each year, the NRC terminates approximately 200 materials licenses. Most of these license terminations are routine, and the sites require little, if any, remediation to meet the NRC's unrestricted release criteria. This report focuses on the more challenging sites where the terminations of licenses are not routine licensing actions.

As of September 30, 2008, 13 nuclear power and early demonstration reactors, 10 research and test reactors, 14 complex decommissioning materials facilities, 1 fuel cycle facility (partial decommissioning), 21 Title I[1] uranium recovery facilities, and 11 Title II uranium recovery facilities are undergoing nonroutine decommissioning or are in long-term safe storage, under NRC jurisdiction. The NRC public Web site (http://www.nrc.gov/about-nrc/regulatory/decommissioning.html) contains site status summaries for the facilities managed under the Decommissioning Program. These summaries describe the status of each site and identify the current technical and regulatory issues affecting the completion of decommissioning. For those licensees or responsible parties that have submitted a decommissioning plan (DP) or license termination plan (LTP), the schedules for completion of decommissioning are based on an assessment of the complexity of the DP or LTP review. For those that have not submitted a DP or LTP, the schedules are based on other available site-specific information and on the anticipated decommissioning approach.

Through the Agreement State Program, 35 States have signed formal agreements with the NRC, by which those States have assumed regulatory responsibility over certain byproduct, source, and small quantities of special nuclear material, including the decommissioning of some complex materials sites and uranium recovery sites. Agreement States do not have regulatory authority over nuclear reactors licensed under Title 10, Part 50, "Domestic Licensing of Production and Utilization Facilities," of the *Code of Federal Regulations* (10 CFR Part 50) or certain fuel cycle facilities (e.g., West Valley). Section 7 of this report discusses the NRC's coordination with the Agreement States' decommissioning programs.

2.1 Nuclear Power Reactor Decommissioning

NRC power reactor decommissioning activities include project management for decommissioning power reactors, technical review of licensee submittals in support of decommissioning, core inspections, support for the development of rulemaking and guidance, public outreach efforts, international activities, and participation in industry conferences and workshops. In addition, the staff routinely processes license amendments and exemptions to support the progressive stages of decommissioning. The staff regularly coordinates with other

[1] The Uranium Mill Tailing Remedial Action Project groups uranium recovery facilities into Title I sites and Title II sites. Section 2.4 explains this in detail.

offices on issues affecting all power reactors, both operating and decommissioning, and with the Office of Nuclear Materials Safety and Safeguards (NMSS) regarding the independent spent fuel storage installations (ISFSIs) at reactor sites undergoing decommissioning.

As of September 30, 2008, the 13 nuclear power reactors identified in Table 2-1 are undergoing decommissioning. Table 2-1 provides an overview on the status of these nuclear power reactors. Plant status summaries for all decommissioning nuclear power reactors are available at http://www.nrc.gov/info-finder/decommissioning/power-reactor/.

2.1.1 Decommissioning Process

The decommissioning process begins when a licensee decides to permanently cease operations. The major steps that make up the decommissioning process are notification, submittal and review of the Post-Shutdown Decommissioning Activities Report (PSDAR), submittal and review of the LTP, implementation of the LTP, and completion of decommissioning.

Notification

When the licensee has decided to permanently cease operations, it is required to submit a written notification to the NRC. In addition, the licensee is required to notify the NRC in writing once fuel has been permanently removed from the reactor vessel.

Post-Shutdown Decommissioning Activities Report

Before, or within 2 years after cessation of operations, the licensee must submit a PSDAR to the NRC and a copy to the affected State(s). The PSDAR must include:

- a description and schedule for the planned decommissioning activities;
- an estimate of the expected costs; and
- a discussion of the means for concluding that the environmental impacts associated with site-specific decommissioning activities will be bounded by appropriate, previously issued Environmental Impact Statements (EISs).

The NRC will notice receipt of the PSDAR in the *Federal Register* and make the PSDAR available for public comment. In addition, the NRC will hold a public meeting in the vicinity of the licensee's facility to discuss the PSDAR. Although the NRC does not approve the PSDAR, the licensee cannot perform any major decommissioning activities until 90 days after the NRC has received the PSDAR. After this period, the licensee can perform decommissioning activities as long as the activities do not have the following results:

- Foreclose release of the site for unrestricted use.
- Result in significant environmental impacts not previously reviewed.
- Jeopardize reasonable assurance that adequate funds will be available for decommissioning.

The regulations in 10 CFR 50.59, "Changes, Tests, and Experiments," allow a reactor licensee to make changes in the facility without a license amendment. In taking actions permitted under 10 CFR 50.59, after submittal of the PSDAR, the licensee must notify the NRC, in writing, before performing any decommissioning activity inconsistent with, or making any significant schedule change from, those actions and schedules in the PSDAR. The licensee exercises its own judgment in determining the scope and extent of the latitude provided in 10 CFR 50.59 and proceeds at its own risk.

License Termination Plan

Each power reactor must submit an application for termination of its license. An LTP must be submitted at least 2 years before the license termination date. The NRC and licensee hold presubmittal meetings to agree on the format and content of the LTP. These meetings are intended to improve the efficiency of the LTP development and review process. The LTP must include the following:

- a site characterization;
- identification of remaining dismantlement activities;
- plans for site remediation;
- detailed plans for the final radiation survey;
- description of the end use of the site, if restricted;
- an updated site-specific estimate of remaining decommissioning costs; and
- a supplement to the environmental report describing any new information or significant environmental change associated with the licensee's proposed termination activities.

In addition, the licensee must demonstrate that it will meet the applicable requirements of the License Termination Rule (LTR) in 10 CFR Part 20, "Standards for Protection Against Radiation," Subpart E, "Radiological Criteria for License Termination."

The NRC will notice receipt of the LTP and make the LTP available for public comment. In addition, the NRC will hold a public meeting in the vicinity of the licensee's facility to discuss the LTP and the LTP review process. The technical review is guided by NUREG-1700, "Standard Review Plan for Evaluating Nuclear Power Reactor License Termination Plans," Revision 1, issued April 2003; NUREG-1757, "Consolidated Decommissioning Guidance," Revision 1 of Volume 2, issued September 2006; and NUREG-0586, "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities—Supplement 1," issued November 2002. The LTP is approved by license amendment.

Implementation of the License Termination Plan

After approval of the LTP, the licensee or responsible party must complete decommissioning in accordance with the approved LTP. The NRC staff will periodically inspect the decommissioning operations at the site to ensure compliance with the LTP. These inspections will normally include in-process and confirmatory radiological surveys.

Decommissioning must be completed within 60 years of permanent cessation of operations, unless otherwise approved by the Commission.

Completion of Decommissioning

At the conclusion of decommissioning activities, the licensee will submit a Final Status Survey Report (FSSR) which identifies the final radiological conditions of the site and requests that the NRC either (1) terminate the 10 CFR Part 50 license or (2) reduce the 10 CFR Part 50 license boundary to the footprint of the ISFSI. For decommissioning reactors with no ISFSI or an ISFSI holding a specific license under 10 CFR Part 72, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor Related Greater Than Class C Waste," completion of decommissioning will result in the termination of the 10 CFR Part 50 license. The NRC will approve the FSSR and the licensee's request if it determines that the licensee has met both of the following conditions:

- The remaining dismantlement has been performed in accordance with the approved LTP.
- The final radiation survey and associated documentation demonstrate that the facility and site are suitable for release in accordance with the LTR.

2.1.2 Summary of Fiscal Year 2008 Activities

- During the past year, decommissioning activities were completed at the Haddam Neck Plant (Connecticut Yankee). Additionally, staff performed inspections at Dresden Unit 1, Fermi Unit 1, Humboldt Bay, Indian Point Unit 1, La Crosse, Peach Bottom Unit 1, Millstone Unit 1, Nuclear Ship Savannah, Rancho Seco, San Onofre Unit 1, Three Mile Island Unit 2, Vallecitos Boiling Water Reactor (VBWR), and Zion Units 1 and 2. Table 2-1 shows the status of power reactor decommissioning activities.
  - Staff reviewed and approved the Rancho Seco LTP. Additionally, staff has been reviewing a request to transfer the licensed ownership, management authorities, and decommissioning trust fund of Zion Units 1 and 2 to ZionSolutions. ZionSolutions plans to construct and transfer the spent fuel to an ISFSI as part of the decommissioning process. Following decommissioning, the license for the spent fuel would be transferred back to the original owner.
- To ensure openness during the regulatory process, the staff held many public meetings,[2] including a meeting to discuss the proposed Zion Units 1 and 2 license transfer, a meeting to discuss Fermi Unit 1 license termination planning, a meeting to discuss the Humboldt Bay decommissioning schedule, a meeting to discuss the La Crosse decommissioning plans, and a meeting to discuss the partial site release of off-shore piping from San Onofre Unit 1.

[2] Public meetings include formal public meetings sponsored by the NRC and/or the licensee, as well as technical meetings that are open to observation by members of the public.

