

**POLICY ISSUE**  
(Information)

November 30, 2007

SECY-07-0209

FOR: The Commissioners

FROM: Luis A. Reyes  
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SUBJECT: STATUS OF DECOMMISSIONING PROGRAM—2007 ANNUAL REPORT

PURPOSE:

This Commission paper provides the Commission with the staff's 2007 Annual Report on the Status of the Decommissioning Program, the highlights of key decommissioning accomplishments in fiscal year (FY) 2007, as well as an outlook of activities for FY 2008. This paper does not address any new commitments or resource implications.

BACKGROUND:

In the staff requirements memorandum to SECY-04-0024, "Recommended Changes to NRC's Decommissioning Program and Annual Decommissioning Program Report," dated March 12, 2004, the Commission approved several changes to the annual decommissioning report, including the publication of the annual report as a NUREG every 2 years. The Commission directed the staff to publish the report in odd-numbered years as a shortened report to the Commission, with reference to the decommissioning Web site.

Enclosed is an Operational Effectiveness Chart (Enclosure 1), which details a nine year trend of site completions from the Decommissioning Program. Enclosure 2, the 2007 Annual Report on the Status of the Decommissioning Program, provides a comprehensive summary of the Decommissioning Program of the U.S. Nuclear Regulatory Commission (NRC). The report summarizes the status of all sites undergoing decommissioning activities since the last report,

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through September 30, 2007, 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 (NUREG-1814, "Status of the Decommissioning Program—2006 Annual Report," Revision 1, issued February 2007), and it informs the Commission of decommissioning issues that the staff will address in the coming year.

## DISCUSSION:

### Summary of Status Update for FY 2007

Decommissioning activities were completed at 11 sites in FY 2007: two reactors (Big Rock Point and Yankee Rowe); three research and test reactors (Cornell-TRIGA, Cornell-ZPR, and University of Washington); and six complex materials sites (Eglin Air Force Base, Kaiser Aluminum, Pathfinder Atomic Plant, Royersford Wastewater Treatment facility, S.C. Holdings Inc., and Westinghouse Electric-Churchill). This yields a 2-year total of 19 sites that have completed decommissioning activities.

In addition, substantial progress was made at several complex materials sites (ABB Prospects, Inc., Mallinckrodt Chemical, Inc., Salmon River, and West Valley) that have languished over the past years. Specifically, the staff worked with the U.S. Army Corps of Engineers (USACE) to create an interagency protocol for the cleanup of contaminated areas at the ABB Prospects, Inc., site. At Mallinckrodt Chemical, Inc., the staff is working with the licensee and the USACE to pursue the cleanup of Formerly Utilized Sites Remedial Action Program waste and licensed waste. Additionally, the staff worked with the U.S. Environmental Protection Agency to secure decommissioning funding for the Salmon River site. Finally, to resolve issues at the West Valley Demonstration Project, a core team comprised of representatives from different agencies was created to resolve technical issues for the development of a draft environmental impact statement for the site. The core team has developed an approach for implementing phased decommissioning. These activities represent significant progress towards the completion of decommissioning at these complex sites.

The total number of sites undergoing decommissioning in Agreement States has increased from the 48 reported in NUREG-1814, "Status of the Decommissioning Program—2006 Annual Report," Revision 1, to 58 in the current annual report. This increase is mainly a result of improved reporting and implementation of the Naturally-Occurring and Accelerator-Produced Radioactive Material (NARM) rulemaking. This data was obtained by working closely with the Agreement States to get more detailed information about the complex materials sites and uranium recovery sites undergoing decommissioning regulated by the Agreement States.

Finally, the Office of Management and Budget and the NRC completed a Program Assessment Rating Tool (PART) review in FY 2007 of the Decommissioning and Low-Level Waste Program. The primary focus of PART is on demonstrating program improvements. PART also establishes accountability for program performance. The scope of the PART review for the Decommissioning and Low-Level Waste Program included the NRC's regulatory activities for the decommissioning of power reactors, test and research reactors, complex materials sites, uranium recovery sites and Low-Level Waste. The Decommissioning and Low-Level Waste Program was rated "effective" under the PART evaluation.

FY 2008 Outlook

As noted below, several new events/initiatives are planned for FY 2008. These include: the Comprehensive Decommissioning Program; inclusion of sites contaminated with discrete sources of NARM in the Decommissioning Program; working with the Department of Defense on sites contaminated with depleted uranium (DU); and the prevention of future legacy sites.

- The Comprehensive Decommissioning Program will allow the NRC to compile, in a centralized and accessible location, more complete information on the status of decommissioning and decontamination of complex materials and uranium recovery sites in the United States – sites regulated by NRC or the Agreement States – in order to provide a national perspective on decommissioning. This will play an important role in the prevention of future legacy sites.
- The staff anticipates that Pennsylvania will become an Agreement State in FY 2008. Consequently, the staff is holding quarterly conference calls with the Pennsylvania Department of Environmental Protection (PADEP) to discuss the status at complex sites. Additionally, the staff invites PADEP to observe NRC inspections. When Pennsylvania becomes an Agreement State, the NRC may transfer as many as seven complex materials sites to the State.
- The Energy Policy Act of 2005 expanded NRC regulatory authority over certain accelerator-produced radioactive materials, discrete sources of radium, and discrete sources of naturally-occurring radioactive materials. The staff will be working to implement the final NARM rule in FY 2008 to address the decommissioning of facilities contaminated with discrete sources of radium.
- The Department of Army has recently identified DU contamination at two Army bases from the use of DU munitions in the 1960s (Schofield Army Barracks, Hawaii and Fort Hood, Texas). These locations are not currently licensed by the NRC. The Army has also indicated that as many as seven additional locations have been identified at other Army bases, which will be further investigated. During the upcoming year, the staff will be working with the Army to determine the need for licensing the contaminated sites and, if necessary, plans for future remediation.

As the decommissioning program matures, the staff is redefining the program's role to focus on preventing future sites that are unable to complete decommissioning. In this regard, the staff prepared SECY-07-0177, "Proposed Rule: Decommissioning Planning (10 CFR Parts 20, 30, 40, 50, 70 and 72: RIN: 3150-AH45)," dated October 3, 2007, which is a two-pronged approach consisting of financial assurance and monitoring. The first revises the requirements of Title 10 of the *Code of Federal Regulations* (CFR) Parts 30, 40, 70, and 72 to strengthen financial assurance. The second revises 10 CFR 20.1406 to require existing licensees to minimize contamination and perform monitoring, if necessary. Additionally, the staff is working to improve broad-scope licensees' understanding of the Decommissioning Timeliness Rule and associated decommissioning-related regulations and on guidance to help prevent future legacy sites.

