

# **Status of the Decommissioning Program**

**2006 Annual Report**

**Final Report**

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## **ABSTRACT**

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, 2006. This includes the decommissioning of complex decommissioning sites, commercial reactors, research and test reactors, uranium recovery facilities, and fuel cycle facilities. In addition, this report discusses accomplishments of the decommissioning program in fiscal year (FY) 2006; identifies the key decommissioning program issues that the staff will address in FY 2007; and provides information Agreement States have supplied on decommissioning in their States.<sup>1</sup>

## **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.

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<sup>1</sup>As of September 2006, NRC is planning to reorganize the Office of Nuclear Material Safety and Safeguards (NMSS) and the Office of State and Tribal Programs (STP), to create two new offices: the Office of Federal and State Materials and Environmental Management Programs (FSME), which will focus on materials programs; and the new NMSS, which will focus on fuel cycle programs. This reorganization is scheduled to take effect on October 1, 2006. This document contains references to NMSS and STP. These references will be updated in future revisions of this document.

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## ABBREVIATIONS

ACL	alternate concentration limit
AEA	Atomic Energy Act of 1954
AEC	U.S. Atomic Energy Commission
ASLBP	Atomic Safety and Licensing Board Panel
ATK	Alliant Ordinance and Ground Systems, LLC
BTP	branch technical position
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	<i>Code of Federal Regulations</i>
Ci	curie
Co	cobalt
CRADAL	Computerized Risk Assessment and Data Analysis Lab
CRCPD	Conference of Radiation Control Program Directors
Cs	cesium
CSM	Consultant Services Meeting
CY	calendar year
DCGL	Derived Concentration Guideline Level
DGSNR	Directorate General for Nuclear Safety Agency
DOE	U.S. Department of Energy
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
FA	financial assurance
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
FSS	final status survey
FSSP	Final Status Survey Plan
FSSR	Final Status Survey Report
FTE	full-time equivalents
FUSRAP	Formerly Utilized Sites Remedial Action Program
FY	fiscal year
g	gram
GPS	groundwater protection standard
GSA	U.S. General Services Administration
IC	institutional control
IAEA	International Atomic Energy Agency
IDIP	Integrated Decommissioning Improvement Plan
ISCMEM	Interagency Steering Committee on Multimedia Environmental Models
ISCORS	Interagency Steering Committee on Radiation Standards
ISFSI	independent spent fuel storage installation
ISL	in situ leach
km	kilometers
kW	kilowatt
l	liter
LLW	low-level waste
LTP	License Termination Plan
LTR	License Termination Rule
LTSP	Long-Term Surveillance Plan
MARLAP	Multi-Agency Radiological Laboratory Analytical Protocols
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDA	minimum detectable activity
MDEQ	Michigan Department of Environmental Quality

MED-AEC	Manhattan Engineering District and the Atomic Energy Commission
MOU	memorandum of understanding
mrem	millirem
NEPA	National Environmental Policy Act
NMSS	Office of Nuclear Material Safety and Safeguards
NPL	National Priorities List
NRC	U.S. Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
OAS	Organization of Agreement States
ODEQ	Oklahoma Department of Environmental Quality
OECD	Organization for Economic Cooperation and Development
OGC	Office of the General Counsel
OIP	Office of International Programs
OMB	Office of Management and Budget
ORISE	Oak Ridge Institute for Science and Education
ORNL	Oak Ridge National Laboratory
PA	preliminary assessment
PADEP	Pennsylvania Department of Environmental Protection
PART	Program Assessment Rating Tool
POTW	Publicly Owned Treatment Works
PSDAR	Post-Shutdown Decommissioning Activities Report
Pu	plutonium
R&D	research and development
RAI	request for additional information
RES	Office of Nuclear Regulatory Research
RIS	Regulatory Issue Summary
ROD	Record of Decision
RP	Remediation Plan



SDMP	Site Decommissioning Management Plan
SER	Safety Evaluation Report
SNM	special nuclear material
Sr	strontium
SRM	staff requirements memorandum
SRP	Standard Review Plan
STP	Office of State and Tribal Programs
TAG	Technical Advisory Group
TBD	to be determined
Tc	technetium
Th	thorium
TS	technical specification
U	uranium
UMTRCA	Uranium Mill Tailings Radiation Control Act
USACE	U.S. Army Corps of Engineers
WCS	Waste Control Specialists
WDEQ	Wyoming Department of Environmental Quality
WPDD	Working Party on Decommissioning and Dismantlement
WASSC	Waste Safety Standards Committee
WVDP	West Valley Demonstration Project
yr	year

## ALPHABETICAL LISTING OF SITE SUMMARIES BY SITE CATEGORY

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LACROSSE. . . . .	A-10
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## 1. Introduction

This report provides a comprehensive summary of the U.S. Nuclear Regulatory Commission's (NRC's) decommissioning program. Its purpose is to provide a reference document that summarizes the decommissioning activities in fiscal year (FY) 2006, including the decommissioning of complex material sites, commercial reactors, research and test reactors, uranium mill tailings facilities, and fuel cycle facilities. In addition, this report discusses accomplishments of the decommissioning program since last year's report, provides information supplied by Agreement States on decommissioning in their States, and identifies key decommissioning program issues that the staff will address in the coming year.

## 2. Decommissioning Sites

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 NRC, are decommissioned in a safe, timely, and effective manner so that they can be returned to beneficial use and that stakeholders are informed and involved in the process, as appropriate. A broad spectrum of activities associated with these program functions is summarized in this report.

On June 17, 2004, the elimination of the Site Decommissioning Management Plan (SDMP) designation was announced in the *Federal Register* (69 *Federal Register* 33946). NRC now manages materials decommissioning sites as "complex sites," under a comprehensive decommissioning program. The SDMP designation will be used in this report only to describe the cleanup criteria before the License Termination Rule (LTR).

Approximately 200 materials licenses are terminated each year. Most of these license terminations are routine, and the sites require little, if any, remediation to meet NRC's unrestricted release criteria. The decommissioning program discussed in this report focuses on the termination of licenses that are not routine, because the sites involve more complex decommissioning activities.

There are 16 nuclear power reactors, 14 research and test reactors, 32 complex decommissioning materials facilities, three fuel cycle facilities (partial decommissioning), and 12 uranium recovery facilities that are undergoing non-routine decommissioning or are in long-term safe storage, under NRC jurisdiction. Appendices A - E of this report contain 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 impacting completion of decommissioning. For those licensees that have submitted a decommissioning plan (DP) or license termination plan (LTP), the schedules are based on an assessment of the complexity of the DP or LTP review. For those licensees that have not submitted a DP or LTP, the schedules are based on other licensee information available, and the anticipated decommissioning approach.

Through the Agreement State Program, 34 States have signed formal agreements with 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. Agreement States do not have regulatory authority over operating or decommissioning nuclear power plants. NRC's coordination with the Agreement States decommissioning programs is discussed in more detail in Section 7 of this report.

## 2.1 Nuclear Power Reactor Decommissioning

In FY 2006, NMSS had regulatory project management responsibility for 12 decommissioning power reactors. The Office of Nuclear Reactor Regulation (NRR) had project management responsibility for two decommissioning reactors (Indian Point – Unit 1, Millstone – Unit 1). In addition, NRR had project management for two decommissioning early demonstration reactors—Vallecitos, and the Nuclear Ship Savannah. Table 2–1 identifies the power reactors undergoing decommissioning.

On October 1, 2006, project management and oversight responsibility for Indian Point – Unit 1, Millstone – Unit 1, Vallecitos, and the Nuclear Ship Savannah will transfer from NRR to FSME. Plant status summaries for all decommissioning reactors are provided in Appendix A.

### 2.1.1 Decommissioning Process

The decommissioning process begins when a licensee decides to permanently cease operations. Several major steps make up the decommissioning process: 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 NRC. In addition, the licensee is required to notify 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. The PSDAR must include:

- A description and schedule for the planned decommissioning activities;
- An estimate of the expected costs; and
- A discussion that provides the means for concluding that the environmental impacts associated with decommissioning activities will be bounded by appropriately issued environmental impact statements (EIS').