Table 2-1 Power Reactors Undergoing Decommissioning

Reactor		Location	PSDAR* Submitted	LTP Submitted	LTP Approved	Completion of Decomm.**
1	Dresden Unit 1	Dresden, IL	6/98	TBD	TBD	2036
2	Fermi Unit 1	Newport, MI	4/98	2009	2010	2012
3	Humboldt Bay	Eureka, CA	2/98	2009	2010	2012
4	Indian Point Unit 1	Buchanan, NY	1/96	2020	2022	2026
5	La Crosse	La Crosse, WI	5/91	TBD	TBD	2020
6	Millstone Unit 1	Waterford, CT	6/99	TBD	TBD	TBD
7	Nuclear Ship Savannah	Baltimore, MD	TBD	2014	TBD	2018
8	Peach Bottom Unit 1	Delta, PA	6/98	TBD	TBD	2034
9	Rancho Seco	Sacramento, CA	12/94	2006	2007	2009
10	San Onofre Unit 1	San Clemente, CA	12/98	2025	2027	2030
11	Three Mile Island Unit 2	Harrisburg, PA	2/79	TBD	TBD	2014
12	Vallecitos Boiling Water Reactor	Pleasanton, CA	7/66	TBD	TBD	2021
13	Zion Units 1 & 2	Waukegan, IL	2/00	TBD	TBD	2018

TBD	to be determined
*	PSDAR or DP equivalent.
**	For decommissioning reactors with no ISFSI or an ISFSI licensed under 10 CFR Part 72, completion of decommissioning will result in the termination of the 10 CFR Part 50 license. For reactors with an ISFSI licensed under the provisions of 10 CFR Part 50, completion of decommissioning will result in reducing the 10 CFR Part 50 license boundary to the footprint of the ISFSI.

Note: Licensees submitted DPs (or equivalent) before 1996 and PSDARs after 1996.

2.2 Research and Test Reactor Decommissioning

NRC research and test reactor decommissioning activities include project management for the decommissioning of these reactors, technical review of licensee submittals in support of decommissioning, core inspections, support of development of rulemaking and guidance, public outreach, and participation in industry conferences and workshops. In addition, the staff routinely processes license amendments and exemptions to support the progressive stages of decommissioning. The staff regularly coordinates with other offices on issues affecting research and test reactors, both operating and decommissioning.

As of September 30, 2008, the 10 research and test reactors identified in Table 2-2 are undergoing decommissioning. The General Atomics Mark F and Mark I research and test reactors are awaiting removal of fuel. Plant status summaries for all decommissioning research and test reactors are available at http://www.nrc.gov/info-finder/decommissioning/research-test/.

2.2.1 Decommissioning Process

The decommissioning process begins when a licensee decides to permanently cease operations. The major steps of the decommissioning process are application, submittal and review of a DP, implementation of the DP, and completion of decommissioning.

Application

When the licensee has decided to permanently cease operations, it is required to submit a written application for license termination to the NRC within 2 years, or 1 year before license expiration. Each application for license termination must be accompanied by a DP submitted for NRC approval. The NRC and licensee hold presubmittal meetings to agree on the format and content of the DP. These meetings are intended to improve the efficiency of the DP development and review process.

Decommissioning Plan

The DP must include the following:

- The choice of the alternative[3] for decommissioning with a description of the planned decommissioning activities.
- A description of the controls and limits on procedures and equipment to protect occupational and public health and safety.
- A description of the planned final radiation survey.

[3] An alternative is acceptable if it provides for completion of decommissioning without significant delay. Consideration will be given to delayed alternatives only when necessary to protect public health and safety, including cases where waste disposal capacity is unavailable or other site-specific conditions, such as the presence of co-located nuclear facilities, are a factor.

- An updated estimate of the expected costs for the alternative chosen, including the following:
  - a comparison with the estimated present funds set aside for decommissioning
  - a plan for assuring the availability of adequate funds for completion of decommissioning
- A description of technical specifications, quality assurance provisions, and physical security plan provisions in place during decommissioning.
- A discussion of the means for evaluating the environmental impacts associated with decommissioning activities, such as a supplement to the environmental report describing any new information or significant environmental change associated with the licensee's proposed termination activities.

In addition, the licensee must demonstrate that it will meet the applicable requirements of the LTR. Often, the licensee does this by demonstrating that the site will qualify for release for unrestricted use after the completion of decommissioning activities.

The technical review is guided by NUREG-1537, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors," issued February 1996, and applicable portions of NUREG-1757. The DP is approved by license amendment, as a supplement to the Safety Evaluation Report (SER), or equivalent.

Implementation of the Decommissioning Plan

For DPs in which the major dismantlement activities are delayed by first placing the facility in storage, planning for these delayed activities may be less detailed. Updated detailed plans must be submitted and approved before the start of these activities.

For DPs that delay completion of decommissioning by including a period of storage or surveillance, the licensee shall meet the following conditions:

- Funds needed to complete decommissioning will be placed into an account segregated from the licensee's assets and outside the licensee's administrative control during the storage or surveillance period, or a surety method or fund statement of intent will be maintained in accordance with the criteria of 10 CFR 50.75(e).
- Means will be included for adjusting cost estimates and associated funding levels over the storage or surveillance period.

After approval of the DP, the licensee or responsible party must complete decommissioning in accordance with the approved DP. The NRC staff will periodically inspect the decommissioning operations at the site to ensure compliance with the DP. These inspections will normally include in-process and confirmatory radiological surveys.

Completion of Decommissioning

At the conclusion of decommissioning activities, the licensee will submit an FSSR which identifies the final radiological conditions of the site and request that the NRC terminate the 10 CFR Part 50 license. The NRC will approve the FSSR and the licensee's termination request if it determines that the licensee has met the following conditions:

- The decommissioning has been performed in accordance with the approved DP.
- The final radiation survey and associated documentation demonstrate that the facility and site are suitable for release in accordance with the LTR.

2.2.2 Summary of Fiscal Year 2008 Activities

- In FY 2008, the NRC terminated the license for the CBS (Westinghouse) research and test reactor.
- The staff approved the University of Illinois DP.
- The staff performed inspections at Ford Nuclear Reactor, General Atomics TRIGA Mark I, General Atomics TRIGA MK F, National Aeronautics and Space Administration (NASA) Mockup, NASA Plum Brook, and CBS (Westinghouse).

Table 2-2 Research and Test Reactors Undergoing Decommissioning

Reactor		Location	Status	Completion of Decomm.
1	Ford Nuclear Reactor	Ann Arbor, MI	DP Approved	2011
2	General Atomics TRIGA Mark F	San Diego, CA	DP Approved	2019
3	General Atomics TRIGA Mark I	San Diego, CA	DP Approved	2019
4	General Electric- Hitachi GETR	Sunol, CA	Possession-Only	2019
5	General Electric-Hitachi VESR	Sunol, CA	Possession-Only	2019
6	NASA Mockup	Sandusky, OH	DP Approved	2010
7	NASA Plum Brook	Sandusky, OH	DP Approved	2010
8	University of Buffalo	Buffalo, NY	Possession-Only	TBD
9	University of Illinois	Urbana, IL	DP Approved	2012
10	Veterans Administration	Omaha, NE	DP Submitted	2010

Notes: GETR General Electric Test Reactor
NASA National Aeronautics and Space Administration
TBD to be determined
TRIGA Training, Research, Isotopes General Atomics
VESR Vallecitos Experimental Superheat Reactor

2.3 Complex Material Facility Decommissioning

Materials facilities decommissioning activities include maintaining regulatory oversight of complex decommissioning sites, undertaking financial assurance reviews, examining issues and funding options to facilitate remediation of sites in non-Agreement States, interacting with the U.S. Environmental Protection Agency (EPA), interacting with the U.S. Army Corps of Engineers (USACE), inspecting complex decommissioning sites, conducting public outreach, participating in international decommissioning activities, conducting program evaluations, and participating in industry conferences and workshops. In addition, the staff routinely reviews decommissioning financial assurance submittals for operating materials and fuel cycle facilities and maintains a financial instrument security program.

As of September 30, 2008, 14 complex materials sites are undergoing decommissioning (see Table 2-3). Table 2-3 identifies whether the completion compliance criteria are based on the dose-based LTR criteria or the concentration-based Site Decommissioning Management Plan (SDMP) Action Plan criteria. Under the provisions of 10 CFR 20.1401(b), any licensee or responsible party that submitted its DP before August 20, 1998, and received NRC approval of that DP before August 20, 1999, may use the SDMP Action Plan criteria for site remediation. In the staff requirements memorandum on SECY-99-195, "Notation Vote on an Exemption for Decommissioning Management Program Sites with Decommissioning Plans under Nuclear Regulatory Commission Review and Eligible for Grandfathering, Pursuant to 10 CFR 20.1401(b)(3)," dated August 18, 1999, the Commission granted an extension of the DP approval deadline for 12 sites to August 20, 2000. In September 2000, the staff notified the Commission that the NRC had approved all 12 DPs by the deadline. All other sites must use the dose-based criteria of the LTR. Only one complex material site remains that is approved for SDMP Action Plan criteria (see Table 2-3).

When Pennsylvania became an Agreement State in FY 2008, the NRC transferred regulatory control for seven complex materials sites undergoing decommissioning to the Commonwealth. These sites were Curtis-Wright Cheswick; Molycorp, Inc.; Quehanna; Safety Light Corporation; Superbolt; Westinghouse Waltz Mill; and Whittaker Corporation. Michigan, New Jersey, and Virginia are in the process of becoming Agreement States but did not complete the process in FY 2008.

Status summaries for the complex materials sites undergoing decommissioning are provided at http://www.nrc.gov/info-finder/decommissioning/complex/.

2.3.1 Decommissioning Process

Any one of the following events can initiate the decommissioning process:

- The license expires.
- The licensee has decided to permanently cease operations at the entire site or in any separate building or outdoor area.
- No principal activities have been conducted for a period of 24 months.
- No principal activities have been conducted for a period of 24 months in any separate building or outdoor area.

Major steps in the decommissioning process are notification, submittal and review of the DP, implementation of the DP, and completion of decommissioning.

Notification

Within 60 days of the occurrence of any of the triggering conditions, the licensee or responsible party is required to notify the NRC of such occurrence and either begin decommissioning or, if required, submit a DP within 12 months of notification and begin decommissioning after approval of the plan.[4] The regulations authorize alternative schedules, with NRC approval.

