

## **POLICY ISSUE INFORMATION**

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FOR: The Commissioners

FROM: Charles L. Miller, Director  
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and Environmental Management Programs

SUBJECT: STATUS OF DECOMMISSIONING PROGRAM — 2009 ANNUAL  
REPORT

PURPOSE:

To provide the Commission with the staff's 2009 Annual Report on the Status of the Decommissioning Program, the highlights of key decommissioning accomplishments in Fiscal Year (FY) 2009, as well as an outlook of activities for FY 2010. This paper does not address any new commitments or resource implications.

BACKGROUND:

The staff requirements memorandum (SRM) to COMSECY-08-0036, "Status of Decommissioning Program — 2008 Annual Report," dated January 8, 2009, stated that staff should publish an annual Commission paper on the status of the decommissioning program with information substantially equivalent to that contained in NUREG-1814, "Status of the Decommissioning Program — 2008 Annual Report," Revision 2, issued February 2009. In accordance with this SRM, the 2009 Annual Report is provided to the Commission for information only.

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Enclosed is the 2009 Annual Report on the Status of the Decommissioning Program, which provides a comprehensive summary of the U.S. Nuclear Regulatory Commission's (NRC's) Decommissioning Program. The report summarizes the status of sites undergoing decommissioning since the last report, through September 30, 2009, including the decommissioning of complex materials sites, commercial reactors, research and test reactors, uranium recovery facilities, and fuel cycle facilities. The report also discusses highlights in the decommissioning program since last year's report, and informs the Commission of decommissioning issues that the staff will address in the coming year.

## DISCUSSION:

### Summary of Status Update for FY 2009

The enclosed report summarizes the decommissioning status of 12 nuclear power and early demonstration reactors, 11 research and test reactors, 18 complex decommissioning materials facilities, and 2 fuel cycle facilities (1 in partial decommissioning). The report also covers 32 uranium recovery sites that are subject to the Uranium Mill Tailings Radiation Control Act of 1978, as amended (UMTRCA). Title I of UMTRCA pertains to 21 sites that were inactive as of 1978 and are decommissioned by the U.S. Department of Energy (DOE). Title II of UMTRCA addresses the issue of uranium mill tailings produced at active sites licensed by the NRC or Agreement States. The enclosed report summarizes the decommissioning status of 11 conventional uranium milling sites that are regulated under Title II of UMTRCA.

Progress was made during FY 2009 in the Decommissioning Program, including the completion of decommissioning at the Rancho Seco nuclear power plant near Sacramento, California, completion of work at complex sites where decommissioning had long been delayed, and the approval of innovative decommissioning approaches for existing reactor sites (e.g., the license transfer to Zion Solutions). Throughout FY 2009, the staff focused on obtaining information on complex decommissioning sites in Agreement States as part of an effort to enhance NRC's Comprehensive Decommissioning Program. NRC staff also worked to transfer regulatory control and oversight of decommissioning sites to the State of New Jersey when it became an Agreement State in September 2009.

As noted in the FY 2008 report, the character of the decommissioning program is changing as (1) successes in the past have substantially reduced the inventory of the sites undergoing decommissioning and, (2) NRC becomes involved with new facilities (e.g. Hunter's Point and McClellan) and new programmatic issues arise, such as the decommissioning of sites contaminated with depleted uranium from military munitions and naturally occurring and accelerator-produced radioactive material. In addition, in FY 2009, increased emphasis was placed on the decommissioning of legacy uranium recovery sites. This emphasis has resulted in a substantial increase in interaction with the U.S. Environmental Protection Agency, the State of New Mexico, and Native American tribes in decommissioning at the UNC Churchrock, Homestake, and Ambrosia Lake Mill sites.

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. In response, in FY 2009, staff evaluated the financial assurance required for Category 1 and 2 radioactive sources. The financial assurance working group (FAWG), which is chaired by a financial assurance expert in

the Division of Waste Management and Environmental Protection, is composed of participants with varied backgrounds from multiple Federal agencies, NRC offices, and Agreement States.

FAWG members met monthly during FY 2009 to evaluate current financial assurance requirements and develop potential recommendations, with the goal of proposing a comprehensive list of viable solutions.

#### Trends in Fiscal Year 2010 and Beyond

It is expected that FY 2010 will see similar trends in the Decommissioning Program as most power reactors remain in SAFSTOR and progress in research and test reactors is level, with NASA Mockup and Plum Brook facilities expected to complete decommissioning in 2010. In FY 2010, decommissioning activities are expected to be completed at several complex materials sites, including the ABC Laboratories, NWI Breckenridge, Sigma-Aldrich, and UNC Naval Products sites. In addition, three UMTRCA Title II conventional uranium milling sites (Bear Creek, ExxonMobil Highlands, and Rio Algom-Ambrosia Lake) are expected to complete decommissioning activities and be transferred to DOE for long-term control.

As in FY 2009, staff will continue its increased interaction with other agencies in efforts related to the UNC Churchrock, Homestake, and Rio Algom-Ambrosia Lake conventional uranium milling sites. This will include continued participation with other Federal agencies in the 5-year plan for the Health and Environmental Impacts of Uranium Contamination in the Navajo Nation (U.S. House Committee on Oversight and Government Reform) and the 5-year plan for uranium contamination in the San Mateo Basin in New Mexico. Both of these 5-year plans consider contamination from uranium milling and uranium mining (the latter of which the NRC does not regulate).

In FY 2010, completion of decommissioning activities at complex materials sites is expected to increase over FY 2009 levels and remain relatively level for several years. Although progress is being made at most legacy materials sites, many sites have ground water contamination which can take years to decades to remediate to NRC standards. Consequently, while progress will continue towards final decommissioning at these sites, it will be slow. NRC involvement with new sites (e.g., Army sites containing depleted uranium from the Davy Crockett spotting round, for which Army has requested a possession-only license) and additional programmatic responsibility (e.g., decommissioning and financial assurance reviews for new fuel cycle facilities) will more than offset reductions that result from the sites completing decommissioning.