A significant reduction in active NRC decommissioning sites is expected after FY 2010 due to successes in decommissioning of sites, many States becoming Agreement States, and the reduction in nuclear reactors and research and test reactors entering into decommissioning. In FY 2008, the staff will evaluate the resource impacts of this reduction in sites, as well as the increasing number of uranium recovery licensing activities (uranium recovery is also managed under the Decommissioning and Low-Level Waste Tier II Program). Given that the technical disciplines of health physics, hydrology, and performance assessment are common to both the regulation of decommissioning sites and uranium recovery, the staff intends to begin to modify its staffing strategy to accommodate the trends in decommissioning and uranium recovery.

#### CONCLUSION:

The staff plans to continue its close oversight of the decommissioning of nuclear power reactors, research and test reactors, complex materials sites, and uranium recovery facilities. In addition, the staff plans to develop programmatic activities that will aid in the protection of public health and safety, as well as the prevention of future legacy sites, while ensuring the efficient and effective use of resources.

Site summaries for all decommissioning sites are accessible to the Commission and the public through the NRC's Decommissioning Web site (<http://www.nrc.gov/about-nrc/regulatory/decommissioning.html>). To ensure that the Web site 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 and has no objections.

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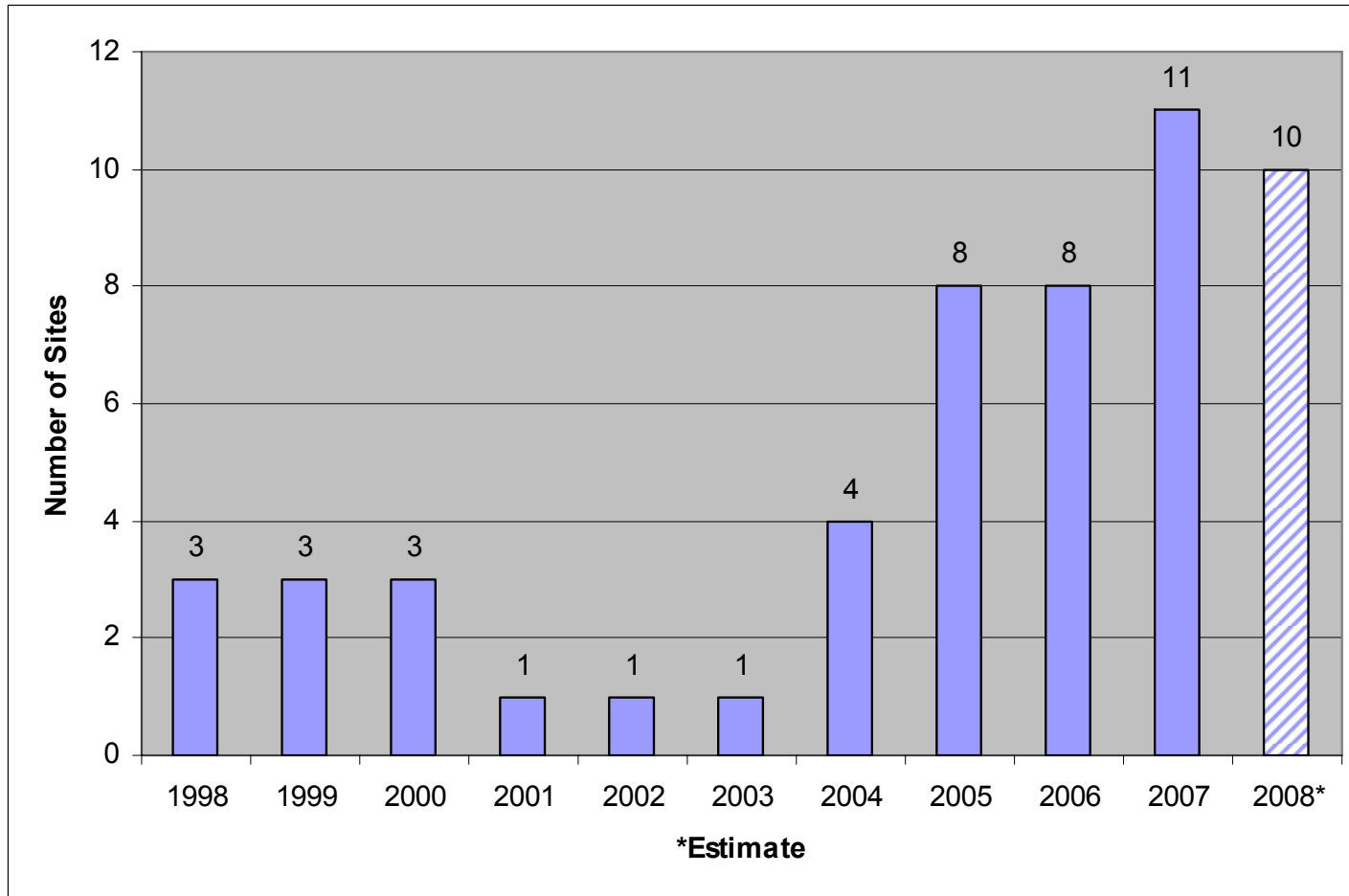
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#### Enclosures:

1. Operational Effectiveness Chart
2. 2007 Annual Report

# Operational Effectiveness

Number of sites removed from Decommissioning Program



Note: Beginning in FY 2007 research and test reactors and 4 additional early demonstration reactors were included in the Decommissioning Program

# **Status of the NRC Decommissioning Program**

**2007 Annual Report**

**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**

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## ABBREVIATIONS

|          |   |
|----------|---|
| ACL      | alternate concentration limit   |
| ARGONAUT | Argonne Nuclear Assembly for University Training                              |
| CERCLA   | Comprehensive Environmental Response, Compensation, and Liability Act of 1980 |
| CFR      | <i>Code of Federal Regulations</i>  |
| 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  |
| FCSS     | Division of Fuel Cycle Safety and Safeguards                                  |
| FR       | <i>Federal Register</i>   |
| FRAME    | Framework for Risk Assessment of Multimedia Environmental Systems             |
| FSME     | Office of Federal and State Materials and Environmental Management Programs   |
| FTE      | full-time equivalents   |
| FUSRAP   | Formerly Utilized Sites Remedial Action Program                               |
| FY       | fiscal year   |
| GETR     | General Electric Test Reactor   |
| HPS      | Hunter's Point Shipyard   |
| IAEA     | International Atomic Energy Agency  |
| IDIP     | Integrated Decommissioning Improvement Plan                                   |
| ISCMEM   | Interagency Steering Committee on Multimedia Environmental Models             |
| ISCORS   | Interagency Steering Committee on Radiation Standards                         |
| ISFSI    | independent spent fuel storage installation                                   |
| ISL      | in situ leach   |
| LTP      | license termination plan  |
| LTR      | License Termination Rule  |
| mrem     | millirem  |