Decommissioning Plan

A DP must be submitted if required by license condition, or if the NRC has not previously approved the procedures and activities necessary to decommission and the procedures could increase potential health and safety impacts on workers or the public, such as in any of the following cases:

- Procedures would involve techniques not applied routinely during cleanup or maintenance operations.
- Workers would be entering areas not normally occupied where surface contamination and radiation levels are significantly higher than routinely encountered during operation.
- Procedures could result in significantly greater airborne concentrations than are present during operations.
- Procedures could result in significantly greater releases of radioactive material to the environment than those associated with operations.

Before submitting a DP, the licensee or responsible party meets with the NRC to agree on the form and content of the DP. This presubmittal meeting is intended to make the DP review process more efficient by reducing the need for requests for additional information (RAIs). It is important for the NRC and the licensee to work effectively in a cooperative manner to resolve the issues that make the decommissioning of these sites challenging.

In a process similar to LTPs and research and test reactor DPs, the complex material site DP review process begins with an acceptance review, to check whether the DP contains: (1) all required information; (2) legible drawings; (3) justification for any proprietary information claims;

[4] Unlike the case of nuclear reactor decommissioning, complex material site licensees or responsible parties cannot proceed with decommissioning until the DP is approved.

and, (4) obvious technical inadequacies. The objective of the acceptance review is to verify that the application contains sufficient information before the staff begins an in-depth technical review. In addition, the staff will conduct a limited technical review to identify significant technical deficiencies at an early stage, thereby precluding a detailed technical review of a technically inadequate submittal. At the conclusion of the acceptance review, the NRC will either accept the DP for detailed technical review or not accept it and return it to the licensee or responsible party with the deficiencies identified. The staff's detailed technical review is guided by NUREG-1757 and its supporting references. The staff documents the results of its detailed technical review in an Environmental Assessment (EA) or EIS and an SER. The staff shares the EA/EIS with the appropriate State and considers State comments in finalizing the EA/EIS. The final EA is either summarized in the *Federal Register,* with a Finding of No Significant Impact (FONSI), or if a FONSI cannot be made, an EIS is developed.

The NRC conducts reviews of DPs proposing restricted release in two phases. The first phase of the review focuses on the financial assurance and institutional control provisions of the DP. The staff will begin the review of the remainder of the DP only after it is satisfied that the licensee's or responsible parties' proposed institutional control and financial assurance provisions comply with the requirements of the LTR. The applicable portions of NUREG-1757 will guide this phase of the review. The second phase of the review addresses all other sections of the technical review as guided by NUREG-1757 and includes the development of an EIS. Therefore, one of the first steps in Phase II is the publication of a Notice of Intent in the *Federal Register* to develop an EIS. The basic EIS development steps are listed below:

- publication of a Notice of Intent.
- public scoping meeting.
- preparation and publication of the scoping report.
- preparation and publication of the draft EIS.
- public comment period on the draft EIS, including a public meeting.
- preparation and publication of the final EIS.

In parallel with the development of the EIS, the staff develops a draft and final SER. The staff coordinates the development of the draft SER with the development of the draft EIS so that any RAIs can be consolidated.

Regardless of whether an EA or EIS is developed, the staff structures its reviews to minimize the number of RAIs, without diminishing the technical quality or completeness of the licensee's or responsible party's ultimate submittal. For example, the staff first develops a set of additional information needs and clarifications, including the bases for the additional information and clarifications, and then meets with the licensee or responsible party to discuss the issues. The staff gives notice of and conducts this meeting in accordance with NRC requirements for meetings open to the public. The staff documents the results of the meeting in a meeting report. The formal RAI includes any issues that cannot be resolved during the meeting. In developing the final RAI, the staff documents the insufficient or inadequate information submitted by the licensee or responsible party and communicates what additional information is needed to address the identified deficiencies. The quality and completeness of the licensee's DP factor directly into the scope and extent of the NRC's RAIs.

After publication of the FONSI or EIS, the NRC issues a license amendment, approving the DP, along with any additional license conditions found to be necessary as a result of the findings of the EA, EIS, and/or the SER.

Implementation of the Decommissioning Plan

After approval of the DP, the licensee or responsible party must complete decommissioning in accordance with the approved DP within 24 months or apply for an alternate schedule. The NRC staff will periodically inspect the decommissioning operations at the site to ensure compliance with the DP. These inspections will normally include in-process and confirmatory radiological surveys.

Completion of Decommissioning

As the final step in decommissioning, the licensee or responsible party is required to do the following:

- Certify the disposition of all regulated material, including accumulated wastes, by submitting a completed NRC Form 314, "Certificate of Disposition of Materials," or equivalent information.

- Conduct a radiation survey of the premises where licensed activities were carried out (in accordance with the procedures in the approved DP, if a DP is required) and submit a report of the results of the survey (FSSR), unless the licensee or responsible party demonstrates in some other manner that the premises are suitable for release in accordance with the LTR.

Licenses are terminated or the site is released by written notice when the NRC determines that the licensee has met the following conditions:

- Regulated material has been disposed of properly.

- Reasonable effort has been made to eliminate residual radioactive contamination, if present.

- The site meets the approved DP.

- The radiation survey has been performed or other information submitted by the licensee or responsible party demonstrates that the premises are suitable for release in accordance with the LTR.

2.3.2 Summary of Fiscal Year 2008 Activities

- Since last year's status report, six sites were removed from the complex site list through license termination or completion of NRC decommissioning actions. These sites are (1) Battelle Columbus Laboratories, (2) Cabot Performance Materials, Inc.,[5] (3) Department of the Army-Fort McClellan, (4) Great Lakes Naval Training Center (Engelhard), (5) Homer Laughlin, and (6) Salmon River Uranium Development. Additionally, the staff reviewed approximately 25 financial assurance submittals in FY 2008.

---

5 Two licenses were associated with the Cabot Site. The NRC terminated one license and transferred the other to the Commonwealth of Pennsylvania. The license transferred to Pennsylvania is not in decommissioning.

- During the past year, the staff participated in public meetings for ABB Prospects, Inc., Battelle Columbus Laboratories, Jefferson Proving Ground, Shieldalloy Metallurgical Corporation, and the West Valley Demonstration Project (WVDP). The staff also participated in industry conferences and workshops, including the 53rd Health Physics Society Annual Meeting, the International Society of Nuclear Air Treatment and Technology Meeting, and the Conference of Radiation Control Program Directors' 40th Annual National Conference on Radiation Control.

- Finally, in FY 2008, the staff approved the DP for Cabot Performance Materials, Inc. The staff is currently reviewing DPs for the ABB Prospects, Inc., ABC Labs, Kerr-McGee Cimarron, Mallinckrodt Chemical, Inc., Shieldalloy Metallurgical Corporation, and the Westinghouse Electric-Hematite sites.

Highlighted Activities

The staff worked with other Federal agencies in FY 2008 to resolve decommissioning issues. This was done at Formerly Utilized Sites Remedial Action Program (FUSRAP) sites, WVDP, the Salmon River Uranium Development site, and other Department of Defense (DOD) sites to further the decommissioning process.

In FY 2008, the staff continued to work closely with USACE to coordinate actions at the NRC licensed sites that are also FUSRAP sites. These sites include ABB Prospects, Inc.; Babcock & Wilcox Shallow Land Disposal Area (SLDA); Mallinckrodt Chemical Inc.; and Stepan Chemical Company. The staff cooperated with USACE and the licensee to define a success path that allows for the completion of decommissioning at the ABB Prospects, Inc., site. Specifically, the NRC and USACE developed an interagency protocol for the cleanup of FUSRAP-contaminated areas of the ABB Prospects, Inc., site that also contain NRC-regulated materials, by the licensee. The revised DP is currently undergoing staff review. Parts of the site, specifically the non-FUSRAP areas, are expected to be released for unrestricted use in the near future. At the Babcock & Wilcox SLDA, the staff participated in a USACE-sponsored interagency FUSRAP meeting to review conceptual Remedial Design plans developed for site decommissioning. The staff has continued with followup discussions with USACE and the Commonwealth of Pennsylvania regarding various aspects of site remediation, including discussions related to the USACE Physical Security and Material Accounting plans, as well as discussions on the disposal of impacted materials that fall below cleanup criteria. At Mallinckrodt Chemical Inc., NRC staff worked with the licensee and the USACE to develop an agreement to delineate areas of the site that would be remediated under the NRC license and the USACE FUSRAP authority. This allowed the licensee to remove a substantial amount of NRC-regulated material that was overlaying FUSRAP material that USACE will now be able to remove and dispose of at an off-site facility. The staff worked with Stepan Chemical Company and USACE to finalize a Confirmatory Suspension Order, which will allow USACE to initiate remediation at the site.

Over the past year, the New York State Energy Research and Development Authority, New York State Department of Environmental Conservation, the U.S. Department of Energy (DOE), EPA, and the NRC have continued to meet regularly to work together as a Core Team to resolve outstanding issues related to the development of a draft EIS for the West Valley site. In January 2008, as a consequence of focused technical discussions among the parties, the Core Team recommended a Preferred Alternative for inclusion among the other reasonable alternatives within the draft EIS. This development and the ongoing commitment of the relevant Federal and State agencies to the Core Team process has enabled the creation of a schedule for release of the draft EIS to the public for review and comment by the end of December 2008.

In addition, the DOE WVDP plans to submit a DP to the NRC for review and comment within the year. On May 19, 2008, the NRC and DOE conducted a public meeting to discuss expectations regarding the scope and content of the DP for the DOE WVDP.

In an effort to facilitate completion of cleanup at the Salmon River Uranium Development site near Salmon, Idaho, the NRC staff requested technical and financial assistance from EPA pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). EPA conducted a site assessment at the Salmon River site in June 2006, with NRC representation. EPA performed the removal action in two phases: in October-November 2007 and then again in May-June 2008. The NRC staff provided technical support to EPA during the cleanup activities and conducted an independent evaluation of the results of the removal action to determine that the site met the NRC regulations and could be released without restrictions.