NRC will notice receipt of the PSDAR in the *Federal Register* and make the PSDAR available for public comment. In addition, NRC will hold a public meeting in the vicinity of the licensee's facility, to discuss the PSDAR. NRC does not approve the PSDAR.

The licensee cannot perform any major decommissioning activities until 90 days after NRC has received the PSDAR. After this period, the licensee can perform decommissioning activities as long as the activities do not:

- Foreclose release of the site for unrestricted use;
- Result in significant environmental impacts not previously reviewed; or
- Result in there no longer being reasonable assurance that adequate funds will be available for decommissioning.

In taking actions permitted under Title 10 of the Code of Federal Regulations (CFR) 50.59, after submittal of the PSDAR, the licensee must notify NRC, in writing, before performing any decommissioning activity inconsistent with, or making any significant schedule change from, those actions and schedules in the PSDAR.

### LTP

Each power reactor must submit an application for termination of its license. The application must be accompanied or preceded by an LTP submitted for NRC approval. The NRC and licensee generally 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:

- A site characterization;
- Identification of remaining dismantlement activities;
- Plans for site remediation;
- Detailed plans for the final radiation survey;
- A 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 the applicable requirements of the LTR will be met.

NRC will notice receipt of the LTP and make the LTP available for public comment. In addition, 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." The LTP is approved by license amendment.

### Implementation of the LTP

NRC staff will inspect the licensee during decommissioning operations 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 NRC either: (1) terminate the 10 CFR Part 50 license; or (2) reduce the Part 50 license boundary to the footprint of the ISFSI. 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 Part 50 license. For reactors with an ISFSI licensed under the provisions of Part 50, completion of decommissioning will result in reducing the Part 50 license boundary to the footprint of the independent spent fuel storage installation (ISFSI). NRC will approve the FSSR and licensee's request if it determines that:

- The remaining dismantlement has been performed in accordance with the approved LTP; and
- 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 FY 2006 Activities

NRC power reactor decommissioning activities include: (a) project management for decommissioning power reactors and technical review responsibility for licensee submittals in support of decommissioning; (b) core inspections; (c) supporting development of rulemaking and guidance; (d) conducting public outreach, including the development of communication plans; and, (e) participating in industry conferences and workshops.

- During the past year, NRR terminated Saxton's Part 50 license. NRC also approved the release of non-impacted areas from the Yankee Rowe Part 50 License. Table 2-1 provides a schedule for reactor decommissioning activities.
- One of the goals identified in NRC's Strategic Plan is to ensure openness in its regulatory process. The Strategic Plan identifies the development of communication plans for specific activities associated with the regulation of radiological decommissioning, as a means to support the openness strategy. The staff continues to implement communication plans for all decommissioning reactors. Site-specific communication plans are useful tools to help ensure that the appropriate stakeholders are identified and contacted and focuses the staff on messages NRC wants to convey.
- The staff also participated in a number of industry conferences and workshops. Examples of conferences and workshops attended by the staff during the past year include: (1) Waste Management '06; (2) American Nuclear Society conferences; (3) Fuel Cycle Facility Forum materials site meeting; (4) International Conference on



Environmental Remediation and Radioactive Waste Management 05; and (5) an Electric Power Research Institute (EPRI) workshop.

## 2.2 Research and Test Reactor Decommissioning

NRR provides project management and inspection oversight for 14 decommissioning research and test reactors. As of September 30, 2006, 10 research and test reactors have decommissioning orders or amendments. Additionally, three research and test reactors are in “possession-only” status, either waiting for shutdown of another research or test reactor at the site, or for removal of the fuel from the site by the U.S. Department of Energy (DOE), and one decommissioning amendment request is under review.

On October 1, 2006, project management and oversight responsibility for the decommissioning research and test reactors will transfer from NRR to FSME. Plant status summaries for the decommissioning research and test reactors are provided in Appendix B.

### 2.2.1 Decommissioning Process

In general, the decommissioning process for research and test reactors and power reactors is the same (see Section 2.1.1).

### 2.2.2 Summary of FY 2006 Activities

In FY 2006, NRR terminated the licenses of three research and test reactors: Manhattan College, University of Virginia, and University of Virginia - Cavalier. In addition, NRC participated in the September 2006, Test Research and Training Reactors conference held in Austin, Texas. Table 2–2 identifies the decommissioning research and test reactors and provides the current status.

**Table 2-1  
Power Reactors Undergoing Decommissioning**

<b>Reactor</b>	<b>Location</b>	<b>PSDAR* Submitted</b>	<b>LTP Submitted</b>	<b>LTP Approved</b>	<b>Completion of Decomm.**</b>	<b>Site Summ. Pg. No.</b>	
1	Big Rock Point	Charlevoix, MI	9/97	4/03	3/05	2007	Page A-1
2	Dresden – Unit 1	Dresden, IL	6/98	TBD	TBD	TBD	Page A-3
3	Fermi – Unit 1	Newport, MI	4/98	2007***	TBD	2008	Page A-5
4	Haddam Neck – Connecticut Yankee	Meriden, CT	8/97	7/00	11/02	2007	Page A-6
5	Humboldt Bay	Eureka, CA	2/98	2009***	TBD	2011	Page A-7
6	Indian Point – Unit 1	Buchanan, NY	1/96	TBD	TBD	TBD	Page A-9
7	La Crosse	La Crosse, WI	5/91	TBD	TBD	TBD	Page A-10
8	Millstone – Unit 1	Waterford, CT	6/99	TBD	TBD	TBD	Page A-11
9	Nuclear Ship Savannah	Newport News, VA	TBD	TBD	TBD	TBD	Page A-12
10	Peach Bottom – Unit 1	Delta, PA	6/98	2012***	TBD	2014	Page A-13
11	Rancho Seco	Sacramento, CA	12/94	4/06	2007***	2008	Page A-14
12	San Onofre – Unit 1	San Clemente, CA	12/98	TBD	TBD	2045	Page A-15
13	Three Mile Island – Unit 2	Harrisburg, PA	2/79	TBD	TBD	2014	Page A-17
14	Vallecitos	Pleasanton, CA	7/66	TBD	TBD	TBD	Page A-18
15	Yankee Rowe	Greenfield, MA	11/94	11/03	4/05	2007	Page A-19

**Table 2-1  
Power Reactors Undergoing Decommissioning**

	<b>Reactor</b>	<b>Location</b>	<b>PSDAR* Submitted</b>	<b>LTP Submitted</b>	<b>LTP Approved</b>	<b>Completion of Decomm.**</b>	<b>Site Summ. Pg. No.</b>
16	Zion – Units 1 & 2	Waukegan, IL	2/00	TBD	TBD	2026	Page A-20
<p>* Post-shutdown Decommissioning Activities Report (PSDAR) or decommissioning plan (DP) equivalent.  ** For decommissioning reactors with no ISFSI or an ISFSI licensed under Part 72, completion of decommissioning will result in the termination of the Part 50 license. For reactors with an ISFSI licensed under the provisions of Part 50, completion of decommissioning will result in reducing the Part 50 license boundary to the footprint of the ISFSI.  *** Estimated date.</p> <p>NOTE: Licensees submitted DPs (or equivalent) before 1996 and PSDARs after 1996.</p>							

**Table 2–2  
Research and Test Reactors Undergoing Decommissioning**

<b>Reactor</b>	<b>Location</b>	<b>Status</b>	<b>Completion of Decomm.</b>	<b>Site Summ. Pg. No.</b>	
1	Cornell University – TRIGA	Ithica, NY	DECON Approved	2007	Page B-1
2	Cornell University – ZPR	Ithica, NY	DECON Approved	2007	Page B-2
3	Ford Nuclear Reactor	Ann Arbor, MI	DECON Approved	TBD	Page B-3
4	General Atomics – TRIGA Mark F	San Diego, CA	DECON Approved	TBD	Page B-4
5	General Atomics – TRIGA Mark I	San Diego, CA	DECON Approved	TBD	Page B-5
6	General Electric Co. – GETR	Sunol, CA	Possession-Only	TBD	Page B-6
7	General Electric Co. – VESR	Sunol, CA	Possession-Only	TBD	Page B-7
8	NASA - Mockup	Sandusky, OH	DECON Approved	2010	Page B-8
9	NASA - Plum Brook	Sandusky, OH	DECON Approved	2010	Page B-9
10	University of Buffalo	Buffalo, NY	Possession-Only	TBD	Page B-10
11	University of Illinois	Urbana, IL	DECON Approved	TBD	Page B-11
12	University of Washington	Seattle, WA	DECON Approved	2007	Page B-12
13	Veterans Administration	Omaha, NE	DECON Amendment	TBD	Page B-13
14	Westinghouse	New Stanton, PA	DECON Approved	TBD	Page B-14

Note: DECON - decontamination; 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; ZPR - Zero Power Reactor.