Finally, FY 2010 also will see a shift in emphasis in the staff's Integrated Decommissioning Improvement Plan (IDIP). In the past, the IDIP focused on materials and reactor decommissioning, but uranium recovery decommissioning was not directly included. Given that decommissioning activities at reactor and materials sites has matured to the point where most efficiencies in the process have been identified and implemented, the staff will be examining what lessons-learned and best practices can be gained in the decommissioning of conventional uranium milling sites, and the future decommissioning of in-situ uranium milling facilities.

CONCLUSION:

The staff plans to continue its close oversight of the decommissioning of nuclear power reactors, research and test reactors, complex materials sites, and conventional uranium milling sites. In addition, the staff plans to continue to identify and implement methods to make the decommissioning program more efficient and effective and continue its efforts to prevent future legacy sites.

Site summaries for all decommissioning sites are accessible to the Commission and the public through the NRC's decommissioning website (<http://www.nrc.gov/about-nrc/regulatory/decommissioning.html>). To ensure that the website is current, project managers in the Office of Federal and State Materials and Environmental Management Programs, the Office of Nuclear Material Safety and Safeguards, and the Regions routinely review and update the program information.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objections. The Office of the Chief Financial Officer has reviewed this paper for resource implications and has no objections.

**/RA/**

Charles L. Miller, Director  
Office of Federal and State Materials  
and Environmental Management Programs

Enclosure:  
Status of the Decommissioning  
Program — 2009 Annual Report

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# **Status of the Decommissioning Program**

**2009 Annual Report**

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**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**

Enclosure

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## 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	<i>Code of Federal Regulations</i>
CRCPD	Conference of Radiation Control Program Directors
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOS	U.S. Department of State
DP	decommissioning plan
DWMEP	Division of Waste Management and Environmental Protection
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FAWG	financial assurance working group
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
GMB	Grants Mineral Belt
HPS	Hunters Point Shipyard
IAEA	International Atomic Energy Agency
IDIP	Integrated Decommissioning Improvement Plan

ISFSI	independent spent fuel storage installation
ISR	in situ recovery
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) 2009, 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. Previously, this report was published as a NUREG every two years; however, consistent with the direction from the Commission, future reports will not be published as a NUREG. Site summaries on the NRC public website (<http://www.nrc.gov/about-nrc/regulatory/decommissioning.html>) are updated on a quarterly basis. The information contained in this report is current as of September 30, 2009.

As noted in our FY 2008 report (NUREG-1814, "Status of the Decommissioning Program—2008 Annual Report," Revision 2), the character of the decommissioning program is changing as (1) successes in the past have substantially reduced the inventory of the sites in decommissioning and, (2) NRC becomes involved with new facilities (e.g. Hunters Point and McClellan) and new programmatic issues arise. Examples of such issues are the regulation of military sites contaminated with depleted uranium from past testing of munitions and the contamination of military sites with naturally occurring and accelerator-produced radioactive material (NARM). In addition, in FY 2009, increased emphasis was placed on the decommissioning of conventional uranium milling sites. This emphasis resulted in a significant increase in interaction with the U.S. Environmental Protection Agency (EPA) and the State of New Mexico in efforts related to the UNC Churchrock, Homestake, and Ambrosia Lake Mill sites.

It is expected that FY 2010 will see similar trends in the decommissioning program as most reactors remain in SAFSTOR and progress in research and test reactors is level. In FY 2010, completion of decommissioning activities at complex materials sites is expected to increase over FY 2009 levels and remain at similar levels for several years. In addition, within the next three years, several Title II uranium recovery sites are expected to complete decommissioning and be transferred to the U.S. Department of Energy (DOE) for long-term control.

## 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 termination of licenses are not routine licensing actions.

As of September 30, 2009, 12 nuclear power and early demonstration reactors, 11 research and test reactors, 18 complex decommissioning materials facilities, 2 fuel cycle facilities, 21 Title I<sup>1</sup> uranium recovery facilities, and 11 Title II uranium recovery facilities are undergoing non-routine 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. The site summaries are updated on a quarterly basis. 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, 37 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

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<sup>1</sup> The Uranium Mill Tailings Radiation Control Act groups uranium recovery facilities into Title I sites and Title II sites. Section 2.4 explains this in detail.

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 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, 2009, the 12 nuclear power reactors identified in Table 2-1 are undergoing decommissioning. Table 2-1 provides an overview of 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 reactor decommissioning process are notification of cessation of operations, submittal and review of the Post-Shutdown Decommissioning Activities Report (PSDAR), submittal, review and approval 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 licensee 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 reactor 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 2009 Activities**

- Decommissioning activities were completed at the Rancho Seco reactor in Sacramento, California.
- During the past year, staff performed inspections at Fermi Unit 1, La Crosse, Millstone Unit 1, Rancho Seco, and Zion Units 1 and 2. Table 2-1 shows the status of power reactor decommissioning activities.
- Staff reviewed and approved a request to transfer the licensed ownership, management authorities, and decommissioning trust fund of Zion Units 1 and 2 to Zion Solutions. The license transfer order allows Zion Solutions to receive the license to complete decommissioning of the site. Zion Solutions plans to construct and transfer the spent fuel to an onsite ISFSI as part of the decommissioning process.

- To ensure openness during the regulatory process, the staff held several public meetings,<sup>2</sup> including a meeting with Fermi Unit 1 to discuss a proposed license amendment and license termination planning, and a meeting to discuss the NSS Savannah PSDAR.