|       |   |
|-------|---|
| NARM  | naturally occurring and accelerator-produced radioactive material |
| NASA  | National Aeronautics and Space Administration                     |
| NMSS  | Office of Nuclear Material Safety and Safeguards                  |
| NRC   | U.S. Nuclear Regulatory Commission                                |
| NRR   | Office of Nuclear Reactor Regulation                              |
| OAS   | Organization of Agreement States                                  |
| OMB   | Office of Management and Budget                                   |
| PART  | Program Assessment Rating Tool                                    |
| pCi   | picocurie   |
| PSDAR | post-shutdown decommissioning activities report                   |
| RES   | Office of Nuclear Regulatory Research                             |
| RP    | reclamation plan  |
| RWMC  | Radioactive Waste Management Committee                            |
| SDMP  | Site Decommissioning Management Plan                              |
| SLDA  | Shallow Land Disposal Area  |
| TAG   | technical advisory group  |
| TBD   | to be determined  |
| TRIGA | Training, Research, Isotopes General Atomics                      |
| U.K.  | United Kingdom  |
| UNC   | United Nuclear Corporation  |
| VESR  | Vallecitos Experimental Superheat Reactor                         |
| WPDD  | Working Party on Decommissioning and Dismantlement                |
| WVDP  | West Valley Demonstration Project                                 |
| yr    | year  |
| ZPR   | zero power reactor  |

# 1. Introduction

This report provides a comprehensive summary of the Decommissioning Program of the U.S. Nuclear Regulatory Commission (NRC). Its purpose is to provide a reference document that summarizes the decommissioning activities in fiscal year (FY) 2007, including the decommissioning of complex material sites, commercial reactors, research and test reactors, uranium recovery facilities, and fuel cycle facilities. In addition, this report discusses accomplishments of the Decommissioning Program since last year's report, provides information supplied by Agreement States on decommissioning in their States, and identifies key Decommissioning Program issues that the staff will address in the coming year. The information contained in this report is current as of September 30, 2007.

# 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 that stakeholders are informed and involved in the process, as appropriate. This report summarizes a broad spectrum of activities associated with these program functions.

Approximately 200 materials licenses are terminated each year by NRC. 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 termination of licenses that are not routine because decommissioning the sites is more complex.

As of September 30, 2007, 14 nuclear power and early demonstration reactors, 11 research and test reactors, 26 complex decommissioning materials facilities, 1 fuel cycle facility (partial decommissioning), and 11 uranium recovery facilities are undergoing nonroutine decommissioning or are in long-term safe storage, under NRC jurisdiction. The NRC public Web site (<http://www.nrc.gov/about-nrc/regulatory/decommissioning.html>) contains site status summaries for the facilities managed under the Decommissioning Program. These summaries describe the status of each site and identify the current technical and regulatory issues affecting the completion of decommissioning. For those licensees 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 licensees that have not submitted a DP or LTP, the schedules are based on other licensee information available and on the anticipated decommissioning approach.

Through the Agreement State Program, 34 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 power plants or fuel cycle facilities licensed under Title 10, Part 50, "Domestic Licensing of Production and Utilization Facilities," of the *Code of Federal Regulations* (10 CFR Part 50). 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 and technical review responsibility for licensee submittals in support of decommissioning, core inspections, support of the development of rulemaking and guidance, public outreach efforts, and participation in industry conferences and workshops.

In FY 2007, the Office of Nuclear Reactor Regulation (NRR) transferred project management responsibility for the decommissioning of two additional nuclear power reactors (Indian Point Unit 1 and Millstone Unit 1) to the Office of Federal and State Materials and Environmental Management Programs (FSME). NRR also transferred project management responsibility for the decommissioning of two early demonstration reactors—Vallecitos and the Nuclear Ship Savannah—to FSME.

As of September 30, 2007, the 14 nuclear power reactors identified in Table 2-1 are undergoing decommissioning. Plant status summaries for all decommissioning nuclear power reactors are provided at <http://www.nrc.gov/info-finder/decommissioning/power-reactor/>.

### **2.1.1 Summary of FY 2007 Activities**

- During the past year, decommissioning activities were completed at the Big Rock Point and Yankee Rowe plants. Additionally, staff performed inspections at Connecticut Yankee, Dresden Unit 1, Fermi Unit 1, Humboldt Bay, Indian Point Unit 1, La Crosse, Peach Bottom, Nuclear Ship Savannah, Rancho Seco, San Onofre Unit 1, Three Mile Island Unit 2, Yankee Rowe, and Zion Units 1 and 2. Table 2-1 provides the status of power reactor decommissioning activities.
- FSME developed a generic communication plan for the decommissioning of nuclear facilities. In support of the communication plan and to ensure openness during the regulatory process, the staff held many public meetings, including a Rancho Seco LTP meeting to accept public comments, a meeting with the San Onofre licensee to discuss partial site release, and a meeting to discuss the partial site release of Humboldt Bay.

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

| <b>Reactor</b> | <b>Location</b>                   | <b>PSDAR*<br/>Submitted</b> | <b>LTP<br/>Submitted</b> | <b>LTP<br/>Approved</b> | <b>Completion of<br/>Decomm.**</b> |      |
|----------------|-----------------------------------|-----------------------------|--------------------------|-------------------------|------------------------------------|------|
| 1              | Dresden Unit 1                    | Dresden, IL                 | 6/98                     | TBD                     | TBD                                | 2036 |
| 2              | Fermi Unit 1                      | Newport, MI                 | 4/98                     | 2007                    | 2009                               | 2011 |
| 3              | Haddam Neck—Connecticut<br>Yankee | Meriden, CT                 | 8/97                     | 7/00                    | 11/02                              | 2007 |
| 4              | Humboldt Bay                      | Eureka, CA                  | 2/98                     | 2009                    | 2011                               | 2012 |
| 5              | Indian Point Unit 1               | Buchanan, NY                | 1/96                     | 2014                    | 2016                               | 2020 |
| 6              | La Crosse                         | La Crosse, WI               | 5/91                     | TBD                     | TBD                                | 2020 |
| 7              | Millstone Unit 1                  | Waterford, CT               | 6/99                     | TBD                     | TBD                                | TBD  |
| 8              | Nuclear Ship Savannah             | Newport News, VA            | 12/06                    | TBD                     | TBD                                | TBD  |
| 9              | Peach Bottom Unit 1               | Delta, PA                   | 6/98                     | TBD                     | TBD                                | 2034 |
| 10             | Rancho Seco                       | Sacramento, CA              | 12/94                    | 4/06                    | 11/07                              | 2009 |
| 11             | San Onofre Unit 1                 | San Clemente, CA            | 12/98                    | 2025                    | 2027                               | 2030 |
| 12             | Three Mile Island Unit 2          | Harrisburg, PA              | 2/79                     | TBD                     | TBD                                | 2024 |
| 13             | Vallecitos                        | Pleasanton, CA              | 7/66                     | TBD                     | TBD                                | 2019 |
| 14             | Zion Units 1 & 2                  | Waukegan, IL                | 2/00                     | TBD                     | TBD                                | 2026 |

- \* Post-shutdown decommissioning activities report (PSDAR) or decommissioning plan (DP) equivalent.
- \*\* For decommissioning reactors with no independent spent fuel storage installation (ISFSI) or an ISFSI licensed under 10 CFR Part 72, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater Than Class C Waste," completion of decommissioning will result in the termination of the 10 CFR Part 50 license. 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 decommissioning research and test reactors and technical review responsibility for licensee submittals in support of decommissioning, core inspections, support of development of rulemaking and guidance, public outreach, and participation in industry conferences and workshops.