## 2.3 Complex Material Facility Decommissioning

There are 32 complex materials sites undergoing decommissioning (see Table 2-3). Table 2-3 identifies the clean-up criteria for each complex site as either LTR or SDMP Action Plan criteria. The LTR (10 CFR Part 20, Subpart E) authorized two different sets of cleanup criteria—the concentration-based SDMP Action Plan criteria and the dose-based LTR criteria. Under the provisions of 10 CFR 20.1401(b), any licensee that submitted its DP before August 20, 1998, and received NRC approval of that DP before August 20, 1999, could use the SDMP Action Plan criteria for site remediation. In the SRM on SECY-99-195, 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 all 12 DPs were approved by the deadline. All other sites must use the dose-based criteria of the LTR.

NRC has eliminated the SDMP designation for certain decommissioning facilities. Instead, NRC manages all materials decommissioning sites as “complex sites,” under a comprehensive decommissioning program. The SDMP designation will be used in this paper only to describe decommissioning activities that have taken place before June 17, 2004.

Status summaries for the Complex Materials Sites undergoing decommissioning are provided in Appendix C.

### 2.3.1 Decommissioning Process

The decommissioning process is initiated by any one of the following conditions:

- The license expires;
- 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; or
- No principal activities have been conducted for a period of 24 months in any separate building or outdoor area.

Several major steps make up the decommissioning process: 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 is required to notify 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. Alternative schedules are authorized under the regulations, with NRC approval.

## DP

A DP must be submitted if required by license condition or if the procedures and activities necessary to decommission have not been previously approved by NRC 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 clean-up 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; or
- Procedures could result in significantly greater releases of radioactive material to the environment than those associated with operations.

Before submitting a DP, it is generally useful for the licensee to meet with NRC, to agree on the form and content of the DP. This pre-submittal meeting is intended to make the DP review process more efficient by reducing the need for requests for additional information (RAIs).

The DP review process begins with an acceptance review. Although primarily an administrative review, the acceptance review includes, but is not be limited to: (a) completeness of the application; (b) legibility of drawings; (c) general adequacy of information; (d) justification for proprietary information; and (e) 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, a limited technical review will be conducted. The purpose of the limited technical review is to identify significant technical deficiencies at an early stage, thereby precluding a detailed technical review of a technically incomplete submittal. At the conclusion of the acceptance review, the DP will either be accepted for detailed technical review or rejected and returned to the licensee with the deficiencies identified. For DPs proposing unrestricted release, a full technical review will be initiated after the successful conclusion of the acceptance review. The staff's review is guided by NUREG-1757, "Consolidated NMSS Decommissioning Guidance," and its supporting references. The results of the staff's review will be documented in an Environmental Assessment (EA) and a Safety Evaluation Report (SER). The EA will be shared with the appropriate State, and State comments will be considered in finalizing the EA. The final EA must be summarized in the *Federal Register* in the form of a Finding of No Significant Impact (FONSI) unless there was a significant environmental impact in which case an EIS would be required.

For reviews of DPs proposing restricted release, the review will be conducted in two phases. The first phase of the review will focus on the financial assurance (FA) and institutional control (IC) provisions of the DP. The review of the remainder of the DP will be initiated only after the staff is satisfied that the licensee's proposed IC & FA provisions will comply with the requirements of the LTR (Part 20, Subpart E). The applicable portions of NUREG-1757, "Consolidated NMSS Decommissioning Guidance," will be used to guide this phase of the review. Phase II of the review will address all other sections of the technical review as guided by NUREG-1757 and will include the development of an EIS. Therefore, one of the first steps

in Phase II is the publication of a Notice of Intent to develop an EIS. The basic EIS development steps are:

- 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; and
- Preparation and publication of the Record of Decision (ROD).

In parallel with the development of the EIS, the staff will develop a draft and final SER. The development of the draft SER will be coordinated 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 so that the number of RAIs is minimized, without diminishing the technical quality or completeness of the licensee's ultimate submittal. For example, the staff will first develop a set of additional information needs and clarifications, including the bases for the additional information/clarifications, and then meet with the licensee or responsible party to discuss the issues. This meeting will be noticed and conducted in accordance with NRC requirements for meetings open to the public. The results of the meeting will be documented in a meeting report. Any issues that cannot be resolved during the meeting will be included in the formal RAI. In developing the final RAI, staff will document the insufficient or inadequate information submitted by the licensee and communicate what additional information is needed to address the identified deficiencies.

After publication of the FONSI (for a DP involving an EA) or the ROD (for a DP involving an EIS), a license amendment will be issued, approving the DP, along with any additional license conditions found to be necessary as a result in the EA/EIS and/or the SER.

#### Implementation of the DP

After approval of the DP, the licensee must complete decommissioning in accordance with the approved DP within 24 months or apply for an alternate schedule. NRC staff will inspect the licensee during decommissioning operations 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 is required to:

- Certify the disposition of all licensed material, including accumulated wastes, by submitting a completed NRC Form 314 or equivalent information; and

- 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, unless the licensee demonstrates in some other manner that the premises are suitable for release in accordance with the LTR.

Licenses are terminated by written notice to the licensee when NRC determines that:

- Licensed material has been properly disposed of;
- Reasonable effort has been made to eliminate residual radioactive contamination, if present;
- Site meets the approved DP; and
- Radiation survey has been performed or other information submitted by the licensee that demonstrates that the premises are suitable for release in accordance with the LTR.

### 2.3.2 Summary of FY 2006 Activities

Material facilities decommissioning activities include: (a) maintaining regulatory oversight of complex decommissioning sites; (b) undertaking financial assurance reviews; (c) examining issues and funding options to facilitate remediation of sites in non-Agreement States; (d) interacting with the U.S. Environmental Protection Agency (EPA) and Interagency Steering Committee on Radiation Standards (ISCORS); (e) inspecting complex decommissioning sites; (f) conducting public outreach; (g) participating in international decommissioning activities; (h) conducting a program evaluation; and (i) participating in industry conferences and workshops.

- Since last year's status report, seven sites were removed from the complex site list through license termination or completion of decommissioning: (1) Department of the Army - Ft. Belvoir; (2) Dow Chemical; (3) Kerr McGee Cushing; (4) Kirtland Air Force Base; (5) Heritage Minerals; (6) Union Carbide Corporation; and (7) Westinghouse Electric - Blairsville.
- Activities associated with complex site decommissioning program include: (a) review and approval of DPs; (b) conduct of pre-DP development meetings with licensees; (c) review of licensee FSSRs and conduct of confirmatory surveys; (d) conduct of in-process inspections; and (e) preparation of EAs and SERs. In FY 2006, the staff approved DPs for Dow Chemical Co., and S.C. Holdings, Inc. The staff is currently reviewing DPs for the following sites: (a) AAR; (b) Cabot Corporation; (c) Curtis-Wright Cheswick; (d) Mallinckrodt Chemical, Inc.; (e) Quehanna; (f) Westinghouse Electric Company (Hematite Facility); (g) Shieldalloy Metallurgical Corp.; and (h) UNC Naval Products.
- Staff routinely reviews financial assurance submittals for materials and fuel cycle facilities, and maintains a financial instrument security program. Approximately 25 financial assurance submittals were reviewed in FY 2006, including two complex reviews for fuel enrichment license applications.
- One of the goals identified in NRC's Strategic Plan is to ensure openness in its regulatory process. The Strategic Plan identifies the development of communication



plans for specific activities associated with the regulation of radiological decommissioning, as a means to support the openness strategy. The staff continues to implement communication plans for all complex sites. Site-specific communication plans are useful tools to help ensure that the appropriate stakeholders are identified and contacted and focuses the staff on messages NRC wants to convey. One of the activities identified in the communication plans for each site is participation in public meetings to inform the public about major licensing actions. During the past year, the staff participated in public meetings for the: (a) West Valley Demonstration Project (WVDP); (b) Mallinckrodt Chemical, Inc.; (c) Michigan Department of Natural Resources; (d) S.C. Holdings Inc.; (e) Quehanna; (f) Heritage Minerals Inc.; and (g) Pathfinder.