The staff completed its evaluation of options for the NRC's involvement with the ongoing remediation of the Hunters Point Shipyard (HPS) site in San Francisco, California. The Navy is conducting its remediation of this Superfund site under CERCLA with State and EPA oversight. The staff presented the results of its evaluation and recommendations to the Commission in a May 30, 2008, Commission paper, SECY-08-0077, "Options for U.S. Nuclear Regulatory Commission Involvement with the Navy's Remediation of the Hunters Point Naval Shipyard Site in California." On the basis of information provided by the Navy, the staff concluded that, although there is uncertainty about the amount of licensed material at the HPS site, the NRC does have jurisdiction over this material. However, such material is likely to be commingled with the atomic weapons testing material over which the NRC has no jurisdiction. The staff also concluded that the radium-226 being remediated by the Navy is under military control and outside of the NRC's jurisdiction. The staff evaluated three options for NRC involvement at the HPS site: (1) no NRC involvement, (2) limited NRC involvement to stay informed about the progress of remediation activities under the CERCLA process, and (3) NRC regulatory oversight through the Navy Master Materials License. The staff recommended the second option. After considering the staff's evaluation, the Commission provided its decisions to the staff on June 26, 2008, in a staff requirements memorandum (SRM-SECY-08-0077). The Commission approved the option of relying on the CERCLA process with EPA oversight and NRC involvement limited to the staff's staying informed.

The staff also informed the Commission about the potential for NRC jurisdiction and involvement at other DOD Base Realignment and Closure Act (BRAC)/National Priority List (NPL) sites. The staff concluded that the only other potential DOD BRAC/NPL site similar to the HPS site is the former McClellan Air Force Base in California. The staff is working with the Air Force to obtain additional information about radionuclides used at the site. If this information indicates the presence of licensed material, the recommendations for the HPS site would also apply to McClellan Air Force Base.

Table 2-3 Complex Decommissioning Sites

Name		Location	Date DP Submitted	Date DP Approved	Compliance Criteria	Projected Removal
1	AAR Manufacturing, Inc.	Livonia, MI	10/97 revised 9/06, 4/07[+]	5/98 TBD	LTR-RES	9/11
2	ABB Prospects, Inc.	Windsor, CT	4/03	6/04	LTR-UNRES	12/10
3	ABC Labs	Columbia, MO	11/07	TBD[++]	TBD	2009
4	Babcock & Wilcox (Shallow Land Disposal Area)	Vandergrift, PA	6/01 revised N/A	N/A	LTR-UNRES	3/13
5	FMRI (Fansteel), Inc.	Muskogee, OK	8/99 revised 5/03	12/03	LTR-UNRES	2023
6	Jefferson Proving Ground	Madison, IN	8/99 revised 6/02, 9/13	10/02 TBD	LTR-RES	12/13
7	Kerr-McGee	Cimarron, OK	4/95	8/99	Action-UNRES	1/17
8	Mallinckrodt Chemical, Inc.	St. Louis, MO	Phase 1 11/97, Phase 2 9/08	5/02 TBD	LTR-UNRES	03/11
9	NWI Breckenridge	Breckenridge, MI	3/04	8/04	LTR-UNRES	12/09
10	Shieldalloy Metallurgical Corp.	Newfield, NJ	6/06	8/09*	LTR-RES	9/12

Table 2-3 Complex Decommissioning Sites

Name		Location	Date DP Submitted	Date DP Approved	Compliance Criteria	Projected Removal
11	Stepan Chemical Company	Maywood, NJ	N/A	N/A	LTR-UNRES	9/11
12	UNC Naval Products	New Haven, CT	8/98 Revised 2004, 12/06	4/99, 10/07	LTR-UNRES	9/09
13	West Valley Demonstration Project	West Valley, NY	TBD	TBD	LTR-UNRES**	TBD
14	Westinghouse Electric (Hematite Facility)	Festus, MO	4/04 revised 6/06, TBD	TBD	LTR-UNRES	6/11

*	Timeline for completion is protracted because of the need to satisfy National Environmental Policy Act requirements, to conduct a public hearing, to address multiphase DP submittals, or a combination of the above.
**	The West Valley DP has not yet been submitted. The staff anticipates that the West Valley DP will include plans to release a large portion of the site for unrestricted use, while the remainder of the site may have a perpetual license or be released with restrictions.
+	The staff is currently reviewing the draft legal agreement and restrictive covenant for restricted use.
++	DP not accepted for review.

Notes:

- The compliance criteria identified in this table present the staff's most recent information but do not necessarily represent the current or likely outcome.
- Abbreviations used in this table include: "N/A" for not applicable, "TBD" for to be determined, "Action" for SDMP Action Plan criteria, "LTR" for LTR criteria, "RES" for restricted use, and "UNRES" for unrestricted use.
- Reasons for multiple DP submittals range from changes in the favored decommissioning approach, to the phased implementation of decommissioning, to poor submittals.

2.4 Uranium Recovery Facility Decommissioning[6]

In enacting the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), as amended, Congress had two general goals. The first was to provide a remedial action program to stabilize and control the residual radioactive material at various identified inactive mill sites, the second was to ensure the adequate regulation of uranium production activities and cleanup of mill tailings at mill sites that were active and licensed by the NRC (or Agreement States). At the time, the agency did not have direct regulatory control over uranium mill tailings. The tailings themselves did not fall into any category of NRC-licensable material. Before 1978, the NRC was regulating tailings at active mills indirectly through its licensing of source material milling operations under the Atomic Energy Act of 1954, largely as a result of the enactment of the National Environmental Policy Act of 1969.

Under the provisions of Title I of UMTRCA, Congress addressed the problem of inactive, unregulated tailings piles. Title I of UMTRCA specifies the inactive processing sites for remediation. Except at the Atlas Moab site, surface reclamation activities have been completed at all Title I sites and approved by the NRC, however, ground water cleanup is still ongoing at many of these Title I sites. When ground water cleanup is completed, DOE will submit a revised long-term surveillance plan (LTSP) for NRC concurrence. Table 2-4a identifies the Title I sites that are undergoing decommissioning. Title 10 of the *Code of Federal Regulation,* Section 40.27, "General License for Custody and Long-Term Care of Residual Radioactive Material Disposal Sites," governs the long-term care of Title I sites under a general license held by either DOE or the State in which the site is located.

Title II of UMTRCA addresses the issue of tailings produced at active sites licensed by the NRC or Agreement States. Title II amended the definition of byproduct material to include mill tailings and added specific authorities for the Commission to regulate this new category of byproduct material at licensed sites. Title II uranium recovery decommissioning activities include regulatory oversight of decommissioning uranium recovery sites; review of site characterization plans and data; review and approval of reclamation plans (RPs); preparation of EAs and EISs; inspection of decommissioning activities, including confirmatory surveys; decommissioning cost estimate reviews, including annual surety updates; and oversight of license termination. Regulations governing uranium recovery facility decommissioning are at 10 CFR Part 40, "Domestic Licensing of Source Material," and in Appendix A to that Part, "Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings of Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily for Their Source Material Content." Licensed operations include conventional uranium mill sites and in situ leach (ISL) facilities. Table 2-4b identifies the Title II sites no longer operating and in decommissioning. As of September 30, 2008, 11 Title II uranium recovery facilities are undergoing decommissioning. 10 CFR 40.28, "General License for Custody and Long-Term Care of Uranium or Thorium Byproduct Materials Disposal Sites," governs the long-term care of Title II sites under a general license held by either DOE or the State in which the site is located. Status summaries for the Title II sites undergoing decommissioning are provided at http://www.nrc.gov/info-finder/decommissioning/uranium/.

---

6 This report does not address regulation of new or operating uranium recovery facilities with the exception of a brief discussion on their decommissioning.

2.4.1 Uranium Recovery Title II Facility Decommissioning Process

These facilities are not subject to the license termination criteria set forth in Subpart E, "Radiological Criteria for License Termination," to 10 CFR Part 20, "Standards for Protection Against Radiation." However, as summarized below, the decommissioning process is nonetheless similar to the process used for other types of facilities.

Any one of the following events may initiate the decommissioning process for uranium recovery facilities:

- The license expires or the license is revoked.
- The licensee has decided to permanently cease principal activities at the entire site or in any separate building or outdoor area.
- No principal activities have been conducted for a period of 24 months (except for impoundments and disposal areas).
- No principal activities have been conducted for a period of 24 months in any separate building or outdoor area (except for impoundments and disposal areas).

The uranium recovery facility decommissioning process includes several major steps, depending on the type of facility. These steps may include notification of intent to decommission; submittal and review of the DP[7] or RP; implementation of the DP/RP; completion of decommissioning/reclamation; submittal and review of a completion report; submittal and review of a well-field restoration report (for ISL facilities); submittal and review of an LTSP for sites with tailings piles; termination of the license; and transfer of the property to the long-term care custodian for sites with tailings piles, under a general license held by either DOE or a State.

Notification

Within 60 days of the occurrence of any of the triggering events, the licensee must notify the NRC of such occurrence and either begin decommissioning or, if required, submit a DP/RP within 12 months of notification and begin decommissioning upon plan approval. For new ISL or conventional facilities, the licensee submits ground water restoration, surface reclamation, and facility DPs with the initial license application. The NRC reviews and approves these plans before issuing a license. For ISLs, ground water restoration can occur at one well-field, while other well-fields are actively extracting uranium. Under 10 CFR 40.42(f), facilities may delay decommissioning if the NRC determines that such a delay is not detrimental to public health and the environment and is in the public interest.