On October 1, 2006, NRR transferred project management and oversight responsibility for all 14 research and test reactors then undergoing decommissioning to FSME. As of September 30, 2007, the 11 research and test reactors identified in Table 2-2 are undergoing decommissioning. Plant status summaries for all decommissioning research and test reactors are provided at <http://www.nrc.gov/info-finder/decommissioning/research-test/>.

### **2.2.1 Summary of FY 2007 Activities**

- In FY 2007, FSME terminated the licenses of three research and test reactors (1) Cornell University TRIGA, (2) Cornell University ZPR, and (3) University of Washington ARGONAUT. Additionally, the staff performed inspections at Ford Nuclear Reactor, General Electric Co. GETR, General Electric Co. VESR, University of Illinois, Veterans Administration-Omaha, and CBS (Westinghouse).
- The staff issued an order imposing fingerprint requirements with respect to the General Atomics TRIGA MK F and the General Atomics TRIGA MK I reactors.
- The staff attended and made presentations at the 2007 Annual Meeting of Test, Research, and Training Reactors.

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

| Reactor |                              | Location        | Status          | Completion of Decomm. |
|---------|------------------------------|-----------------|-----------------|-----------------------|
| 1       | Ford Nuclear Reactor         | Ann Arbor, MI   | DECON Approved  | 2008                  |
| 2       | General Atomics TRIGA Mark F | San Diego, CA   | DECON Approved  | 2019                  |
| 3       | General Atomics TRIGA Mark I | San Diego, CA   | DECON Approved  | 2019                  |
| 4       | General Electric Co. GETR    | Sunol, CA       | Possession-Only | 2019                  |
| 5       | General Electric Co. VESR    | Sunol, CA       | Possession-Only | 2019                  |
| 6       | NASA Mockup                  | Sandusky, OH    | DECON Approved  | TBD                   |
| 7       | NASA Plum Brook              | Sandusky, OH    | DECON Approved  | TBD                   |
| 8       | University of Buffalo        | Buffalo, NY     | Possession-Only | TBD                   |
| 9       | University of Illinois       | Urbana, IL      | Possession-Only | Late 2008             |
| 10      | Veterans Administration      | Omaha, NE       | DECON Amendment | 2009                  |
| 11      | CBS (Westinghouse)           | New Stanton, PA | DECON Approved  | TBD                   |

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

Additional information about the definition of decontamination is available at  
<http://www.nrc.gov/reading-rm/basic-ref/glossary/decontamination.html>.

## **2.3 Complex Material Facility Decommissioning**

Material facilities decommissioning activities include maintaining regulatory oversight of complex decommissioning sites, undertaking financial assurance reviews, examining issues and funding options to facilitate remediation of sites in non-Agreement States, interacting with the U.S. Environmental Protection Agency (EPA), interacting with the U.S. Army Corps of Engineers (USACE), participating in the Interagency Steering Committee on Radiation Standards (ISCORS), 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 financial assurance submittals for materials and fuel cycle facilities and maintains a financial instrument security program.

As of September 30, 2007, 26 complex materials sites are undergoing decommissioning (see Table 2-3). Table 2-3 identifies the cleanup criteria for each complex site as either 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 that submitted its DP before August 20, 1998, and received NRC approval of that DP before August 20, 1999, could use the SDMP Action Plan criteria for site remediation. In the 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 in 10 CFR Part 20, "Standards for Protection Against Radiation," Subpart E, "Radiological Criteria for License Termination." Only two complex material sites remain that are approved for SDMP Action Plan criteria (see Table 2-3).

Pennsylvania is expected to become an Agreement State in FY 2008. When Pennsylvania becomes an Agreement State, as many as seven complex materials sites undergoing decommissioning may be transferred to the State. Michigan, New Jersey, and Virginia are also in the process of becoming Agreement States, but will not complete the process in FY 2008.

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

### **2.3.1 Summary of FY 2007 Activities**

- Since last year's status report, six sites were removed from the complex site list through license termination or completion of NRC decommissioning actions. These sites are (1) Eglin Air Force Base, (2) Kaiser Aluminum, (3) Pathfinder Atomic Plant, (4) Royersford Wastewater Treatment Facility, (5) S.C. Holdings, Inc., and (6) Westinghouse Electric-Churchill. The staff reviewed approximately 25 financial assurance submittals in FY 2007, including two complex reviews for fuel cycle enrichment license applications.



- The staff continues to implement communication plans for all complex sites. The staff developed a generic communication plan for all complex sites to enhance the staff's efficiency in reaching out to stakeholders. One of the activities identified in the communication plan for each site is participation in meetings<sup>1</sup> to inform the public about major licensing actions. During the past year, the staff participated in public meetings for Jefferson Proving Ground, Mallinckrodt Chemical, Inc., Shieldalloy, West Valley Demonstration Project (WVDP), and Westinghouse-Hematite. The staff also participated in industry conferences and workshops, including the 52<sup>nd</sup> Health Physics Society Annual Meeting; the American Nuclear Society Topical Meeting on Decommissioning, Decontamination, and Revitalization; Waste Management 2007; and the Conference of Radiation Control Program Directors' 39<sup>th</sup> Annual National Conference on Radiation Control.
- Finally, in FY 2007, the staff approved the Quehanna DP within timeliness goals. The staff is currently reviewing DPs for the Cabot Performance Materials, Inc.; Shieldalloy; and Whittaker Corporation sites.

### Highlighted Activities

Significant progress made by the staff in FY 2007 includes work to resolve dual regulation at Formerly Utilized Sites Remedial Action Program (FUSRAP) sites, WVDP, and the Salmon River site.

In FY 2007, staff worked closely with the USACE to coordinate actions at the following FUSRAP sites: ABB Prospects Inc.; Babcock & Wilcox Shallow Land Disposal Area (SLDA); Mallinckrodt Chemical Inc.; and Stepan Chemical Company. The staff cooperated with the USACE and the licensee to define a success path that allows the completion of decommissioning at the ABB Prospects, Inc., site. Specifically, the NRC and the USACE developed an interagency protocol for the cleanup of FUSRAP-contaminated areas of the ABB Prospects, Inc. site that also contain NRC-regulated materials. The staff has worked with the USACE at SLDA to issue the Record of Decision, which describes the process for cleanup at the site. At Mallinckrodt Chemical Inc., a delineation agreement between the licensee and the USACE has established the responsibility for the cleanup between the two parties. This delineation agreement supports the removal of NRC-licensed material that overlays FUSRAP material. The staff is currently reviewing both the delineation agreement and the removal amendment. Finally, staff is continuing coordination efforts with Stepan Chemical Company and the USACE to draft a Confirmatory Suspension Order, which will allow the USACE to initiate remediation at the site.