- The staff's participation in International activities is discussed in Section 5.
- The staff also participated in a number of industry conferences and workshops. Examples of conferences and workshops attended by the staff during the past year include: (1) Waste Management '06; (2) American Nuclear Society conferences; (3) Fuel Cycle Facility Forum meetings; (4) ICEM 05; and (5) an EPRI workshop.

#### 2.4 Uranium Recovery Facility Decommissioning

Currently, 12 uranium recovery facilities are in decommissioning. Uranium recovery decommissioning activities in the Division of Fuel Cycle Safety and Safeguards (FCSS) include: (a) regulatory oversight of decommissioning uranium recovery (milling) sites; (b) review of site characterization plans and data; (c) review and approval of reclamation plans (RPs); (d) preparation of EAs and EIS; (e) inspection of decommissioning activities, including confirmatory surveys; (f) decommissioning cost estimate reviews (including annual surety updates); and (g) oversight of license termination. Regulations governing uranium recovery facility decommissioning are found in 10 CFR Part 40 and Part 40, Appendix A. These licensees include conventional uranium mills and in-situ leach (ISL) facilities. Table 2-4 identifies the Title II decommissioning sites. Site status summaries for each of the facilities are provided in Appendix D.

On October 1, 2006, responsibility for uranium recovery decommissioning activities will be transferred from the FCSS to the Division of Waste Management and Environmental Protection (DWMEP), as part of the consolidation of NRC's decommissioning program. Details of the consolidation are provided in SECY-06-0106.

**Table 2-3  
Complex Decommissioning Sites**

<b>Name</b>	<b>Location</b>	<b>Date DP Submitted</b>	<b>Date DP Approved</b>	<b>Cleanup Criteria</b>	<b>Projected Removal</b>	<b>Site Summ. Pg. No.</b>	
1	AAR Manufacturing, Inc.	Livonia, MI	10/97 revised 9/06	5/98 TBD	LTR-RES	9/08	Page C-1
2	ABB Prospects, Inc.	Windsor, CT	4/03	6/04	LTR-UNRES	12/07	Page C-2
3	Babcock & Wilcox (Shallow Land Disposal Area)	Vandergrift, PA	6/01 revised NA	TBD	LTR-UNRES	10/09	Page C-4
4	Battelle Columbus Laboratories	Columbus, OH	8/00	2001	LTR-UNRES	11/06	Page C-6
5	Cabot Performance Materials, Inc.	Reading, PA	6/05 revised 8/06	2/07*	LTR-UNRES	10/07	Page C-8
6	Curtis-Wright Cheswick	Cheswick, PA	3/06	6/07	LTR-UNRES	12/08	Page C-10
7	Department of the Army (Ft. McClellan)	Fort McClellan, AL	3/99	3/01	LTR-UNRES	12/06	Page C-11
8	Eglin Air Force Base	Walton County, FL	8/03	9/05	LTR-UNRES	12/06	Page C-12
9	Engelhard Minerals	Great Lakes, IL	NA	NA	LTR-UNRES	TBD	Page C-13
10	FMRI (Fansteel) Inc.	Muskogee, OK	8/99 Revised 5/03	12/03	LTR-UNRES	2023**	Page C-15

**Table 2-3  
Complex Decommissioning Sites**

<b>Name</b>	<b>Location</b>	<b>Date DP Submitted</b>	<b>Date DP Approved</b>	<b>Cleanup Criteria</b>	<b>Projected Removal</b>	<b>Site Summ. Pg. No.</b>	
11	Homer Laughlin	Newell, WV	1/95	1/95	LTR-UNRES	TBD	Page C-18
12	Jefferson Proving Ground	Madison, IN	8/99 revised 6/02, 6/10*	10/02 8/10*	LTR-RES	9/10	Page C-20
13	Kaiser Aluminum	Tulsa, OK	(Phase 1) 8/98 (Phase 2) 5/01	2/00 6/03	Action-UNRES LTR-UNRES	10/06	Page C-21
14	Kerr-McGee	Cimarron, OK	4/95	8/99	Action-UNRES	5/10	Page C-22
15	Mallinckrodt Chemical Inc.	St. Louis, MO	(Phase 1) 11/97 (Phase 2) 11/03	5/02 5/07* **	LTR-UNRES	7/08	Page C-4
16	Molycorp, Inc. – Washington	Wash., PA	6/99	8/00	Action-UNRES	6/08	Page C-26
17	NWI Breckenridge	Breckenridge, MI	3/04	8/04	LTR-UNRES	TBD	Page C-28
18	Pathfinder	Souix Falls, SD	2/04	5/05	LTR-UNRES	5/07	Page C-30
19	Quehanna (formerly Permagrain Products, Inc.)	Media, PA	4/98, revised 3/03, 3/06	7/98, 9/03, 11/06*	LTR-UNRES	5/07	Page C-31

**Table 2-3  
Complex Decommissioning Sites**

<b>Name</b>	<b>Location</b>	<b>Date DP Submitted</b>	<b>Date DP Approved</b>	<b>Cleanup Criteria</b>	<b>Projected Removal</b>	<b>Site Summ. Pg. No.</b>	
20	Royersford Wastewater Treatment Facility	Royersford, PA	TBD	TBD	LTR-UNRES	TBD	Page C-32
21	Safety Light Corp.	Bloomsburg, PA	12/00	12/01	LTR-UNRES	12/07	Page C-34
22	Salmon River	Salmon, ID	TBD	TBD	LTR-UNRES	5/12	Page C-36
23	S.C. Holdings	Kawkawlin, MI	11/03	3/06	LTR-UNRES	11/06	Page C-37
24	Shieldalloy Metallurgical Corp.	Newfield, NJ	6/06	9/07*	LTR-RES	9/10	Page C-38
25	Stepan Chemical Company	Maywood, NJ	NA	NA	LTR-UNRES	9/09	Page C-40
26	Superbolt (formerly Superior Steel)	Pittsburgh, PA	TBD	TBD	LTR-UNRES	TBD	Page C-42
27	UNC Naval Products	New Haven, CT	8/98 revised 2004	4/99 11/06*	LTR-UNRES	10/07	Page C-43
28	West Valley	West Valley, NY	2007*	2008*	LTR-UNRES***	TBD	Page C-44
29	Westinghouse Electric (Churchill Facility)	Pittsburgh, PA	5/05	NA+	LTR-UNRES	TBD	Page C-46
30	Westinghouse Electric (Hematite Facility)	Jefferson City, MO	4/04 revised 6/06	9/07*	LTR-UNRES	3/10	Page C-47

**Table 2-3  
Complex Decommissioning Sites**

Name	Location	Date DP Submitted	Date DP Approved	Cleanup Criteria	Projected Removal	Site Summ. Pg. No.
31	Westinghouse Electric (Waltz Mill)	Madison, PA	4/97	1/00	LTR-UNRES	10/07 Page C-49
32	Whittaker Corp.	Greenville, PA	12/00 Revised 8/03, 10/06*	5/07*	LTR-UNRES	2/08 Page C-50
<p>* Estimated Date</p> <p>** Timeline for approving DP is protracted because of: (a) satisfying National Environmental Policy Act (NEPA) requirements; (b) conduct of public hearing; (c) multi-phase DP submittals; or (d) combination of all the above.</p> <p>*** The West Valley DP has not yet been submitted. The staff anticipates that West Valley DP will include plans to release a large portion of the site for unrestricted use, and the remainder of the site may have a perpetual license or be released with restrictions.</p> <p>+ The Westinghouse Electric (Churchill Facility) submitted a DP before notifying NRC that it had permanently ceased operations. The licensee intends to continue licensed operations for several more years. The staff reviewed the DP and will provide a summary of its findings regarding the adequacy of the DP, but will not approve it. When the licensee permanently ceases operations, a new DP will need to be submitted to NRC for review and approval.</p> <p>NOTES:</p> <ul style="list-style-type: none"> <li>• The cleanup criteria identified in this table present the staff's most recent information, but not necessarily represent the current or likely outcome.</li> <li>• Abbreviations used in this table include Action for SDMP Action Plan Criteria, LTR for LTR Criteria, RES for Restricted Use, and UNRES for Unrestricted Use.</li> </ul>						