### **2.1.3 Fiscal Year 2010 Trends and Areas of Focus**

Progress in power reactor decommissioning will remain at a similar level as in FY 2009, with the number of sites expected to stay the same as most reactors stay in SAFSTOR. Fermi and Humboldt Bay reactors are expected to complete decommissioning in 2012 and 2014, respectively. Through unique decommissioning approaches such as the one employed at Zion, there may be an increase in the rate of completion of power reactor decommissioning in the future.

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<sup>2</sup> 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	Morris, IL	6/98	TBD	TBD	2036
2	Fermi Unit 1	Newport, MI	4/98	2009	2010	2012
3	Humboldt Bay	Eureka, CA	2/98	2011	2012	2014
4	Indian Point Unit 1	Buchanan, NY	1/96	2020	2022	2026
5	La Crosse	La Crosse, WI	5/91	TBD	TBD	2026
6	Millstone Unit 1	Waterford, CT	6/99	TBD	TBD	TBD
7	Nuclear Ship Savannah	Baltimore, MD	12/08	2014	TBD	2031
8	Peach Bottom Unit 1	Delta, PA	6/98	TBD	TBD	2034
9	San Onofre Unit 1	San Clemente, CA	12/98	TBD	TBD	2030
10	Three Mile Island Unit 2	Harrisburg, PA	2/79	TBD	TBD	2036
11	Vallecitos Boiling Water Reactor	Pleasanton, CA	7/66	TBD	TBD	2019
12	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 for the 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, 2009, the 11 research and test reactors identified in Table 2-2 are undergoing decommissioning, representing an increase of 1 facility (the Worcester Polytechnic Institute) from the previous FY. 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 submittal, review and approval of a DP, implementation of the DP, and completion of decommissioning.

#### Application

Within 2 years following permanent cessation of operations, the licensee must submit a written application for license termination to the NRC, and in no case later than 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<sup>3</sup> 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;

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<sup>3</sup> 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.

- A description of the planned final radiation survey;
- 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; and
- 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.

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 any dismantlement 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 2009 Activities**

- The NRC staff began reviewing the Worcester Polytechnic Institute DP, submitted in April 2009.
- The staff performed inspections at Ford Nuclear Reactor, National Aeronautics and Space Administration (NASA) Mockup, and NASA Plum Brook facilities.
- The staff monitored negotiations between General Atomics and DOE regarding the movement of fuel.

### **2.2.3 Fiscal Year 2010 Trends and Areas of Focus**

Progress in research and test reactor decommissioning is expected to increase in FY 2010 and beyond, with NASA Mockup and Plum Brook facilities expected to complete decommissioning in 2010. Decommissioning is expected to be completed at the Ford Nuclear Reactor and Veterans Administration facilities in 2011, and the University of Illinois facility in 2012. General Atomics Mark F and Mark I research and test reactors are awaiting removal of fuel.

**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	2011
11	Worcester Polytechnic Institute	Worcester, MA	DP Submitted	TBD

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 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, 2009, 18 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 eligible to use the SDMP Action Plan criteria (see Table 2-3).

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). In the parenthetical cases, the decommissioning process does not lead to license termination;
- 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. In these cases, the decommissioning process does not lead to license termination.

Major steps in the decommissioning process are notification of cessation of operations, submittal, review and approval 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.<sup>4</sup> 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 complex 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 ensure that the DP contains: (1) all required information; (2) legible drawings; (3) justification for any proprietary information claims; and, (4) no 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 avoiding 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

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<sup>4</sup> Unlike the case of nuclear power reactor decommissioning, complex material site licensees or responsible parties cannot proceed with decommissioning until the DP is approved.

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 SER and either an Environmental Assessment (EA) or EIS. Before finalizing the EA/EIS, the staff provides its draft to the appropriate State agency for review and comment. The final EA is published in full or summary form in the *Federal Register*, with a Finding of No Significant Impact (FONSI). 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 guide both phases of the review.

The second phase of the review addresses all other sections of the technical review and will usually include the development of an EIS. If an EIS is to be prepared, the following steps are taken:

- 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 within 24 months in accordance with the approved DP, 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 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 2009 Activities**

- During the past year, the staff participated in public meetings for the Kerr-McGee Cimarron, Shieldalloy Metallurgical Corporation, Westinghouse Electric-Hematite, West Valley Demonstration Project, Jefferson Proving Ground, Schofield Barracks, and Pohakuloa Training Area sites. The staff also participated in industry conferences and workshops, including the Health Physics Society Annual Meeting and the Conference of Radiation Control Program Directors' Annual National Conference on Radiation Control.

- In FY 2009, the staff reviewed DPs for the ABC Laboratories, Kerr-McGee Cimarron, Mallinckrodt Chemical, Inc., Shieldalloy Metallurgical Corporation, and the Westinghouse Electric-Hematite sites. Staff approved the DP for Sigma-Aldrich and the draft EIS for the West Valley Demonstration Project.
- Energy Solutions was selected as a contractor for site remediation at the NWI Breckenridge site.
- Staff transferred regulatory control of the Shieldalloy Metallurgical Corporation site to the State of New Jersey when it became an Agreement State at the end of FY 2009.

Other significant activities are described below.

#### Hunters Point, McClellan, and Alameda Military Sites in California

The staff began implementing the limited involvement approach approved by the Commission in June 2008 for the Navy's remediation of the Hunters Point Shipyard (HPS) site in San Francisco, California. This approach includes reliance on the Navy's ongoing remediation of this Superfund site conducted under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) process with EPA oversight. The primary purpose of NRC's limited involvement approach is to stay informed about the ongoing Navy remediation activities. To implement this approach, the staff sent letters to the Navy and EPA Region 9 explaining the Commission's decision and requesting agreement and support. In April and May respectively, the Navy and EPA Region 9 provided letters agreeing to support NRC's limited involvement approach at the HPS site. The staff also published a *Federal Register* Notice on August 6, 2009, notifying interested stakeholders about NRC's limited involvement approach for the HPS site and the agreement between NRC, the Navy, and EPA Region 9 on NRC's limited involvement approach.