Decommissioning Plan/Reclamation Plan—Existing Facilities

All uranium recovery facilities currently licensed by the NRC have NRC-approved DP/RPs. Therefore, for these facilities, the staff would review only amendments to the existing DP/RPs. Amendments would be necessary under the following circumstances:

---

[7] For uranium recovery sites, DPs typically deal with the remediation of structures, while RPs typically deal with tailings impoundments, ground water cleanup, and other remediation efforts.

- Environmental contamination exists or other new conditions arise that were not considered in the existing DP/RP.

- The licensee requests a change in reclamation design or procedures.

- The licensee requests a change in timing of restoration.

Depending on the complexity of the revision, a meeting between the licensee and the NRC staff may be warranted. This meeting may result in a more efficient DP/RP amendment process by reducing the need for multiple rounds of RAIs. A high-quality and complete DP/RP by the licensee is invaluable to an effective and efficient review of a proposed amendment.

Decommissioning Plan/Reclamation Plan—New Facilities

Procedures for reviewing DP/RPs for new facilities are similar to those for existing facilities. Note that, per 10 CFR 51.20(b)(8), preparation of an EIS is a required part of the licensing process for new facilities. A generic EIS is being developed for ISL facilities to accommodate the expected surge in applications.

Implementation of the Decommissioning Plan/Reclamation Plan

After approval of the DP/RP, the licensee must complete decommissioning within 24 months or apply for an alternate schedule. For conventional facilities, with ground water contamination, or for ISL facilities with well-field restoration, 24 months is usually insufficient, because remediation of ground water contamination is more time-consuming than remediation of surface contamination. As such, an alternate schedule may be appropriate.

The NRC staff will inspect the licensee activities during decommissioning/reclamation to ensure compliance with the DP/RP, associated license conditions, and NRC and other applicable regulations (e.g., U.S. Department of Transportation regulations). The staff will also ensure that there is no degradation in ground water quality after the completion and approval of ground water restoration by monitoring the ground water for a period of time.

Decommissioning at uranium recovery sites involves two main activities, surface reclamation (i.e., soil contamination cleanup, 11e.(2) byproduct material reclamation and disposal, equipment removal, and structure decommissioning), and ground water restoration/reclamation. Ground water reclamation is considered completed when concentrations on and off site (depending on the extent of contaminant migration) meet previously established ground water protection standards in accordance with Appendix A to 10 CFR Part 40. Three types of standards have been established in accordance with Criterion 5B(5) in Appendix A:

(1) NRC-approved background concentrations
(2) representative values presented in Table 5C in Appendix A
(3) alternate concentration limits (ACLs)

If the licensee demonstrates that concentrations of certain constituents cannot be restored to either background or Table 5C values in Appendix A, then the staff may approve ACLs, after considering all the items required in Criterion 5B(6) in Appendix A. To obtain ACLs, the licensee submits a license amendment application and a detailed environmental report that addresses all the items in Criterion 5B(6). If the staff determines that the ACLs are protective of public health and the environment, the staff may approve the ACLs. The staff documents its

review by publishing an EA and FONSI or developing an EIS and issuing a technical evaluation report (TER). After ACLs are approved, ground water reclamation may cease. However, ACL amendments at conventional mill sites incorporate ground water monitoring programs that continue after reclamation is finished.

After surface decommissioning/reclamation is completed, the licensee issues a construction completion report for staff review and approval. As part of this review, the staff performs a completion inspection to confirm that surface reclamation was performed according to the DP/RP, license conditions, and NRC regulations. Inspections also include surveys of tailings disposal areas to ensure that radon emissions comply with 10 CFR Part 40, Appendix A, Criterion 6. If additional information is required, the staff will issue RAIs to address outstanding issues. After all issues are resolved, the staff will publish an EA and FONSI, if warranted. The staff will issue a license amendment and TER documenting its review and approving the construction completion report.

License Termination—Conventional Mills

After all reclamation activities have been completed and approved, the licensee, the NRC staff, and the long-term custodian will start license termination procedures. Before a conventional mill license is terminated, the custodial agency (i.e., State agency, DOE, or other Federal agency) will submit an LTSP for NRC staff review and acceptance. The LTSP documents the custodian's responsibilities for long-term care, including security, inspections, ground water and surface water monitoring, and remedial actions. Concurrent with the staff acceptance of an LTSP, the existing license is terminated and title to the site, including all disposal areas, is transferred to the custodian under 10 CFR 40.28, "General License for Custody and Long-Term Care of Uranium or Thorium Byproduct Materials Disposal Sites."

All land beyond the site boundary that is purchased or otherwise regulated by institutional controls is incorporated into the long-term surveillance boundary. The use of institutional controls represents an alternative to the regulations in Appendix A to 10 CFR Part 40. The NRC staff may consider the use of institutional controls but only after all practicable measures have been taken to control emissions at the source and the licensee can demonstrate that the institutional controls are protective of public health and the environment.

License Termination—In Situ Leach Uranium Extraction Facilities

License termination at an ISL uranium extraction facility occurs when all ground water is restored to acceptable levels and surface decommissioning/reclamation is completed and approved by the staff. Surface decommissioning completion typically would include an inspection. Because regulations discourage ISL uranium extraction facility owners from disposing of 11e.(2) byproduct material at their sites, long-term care by a governmental custodian under a general license is not required. However, ISL facilities are still required to find a licensed 11e.(2) disposal site for their waste, though some facilities are allowed to dispose of liquid wastes in deep disposal wells. Thus, all ground water restoration and surface reclamation is performed so that the site can qualify for unrestricted release, and all land occupied by the ISL facility is returned to the original owner.

2.4.2 Summary of Fiscal Year 2008 Activities

- For Title I facilities in FY 2008, the staff concurred on the remedial action plan for the Moab Mill, reviewed the Falls City LTSP, and reviewed the New Rifle Groundwater Compliance Action Plan.

- For Title II facilities undergoing decommissioning in FY 2008, the staff approved the construction completion report for Western Nuclear, construction completion report for Umetco Gas Hills, Homestake-Grants third evaporation pond, and Rio Algom Pond two-cell design. Also in FY 2008, the staff performed site inspections at American Nuclear Corporation, Pathfinder Shirley Basin, Homestake Mining, Rio Algom-Ambrosia Lake, Sequoyah Fuels Corporation, Umetco-Gas Hills, Pathfinder-Lucky Mc and Western Nuclear-Split Rock.

- The staff has held several meetings open to the public during the past year. These include meetings with the Homestake Mining Corporation, and several meetings with licensees in conjunction with the National Mining Association Annual Meeting.

Table 2-4a Decommissioning Title I Uranium Recovery Sites			
	Name	**Location**	**Status**
1	Ambrosia Lake	New Mexico	Monitoring
2	Burrell	Pennsylvania	Monitoring
3	Canonsburg	Pennsylvania	Monitoring
4	Durango	Colorado	Active
5	Falls City	Texas	Monitoring
6	Grand Junction	Colorado	Monitoring
7	Green River	Utah	Active
8	Gunnison	Colorado	Active
9	Lakeview	Oregon	Active
10	Lowman	Idaho	Monitoring
11	Maybell	Colorado	Monitoring
12	Mexican Hat/Monument Valley	Utah	Monitoring
13	Moab Mill	Utah	Active
14	Naturita	Colorado	Monitoring
15	Rifle	Colorado	Active
16	Riverton	Wyoming	Active
17	Salt Lake City	Utah	Monitoring
18	Shiprock	New Mexico	Active
19	Slick Rock	Colorado	Active
20	Spook	Wyoming	Monitoring

Table 2-4a Decommissioning Title I Uranium Recovery Sites			
21	Tuba City	Arizona	Active

Note: Active denotes that a site is still undergoing surface reclamation or is resolving groundwater issues. Monitoring denotes that the site is being monitored under its LTSP or a groundwater compliance action plan.

Table 2-4b Decommissioning Title II Uranium Recovery Sites				
	Name	**Location**	**DP/RP Approved**	**Completion of Decomm.**
1	American Nuclear Corporation	Casper, WY	10/88, Revision 2006	2011
2	Bear Creek	Converse County, WY	5/89	2010
3	ExxonMobil Highlands	Converse County, WY	1990	2010
4	Homestake Mining Company	Grants, NM	Revised plan—3/95	2017
5	Pathfinder—Lucky Mc	Gas Hills, WY	Revised plan—7/98	TBD
6	Pathfinder—Shirley Basin	Shirley Basin, WY	Revised plan—12/97	TBD
7	Rio Algom—Ambrosia Lake	Grants, NM	2003 (mill); 2004 (soil)	2010
8	Sequoyah Fuels Corporation	Gore, OK	2008	2012
9	Umetco Minerals Corporation	East Gas Hills, WY	Revised soil plan—4/01	TBD
10	United Nuclear Corporation	Churchrock, NM	3/91, Revision 2005	TBD
11	Western Nuclear Inc.—Split Rock	Jeffrey City, WY	1997	TBD

Note: COGEMA, Crow Butte, Kennecott Uranium Company, and Power Resources Inc., are all operating, or in standby, uranium recovery facilities in various stages of partial restoration/decommissioning.

TBD to be determined

2.5 Fuel Cycle Facility Decommissioning

Currently, the only fuel cycle facility undergoing partial decommissioning is the Nuclear Fuel Services site in Erwin, Tennessee. The public Web site at http://www.nrc.gov/info-finder/decommissioning/fuel-cycle/ summarizes additional information about the status of the facility.

2.5.1 Fuel Cycle Facility Decommissioning Process

The decommissioning processes for fuel cycle facilities and for complex material sites are similar (see Section 2.3.1). Decommissioning activities at fuel cycle facilities can be conducted during operations (partial decommissioning) or after the licensee has ceased all operational activities.