**Table 2-4  
Decommissioning Title II Uranium Recovery Sites**

	<b>Name</b>	<b>Location</b>	<b>DP Approved</b>	<b>Completion of Decomm.</b>	<b>Site Summ. Pg. No.</b>
1	American Nuclear Corporation	Casper, WY	10/88, Revision 2006	TBD	Page D-1
2	Bear Creek	Converse County, WY	5/89	2007	Page D-2
3	COGEMA Mining Inc.	Mills, WY	12/01	TBD	Page D-3
4	ExxonMobil Highlands	Converse County, WY	1990	2008	Page D-4
5	Homestake	Grants, NM	Revised plan - 3/95	2017	Page D-5
6	Pathfinder - Lucky MC	Gas Hills, WY	Revised plan - 7/98	2007	Page D-6
7	Pathfinder - Shirley Basin	Shirley Basin, WY	Revised plan - 12/97	TBD	Page D-7
8	Rio Algom - Ambrosia Lake	Grants, NM	2003 (mill); 2004 (soil)	2009	Page D-8
9	Sequoyah Fuels Corporation	Gore, OK	2007	TBD	Page D-9
10	Umetco Minerals Corporation	East Gas Hills, WY	Revised soil plan - 4/01	2010	Page D-10
11	United Nuclear Corporation	Churchrock, NM	3/91, Revision 2005	TBD	Page D-11
12	Western Nuclear Inc.- Split Rock	Jeffrey City, WY	1997	2008	Page D-13

## 2.4.1 Uranium Recovery Facility Decommissioning Process

The decommissioning process is initiated by any one of the following conditions:

1. The license expires or the license is revoked;
2. The licensee has decided to permanently cease principal activities at the entire site or in any separate building or outdoor area;
3. No principal activities have been conducted for a period of 24 months; or
4. No principal activities have been conducted for a period of 24 months in any separate building or outdoor area.

Several major steps comprise the decommissioning process including the following: (a) notification; (b) submittal and review of the reclamation plan (RP); (c) implementation of the RP; (d) completion of reclamation; (e) construction-completion report review and inspection; (f) well-field restoration report review; (g) license termination; and (h) transfer of property to the long-term care custodian.

### Notification

Within 60 days of the occurrence of any of the triggering conditions, the licensee must notify NRC of such occurrence and either begin decommissioning or, if required, submit an RP within 12 months of notification and begin decommissioning upon plan approval. Two exceptions to this exist. First, for new ISL or conventional facilities, groundwater restoration, surface reclamation, and facility DPs are submitted with the initial license application. These plans are reviewed and approved before a license is issued. For ISLs, reclamation can occur at one well field, while others are being actively mined. Second, under 10 CFR 40.42(f) (timeliness in decommissioning requirements), facilities may delay decommissioning if NRC determines that such a delay is not detrimental to public health and the environment and it is in the public interest. Such a delay has been granted on multiple occasions to one conventional mill facility in standby status.

### RP - Existing Facilities

At this point in time, all uranium recovery facilities in existence before the enactment of the Uranium Mill Tailings Radiation Control Act of 1978 have NRC-approved RPs. Therefore, staff would only review amendments to existing RPs for such existing facilities. Amendments to RPs would be required under the following circumstances:

- Environmental contamination or other conditions not considered in the existing RP;
- A change in reclamation procedures that the licensee had requested.

Depending on the complexity of the revision, a meeting between the licensee and NRC staff may be warranted. This meeting would serve to make the RP amendment process more efficient by reducing the need for multiple RAs.

After the amended RP is submitted, the review process begins with an acceptance review. Acceptance reviews are generally administrative in nature and include, but are not limited to,

the following: (a) completeness of the application; (b) legibility of drawings; (c) adequacy of information; (d) justification for proprietary information; and (e) obvious technical inadequacies. Acceptance reviews are used to verify that the application contains sufficient information before the staff begins detailed technical reviews. Furthermore, a limited technical review would be conducted.

Amendments to RPs would require either an EA or an EIS, depending on amendment complexity. If staff determine that an EIS is required, staff will take the following basic EIS development steps:

- 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; and
- Preparation and publication of the ROD.

If an EA is adequate for the RP amendment, staff will issue a draft EA to cooperating agencies, incorporate agency comments, and publish the final EA and a FONSI. Staff will also prepare the technical evaluation report (TER) concurrently with EA or EIS preparation. After publication of the FONSI or ROD, a license amendment and TER will be issued, approving the RP amendment, along with any additional license conditions deemed necessary from the environmental and technical review processes.

Regardless of whether an EA or EIS is developed, the staff structures its reviews to minimize the quantity of RAIs without diminishing the technical quality or completeness of the licensee's ultimate submittal. For example, staff will develop a set of needs and clarifications and discuss those needs to determine the necessity of all the requests before addressing the licensee. Staff will subsequently discuss those needs and clarifications, with the licensee, before developing the final RAI, to provide the licensee with an opportunity to address the straightforward needs or clarifications immediately.

#### RP - New Facilities

Procedures for reviewing RPs for new facilities are similar to those for existing facilities. However, because new facility RPs are incorporated into the license application, an EIS is automatically required for the RP, per 10 CFR 51.20(8).

#### Implementation of the RP

After approval of the RP, the licensee must complete decommissioning, in accordance with the approved RP, within 24 months, or apply for an alternate schedule. For conventional facilities, with groundwater contamination or ISL uranium extraction facilities, 24 months are usually insufficient to complete groundwater reclamation, because groundwater contamination is more difficult to remediate than surface contamination. NRC staff will inspect the licensee, during decommissioning operations, to ensure compliance with the RP, license conditions, and NRC, and other applicable regulations (i.e., US Department of Transportation regulations).



## Completion of Decommissioning

Decommissioning involves two different activities, surface reclamation (i.e., surface contamination, 11e.(2) byproduct material, and structures) and groundwater reclamation. Groundwater reclamation is considered completed when concentrations on and offsite (depending on the extent of contaminant migration) meet previously established groundwater protection standards (GPS') per Part 40, Appendix A. Three types of standards have been established per Criterion 5B(5), in Appendix A. These are as follows:

- Commission-approved background concentrations;
- Representative values presented in Table 5C in Appendix A; and
- Alternate concentration limits (ACLs).

When GPS' are originally established, the values are generally Commission-approved background or values, Table 5C, or EPA maximum concentration levels (MCLs), per the Safe Drinking Water Act. If the licensee demonstrates that concentrations of certain constituents cannot be restored to either background or MCLs, then the staff may approve alternate concentration limits (ACLs), after considering all the items found in Appendix A, Criterion 5B(6).

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. Staff documents its review by publishing an EA and FONSI, and issuing a TER. After ACLs are approved, groundwater reclamation may cease and surface reclamation may be completed. However, ACL amendments will incorporate groundwater and surface water (if needed) monitoring programs that continue after reclamation is finished.

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

## License Termination - Conventional Mills

After all reclamation activities have been completed and approved, the licensee, 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 a long-term surveillance plan (LTSP) for staff review and concurrence. The LTSP documents the custodian's responsibilities for long-term care, including security, inspections, groundwater and surface water monitoring, and remedial actions. After staff approves an

LTSP, the license may be terminated and title to the site, including all disposal areas, is transferred to the custodian. After a license is terminated, the custodian is regulated under a 10 CFR 40.28 general license.