NRC staff completed its review of the ongoing remediation of the former McClellan Air Force base, a Superfund site in Sacramento, California. The staff confirmed its preliminary view (stated in 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") that the McClellan site is sufficiently similar to the HPS site to permit use of the limited involvement approach at the McClellan site.

In September 2009, the staff conducted a scoping site visit to the Navy's Alameda Naval Air Station in Oakland, CA to obtain information on the radioactive contaminants there and the Navy's ongoing remediation. This information will be evaluated by the staff to determine if this site is similar enough to Hunters Point to warrant taking the same limited involvement approach at Alameda.

#### Coordination with U.S. Army Corps of Engineers

During the past year the staff, participated in two interagency meetings with the U.S. Army Corps of Engineers (USACE) and the Commonwealth of Pennsylvania to review site decommissioning activities at the BWXT Shallow Land Disposal Site in Vandergrift, PA. NRC staff is currently reviewing USACE's Final Work Plans and providing guidance to USACE to satisfy relevant requirements set forth in 10 CFR Part 70, "Domestic Licensing of Special

Nuclear Material”, 10 CFR Part 73, “Physical Security Protection of Plants and Materials” and 10 CFR Part 74, “Material Control and Accounting of Special Nuclear Material” for the future remediation of FUSRAP material located in the ten onsite burial pits. In addition, there have been follow-up discussions related to the disposal of impacted material that falls below NRC’s site-specific cleanup criteria and water discharge permits. USACE indicated their intent to take physical possession of the BWXT-SLDA site in the spring of 2010. NRC staff is currently working with USACE to finalize a Confirmatory Order, which will allow suspension of the BWXT-SLDA license and for the USACE to initiate remediation activities of FUSRAP material under their CERCLA authority.

Although New Jersey is now a licensed Agreement State, they did not request to have the Stepan Company site under their portfolio due to the presence of FUSRAP material on-site. As a result, NRC retained jurisdiction. There is a Memorandum of Understanding between NRC and USACE for the cleanup of this FUSRAP material. USACE took physical possession of Burial Pit No. 3 in December 2008 and Burial Pit No. 2 in August 2009 to conduct remediation at two of three burial pits at the site. NRC staff continues to perform periodic inspections to ensure that the licensee complies with environmental monitoring requirements and continued oversight of Burial Pit No. 1, which is not yet under the physical control of the USACE. In October 2009, the NRC updated and issued an amended license to the Stepan Company.

#### Army Sites in Hawaii

In August 2005, an Army contractor clearing a firing range identified 15 “tail fin assemblies” as being from the M101 spotting round – a round used with the Davy Crockett Weapons System. The Davy Crockett was a nuclear capable weapon, and a depleted uranium spotting round was used during testing activities that were concluded in the 1960s. The depleted uranium was licensed by the AEC for manufacture and distribution to Army field units. Concerns of residents near firing ranges at the Schofield Barracks (on the island of Oahu) and Pohakuloa Training Area (on the island of Hawaii) resulted in NRC staff performing inspections to verify the presence of depleted uranium at these sites. Staff has met several times with the Army to develop a path forward for managing this depleted uranium. The Army is in the process of determining the extent to which depleted uranium from Davy Crockett munitions testing is present at other Army bases on the US mainland.

On November 6, 2008, the U.S. Army submitted a request for a possession-only license for its sites containing depleted uranium. This license request was supplemented on July 8, 2009, when the Army submitted physical security and radiation monitoring plans. The Army application was accepted for review on August 3, 2009. Notice of opportunity to request a hearing on the Army’s application was published in the *Federal Register* on August 13, 2009. On August 25-27, 2009, three Category 3 public meetings were held—one in the vicinity of the Schofield Barracks, and two in the vicinity of the Pohakuloa Training Area—to discuss the Army’s application, the NRC process for review, and the public’s opportunity to participate in the process.

#### Jefferson Proving Ground Site in Indiana

Throughout FY 2009, NRC staff participated in numerous teleconferences and has participated in several site visits with the Army to discuss progress at the Jefferson Proving Ground (JPG) site. The focus of these discussions was the site characterization of the depleted uranium

impacted area (e.g. sampling of various environmental media; hydraulic conductivity tests; stream flowmeter measurements, seepage run surveys, age dating of groundwater). This field work is in addition to an ongoing depleted uranium penetrator corrosion study to determine leachate rates in various soil types. NRC also hosted an annual public meeting to discuss proposed future work such as the preliminary fate and transport modeling and radiation dose modeling exercises to support future termination of the license with restricted release for the JPG site.

#### Mixed Plutonium Contamination Event in Colorado

During FY 2009, support was provided to Region IV for special inspections of a mixed plutonium contamination event at the National Institute of Standards and Technology (NIST) facility located in Boulder, Colorado. The event occurred in June 9, 2008, and the special team inspection began on June 30, 2008. The special inspection was completed on September 17, 2009. NIST and its decontamination contractor remediated the contaminated areas at the facility, and on July 24, 2009, NRC issued a letter informing NIST that a review of their final status survey report had been completed and that the results demonstrated that the previously contaminated areas met the criteria in 10 CFR Part 20, Subpart E, for unrestricted use.

#### Kerr-McGee Cimarron Financial Assurance

In January 2009, Tronox, Inc.'s U.S. operations filed for Chapter 11 bankruptcy protection, and bankruptcy proceedings are ongoing. Tronox holds an NRC Part 70 license for the Kerr-McGee Cimarron site, which has a significant NRC financial assurance requirement. The Letter of Credit pledged for decommissioning financial assurance is currently in effect until March 2010. The NRC Bankruptcy Review Team has determined not to draw upon the Letter of Credit for the site at this time since it remains in effect until March 2010. Staff continues to work closely with the Office of the General Counsel and U.S. Department of Justice (DOJ) in evaluating and negotiating a settlement agreement and will revisit the issue of drawing on the Letter of Credit before it expires.