Project management responsibility for fuel cycle facilities resides in NMSS and the Division of Fuel Cycle Safety and Safeguards (FCSS) during licensee operations and partial site decommissioning, and within the Office of Federal and State Materials and Environmental Management Programs (FSME) and within the Division of Waste Management and Environmental Protection (DWMEP) during entire site decommissioning in support of license termination. Project management responsibility for fuel cycle facilities is transferred from FCSS to DWMEP when the licensee has ceased all operational activities and a critical mass of material no longer remains at the site.

2.5.2 Summary of Fiscal Year 2008 Activities

In FY 2008, the staff completed reviews and released the final facility area of the General Atomics facility in San Diego, California, for which the NRC was the lead reviewing agency. However, this site will retain its State of California license and continue operations.

Nuclear Fuel Services has begun submitting FSSRs for partial decommissioning of the Erwin, Tennessee site and these reports are currently undergoing staff review.

3. GUIDANCE AND RULEMAKING ACTIVITIES

In FY 2008, the staff worked to increase the effectiveness of the Decommissioning Program and to gain a better perspective on decommissioning as a whole. The Decommissioning Program has been performing a self-evaluation of dose modeling to help it become more effective in the decommissioning of sites. Additionally, staff has been working on initiatives which will help prevent the creation of sites that are unable to complete decommissioning.

Division of Waste Management and Environmental Protection Self-Evaluation of Dose Modeling

DWMEP is conducting an evaluation of the uses and applicability of computer codes used in carrying out DWMEP licensing activities, particularly those codes used for the demonstration of compliance with the decommissioning dose criteria. This evaluation is intended for DWMEP management use, to enhance the efficiency of the use of codes and models and to establish consistency and relevance in the selection of these computer codes and models. This activity is expected to be completed in FY 2009.

Decommissioning Planning Rule

As the NRC's Decommissioning Program continues to mature, and fewer sites remain in the Decommissioning Program, the program is evolving to focus on ways to expedite the timely and effective decommissioning of sites with difficult issues (e.g., those with ground water contamination) and the prevention of future sites that are unable to complete decommissioning (legacy sites). To help prevent future legacy sites, the NRC staff is in the final stages of preparation of the draft final rule "Decommissioning Planning (10 CFR PARTS 20, 30, 40, 50, 70, AND 72; RIN: 3150-AH45)," which had been previously published as a draft rule on January 22, 2008. One aspect of the rulemaking focuses on ensuring that licensees have adequate financial assurance to complete decommissioning, while the other ensures that licensees have in place an adequate ground water monitoring program and will implement measures to minimize ground water contamination. Additionally, in certain cases, licensees will have new recordkeeping requirements for documenting spills, leaks, and unplanned releases.

Publication of Regulatory Guide 4.21, Minimization of Contamination and Radioactive Waste Generation: Life Cycle Planning

In June 2008, the NRC published Regulatory Guide 4.21, "Minimization of Contamination and Radioactive Waste Generation: Life Cycle Planning." This regulatory guide supports implementation of 10 CFR 20.1406 (a) and (b), which require license applications submitted after August 1997 to demonstrate how the facility's design and procedures for operation will facilitate decommissioning and minimize (a) contamination of the facility and environment and (b) the generation of radioactive waste. The implementation guidance provided by this regulatory guide will result in designs and operating procedures that (1) reduce the likelihood and extent of contamination, (2) provide design and operating features to promptly identify contamination, (3) anticipate the actions necessary to respond to contamination events, and (4) allow flexibility in managing such events. Proper implementation of this guidance for new facilities should substantially reduce or eliminate the occurrence of legacy sites for the next generation of nuclear facilities.

4. RESEARCH ACTIVITIES

The Office of Nuclear Regulatory Research (RES) continued to support the dose modeling of releases of radioactive material from decommissioning sites. In addition to research activities, RES staff provided technical support to FSME for the Kerr-McGee Cimarron and Shieldalloy sites.

RES is continuing the development or modification of computer codes useful for site decommissioning analyses. This work includes modifying dose assessment codes to incorporate added realism, enhancing RESRAD-OFFSITE with a three-dimensional ground water model, completing a linkage of the DOD Groundwater Modeling System to the Framework for Risk Assessment of Multimedia Environmental Systems and training FSME staff in the use of the linked codes, and continuing to update parameter values for food-chain pathways. The staff completed the beta version of Spatial Analysis and Decision Assistance (SADA) to provide tools for more efficiently designing site characterization of contaminated sites, assessing risk, determining the location of future samples, and designing remedial action. The staff is now developing examples of applications of SADA to actual sites for training purposes.

RES completed work on the practical application of reactive transport models and initiated participation in an international project, the Nuclear Energy Agency (NEA) Sorption Project, Phase III, to provide practical and widely accepted guidance for the use of reactive transport models in performance assessments of chemically complex sites. An emerging issue, the use of bioremediation at uranium-contaminated sites became the focus of two new projects with part of the effort focused on ISL facilities. New work was also started on better models of leaching from radioactive slags from mineral processing. RES completed work with the USACE to understand the evolution and degradation of clay covers through laboratory testing and continued joint support, with EPA and the National Science Foundation, of a project exploring the failure mechanisms of covers at existing disposal facilities.

In addition, RES maintains two technical advisory groups (TAGs) that enhance communication on issues important to site decommissioning and provide feedback to RES on research direction. These are the TAG on Groundwater and Performance Monitoring and the TAG on Assessing Uncertainty in Simulation Modeling of Environmental Systems. The TAG on ground water issues continued to be particularly useful this past year in providing insights about the environmental contamination found at several operating nuclear power plants. Also in this area, RES completed work on a strategy for ground water monitoring, documenting the work in NUREG/CR-6948, "Integrated Ground-Water Monitoring Strategy for NRC-Licensed Facilities and Sites," Volume 1, "Logic, Strategic Approach and Discussion," and Volume 2, "Case Study Applications," issued November 2007, and provided training for the NRC staff.

Finally, initiation of the Cement Partnership with DOE and the National Institute of Standards and Technology has proven to be very productive. The Cement Partnership shares the expertise and resources of three federal organizations to develop common data and tools to evaluate the use of cementitious materials for the isolation of environmentally mobile radioactive materials from the public and the environment through solidification or containment.

5. INTERNATIONAL ACTIVITIES

DWMEP interacts with international organizations and governments in a number of ways, including through the International Atomic Energy Agency (IAEA) and the NEA of the Organization for Economic Cooperation and Development, bilateral and trilateral exchanges with other countries, hosting foreign assignees and providing reciprocal assignments, developing and providing workshops to requesting countries, and providing technical support as needed to the NRC Office of International Programs. The NRC is generally recognized in the international nuclear community as an experienced leader in the regulation and safety of decommissioning of nuclear sites. NRC staff interaction with international organizations and governments allows the NRC to share insights into successful, safe, and cost-effective decommissioning approaches. This interaction also allows the NRC staff to provide input into the various international guidance and requirements that the NRC will need to consider within the international regulatory context. The NRC staff gains insight into approaches and methodologies used in the international community and considers these approaches as they continue to risk-inform the NRC Decommissioning Program. A summary of the most significant of these activities appears below.

International Atomic Energy Agency Activities

The NRC decommissioning staff participated in the development of the IAEA Safety Standards Series. Within the past year, the staff supported the IAEA in the following ways:

- Participating in the December 2007, IAEA Consultancy Meeting in Vienna, Austria, on Safety Requirement GS-R-1, "Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety," originally published in September 2000.

- Participating in the February 2008, and July 2008, IAEA Consultancy Meetings in Vienna, Austria, to assist in the review of Safety Guide WS-G-2.4, "Decommissioning of Fuel Cycle Facilities," originally published in July 2001.

- Participating in the March 2008, and July 2008, IAEA Consultancy Meetings in Vienna, Austria, to assist in the review and revision of Safety Guide WS-G-2.2, "Decommissioning of Medical, Industrial, and Research Facilities," originally published in October 1999.

- Participating in the January 2008, and July 2008, IAEA Consultancy Meetings in Vienna, Austria, to review and revise Safety Guide WS-G-2.1, "Decommissioning of Nuclear Power Plants and Research Reactors," originally published in October 1999.

- Participating in twice-yearly meetings of the IAEA Waste Safety Standards Committee, which addresses decommissioning specifically, as part of IAEA waste safety activities.

- Conducting an IAEA expert mission to Tbilisi, Georgia, in May 2008, to assist the Republic of Georgia policymakers with legislative requirements, regulatory framework and regulations for radiation and nuclear safety, radioactive waste management, transportation, and decommissioning.

- Participating in the IAEA International Project on Evaluation and Demonstration of Safety for Decommissioning of Nuclear Facilities (DeSa). The October–November 2007, DeSa meeting was held in Vienna, Austria, to revise the content of safety assessment guidance to reflect NRC experience in decommissioning nuclear facilities.

Site Visit to the Harwell Site in the United Kingdom

On November 9, 2007, a DWMEP representative participated in a visit to the Harwell Site, the original civil nuclear research center in the United Kingdom. The facility is undergoing decommissioning of nuclear reactors and research facilities. The visit included presentations by the United Kingdom Atomic Energy Authority (UKAEA) and a guided tour of the radioactive waste-handling facilities for cleanup, volume reduction, and packaging activities.

Nuclear Energy Agency Activities

- The staff contributed to the NEA Radioactive Waste Management Committee (RWMC) Bureau Annual Report for the RWMC-41.

- The staff provided support to senior management participating in the March 2008, annual RWMC meeting and topical sessions on assisting member countries in the management of radioactive waste and materials, with a focus on the development of strategies for the safe, sustainable, and broadly acceptable management of all types of radioactive waste, in particular long-lived waste and spent fuel.