In some cases, groundwater contamination has migrated offsite and cannot be reclaimed. In these cases, the licensee must purchase the offsite properties or otherwise establish institutional controls (ICs) over the land and groundwater use to prevent human exposures to contaminated groundwater. All land, beyond the site boundary, that is purchased or otherwise regulated by ICs, is incorporated into the long-term surveillance boundary. Use of ICs represents an alternative to the regulations in Part 40, Appendix A. However, staff may consider the use of ICs, if the licensee can demonstrate that it is protective of public health and the environment.

#### License Termination - ISL Uranium Extraction facility

License termination at an ISL uranium extraction facility occurs when all groundwater and surface reclamation is completed. After reclamation, well-field restoration and surface restoration reports are reviewed and approved by the staff. Surface restoration reports would typically include an inspection. Because ISL uranium extraction facility owners are prohibited by regulation to dispose of 11e.(2) byproduct material at their sites, long-term care is not required. Thus all groundwater and surface reclamation is performed for unrestricted release, and all land occupied by the ISL facility is returned to the original owner.

#### 2.4.2 Summary of FY 2006 Activities

In FY 2006, Uranium Recovery staff completed approximately 30 licensing actions. The most significant of the decommissioning actions are as follows:

- Approval of the ACL amendment for the Pathfinder Mines Corporation, Shirley Basin site;
- Approval of the ACL amendment for the Rio Algom Mining Corporation, Ambrosia Lake site;
- Approval of the ACL amendment for the Western Nuclear, Inc., Split Rock site;
- Approval of the COGEMA - Irigaray Mine restoration report; and
- Approval of revisions to the GPS' at the United Nuclear Corporations, Church Rock site.

#### 2.5 Fuel Cycle Facility Decommissioning

FCSS regulates facilities that enrich uranium and fabricate it into fuel for use in nuclear reactors, and facilities that fabricate nuclear fuel that is a combination of uranium and plutonium oxides. Several types of fuel cycle facilities are licensed for the enrichment and fabrication of uranium into nuclear fuel used for nuclear power plants. These include uranium fuel fabrication facilities, uranium hexafluoride production (conversion) facility, and gaseous diffusion

enrichment facilities. Most of these facilities have been in operation for 20 or more years. As technology improves and operations at these facilities change, there are often unused areas on the sites that have residual contamination. The NRC staff continues to work closely with the States and EPA to regulate remediation of unused portions of fuel cycle facilities.

Regulation of fuel cycle facilities is accomplished through a combination of: (a) regulatory requirements; (b) licensing; (c) safety oversight, including inspection, assessment of performance, and enforcement; (d) operational experience evaluation; and (e) regulatory support activities. Table 2-5 identifies the fuel cycle facilities undergoing decommissioning. Facility status summaries are provided in Appendix E.

**Table 2-5  
Fuel Cycle Facilities Undergoing Decommissioning**

	<b>Name</b>	<b>Location</b>	<b>Status</b>	<b>Site Summ. Pg. No.</b>
1	AREVA NP	Richland, WA	Active	Page E-1
2	General Atomics	San Diego, CA	Active	Page E-2
3	Honeywell	Metropolis, IL	Active	Page E-3

### 2.5.1 Fuel Cycle Facility Decommissioning Process

In general, the decommissioning process for fuel cycle facilities and complex material sites is the same (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 FCSS during licensee operations, and within DWMEP during entire site decommissioning in support of license termination. Project management responsibility for fuel cycle facilities is transferred from FCSS to DWMEP when: (1) the licensee has ceased all operational activities; and (2) a critical mass of material no longer remains at the site.

### 2.5.2 Summary of FY 2006 Activities

In 2006, one conversion facility (Honeywell) and two fuel manufacturers (AREVA NP and General Atomics) continued some decommissioning activities.

## 3. Guidance and Rulemaking Activities

In FY 2006, the staff completed a number of guidance and rulemaking activities. These activities resulted from the Integrated Decommissioning Improvement Plan (IDIP), Rev. 1, published in March 2005. The IDIP described how the staff planned to implement recommendations from the Decommissioning Program Evaluation, the LTR Analysis

recommendations approved by the Commission, Commission direction resulting from the 2004 annual decommissioning briefing, and other improvements.

The 2005 annual decommissioning report identified a number of follow-up actions the staff intended to take to implement the IDIP in FY 2006. Updates to the IDIP, based on staff assessments, staff decommissioning experience, and independent program reviews, such as the Office of the Inspector General (OIG) audits result in “continuous improvement” of the Decommissioning Program.

Major IDIP improvement activities completed in FY 2006 include:

- Finalized guidance in NUREG-1757, Supplement 1, “Consolidated NMSS Decommissioning Guidance: Updates to Implement the License Termination Rule Analysis,” which included guidance on issues associated with implementing the LTR in Part 20, Subpart E, including: (a) restricted use; (b) onsite disposal; (c) realistic scenarios; (d) removal of material after license termination; (e) engineered barriers; and (f) intentional mixing of soil;
- Began development of a proposed rule and supporting guidance for preventing future legacy sites (i.e., sites with inadequate funding to complete decommissioning). These actions will eventually resolve the LTR Analysis issues regarding financial assurance and facility operational releases that have resulted in decommissioning difficulties.
- Continuation of improvements to collect, document, and disseminate decommissioning lessons-learned, including: (a) updating the decommissioning web page for lessons learned; and (b) exchanging information on lessons-learned with stakeholders at the March 2006 meeting with the Fuel Cycle Facility Forum, OAS, and Nuclear Energy Institute;
- Published DWMEP Operations Manual to put in place new procedures that implement program improvements including: (a) staff expenditure tracking; (b) prioritization of work; (c) operating plan management; (d) planning for revised guidance; (e) sharing information; (f) updating the IDIP; (g) independent reviews; and, (h) defining the roles of the offices and divisions involved with the Comprehensive Decommissioning Program;

#### **4. Research Activities**

The Office of Nuclear Regulatory Research (RES) continued providing information to NMSS to support dose modeling of releases of radioactive material from decommissioning sites. In addition to research activities, RES staff provided technical support to NMSS for Cimarron and West Valley, and developed input for the final version of revised decommissioning guidance on the use of engineered barriers.

RES is continuing the development or modification of a number of computer codes useful for site decommissioning analyses, including: (a) modifying dose-assessment codes, to incorporate added realism; (b) bench-marking RESRAD-OFFSITE to compare its capabilities to those of other commonly used dose codes; (c) developing FRAMES2 (Framework for Risk Assessment

of Multimedia Environmental Systems) with a linkage to the Department of Defense Groundwater Modeling System, and training NMSS staff in the use of the linked codes; and (d) providing NMSS with a report on new conceptual models for food-chain pathways . A new contract to support further development of Spatial Analysis and Decision Assistance was placed to provide tools for more efficiently designing site characterization of contaminated sites, assessing risk, determining the location of future samples, and designing remedial action. During the past year, RES also provided training to NMSS, NRR, and Regional staff on the assessment of uncertainty in groundwater modeling and the design of monitoring systems to assess groundwater contamination.

RES completed work on modeling the fundamental processes controlling sorption reactions. It continued work on the practical application of reactive transport models, in performance assessments of chemically complex sites, and resolution of comments on methods for establishing financial assurance requirements for the decommissioning of in-situ leach mines. It also provided information on formal model abstraction techniques for selecting the right level of abstraction for a given degree of site or process complexity. Additionally, RES also continued work to further the understanding of the evolution and degradation of clay covers, through laboratory testing.

RES maintains two technical advisory groups (TAGs) that enhance communication on issues important to site decommissioning and provide feedback to RES on research direction. The TAGs are the "Technical Advisory Group on Groundwater and Performance Monitoring," and the "Technical Advisory Group on Assessing Uncertainty in Simulation Modeling of Environmental Systems." The TAG on ground-water issues was particularly useful this year in providing insights about the environmental contamination found at several operating nuclear power plants.

During the past year, RES staff also continued to support interagency cooperative activities. The RES staff, along with NMSS staff, continued to participate in activities of the ISCORS, and RES staff supported the Interagency Steering Committee on Multimedia Environmental Models (ISCMEM). During this year, the memorandum of understanding (MOU) that created ISCMEM was renewed by seven participating federal agencies (for details see [www.ISCMEM.org](http://www.ISCMEM.org)).