### **2.3.3 Fiscal Year 2010 Trends and Areas of Focus**

As indicated above, in FY 2010, staff will focus on the potential addition of Army sites with depleted uranium contamination. As of September 30, 2009, individual site-specific monitoring programs have only been submitted by the Army for its Schofield Barracks and Pohakuloa Training Area sites. As the Army completes its investigation of additional sites on the U.S. mainland where depleted uranium contamination is suspected, such sites would be added by license amendment to any possession-only license the staff may issue regarding the Army's Hawaii sites.

**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 <sup>+</sup>	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 <sup>++</sup>	LTR-UNRES	2010
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	Hunter's Point Naval Shipyard <sup>***</sup> (former Naval shipyard)	San Francisco, CA	N/A	N/A	N/A	N/A
7	Jefferson Proving Ground	Madison, IN	8/99 revised 6/02, 9/13	10/02 TBD	LTR-RES	12/13
8	Kerr-McGee	Cimarron, OK	4/95	8/99	Action-UNRES	1/17
9	Mallinckrodt Chemical, Inc.	St. Louis, MO	Phase 1 11/97, Phase 2 9/08	5/02 TBD	LTR-UNRES	2012

**Table 2-3 Complex Decommissioning Sites**

<b>Name</b>	<b>Location</b>	<b>Date DP Submitted</b>	<b>Date DP Approved</b>	<b>Compliance Criteria</b>	<b>Projected Removal</b>	
10	McClellan*** (former Air Force base)	Sacramento, CA	N/A	N/A	N/A	N/A
11	NWI Breckenridge	Breckenridge, MI	3/04	8/04	LTR-UNRES	2010
12	Pohakuloa Training Area (Army site)	Hawaii	N/A	N/A	N/A	N/A
13	Schofield Army Barracks (Army site)	Oahu, HI	N/A	N/A	N/A	N/A
14	Sigma-Aldrich	Maryland Heights, MO	10/08	5/09	LTR-UNRES	2010
15	Stepan Chemical Company	Maywood, NJ	N/A	N/A	LTR-UNRES	TBD
16	UNC Naval Products	New Haven, CT	8/98 Revised 2004, 12/06	4/99, 10/07	LTR-UNRES	2010
17	West Valley Demonstration Project	West Valley, NY	Phase I 3/09	TBD	LTR-UNRES**	TBD
18	Westinghouse Electric (Hematite Facility)	Festus, MO	4/04 revised 6/06, 8/09	TBD	LTR-UNRES	2013

- \* 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 for Phase I has been submitted. The West Valley Phase I DP includes 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 Navy's Hunter's Point Shipyard site and the Air Force's McClellan site are being remediated by the Navy and Air Force, respectively, under the required CERCLA process and EPA oversight. It is assumed that some licensable material might be present at both sites; however, NRC has not licensed these sites. Instead, the Commission has approved a "limited involvement approach to stay informed" and will rely on the ongoing CERCLA process and EPA oversight. More information is available on this approach in SECY-08-0077.
- + 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<sup>5</sup>

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 NRC 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, as supplemented by authority provided by the National Environmental Policy Act of 1969, as it was then construed.

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 and approved by the NRC at all Title I sites. 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 Regulations*, 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 mill 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 facilities and in situ recovery (ISR) facilities, as both types of these facilities conduct "uranium milling" (as defined in 10 CFR 40.4). Table 2-4b identifies the Title II sites no longer operating and in decommissioning. As of September 30, 2009, 11 Title II uranium recovery facilities are undergoing decommissioning. Title 10 of the *Code of Federal Regulations*, Section 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 conventional uranium mill 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/>.

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<sup>5</sup> 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 Decommissioning Process for Uranium Mills

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.” They are subject instead to similar requirements in 10 CFR Part 40, Appendix A, as summarized below.

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, review and approval of the DP<sup>6</sup> 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 ISR 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 ISR 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 ISR facilities, ground water restoration should 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.

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<sup>6</sup> 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.

### 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:

- 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 the timing of restoration.

Depending on the complexity of the revision, a meeting between the licensee and the NRC staff may be warranted.

### 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 uranium milling facilities. A generic EIS is now in place for ISR facilities. Site specific supplemental EISs are being developed for the new ISR license applications under review, and these SEISs will tier off of the generic EIS.

### Implementation of the Decommissioning Plan/Reclamation Plan

Typically, a DP/RP is submitted with an application for an ISR facility. As the licensee prepares to enter decommissioning, a revised DP/RP is submitted. 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 ISR 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. Ground water restoration 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 of 10 CFR Part 40. For the groundwater constituents being monitored at a given site, three types of standards are potentially applicable in accordance with Criterion 5B(5) in Appendix A:

- (1) NRC-approved background concentrations
- (2) Maximum contaminant levels established by the EPA (in Table 5C of 10 CFR Part 40, Appendix A)
- (3) NRC-approved alternate concentration limits (ACLs)

If the licensee demonstrates that concentrations of monitored constituents cannot be restored to either background or Appendix A Table 5C values (whichever value is higher), the staff may approve ACLs, after considering all the factors required in Appendix A Criterion 5B(6). To obtain approval of ACLs, the licensee submits a license amendment request and a detailed environmental report that addresses all the Criterion 5B(6) factors. If the staff determines that the ACLs are protective of public health and the environment, the staff may approve the ACLs.

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.

#### 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's acceptance of an LTSP, the existing license is terminated and titles to any mill tailings disposal sites are 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."