Over the past year, the New York State Department of Health, New York State Department of Environmental Conservation, New York State Energy Research and Development Authority, EPA, and the NRC have met monthly and worked together as a core team to resolve outstanding technical issues related to the development of a draft environmental impact statement (DEIS) for the WVDP. In two recently achieved milestones, the core team: (1) identified a proposed preferred alternative for the DEIS that would identify decommissioning actions that can be completed now and would defer decommissioning actions that cannot be completed at this time; and (2) scheduled an erosion workshop to address long-term performance assessment issues that have impeded decision making for this DEIS.

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<sup>1</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.

In an effort to initiate action at the Salmon River, Oregon site, the NRC staff requested technical and financial assistance from EPA. EPA visited Salmon River in June 2006. EPA subsequently conducted a site assessment and provided a copy of the final report to the NRC in April 2007. In August 2007, EPA management approved a removal action, which will take place in early FY 2008. The NRC staff will support EPA during the cleanup activities and will conduct an independent evaluation of the results of the removal action to determine if the site can be released without restrictions.

**Table 2-3  
Complex Decommissioning Sites**

| Name |   | Location              | Date DP Submitted                              | Date DP Approved  | Cleanup Criteria | Projected Removal |
|------|---|-----------------------|--|-------------------|------------------|-------------------|
| 1    | AAR Manufacturing, Inc.                             | Livonia, MI           | 10/97<br>revised<br>9/06,<br>4/07 <sup>+</sup> | 5/98<br>TBD       | LTR-RES          | 9/11              |
| 2    | ABB Prospects, Inc.                                 | Windsor, CT           | 4/03   | 6/04              | LTR-UNRES        | 12/10             |
| 3    | Babcock & Wilcox<br>(Shallow Land Disposal<br>Area) | Vandergrift, PA       | 6/01<br>revised<br>NA                          | NA                | LTR-UNRES        | 3/13              |
| 4    | Battelle Columbus<br>Laboratories                   | Columbus, OH          | 8/00   | 2001              | LTR-UNRES        | 12/07             |
| 5    | Cabot Performance<br>Materials, Inc.                | Reading, PA           | 6/05<br>revised<br>8/06                        | 10/07*            | LTR-UNRES        | 1/08              |
| 6    | Curtis-Wright Cheswick                              | Cheswick, PA          | 3/06   | TBD <sup>++</sup> | LTR-UNRES        | 12/08             |
| 7    | Department of the Army<br>(Fort McClellan)          | Fort McClellan,<br>AL | 3/99   | 3/01              | LTR-UNRES        | 6/08              |
| 8    | Engelhard Minerals                                  | Great Lakes, IL       | NA   | NA                | LTR-UNRES        | TBD               |
| 9    | FMRI (Fansteel), Inc.                               | Muskogee, OK          | 8/99<br>revised<br>5/03                        | 12/03             | LTR-UNRES        | 2023*             |
| 10   | Homer Laughlin                                      | Newell, WV            | 1/95   | 1/95              | LTR-UNRES        | 12/07             |

**Table 2-3  
Complex Decommissioning Sites**

| <b>Name</b> | <b>Location</b>                                     | <b>Date DP Submitted</b> | <b>Date DP Approved</b>              | <b>Cleanup Criteria</b> | <b>Projected Removal</b> |                    |
|-------------|---|--------------------------|--------------------------------------|-------------------------|--------------------------|--------------------|
| 11          | Jefferson Proving Ground                            | Madison, IN              | 8/99<br>revised<br>6/02, 6/11*       | 10/02<br>TBD            | LTR-RES                  | 12/13              |
| 12          | Kerr-McGee  | Cimarron, OK             | 4/95                                 | 8/99                    | Action-UNRES             | 1/17               |
| 13          | Mallinckrodt Chemical, Inc.                         | St. Louis, MO            | Phase 1<br>11/97,<br>Phase 2<br>5/03 | 5/02<br>TBD             | LTR-UNRES                | TBD                |
| 14          | Molycorp, Inc.<br>Washington                        | Wash., PA                | 6/99                                 | 8/00                    | Action-UNRES             | 6/08               |
| 15          | NWI Breckenridge                                    | Breckenridge, MI         | 3/04                                 | 8/04                    | LTR-UNRES                | TBD <sup>+++</sup> |
| 16          | Quehanna (formerly<br>Permagrain Products,<br>Inc.) | Media, PA                | 4/98,<br>revised<br>3/03, 3/06       | 7/98,<br>9/03,<br>10/06 | LTR-UNRES                | 3/08               |
| 17          | Safety Light Corp.                                  | Bloomsburg, PA           | 12/00                                | 12/01                   | LTR-UNRES                | 12/07              |
| 18          | Salmon River  | Salmon, ID               | TBD                                  | TBD                     | LTR-UNRES                | 5/12               |
| 19          | Shieldalloy Metallurgical Corp.                     | Newfield, NJ             | 6/06                                 | 11/08*                  | LTR-RES                  | 9/12               |

**Table 2-3  
Complex Decommissioning Sites**

| Name |  | Location           | Date DP Submitted                 | Date DP Approved | Cleanup Criteria | Projected Removal |
|------|--|--------------------|-----------------------------------|------------------|------------------|-------------------|
| 20   | Stepan Chemical Company                      | Maywood, NJ        | NA                                | NA               | LTR-UNRES        | TBD               |
| 21   | Superbolt<br>(formerly Superior Steel)       | Pittsburgh, PA     | TBD                               | TBD              | LTR-UNRES        | TBD               |
| 22   | UNC Naval Products                           | New Haven, CT      | 8/98<br>revised<br>2004,<br>12/06 | 4/99,<br>10/07   | LTR-UNRES        | 06/08             |
| 23   | West Valley<br>Demonstration Project         | West Valley, NY    | TBD                               | TBD              | LTR-UNRES**      | TBD               |
| 24   | Westinghouse Electric<br>(Hematite Facility) | Jefferson City, MO | 4/04<br>revised<br>6/06,<br>TBD   | TBD              | LTR-UNRES        | 3/12              |
| 25   | Westinghouse Electric<br>(Waltz Mill)        | Madison, PA        | 4/97                              | 1/00             | LTR-UNRES        | 3/08              |
| 26   | Whittaker Corp.                              | Greenville, PA     | 12/00<br>revised<br>8/03,<br>1/07 | 3/08             | LTR-UNRES        | 4/08              |

\* Timeline for completion is protracted because of the need to satisfy National Environmental Policy Act requirements, to conduct a public hearing, to address multiphase DP submittals, or a combination of the above.