## **5. International Activities**

The DWMEP interacts with international organizations and governments in a number of ways including: (a) the International Atomic Energy Agency (IAEA); (b) the Organization for Economic Cooperation and Development's Nuclear Energy Agency; (c) bilateral and trilateral exchanges with other countries; (d) hosting foreign assignees and providing reciprocal assignments; (e) developing and providing workshops to requesting countries; and (f) providing technical support as needed to the NRC Office of International Programs. NRC generally is recognized in the international nuclear community as an experienced leader in the decommissioning of nuclear sites. NRC staff interaction with international organizations and governments allows NRC to share insights into decommissioning approaches that are successful, safe, and cost-effective. It also allows the NRC staff to provide input into the various international guidance and requirements that NRC and NRC licensees will need to consider as they interact in a global environment. The NRC staff gains insight into approaches

and methodologies that are being employed 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 is provided below.

### IAEA Activities

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

- Participating in the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, by completing Joint Convention country report reviews.
- Participating in twice-yearly meetings of the IAEA Waste Safety Standards Committee, which address decommissioning specifically, as part of the IAEA's waste safety activities.
- In March 2006, staff traveled to Kiev, Ukraine, for expert assistance in the preparation of a draft DP for Units 1-3 of the Chernobyl Nuclear Power Plant.

### Bilateral and Trilateral Exchanges with Other Countries

A delegation from Spain visited NRC in FY 2006 to discuss many topics associated with radioactive waste management. Facility decommissioning, especially for nuclear power plants, is usually of significant interest to the visiting delegations.

Staff also participated in a meeting with a Ukrainian Delegation in April 2006 – DWMEP topics included U.S. regulations and experience in specific regulatory areas, such as legal bases for establishing, and functioning of, decommissioning funds and funds for radwaste management.

Staff met with a delegation from the Korean Institute of Nuclear Safety, in July 2006, to discuss the decommissioning of nuclear reactors.

### Nuclear Energy Agency Activities

- Annual Meeting / Topical Session; and
- Updating National Fact Sheets.

## **6. Program Integration**

The staff continues to take steps to ensure integration of decommissioning activities. First, NMSS, NRR, RES, and Regions mutually track and coordinate decommissioning activities. Second, the Decommissioning Management Board meets bi-monthly to provide management input on decommissioning activities and issues. The Board, composed of managers from NMSS, RES, NRR, and the Regions, along with the Office of the General Counsel, serves as

an effective mechanism for integrating interoffice and interregional program activities and issue resolution. The Board is a mechanism by which the staff has enhanced intraagency communication, and it ensures that NRC's regulatory processes are integrated. Third, Headquarters and Regional staff held a Decommissioning Counterparts Meeting, in May 2006, to discuss issues affecting the decommissioning program. In FY 2006, consolidation of the decommissioning program began with consideration of re transfer or RTRs from NRR to NMSS. As noted in Section 2.1, the transition occurred on October 1, 2006. Finally, RES, NRR, the regions, and Agreement States participate on review teams to comment on draft decommissioning guidance.

## **7. Agreement State Activities**

As stated in Section 2 of this report, 34 States have signed formal agreements with NRC, by which those States have assumed regulatory responsibility over certain byproduct, source, and small quantities of special nuclear material, including decommissioning of some complex materials sites. However, once a State becomes an Agreement State, NRC continues to have formal and informal interactions with the State.

Formal interactions with Agreement States in FY 2006 include:

- IMPEP reviews of 11 Agreement States;
- Organization of Agreement States (OAS) participation on the Division of Industrial and Medical Nuclear Safety (IMNS) working group to develop the proposed rule to prevent future legacy sites;
- Agreement State representative participation on the writing and review teams revising NUREG-1757; and
- DWMEP staff participation in Conference of Radiation Control Program Directors E-24 Subcommittee on Decommissioning.

Examples of informal interactions include:

- OAS participation at the 2006 Annual Decommissioning Commission briefing;
- DWMEP staff attendance at the annual OAS meeting;
- DWMEP and Regions coordinated and interacted with States on specific decommissioning sites and issues (Yankee Rowe, Connecticut Yankee, Union Carbide, FMRI, Kerr McGee Cushing and Cimarron, Indian Point Unit 1, Heritage Minerals, Inc., Shieldalloy Metallurgical Corp., and the WVDP); and
- DWMEP and Regional coordination with Pennsylvania Department of Environmental Protection, in preparation for Pennsylvania becoming an Agreement State (quarterly conference calls to discuss the status of decommissioning activities at complex sites and Pennsylvania observation of NRC inspections).

Table 7-1 identifies the decommissioning and uranium recovery sites in the Agreement States. In FY 2007, NRC staff will work with the Agreement states to incorporate information on Decommissioning activities in Agreement states into the annual report.



**Table 7-1  
Decommissioning and Uranium Recovery Sites in Agreement States**

<b>State</b>	<b>Name</b>	<b>Location</b>	<b>Date DP Submitted</b>	<b>Date DP Approved</b>	<b>Clean-up Criteria</b>	<b>Project Complete</b>
AL	No Sites					
AZ	No Sites					
AR	Harmon Road LLRW Disposal Site (Arkansas University)	Fayetteville, AR				TBD
AR	SEFOR (Research Reactor at University of Arkansas)	Fayetteville, AR				TBD
CA	General Atomics	San Diego, CA	10/14/96	8/26/97	Surface- & concentration-based criteria	12/07
CA	ICN Biomedicals	Irvine, CA	11/14/05	5/15/06	Surface- & concentration-based criteria	3/07
CA	Excel Research Services, Inc	Fresno, CA	5/03	TBD	Concentration-based criteria	TBD
CA	Providencia Holdings, Inc.	Burbank, CA	7/16/01	10/31/02	Surface- & concentration-based criteria	12/06
CA	Molycorp, Inc. – Mountain Pass Plant	Mountain Pass, CA	6/9/06		Concentration-based criteria	3/07
CA	Aerojet Ordnance Company	Chino Hills, CA	2/15/96	5/31/96	Surface- & concentration-based criteria	12/07

**Table 7-1  
Decommissioning and Uranium Recovery Sites in Agreement States**

<b>State</b>	<b>Name</b>	<b>Location</b>	<b>Date DP Submitted</b>	<b>Date DP Approved</b>	<b>Clean-up Criteria</b>	<b>Project Complete</b>
CA	PTRL West Inc.	Hercules, CA	2/7/00	4/6/00	Indistinguishable from background	12/07
CA	Kirk Rich Dial Company	Los Angeles, CA	N/A	N/A	Indistinguishable from background	TBD
CA	ABC Management Inc./ dba ABC Laboratories	Madera, CA	4/7/93	12/21/94	Surface- & concentration-based criteria	TBD
CA	MP Biomedicals	Irvine, CA	5/17/06	TBD	Surface-based criteria	TBD
CO	Umetco	Uravan, CO		02/01/1987	Criterion 6(6)	2008
CO	Umetco Maybell	Maybell, CO	01/01/1995	1995	Criterion 6(6)	2005
CO	Cotter Uranium Mill	Canon City, CO	Revised 2005	2005	Criteria 6(6) - restricted area for soils. Surface- & concentration-based - some Superfund units and licensed portion	In standby. TBD if going into D&D
CO	Schwardzwald Mine (Cotter)	Golden, CO	12/01/1996	1997	Criterion 6(6)	TBD
CO	Hecla Durita	Naturita, CO	1991	1993	Criterion 6(6)	Completed 1998
CO	CSMRI Table Mtn.	Golden, CO	08/01/2006	TBD	Criterion 6(6)	2007
CO	CSMRI Creekside	Golden, CO	TBD	TBD	TBD	2007