#### License Termination—In Situ Uranium Recovery Facilities

License termination at an ISR uranium recovery facility occurs when all ground water is restored to acceptable levels and surface decommissioning/reclamation is completed and approved by the NRC. Surface decommissioning completion typically would include an inspection. Because 10 CFR Part 40, Appendix A, Criterion 2 generally prohibits ISR uranium extraction facility owners from disposing of 11e.(2) byproduct material at their sites, long-term care of ISR facilities by a governmental custodian under a general license is not required. However, ISR 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.

### **2.4.2 Summary of Fiscal Year 2009 Activities**

- For Title I facilities in FY 2009, the staff reviewed Groundwater Compliance Action Plans for the Durango, Gunnison, and Lakeview sites.

- For Title II facilities in FY 2009, the staff reviewed the Pathfinder-Lucky Mc LTSP.
- In FY 2009, staff performed site inspections at PRI Smith Ranch, Pathfinder-Shirley Basin, and COGEMA Irigary and Christensen Ranch sites. Staff also visited the Rio Algom-Ambrosia Lake site for a confirmatory survey conducted by the Oak Ridge Institute for Science and Education.
- Staff completed its Safety Evaluation Report and approved a reclamation plan for Sequoyah Fuels Corporations in 2009.

The Grants Mineral Belt (GMB) was the primary locus of conventional uranium extraction and production activities in New Mexico from the 1950s until late into the 20<sup>th</sup> century. The GMB extends along the southern margin of the San Juan basin in Cibola, McKinley, Sandoval, and Bernalillo counties as well as Tribal lands. There are approximately 100 documented formerly-producing conventional mines/mills in the GMB. Legacy uranium mine and mill sites either have had documented contaminant releases, or may have the potential to release contaminants. Some of the conventional uranium mine sites have undergone surface reclamation, and may have uncontrolled waste rock and ore piles on-site, as well as physical hazards such as open shafts. The NRC, EPA, State, and Tribal partners have developed a 5-year plan, and will work together, to address public health and environmental impacts from historical conventional uranium mining in the GMB.

NRC staff also participated in two interagency meetings and a collaborative site visit with DOE, Navajo Nation Environmental Protection Agency, and New Mexico Environmental Department concerning uranium contamination on or near Navajo lands at the UNC Churchrock site. Meeting discussions focused on an integrated site-wide cleanup approach to achieve cleanup goals and to avoid dual regulations, migration of the groundwater plume, and co-disposal of mine waste from the adjoining Northeast Churchrock Mine with licensed by-product material at the UNC Churchrock conventional mill site. NRC staff also attended a public meeting hosted by the EPA in which the third Five Year Review Plan was presented. In June 2009, NRC presented an update to the White House Congressional Staff on the Navajo Nation 5-Year Plan. NRC staff continues to assist EPA in technical peer review and anticipates having future tribal consultation on these matters.

### **2.4.3 Fiscal Year 2010 Trends and Areas of Focus**

The staff's efforts are expected to result in the termination of several uranium milling licenses within the next few years. Bear Creek, ExxonMobil Highlands, and Rio Algom-Ambrosia Lake sites are expected to complete decommissioning activities in 2010, with American Nuclear Corporation and Sequoyah Fuels Corporation expected to complete decommissioning in 2011 and 2012, respectively. As in FY 2009, staff will continue its increased interaction with other agencies in efforts related to sites in New Mexico such as the mill sites at UNC Churchrock, Homestake, and Ambrosia Lake.

<b>Table 2-4a Decommissioning Title I Uranium Recovery Sites</b>			
	<b>Name</b>	<b>Location</b>	<b>Status</b>
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

<b>Table 2-4a Decommissioning Title I Uranium Recovery Sites</b>			
20	Spook	Wyoming	Monitoring
21	Tuba City	Arizona	Active
<p>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.</p>			

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

	<b>Name</b>	<b>Location</b>	<b>DP/RP Approved</b>	<b>Completion of Decomm.</b>
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 fuel cycle facilities undergoing partial decommissioning are the Nuclear Fuel Services site in Erwin, Tennessee, and Eastman Kodak in Rochester, New York. The public Web site at <http://www.nrc.gov/info-finder/decommissioning/fuel-cycle/> summarizes additional information about the status of the facilities.

### **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 2009 Activities**

In FY 2009, Nuclear Fuel Services submitted FSSRs for partial decommissioning of the Erwin, Tennessee site and these reports are currently undergoing staff review.

Eastman Kodak has removed all of the material associated with their Californium Flux Multiplier activities, and has submitted a request to terminate this license. They have completed all the surveys required for release, and NMSS has begun the license termination process.

### **3. GUIDANCE AND RULEMAKING ACTIVITIES**

In FY 2009, 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 employed 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. A preliminary draft report was submitted to DWMEP management for review. This activity is expected to continue into FY 2010.

#### 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 submitted SECY-09-0042, dated March 13, 2009, to the Commission requesting approval to publish a final rule, "Decommissioning Planning (10 CFR PARTS 20, 30, 40, 50, 70, AND 72; RIN: 3150-AI55)," which was previously published as a proposed rule on January 22, 2008 (73 FR 3812). One aspect of the rulemaking focuses on ensuring that licensees have adequate financial assurance to complete decommissioning, while the other ensures that licensees have an adequate ground water monitoring program in place 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.