- The staff contributed to the April 2008, revision of the NEA report "Revision of Waste Party on Decommissioning and Decontamination Report on Recent Evolution in Nuclear Site Licensing for Decontamination and Decommissioning—Relevant Issues and Emerging Practices."

- The staff participated in the NEA Working Party on Decommissioning and Dismantling, hosted by UKAEA in November 2007.

6. PROGRAM INTEGRATION

The Decommissioning Program currently encompasses power and early demonstration reactors, research and test reactors, complex materials facilities, and uranium recovery facilities. In addition to the sites undergoing decommissioning regulated by the NRC, many complex decommissioning sites are being decommissioned under the purview of the Agreement States. Given this large breadth of projects, the Decommissioning Program has undertaken many initiatives to keep abreast of sites undergoing decommissioning.

Comprehensive Decommissioning Program

Before FY 2008, information available in previous Decommissioning Program Annual Reports on sites undergoing decommissioning in the Agreement States was limited to site name, location, and materials on site. The implementation of an enhanced Comprehensive Decommissioning Program now allows the NRC to compile, in a centralized location, more complete information on the status of decommissioning and decontamination of complex sites and uranium recovery sites in the United States. Summaries of information on sites regulated by the Agreement States are currently available to the public to ensure openness and promote communication and thus enhance public confidence with a national perspective on decommissioning.

Evaluation of Broad-Scope Licensees

The Division of Nuclear Materials Safety in Region III continued a pilot inspection effort focused on broad-scope licensees' understanding of the Decommissioning Timeliness Rule and associated regulations and guidance regarding decommissioning. These inspections identified common weaknesses in broad-scope licensees' implementation and understanding of decommissioning requirements. The staff is developing a generic communication focusing on the results of this broad-scope pilot effort to highlight the inspection findings and inform licensees of decommissioning requirements.

7. AGREEMENT STATE ACTIVITIES

Thirty-five States have signed formal agreements with the NRC and assumed regulatory responsibility over certain byproduct, source, and small quantities of special nuclear material, including the decommissioning of some complex materials sites. However, after a State becomes an Agreement State, the NRC continues to have formal and informal interactions with the State.

Formal interactions with Agreement States in FY 2008 included the following:

- The Organization of Agreement States (OAS) participated in the Division of Intergovernmental Liaison and Rulemaking Working Group to develop the Decommissioning Planning Rule, as discussed in Section 3 of this report.

- DWMEP staff participated in the Conference of Radiation Control Program Directors (CRCPD) activities, including the May 2008, annual meeting.

- As described in Section 6 of this report, DWMEP staff worked with the Agreement States to incorporate more detailed information about complex materials decommissioning sites and uranium recovery facilities undergoing decommissioning under the purview of the Agreement States on the decommissioning Web site. These site summaries are available at http://www.nrc.gov/info-finder/decommissioning/complex/.

- Integrated Materials Performance Evaluation Program reviews that included decommissioning were conducted in several Agreement States (Arizona, California, Georgia, Kentucky, Louisiana, Minnesota, New Hampshire, Oregon, Rhode Island, Tennessee, and Washington).

The following are examples of informal interactions:

- DWMEP staff participated in monthly OAS/CRCPD teleconferences.

- DWMEP and the Regions coordinated with the Pennsylvania Department of Environmental Protection to transfer regulatory responsibility for the Curtis-Wright Cheswick, Molycorp, Inc., Quehanna, Safety Light Corporation, Superbolt, Westinghouse Waltz Mill, and Whittaker Corporation sites.

Table 7-1 identifies the decommissioning and uranium recovery sites in the Agreement States.

Table 7-1 Agreement State Decommissioning Sites					
State	**Name**	**Location**	**Date DP Submitted**	**Date DP Approved**	**Project Complete**
CA	General Atomics	San Diego, CA	10/14/96	8/26/97	TBD
CA	Excel Research Services, Inc	Fresno, CA	6/22/06	8/30/07	TBD
CA	Providencia Holdings, Inc.	Burbank, CA	7/16/01	10/31/02	TBD
CA	Halaco	Oxnard, CA			TBD
CA	The Boeing Company	Simi Valley, CA		2/18/99	TBD
CA	Chevron Mining, Inc. (formerly Molycorp)	Mountain Pass, CA	6/9/06	TBD	TBD
CA	AeroJet Ordnance Company	Chino, CA	2/23/96	5/31/96	TBD
CA	Isotope Specialties	Burbank, CA	N/A	N/A	TBD
CA	Magnesium Alloy Products	Compton, CA	N/A	N/A	12/08
CO	Umetco Uravan	Uravan, CO		2/01/87	2009
CO	Umetco Maybell	Maybell, CO	01/01/1995	1995	TBD

Table 7-1 Agreement State Decommissioning Sites					
State	**Name**	**Location**	**Date DP Submitted**	**Date DP Approved**	**Project Complete**
CO	Cotter Uranium Mill	Canon City, CO	Revised 2005	2005	In standby. TBD if going into D&D.
CO	Schwartzwalder Mine (Cotter)	Golden, CO	12/01/1996	1997	2009
CO	Colorado School of Mines Research Institute Table Mtn.	Golden, CO	08/01/2006	TBD	2008
CO	Colorado School of Mines Research Institute Creekside	Golden, CO	TBD	TBD	TBD
CO	Sweeney Mining and Milling	Boulder, CO	Pending		TBD
CO	Homestake Mining and Pitch	Sargeants, CO	05/01/2001	06/01/2001	TBD
CO	Redhill Forest	Fairplay, CO	Pending	TBD	TBD
CO	Clean Harbors	Deer Trail, CO	2005	2006	TBD
FL	Mosaic Fertilizer, LLC-Nichols	Mulberry, FL	8/19/03	3/25/08	1/09
FL	U.S. Agri-Chemicals Corp.	Fort Meade, FL	3/13/06	Pending	7/10
FL	C.F. Industries, Inc.	Bartow, FL	3/30/07	Pending	10/08
FL	Mosaic Fertilizer, LLC-Mulberry	Mulberry, FL	4/10/07	Pending	7/09
FL	HRK Holdings, Inc.	Palmetto, FL	11/01/07	Pending	2010

Table 7-1 Agreement State Decommissioning Sites					
State	**Name**	**Location**	**Date DP Submitted**	**Date DP Approved**	**Project Complete**
IL	Spectrulite Consortium	Madison, IL			TBD
IL	Chicago Magnesium	Blue Island, IL	11/02/02	02/01/04	Phase 1—12/04 Phase 2—8/06 Phase 3—11/10
IL	TRONOX (formerly Kerr-McGee)	West Chicago, IL	09/01/93	09/01/94	Complete 11/05 Unknown
KS	Air Capitol Dial	Wichita, KS	TBD	TBD	TBD
KS	Aircraft Instrument & Development/RC Allen Instruments	Wichita, KS	TBD	TBD	TBD
KS	Century Instruments Corporation	Wichita, KS	TBD	TBD	TBD
KS	Instrument and Flight Research	Wichita, KS	TBD	TBD	TBD
KS	Kelley Instruments, Inc.	Wichita, KS	TBD	TBD	TBD
KS	Instrument, Inc.	Wichita, KS	TBD	TBD	TBD
MA	Shpack Landfill	Norton, MA	09/04	09/04	9/09

Table 7-1 Agreement State Decommissioning Sites					
State	**Name**	**Location**	**Date DP Submitted**	**Date DP Approved**	**Project Complete**
MA	BASF (formerly Engelhard)	Plainville, MA	None	N/A	TBD
MA	Starmet Corp. (formerly Nuclear Metals)	Concord, MA	10/06	Pending	TBD
MA	Wyman-Gordon Co.	North Grafton, MA	None	TBD	TBD
MA	Texas Instruments	Attleboro, MA	None	TBD	TBD
MA	Norton/St. Gobain	Worcester, MA	None	TBD	TBD
NE	LLWR Disposal Site (University of Nebraska-Lincoln)	Mead, NE	9/05/07	9/14/07	2008
OH	Metallurg Vanadium Corp. (Formerly Shieldalloy Metallurgical Corp.)	Cambridge, OH	7/13/99	3/6/02	1/09
OH	Ineos USA, LLC (formerly BP Chemical)	Lima, OH	4/92	6/98	12/20
OH	Advanced Medical Systems, Inc.	Cleveland, OH	6/01/04	5/23/05	12/10
OR	TDY Industries Dba Wah Chang	Albany, OR	6/11/03	3/08/06	TBD
OR	PCC Structurals, Inc.	Portland, OR	6/10/06	9/14/06	TBD

Table 7-1 Agreement State Decommissioning Sites					
State	**Name**	**Location**	**Date DP Submitted**	**Date DP Approved**	**Project Complete**
PA	Curtis-Wright Cheswick	Cheswick, PA	3/06	6/07	12/08
PA	Karnish Instruments	Lock Haven, PA			TBD
PA	Molycorp, Inc. (Washington)	Washington, PA	6/99	8/00	TBD
PA	Superbolt (formerly Superior Steel)	Carnegie, PA			TBD
PA	Quehanna (formerly Permagrain Products, Inc.)	Karthaus, PA	4/98, revised 3/03, 3/06	7/98, 9/03, 11/06	12/08
PA	Safety Light Corporation	Bloomsburg, PA			TBD
PA	Strube Incorporated	Lancaster County, PA			TBD
PA	Westinghouse Electric Corp. (Waltz Mill)	Madison, PA	4/97	1/00	TBD
PA	Whittaker Corporation	Greenville, PA	12/00, revised 8/03, 10/06	5/07	12/08
TX	ExxonMobil	Three Rivers, TX	4/85	9/82	TBD
TX	ConocoPhillips	Falls City, TX	11/87	9/80	TBD
TX	Rio Grande Resources	Hobson, TX	4/93 Alternate Concentration Limit—11/97	11/96	TBD