**Table 7-1  
Decommissioning and Uranium Recovery Sites in Agreement States**

State	Name	Location	Date DP Submitted	Date DP Approved	Clean-up Criteria	Project Complete
CO	Sweeney Mining and Milling	Boulder, CO	Pending		TBD	TBD
CO	Homestake Mining and Pitch	Sargeants, CO	05/01/2001	06/01/2001	Criterion 6(6)	TBD
CO	Redhill Forest	Fairplay, CO	Pending	TBD	25 mrem	TBD
CO	Clean Harbors	Deer Trail, CO	2005	2006	25 mrem	TBD
CO	Cyprus Amax	Golden, CO	01/01/2005	05/01/2005	5 pCi/g Ra-226 > bkgd.	2006
FL	Mosaic Fertilizer, LLC	Nichols, FL	6/3/05	Pending	<25mrem/yr	2007
FL	U.S. Agri-Chemicals Corp.	Fort Meade, FL	3/13/06	Pending	<25mrem/yr	None
FL	C.F. Industries, Inc.	Bartow, FL	Pending	N/A	N/A	N/A
FL	Piney Point Phosphates, Inc.	Bradenton, FL	Pending	TBD	TBD	TBD
GA	No Sites					
IA	No Sites					
IL	Chicago Magnesium	Blue Island, IL	11/02/02	02/01/04	Surface- & concentration-based criteria	Ph 1-12/04 Ph 2- 8/06 Ph 3- unk

**Table 7-1  
Decommissioning and Uranium Recovery Sites in Agreement States**

State	Name	Location	Date DP Submitted	Date DP Approved	Clean-up Criteria	Project Complete
IL	Spectrulite	Madison, IL	01/01/05	06/01/05	Surface- & concentration-based criteria	11/06/06
IL	Tronox (Kerr-McGee) (Uranium Recovery Site)	West Chicago, IL	09/01/93	09/01/94	Concentration-based criteria	Completed 11/05
					Groundwater: Part 332.230 references 10 CFR Part 40, Appendix A	Unknown
KS	No Sites					
KY	State did not reply to information request					
LA	No Sites					
ME	No Sites					
MD	No Sites					
MA	Shpack Landfill	Norton, MA	09/04	09/04	<10 mrem/yr	
MA	Yankee Rowe Nuclear Power Plant	Rowe, MA	12/05	12/05	< 10 mrem/yr < 20,000 pCi/L H-3(GW)	6/07
MN	No Sites					
MS	No Sites					

**Table 7-1  
Decommissioning and Uranium Recovery Sites in Agreement States**

State	Name	Location	Date DP Submitted	Date DP Approved	Clean-up Criteria	Project Complete
NE	No Sites					
NV	No Sites					
NH	Kollsman, Inc.	Merrimac, NH	5/05	2/06	<10 mrem/year	12/06
NM	No Sites					
NY	No Sites					
NC	No Sites					
ND	No Sites					
OH	RMI Environmental Services, Inc.	Ashtabula, OH	4/27/95	9/97	Surface- & concentration-based criteria	12/31/06
OH	Metallurg Vanadium Corp. (Formerly Shieldalloy Metallurgical Corp.)	Cambridge, OH	7/13/99	3/6/02	Concentration-based criteria	7/31/07
OH	Ineos USA, LLC. (Formerly BP Chemicals, Inc.)	Lima, OH	4/16/92	6/98	Concentration-based criteria	8/18/03
OH	Advanced Medical Systems, Inc.	Cleveland, OH	5/25/04	7/5/05	Surface- & concentration-based criteria	
OK	No Sites					
OR	TDY Industries dba Wah Chang	Albany, OR	6/11/03	3/08/06	<25 mrem/yr	TBD

**Table 7-1  
Decommissioning and Uranium Recovery Sites in Agreement States**

State	Name	Location	Date DP Submitted	Date DP Approved	Clean-up Criteria	Project Complete
OR	PCC Structurals, Inc.	Portland, OR	6/10/06	9/14/06	<25 mrem/yr	TBD
RI	No Sites					
SC	No Sites					
TN	No Sites					
TX	ExxonMobil (Uranium Recovery Site)	Live Oak Co., TX	4/85	9/82	Concentration-based criteria	TBD
TX	ConocoPhillips (Uranium Recovery Site)	Karnes Co., TX	11/87	9/80	Concentration-based criteria	TBD
TX	Rio Grande Resources (Uranium Recovery Site)	Karnes Co., TX	4/93 ACL - 11/97	11/96	Concentration-based criteria	TBD
TX	COGEMA (Uranium Recovery Site)	Duval Co., TX	11/03	4/06	Concentration-based criteria	GW complete  Surface - ongoing
TX	Intercontinental Energy Corp. (Uranium Recovery Site)	Live Oak Co., TX	3/03	Ongoing	Concentration-based criteria	GW complete  Surface - 12/07

**Table 7-1  
Decommissioning and Uranium Recovery Sites in Agreement States**

<b>State</b>	<b>Name</b>	<b>Location</b>	<b>Date DP Submitted</b>	<b>Date DP Approved</b>	<b>Clean-up Criteria</b>	<b>Project Complete</b>
TX	Everest Exploration, Inc. (decommissioning of Tex-1 Mt. Lucas sites)	Karnes and Live Oak Counties	8/01	Ongoing	Concentration based criteria	GW complete  Surface clean-up ongoing
UT	Rio Algom Uranium Mill	Lisbon Valley, UT			Concentration based criteria	TBD
WA	Dawn Mining Company (Uranium Recovery Site)	Ford, WA	05/94	02/95	Concentration based criteria	12/13
WI	No Sites					

## 8. Resources

The total decommissioning program staff budget, for FY 2006 and FY 2007, is 96 full-time equivalents (FTEs) and 91 FTEs, respectively. These resource figures include: (a) licensing casework directly related to decommissioning sites; (b) inspections; (c) project management and technical support for decommissioning power reactors, uranium mill tailings facilities, and fuel cycle facilities; (d) development of rules and guidance; (e) environmental impact statements and EAs; (f) research to develop more realistic analytical tools to support licensing and rulemaking activities; and (g) Waste Incidental to Reprocessing. These figures also include supervisory and non-supervisory indirect FTEs associated with the decommissioning program.

## 9. FY 2007 Planned Programmatic Activities

A number of programmatic activities are planned for FY 2007. The most significant of these activities include: (1) consolidation of the Decommissioning Program; (2) continuation of IDIP improvement activities; (3) continuation of International activities; and (4) licensing of uranium mills.

As noted in Section 2.1, project management and oversight responsibility for several decommissioning reactors (Indian Point – Unit 1, Millstone – Unit 1, Vallecitos, and the Nuclear Ship Savannah) and 14 research and test reactors will transfer from NRR to FSME on October 1, 2006. The transfer will be accomplished in accordance with the “Transition Plan and Communication Plan for the Transfer of 14 Decommissioning Research and Test Reactors, Two Decommissioning Early Demonstration Reactors and Two Decommissioning Power Reactors.”

Section 3 of this report identifies a number of IDIP improvement activities completed in FY 2006. In addition to the completed activities, the staff is making progress on a number of IDIP activities planned for completion in FY 2007. Major IDIP improvement activities planned for FY 2007 include:

- Preparing for, and participating in, an Office of Management and Budget (OMB) Program Assessment Rating Tool (PART) review, including a reevaluation of the decommissioning program and effectiveness of improvements. At OMB’s request, the PART review was postponed from 2006;
- Continue with rulemaking concerning groundwater restoration at ISLs;
- Publishing a proposed rule and draft guidance, for public comment, in 2007, for the rulemaking and supporting guidance on measures to prevent future legacy sites (changes to financial assurance and licensee operations);
- Draft inspection and enforcement guidance to enhance monitoring, and reporting procedures to prevent future legacy sites; and
- Implementing restricted release options in the license termination role at Shieldalloy and AAR sites.



In FY 2007, the staff will continue its interactions with IAEA and participation in bilateral and trilateral exchanges with other countries. One new activity of note for FY 2007, and possibly FY 2008, will be NRC's support of the IAEA technical assistance efforts to help the Iraqi Radioactive Source Regulatory Authority locate, secure, and regulate radioactive materials, and to decommission and manage the waste of the former Iraqi nuclear facilities.

As of September 2006, there is a renewed interest in uranium mining and milling. Consequently, approximately 10 entities have contacted the staff expressing interest in either submitting license applications for new mills (both ISL and conventional) or for satellite operations of existing mills. Furthermore, owners of two decommissioning sites and one conventional mill on standby have expressed interest in restarting operations. As a result, the staff expects to receive two applications to restart operations, in addition to at least two applications for new facilities and one application for a satellite facility, in FY 2007.