## 4. RESEARCH ACTIVITIES

The Office of Nuclear Regulatory Research (RES) continued to support the dose modeling of releases of radioactive material from decommissioning sites and the remediation of ISR facilities. In addition to research activities, RES staff provided extensive 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 enhanced source term capability, maintaining and providing training on FRAMES, and continuing to update parameter values for food-chain pathways. Research on plant uptake was extended this year to include data from Russian measurements of uptake in large animals. This year, working as part of an international team, RES helped complete the International Atomic Energy Agency (IAEA) TRS-364 "Handbook of Parameter Values for the Prediction of Radionuclide Transfer in Temperate Environments" and its supporting technical basis document. Beta testing of the "Spatial Analysis and Decision Assistance" (SADA) code was completed and the code, documentation including case studies, and training were provided for user office staff. This code provides a tool for more efficiently designing site characterization of contaminated sites, assessing risk, determining the location of future samples, and designing remedial action.

RES continued participation in 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. Work on the long term efficacy of the use of bioremediation at uranium-contaminated sites and ISR facilities continued and new tasks were added to secure drill core from an active ISR facility. Work also continued at Argonne National Laboratory to develop better models of leaching from radioactive slags from mineral processing. The report "Radionuclide Release from Slag and Concrete Waste Materials: Modeling and Test Methods" was completed and published in FY 2009. RES completed joint work with EPA and the National Science Foundation on a project exploring the failure mechanisms of covers at existing disposal facilities. A final report was published establishing an extensive technical record on the performance of these covers. Additional work was started on the optimization of cover designs and control of the effects of erosion.

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. It was also instrumental in reviewing drafts of a revised ANS 2.17 "Evaluation of Radionuclide Transport in the Subsurface."

Finally, the Cement Partnership with DOE and the National Institute of Standards and NIST moved into its second year. 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. Complementary work at NIST was begun to examine pore solution chemistry and mineral phases in cementitious composites with chemical and mineral admixtures.

## 5. INTERNATIONAL ACTIVITIES

DWMEP interacts with international organizations and governments in a number of ways, including through IAEA and the NEA of the Organization for Economic Cooperation and Development (OECD), 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, as well as in the safety of decommissioning waste disposal, site remediation, and environmental protection. NRC staff interaction with international organizations and governments allows the NRC to share insights about 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. The most significant of these activities are summarized below.

### International Atomic Energy Agency Activities

The NRC 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 2008 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 June 2009 IAEA conference on uranium recovery (UR) and cleanup activities, as well evaluation of IAEA proposed projects for decommissioning of UR facilities;
- Participating in twice-yearly meetings of the IAEA Waste Safety Standards Committee (WASSC) meetings 26 and 27, in October 2008 and June 2009, respectively. These meetings addressed decommissioning and other related issues specifically, as part of IAEA waste safety activities;
- Participating in the IAEA International Project on “Use of Safety Assessment in Planning and Implementation of Decommissioning of Facilities Using Radioactive Material, (FaSa).” The October 2008, FaSa meeting was held in Vienna, Austria, to provide direction and planning for decommissioning of facilities using radioactive materials;
- Hosting two staff from Iraq for training on decommissioning, decontamination, and disposal of radioactive sources;
- Conducting a July 2009 training course on decommissioning for the Vietnamese;

- Participation in the Joint Convention on the Safety of Spent Fuel and Safety of Radioactive Waste Disposal (JC) Organization meeting in October 2008;
- Participation in the World Nuclear University (WNU) summer institute in Oxford, UK for staff training and exchange of information including decommissioning activities;
- Participation in the third review cycle of the JC and meeting in May 2009, including review of decommissioning. Staff responded and reviewed 45 national reports related to decommissioning activities;
- Participation in France/USA two workshops: (a) IRSN/NRC workshop in September 2008; and (b) ASN/NRC bilateral workshops, on June 15, 2009 for exchange of information including decommissioning activities.

#### Nuclear Energy Agency Activities

- The staff contributed to the NEA Radioactive Waste Management Committee (RWMC) Bureau Annual Report for the RWMC-42.
- The staff provided support to senior management participating in the March 2009, annual RWMC meeting, responded to survey questionnaires, 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 participated in the NEA Working Party on Decommissioning and Dismantling (WPDD) 9<sup>th</sup> annual meeting, hosted by Slovenia in November 2008. Staff participated in preparation and review of several WPDD documents and delivered two presentations. Staff participated via teleconference in WPDD two core group meetings in March 2009 and June 2009.
- The staff contributed to, and reviewed WPDD reports developed during FY 2008/2009, titled: (a) Applying Lessons from Decommissioning for the Design and Operation of New Reactors; (b) Risk-Informed Approach to Decommissioning and Waste Storage Facilities; (c) Decommissioning of Nuclear Facilities – Yes It Can and Has Been Done; and (d) Decommissioning Cost Elements, Estimation, Practices, and Reporting Requirements.
- Staff participated in providing responses to WPDD and RWMC survey questionnaires.
- DWMEP staff participated in an April 2009 workshop/conference on degradation of concrete and cement and implications to performance assessments.

## 6. PROGRAM INTEGRATION

The Decommissioning Program currently encompasses power and early demonstration reactors, research and test reactors, complex materials facilities, fuel 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 breadth of projects, the Decommissioning Program has undertaken many initiatives to keep abreast of sites undergoing decommissioning.

### Comprehensive Decommissioning Program

In FY 2009, NRC continued the implementation of an enhanced Comprehensive Decommissioning Program, which allows 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. State contacts were provided a username and password to edit their site summaries in NRC's Complex Sites Tracking System database as new information becomes available. 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 by providing them 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 developed a generic communication focusing on the results of this broad-scope pilot effort to highlight the inspection findings and inform licensees of the NRC's decommissioning requirements.