Table 7-1 Agreement State Decommissioning Sites					
State	**Name**	**Location**	**Date DP Submitted**	**Date DP Approved**	**Project Complete**
TX	COGEMA	Bruni, TX	11/03	4/06	Ground water complete Surface ongoing
TX	Intercontinental Energy Corp.	Three Rivers, TX	3/03	Ongoing	Ground water complete Surface TBD
TX	Everest Exploration, Inc. (decommissioning of Tex-1, Mt. Lucas sites)	Hobson and Dinero, TX	8/01	Ongoing	Ground water complete Surface cleanup ongoing
UT	Rio Algom Uranium Mill	Lisbon Valley, UT	9/03/02	7/06/04	TBD
WA	Dawn Mining Company	Ford, WA	12/94	02/95	12/13

N/A not applicable

TBD to be determined

8. RESOURCES

The total Decommissioning Program staff budget for FY 2008 is 70 full-time equivalents (FTE); for FY 2009, the program has 77 FTE. These resource figures include personnel to perform licensing casework directly related to decommissioning sites; inspections; project management and technical support for decommissioning power reactors, uranium mill tailings facilities, and fuel cycle facilities; development of rules and guidance; EISs and EAs; research to develop more realistic analytical tools to support licensing and rulemaking activities; and Office of the General Counsel support. These figures also include supervisory and nonsupervisory indirect FTE associated with the Decommissioning Program, and environmental reviews for new uranium recovery facilities.

9. FISCAL YEAR 2009 PLANNED PROGRAMMATIC ACTIVITIES

The staff has planned a number of programmatic activities for FY 2009. The most significant of these activities are implementing the Decommissioning Planning Rule, working towards preventing future legacy sites, employing new approaches to advance decommissioning at existing legacy sites, forming a working group on financial assurance for the disposition of Category 1 and 2 sources, ensuring timely well-field restoration for ISL facilities, licensing Department of the Army sites contaminated with DU, drafting a Commission paper addressing NARM at former military sites, completing an evaluation of the uses and applicability of computer codes; and continuing the Integrated Decommissioning Improvement Plan (IDIP).

Implementation of the Decommissioning Planning Rule, discussed in Section 3 of this report, is planned to begin by the end of calendar year 2009. The steps needed for implementation of the rule include publishing a future NUREG-series publication for the financial assurance aspects of the rule. The staff will also prepare a draft regulatory guide for public comment in March 2009, to reflect the contamination monitoring aspects of the rule. The final regulatory guide is planned to be completed in November 2009. These implementation activities are expected to continue into FY 2010.

In response to the staff requirements memorandum to SECY-07-0177, "Proposed Rule: Decommissioning Planning (10 CFR Parts 20, 30, 40, 50, 70 and 72: RIN: 3150-AH45)," dated December 10, 2007, the staff is also making further improvements to the decommissioning planning process for the remediation of significant radioactivity during the operational phase of facilities. The objective is to reduce complex decommissioning challenges (e.g., ground water contamination) that can lead to sites with inadequate financial assurance that are unable to complete decommissioning, also known as legacy sites. The staff is planning to engage stakeholders in developing a technical basis for mandating remediation, possible dose limits, or alternatives to the dose limits to help prevent future legacy sites. The technical bases will be a precursor to a proposed rule to include requirements for licensees to promptly remediate radioactively contaminated areas and thereby minimize the creation of legacy sites. The staff will be working on this issue through FY 2009.

The staff will be reviewing the status of existing legacy sites. The staff will be examining alternative approaches for decommissioning these legacy sites, such as working with the licensees to identify ways to reduce the costs of completing decommissioning, working with other agencies to secure funding for decommissioning, or working with other agencies towards decommissioning under CERCLA or FUSRAP. A successful example of this approach that was implemented in FY 2008 is the Salmon River Uranium Development site, which had a removal action performed by EPA. The staff will be working on this effort through FY 2009.

The Energy Policy Act of 2005 required establishment of an interagency task force on radiation source protection and security under the lead of the NRC (hereafter referred to as the Task Force). The Task Force provided, in The Radiation Source Protection and Security Task Force Report, dated August 15, 2006, recommendations to the President and Congress for possible regulatory and legislative changes on several specific topics related to the protection and security of radiation sources. One of the recommendations included in the report (Recommendation 9-2 "Evaluation of Financial Assurance") tasks NRC to lead a working group in an effort to evaluate the financial assurance required for the final disposition of Category 1 and 2 radioactive sources. A chair with financial assurance expertise from FSME has been

selected to lead the working group. The selection of working group participants, which will include NRC, State, and other Federal agency representatives, will continue into FY 2009.

The staff has contacted ISL facility licensees to remind them of the applicability of the timeliness requirements of 10 CFR 40.42, "Expiration and Termination of Licenses and Decommissioning of Sites and Separate Buildings or Outdoor Areas," for the restoration of mine units/well-fields at the end of production. Through inspections and licensing actions, the staff will be working in FY 2009 to ensure that ground water restoration plans for ISL facilities clearly identify scheduled actions that result in timely restoration of each mine unit/well-field.

The Department of Army has identified the existence of DU contamination at several locations related to the use of DU spotter[8] round munitions in the 1960s. Sites that have been identified include Schofield Army Barracks (Hawaii), Pohakaloa Training Area (Hawaii), and Fort Hood (Texas). The Schofield Army Barracks and Fort Hood were visited by NRC staff in FY 2008. Other Department of the Army sites are currently under investigation as possible locations of previous DU usage. These activities were not licensed because of the secrecy of the program at the time. The Department of the Army is preparing a license application for submission to the NRC for the possession of DU at these and other sites. The license application is expected to outline site-specific environmental monitoring plans for the identified locations.

Under the NRC's recent NARM rule, DOD remediation of radium-226, while under military control, is outside of the NRC's jurisdiction. However, in many cases, upon completion of the DOD remediation of the radium-226, the land is likely to be transferred to a nonmilitary owner and could come under NRC jurisdiction. A future Commission paper will discuss issues and make recommendations regarding the NRC's jurisdiction and options for involvement when the remediated property is transferred to a nonmilitary owner, or is no longer under military control, such as when the military-owned property might be leased to a nonmilitary party. This paper would also identify the DOD sites potentially affected by this issue.

As previously discussed in Section 3 "Guidance and Rulemaking Activities," of this report, staff is expecting to complete its evaluation of the uses and applicability of computer codes used in carrying out DWMEP licensing activities in FY 2009.

In FY 2009, IDIP Revision 3 will continue to include decommissioning, but will also include decommissioning of uranium recovery sites and low-level waste activities that affect decommissioning (e.g., storage). The staff will identify improvements to enhance the completion of the remaining complex materials decommissioning sites. The staff will also prepare a draft of IDIP Revision 3 by the end of the calendar year for use in the next budget cycle and will complete the final version to reflect the budget request. Finally, the staff will conduct knowledge management activities to identify and exchange decommissioning lessons learned for selected topics (e.g., institutional controls, engineered barriers/erosion controls, and cost-benefit analyses for restricted use sites).

[8] These spotter rounds were used to help aim the trajectory of the "Davy Crockett" recoilless nuclear rifle.

NRC FORM 335
(9-2004)
NRCMD 3.7

U.S. NUCLEAR REGULATORY COMMISSION

BIBLIOGRAPHIC DATA SHEET

(See instructions on the reverse)

1. REPORT NUMBER
(Assigned by NRC, Add Vol., Supp., Rev., and Addendum Numbers, if any.)

NUREG-1814, Rev.2

2. TITLE AND SUBTITLE

Status of the Decommissioning Program
2008 Annual Report
Final Report

3. DATE REPORT PUBLISHED

MONTH	YEAR
February	2009

4. FIN OR GRANT NUMBER

5. AUTHOR(S)

Richard Chang
Giorgio Gnugnoli

6. TYPE OF REPORT

Technical

7. PERIOD COVERED *(Inclusive Dates)*

10/01/2007 thru 9/30/2008

8. PERFORMING ORGANIZATION - NAME AND ADDRESS *(If NRC, provide Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address; if contractor, provide name and mailing address.)*

Division of Waste Management and Environmental Protection
Office of Federal and State Materials and Environmental Management Programs
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

9. SPONSORING ORGANIZATION - NAME AND ADDRESS *(If NRC, type "Same as above"; if contractor, provide NRC Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address.)*

same as above

10. SUPPLEMENTARY NOTES

11. ABSTRACT *(200 words or less)*

This report provides a comprehensive overview of the U.S. Nuclear Regulatory Commission's (NRC's) decommissioning program. Its purpose is to provide a stand-alone reference document that describes the decommissioning process and summarizes the status of decommissioning activities, under NRC jurisdiction, through September 30, 2008. This includes the decommissioning of complex materials sites, commercial reactors, research and test reactors, uranium recovery facilities, and fuel cycle facilities. Additionally, this report discusses accomplishments of the decommissioning program in fiscal year (FY) 2008; identifies the key decommissioning program issues that the staff will address in FY 2009; and provides information Agreement States have supplied on decommissioning in their States.

12. KEY WORDS/DESCRIPTORS *(List words or phrases that will assist researchers in locating the report.)*

Decommissioning
Complex Material Sites
2008 Annual Report

13. AVAILABILITY STATEMENT

unlimited

14. SECURITY CLASSIFICATION

(This Page)
unclassified

(This Report)
unclassified

15. NUMBER OF PAGES

16. PRICE

PRINTED ON RECYCLED PAPER

Printed
on recycled
paper

Federal Recycling Program

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

OFFICIAL BUSINESS