\*\* The West Valley DP has not yet been submitted. The staff anticipates that the West Valley DP will include plans to release a large portion of the site for unrestricted use, while the remainder of the site may have a perpetual license or be released with restrictions.

+ The staff is currently reviewing the draft legal agreement and restrictive covenant for restricted use.

++ DP rejected.

+++ Legal settlement between the NRC and site owner is still ongoing.

Notes:

- The cleanup 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 Action for SDMP Action Plan criteria, LTR for LTR criteria, RES for Restricted Use, and UNRES for Unrestricted Use.
- Westinghouse Electric (Churchill Facility) submitted a DP for future use but had not notified the NRC that it was permanently ceasing operations. The licensee now continues licensed operations. When the licensee permanently ceases operations, it will need to submit a new DP to the NRC for review and approval.
- The Westinghouse Electric (Waltz Mill) facility expects to remain operational; the dates reflected in the table relate to the remediation of onsite decontamination.
- Reasons for multiple DP submittals range from changes in the favored decommissioning approach, to the phased implementation of decommissioning, to poor submittals.
- When Pennsylvania becomes an Agreement State, as many as seven sites from this table will be transferred to the State.

## **2.4 Uranium Recovery Facility Decommissioning**

Uranium recovery decommissioning activities include regulatory oversight of decommissioning uranium recovery (milling) sites; review of site characterization plans and data; review and approval of reclamation plans (RPs); preparation of environmental assessments (EAs) and EISs; inspection of decommissioning activities, including confirmatory surveys; decommissioning cost estimate reviews, including annual surety updates; and oversight of license termination. This report does not address regulation of new or operating uranium recovery facilities. Regulations governing uranium recovery facility decommissioning appear in 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." Licensees include conventional uranium mill sites and *in-situ* leach (ISL) facilities. Table 2-4 identifies the Title II decommissioning sites.<sup>2</sup>

On October 1, 2006, the NRC transferred responsibility for uranium recovery decommissioning activities from the Office of Nuclear Materials Safety and Safeguards' (NMSS) Division of Fuel Cycle Safety and Safeguards (FCSS) to FSME's Division of Waste Management and Environmental Protection (DWMEP), as part of the consolidation of the NRC's Decommissioning Program. SECY-06-0106, "Consolidation of U.S. Nuclear Regulatory Commission's Decommissioning Program in the Division of Waste Management and Environmental Protection, Office of Nuclear Material Safety and Safeguards," dated May 9, 2006, provides details of the consolidation. As of September 30, 2007, 11 uranium recovery facilities are undergoing decommissioning. COGEMA Mining, Inc., which was in decommissioning, has applied for a license amendment to restart its Christensen Ranch facility.

### **2.4.1 Summary of FY 2007 Activities**

- In FY 2007, the staff reviewed the draft Remedial Action Plan for Atlas Moab<sup>3</sup>, approved the Corrective Action Ponds Closure Plan at Western Nuclear, resolved the remaining open issues identified in the draft Safety Evaluation Report for the Sequoyah Fuels Corporation site, and reviewed the Rio Algom Cell 2 expansion design. Also in FY 2007, the staff performed site inspections at American Nuclear Corporation, ExxonMobil Highlands, Pathfinder Lucky Mc, Homestake, Sequoyah Fuels Corporation, Umetco Minerals Corporation, United Nuclear Corporation, and Western Nuclear, Inc.
- The NRC staff strives to ensure openness in its regulatory process. In support of this goal, the staff has held multiple meetings open to the public during the past year. These include meetings with the Homestake Mining Corporation, the National Mining Association, the EPA, and the New Mexico Environmental Department.

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<sup>2</sup> Commercial uranium recovery facilities are licensed under the authority of Title II of the Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978, as amended. Title I of the Act relates to abandoned mill tailings sites not licensed at the time UMTRCA was enacted.

<sup>3</sup> The Atlas Moab site was transferred to the Title I program in 2001.

| <b>Table 2-4</b>   |                                 |                     |                          |                              |
|--|---------------------------------|---------------------|--------------------------|------------------------------|
| <b>Decommissioning Title II Uranium Recovery Sites</b>   |                                 |                     |                          |                              |
|  | <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     | TBD                          |
| 2  | Bear Creek                      | Converse County, WY | 5/89                     | 2008                         |
| 3  | ExxonMobil Highlands            | Converse County, WY | 1990                     | 2008                         |
| 4  | Homestake                       | 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                     | TBD                          |
| 9  | Umetco Minerals Corporation     | East Gas Hills, WY  | Revised soil plan—4/01   | 2010                         |
| 10   | United Nuclear Corporation      | Churchrock, NM      | 3/91, Revision 2005      | TBD                          |
| 11   | Western Nuclear Inc.—Split Rock | Jeffrey City, WY    | 1997                     | 2008**                       |
| <p>* Site is a candidate for potentially restarting.<br/> ** Estimated date<br/> *** Decommissioning was approved in 2006.</p> <p>Note: 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.</p> |                                 |                     |                          |                              |



## **2.5 Fuel Cycle Facility Decommissioning**

Currently, the only fuel cycle facility undergoing partial decommissioning is the General Atomics facility in San Diego, California. Additional information about the status of the facility is summarized on the public Web site at <http://www.nrc.gov/info-finder/decommissioning/fuel-cycle/>.

### **2.5.1 Summary of FY 2007 Activities**

- One conversion facility (Honeywell) and one fuel manufacturer (AREVA NP-Richland) have completed partial site decommissioning activities.

## **3. Guidance and Rulemaking Activities**

In FY 2007, the staff completed a number of guidance and rulemaking activities. These activities resulted from the Integrated Decommissioning Improvement Plan (IDIP), Revisions 1 and 2. The IDIP describes the staff's plans for implementing recommendations from the Decommissioning Program evaluation, the LTR analysis recommendations approved by the Commission, Commission direction resulting from the 2004 annual decommissioning briefing, and other improvements.

The 2006 annual decommissioning report identified followup actions that the staff intended to take to implement the IDIP in FY 2007. Updates to the IDIP, based on staff assessments, staff decommissioning experience, and independent program reviews, such as the Office of the Inspector General audits, result in continuous improvement of the Decommissioning Program.