### Financial Assurance Working Group

The Energy Policy Act of 2005 required the 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 related to the security of radiation sources in the United States from terrorist threats, including acts of sabotage, theft, or use of a radiation sources in a radiological dispersal device. One of the recommendations included in the report (Recommendation 9-2 "Evaluation of Financial Assurance") tasked NRC to lead a working group in an effort to evaluate the financial assurance required for Category 1 and 2 radioactive sources to ensure that funding is available for the final disposition of the sources. The financial assurance working group (FAWG), which is chaired by DWMEP, is composed of participants with varied backgrounds from DOE, the U.S. Department of State (DOS), EPA, Organization of Agreement States (OAS), and multiple NRC offices. The FAWG is also considering Category 3 quantities of material in its assessment. Additionally, the FAWG is evaluating Action 7-1 from the Task Force report, which focuses on long-term storage of risk-significant sources not in use. FAWG members met monthly during FY 2009 to evaluate

current financial assurance requirements and develop potential recommendations, with the goal of proposing a comprehensive list of viable solutions. The FAWG will continue to meet in FY 2010 in order to finalize the proposal.

## 7. AGREEMENT STATE ACTIVITIES

Thirty-seven 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 2009 included the following:

- 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 2009 annual meeting.
- 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 (Illinois, Mississippi, Nevada, New Mexico, North Carolina, Ohio, Oregon, and Wisconsin).

The following are examples of informal interactions:

- DWMEP staff participated in monthly OAS/CRCPD teleconferences.
- Coordinated with New Jersey on activities at the Shieldalloy site in Newfield, New Jersey.

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

<b>Table 7-1 Agreement State Decommissioning Sites</b>					
<b>State</b>	<b>Name</b>	<b>Location</b>	<b>Date DP Submitted</b>	<b>Date DP Approved</b>	<b>Project Complete</b>
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	TBD
CO	Umetco Uravan	Uravan, CO		2/01/87	TBD
CO	Umetco Maybell	Maybell, CO	01/01/1995	1995	TBD

<b>Table 7-1 Agreement State Decommissioning Sites</b>					
<b>State</b>	<b>Name</b>	<b>Location</b>	<b>Date DP Submitted</b>	<b>Date DP Approved</b>	<b>Project Complete</b>
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	TBD
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	2009
FL	U.S. Agri-Chemicals Corp.	Fort Meade, FL	3/13/06	Pending	2010
FL	C.F. Industries, Inc.	Bartow, FL	3/30/07	Pending	TBD
FL	Mosaic Fertilizer, LLC-Mulberry	Mulberry, FL	4/10/07	Pending	2009

<b>Table 7-1 Agreement State Decommissioning Sites</b>					
<b>State</b>	<b>Name</b>	<b>Location</b>	<b>Date DP Submitted</b>	<b>Date DP Approved</b>	<b>Project Complete</b>
FL	HRK Holdings, Inc.	Palmetto, FL	11/01/07	Pending	2010
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

<b>Table 7-1 Agreement State Decommissioning Sites</b>					
<b>State</b>	<b>Name</b>	<b>Location</b>	<b>Date DP Submitted</b>	<b>Date DP Approved</b>	<b>Project Complete</b>
MA	Shpack Landfill	Norton, MA	09/04	09/04	2009
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	TBD
NJ	Shieldalloy Metallurgical Corp.	Newfield, NJ	6/06	TBD	2013
OH	Metallurg Vanadium Corp. (Formerly Shieldalloy Metallurgical Corp.)	Cambridge, OH	7/13/99	3/6/02	2009

<b>Table 7-1 Agreement State Decommissioning Sites</b>					
<b>State</b>	<b>Name</b>	<b>Location</b>	<b>Date DP Submitted</b>	<b>Date DP Approved</b>	<b>Project Complete</b>
OH	Ineos USA, LLC (formerly BP Chemical)	Lima, OH	4/92	6/98	2020
OH	Advanced Medical Systems, Inc.	Cleveland, OH	6/01/04	5/23/05	2010
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
PA	Curtis-Wright Cheswick	Cheswick, PA	3/06	6/07	2009
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	2009
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	2009

<b>Table 7-1 Agreement State Decommissioning Sites</b>					
<b>State</b>	<b>Name</b>	<b>Location</b>	<b>Date DP Submitted</b>	<b>Date DP Approved</b>	<b>Project Complete</b>
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
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

<b>Table 7-1 Agreement State Decommissioning Sites</b>					
<b>State</b>	<b>Name</b>	<b>Location</b>	<b>Date DP Submitted</b>	<b>Date DP Approved</b>	<b>Project Complete</b>
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	2013
N/A not applicable					
TBD to be determined					

## **8. RESOURCES**

The total Decommissioning Program staff budget for FY 2009 was 59 full-time equivalents (FTE); and for FY 2010, the program has 65 FTE. Increases in the functional areas of materials licensing, inspection, and legal advice and representation are offset somewhat by decreases in other areas. These resource figures include personnel to perform licensing casework directly related to decommissioning sites; inspections; project management and technical support for decommissioning power reactors, complex materials sites, 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 2010 PLANNED PROGRAMMATIC ACTIVITIES**

The staff has planned a number of programmatic activities for FY 2010, including the continued implementation of the Integrated Decommissioning Improvement Plan (IDIP). In FY 2010, staff will focus its activities on implementing knowledge management aspects of the IDIP.

Specifically, knowledge management activities for the exchange of decommissioning lessons learned for selected topics (e.g., uranium recovery, institutional controls) have been identified by NRC staff for management review. To reflect an emphasis on uranium recovery activities, staff has developed a number of initiatives, including: updating site closure and site transition management directives, clearly defining the closure process, and seeking additional program improvements from staff with extensive experience. DWMEP management will prioritize the implementation of the identified decommissioning lessons learned.

Depending upon direction by the Commission, implementation of the Decommissioning Planning Rule, discussed in Section 3 of this report, is planned to begin in FY 2010. The steps needed for implementation of the rule include publishing a future NUREG-series publication for the financial assurance aspects of the rule. The final regulatory guide is planned to be completed in FY 2010. As of September 30, 2009, implementation activities are on hold pending the Commission's consideration of SECY-09-0042.

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 technical basis through FY 2010.