Major IDIP activities in FY 2007 include the following:

- Completion of a draft proposed rule and draft supporting guidance for preventing future legacy sites (i.e., sites with inadequate funding to complete decommissioning); these actions will eventually resolve issues identified in SECY-03-0069, "Results of the License Termination Rule Analysis," dated May 2, 2003, regarding financial assurance and facility operational releases that have resulted in decommissioning difficulties;
- Continuation of staff efforts to collect, document, and disseminate decommissioning lessons learned, including updating the decommissioning Web page for lessons learned and exchanging information on lessons learned with stakeholders at the April 2007 meeting with the Advisory Committee on Nuclear Waste, U.S. Department of Energy (DOE), Electric Power Research Institute, Fuel Cycle Facilities Forum, Organization of Agreement States (OAS), and Nuclear Energy Institute; and
- Development of a Web-based class on dose modeling.

### Program Assessment Rating Tool

The Office of Management and Budget (OMB) and the NRC completed a Program Assessment Rating Tool (PART) review in FY 2007 of the Decommissioning and Low-level Waste Program. OMB has been conducting PART reviews of Federal programs, including other NRC programs, over the past 5 years. The PART process is used to evaluate all Federal programs in a systematic, consistent, and transparent manner. Results of PART reviews help agencies and OMB make decisions on resource allocation. The primary focus of PART is on demonstrating program improvements. PART also establishes accountability for program performance. Results of PART reviews and links to supporting evidence are available to the public on OMB's Web site, <http://www.ExpectMore.gov>.

The program was rated "effective," which is the highest possible rating. Improvement plans identified for the program include: (1) developing additional efficiency measures and targets that demonstrate improved efficiency or cost-effectiveness over the previous year, and (2) developing better linkage of budget requests to the program's achievement of annual and agency long-term goals so that there is a clearer connection between funding and goal achievement.

### DWMEP Self-Evaluation of Dose Modeling

DWMEP is conducting an internal evaluation of the uses and applicability of inputs into existing computer models that assess compliance with decommissioning regulations. Specifically, this activity will focus on assessments of input parameters used in codes and models, as well as on the basis for the selection of certain scenarios used for demonstrating compliance with the NRC's decommissioning dose criteria. This evaluation is intended to improve the efficiency and consistency of approaches and methodology used in the Decommissioning Program. DWMEP staff is closely monitoring the dose modeling work of the Office of Nuclear Regulatory Research (RES) (see Section 4) to aid in this self-evaluation activity, which is anticipated to be completed in early FY 2008.

## **4. Research Activities**

RES continued to support dose modeling of releases of radioactive material from decommissioning sites. In addition to research activities, RES staff provided technical support to FSME for the Kerr-McGee and West Valley 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; benchmarking RESRAD-OFFSITE to compare its capabilities to those of other commonly used dose codes; developing FRAMES2 (Framework for Risk Assessment of Multimedia Environmental Systems) with a linkage to the U.S. Department of Defense Groundwater Modeling System and training FSME staff in the use of the linked codes; and providing FSME with a report on new conceptual models for food-chain pathways. A contract to support further development of spatial analysis and decision assistance is in place to provide tools for more efficiently designing site characterization of contaminated sites, assessing risk, determining the location of future samples, and designing remedial action.

RES continued work on the practical application of reactive transport models, performance assessments of chemically complex sites, and the resolution of comments on methods for establishing financial assurance requirements for the decommissioning of ISL mines. RES continued work to increase the understanding of the evolution and degradation of clay covers, through laboratory testing.

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

RES staff continues to support interagency cooperative activities. The RES staff, along with FSME staff, continued to participate in activities of the ISCORS, and RES staff supported the Interagency Steering Committee on Multimedia Environmental Models (ISCMEM), which involved seven participating Federal agencies. These agencies renewed the memorandum of understanding that created ISCMEM through 2011 (for details see [www.ISCMEM.org](http://www.ISCMEM.org)).

## 5. International Activities

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

### IAEA Activities

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

- participating in a promotional workshop to encourage ratification of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (the Joint Convention), by IAEA member states that have not yet ratified the Joint Convention

- working with DOE representatives at the Technical Meeting on the Use of IAEA Safety Standards in the Preparation of National Reports for the Joint Convention, which was a followup to the second Review Meeting of Contracting Parties and held in anticipation of the third such meeting
- participating in twice-yearly meetings of the IAEA Waste Safety Standards Committee, which addresses decommissioning specifically, as part of the waste safety activities of the IAEA
- conducting an IAEA expert mission to Tbilisi, Georgia, in May 2007, to provide expert assistance in the development of legislation and a regulatory framework for decommissioning, with a specific interest in research reactors
- participating in the IAEA Technical Meeting to Develop a Safety Guide on Safety Assessments for Decommissioning of Facilities Using Radioactive Materials (DS-376)
- participating in the IAEA's International Project on Evaluation and Demonstration of Safety for Decommissioning of Nuclear Facilities (DeSa)
- conducting an IAEA expert mission in Romania on the decommissioning for a VVR-S<sup>4</sup> research reactor in accordance with the IAEA safety standards

#### Discussions on Decommissioning with the United Kingdom

At the request of the United Kingdom's (U.K.'s) Nuclear Decommissioning Authority, NRC staff traveled to meet with them and the U.K. Health and Safety Executive to discuss the challenges facing the U.K.'s decommissioning program and to share lessons learned from the NRC's Decommissioning Program in the U.S.

#### Bilateral and Trilateral Exchanges with Other Countries

Staff provided support to the U.S. Department of State (DOS) for the 3rd United States-Brazil Joint Standing Committee on Nuclear Energy Cooperation Meeting held on May 23-25, 2007, at the DOS. Relevant topics included low- and intermediate-level waste and the Joint Convention. A Korean delegation visited the NRC in June 2007; during this visit, the NRC staff discussed the topic, "Release of Radioactive Waste from Regulatory Control." Additionally, DWMEP staff members assisted in the initial bilateral interactions with Iraqi regulators for cleanup and decommissioning activities. These activities are expected to continue into FY 2008.

#### Nuclear Energy Agency Activities

- Staff participated in the Nuclear Energy Agency Radioactive Waste Management Committee (RWMC) Bureau meeting to address Bureau decisions regarding long-term safety criteria updates and a path forward, planned RWMC Bureau reviews, and the planning for upcoming RWMC meetings. Travelers also met with the European Commission's Decommissioning Group specifically to examine the financing of nuclear facility decommissioning.

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<sup>4</sup> Water-moderated, water-cooled reactors of Russian design.

- Staff made a presentation on *Emerging Trends and Issues During Decommissioning* in the Annual Topical Meeting of the Nuclear Energy Agency, Working Party on Decommissioning and Dismantlement (WPDD) in Paris, France. NRC/DWMEP management chaired the WPDD Workshop.
- Staff provided support to the NMSS management participating in the Annual Meeting and Topical Sessions.

## 6. Program Integration

In FY 2007, consolidation of NRC decommissioning activities into the Decommissioning Program was completed with the transfer of decommissioning research and test reactors from NRR to FSME. As noted in Section 2.2, the transition occurred on October 1, 2006. Also in FY 2007, FSME assumed responsibility for the decommissioning of uranium recovery facilities. The Decommissioning Program currently encompasses power and early demonstration reactors, research and test reactors, complex materials facilities, and uranium recovery facilities.

### Evaluation of Broad-Scope Licensees

The Division of Nuclear Materials Safety in Region III initiated a pilot inspection effort focused on broad-scope licensees' understanding of the Decommissioning Timeliness Rule and associated regulations and guidance related to decommissioning. The pilot effort, which consisted of four inspections during FY 2007, resulted in several findings and violations. The common theme of the findings and violations is the failure to maintain adequate decommissioning records, failure to submit timely decommissioning plans, and failure to ensure that proper surveys were conducted to support unrestricted release of an area. As a continuation of this effort, Region III will conduct three more inspections of this type. Region III will then recommend enhancements of the inspection program to FSME.

## 7. Agreement State Activities

As stated in Section 2 of this report, 34 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 2007 included the following:

- OAS participation in the Division of Intergovernmental Liaison and Rulemaking working group to develop the proposed rule to prevent future legacy sites
- DWMEP staff participation in the Conference of Radiation Control Program Directors activities, including the May 2007 annual meeting

The following are examples of informal interactions:

- DWMEP staff participation at monthly OAS teleconferences
- coordination and interaction between DWMEP and the Regions with States on specific decommissioning sites and issues (ABB Prospects, Inc., Big Rock Point, Connecticut Yankee, Kerr-McGee Cimarron, Indian Point Unit 1, S.C. Holdings, Westinghouse-Hematite, the WVDP, and Yankee Rowe)
- DWMEP and regional coordination with the Pennsylvania Department of Environmental Protection, in preparation for Pennsylvania's becoming an Agreement State (quarterly conference calls to discuss the status of decommissioning activities at complex sites and Pennsylvania observation of NRC inspections)

Table 7-1 identifies the decommissioning and uranium recovery sites in the Agreement States. In FY 2008, the NRC staff will continue to work with the Agreement States to incorporate in the annual report more detailed information about complex materials decommissioning sites and uranium recovery facilities undergoing decommissioning. This will be done as part of the Comprehensive Decommissioning Program, which is discussed in Section 9 of this report.

**Table 7-1**

**Decommissioning and Uranium Recovery Sites in Agreement States**

| <b>State</b> | <b>Name</b>  | <b>Location</b>   | <b>Date DP Submitted</b> | <b>Date DP Approved</b> | <b>Cleanup Criteria</b>                   | <b>Project Complete</b> | <b>Additional Notes</b>                       |
|--------------|--|-------------------|--------------------------|-------------------------|---|-------------------------|---|
| AR           | Harmon Road LLRW Disposal Site (Arkansas University) | Fayetteville, AR  |                          |                         |   | TBD                     |   |
| AR           | SEFOR (Research Reactor at University of Arkansas)   | Fayetteville, AR  |                          |                         |   | TBD                     |   |
| CA           | General Atomics                                      | San Diego, CA     | 10/14/96                 | 8/26/97                 | Surface- and concentration-based criteria | 12/09                   | Subsets of property released every few months |
| CA           | ICN Biomedicals                                      | Irvine, CA        | 11/14/05                 | 5/15/06                 | Surface- and concentration-based criteria | 11/07                   |   |
| CA           | Excel Research Services, Inc                         | Fresno, CA        | 5/03                     | TBD                     | Concentration-based criteria              | TBD                     |   |
| CA           | Providencia Holdings, Inc.                           | Burbank, CA       | 7/16/01                  | 10/31/02                | Surface- and concentration-based criteria | 12/07                   |   |
| CA           | Molycorp, Inc. Mountain Pass Plant                   | Mountain Pass, CA | 6/9/06                   |                         | Concentration-based criteria              | 3/08                    |   |

Table 7-1

Decommissioning and Uranium Recovery Sites in Agreement States

| State | Name                     | Location        | Date DP Submitted | Date DP Approved | Cleanup Criteria                          | Project Complete | Additional Notes   |
|-------|--------------------------|-----------------|-------------------|------------------|---|------------------|--|
| CA    | Aerojet Ordnance Company | Chino Hills, CA | 2/15/96           | 5/31/96          | Surface- and concentration-based criteria | 12/07            | Confirmatory survey to begin after ICN Biomedicals survey is completed |
| CA    | PTRL West, Inc.          | Hercules, CA    | 2/7/00            | 4/6/00           | Indistinguishable from background         | 3/08             |  |
| CA    | Kirk Rich Dial Company   | Los Angeles, CA | N/A               | N/A              | Indistinguishable from background         | 12/07            | EPA completed remediation  |
| CA    | MP Biomedicals           | Irvine, CA      | 5/17/06           | 4/25/07          | Surface-based criteria                    | 8/07             |  |
| CO    | Umetco                   | Uravan, CO      |                   | 2/01/87          | Criterion 6(6)*                           | 2008             | Uranium mill   |
| CO    | Umetco Maybell           | Maybell, CO     | 01/01/1995        | 1995             | Criterion 6(6)                            | TBD              | Uranium mill; LTSP under review by NRC                                 |



Table 7-1

Decommissioning and Uranium Recovery Sites in Agreement States

| State | Name   | Location       | Date DP Submitted | Date DP Approved | Cleanup Criteria  | Project Complete                   | Additional Notes                      |
|-------|--|----------------|-------------------|------------------|---|------------------------------------|---------------------------------------|
| CO    | Cotter Uranium Mill                                    | Canon City, CO | Revised 2005      | 2005             | Criteria 6(6)—restricted area for soils. Surface- and concentration-based. Some Superfund units and licensed portion. | In standby. TBD if going into D&D. | Uranium mill                          |
| CO    | Schwardzwalder Mine (Cotter)                           | Golden, CO     | 12/01/1996        | 1997             | Criterion 6(6)  | TBD                                | Uranium mine                          |
| CO    | Colorado School of Mines Research Institute Table Mtn. | Golden, CO     | 08/01/2006        | TBD              | Criterion 6(6)  | 2007                               | Uranium decay chain contaminated site |
| CO    | Colorado School of Mines Research Institute Creekside  | Golden, CO     | TBD               | TBD              | TBD   | 2007                               | Uranium decay chain contaminated site |
| CO    | Sweeney Mining and Milling                             | Boulder, CO    | Pending           |                  | TBD   | TBD                                | Uranium mine and mill                 |
| CO    | Homestake Mining and Pitch                             | Sargeants, CO  | 05/01/2001        | 06/01/2001       | Criterion 6(6)  | TBD                                | Uranium recovery                      |

**Table 7-1**

**Decommissioning and Uranium Recovery Sites in Agreement States**

| <b>State</b> | <b>Name</b>                   | <b>Location</b> | <b>Date DP Submitted</b> | <b>Date DP Approved</b> | <b>Cleanup Criteria</b>     | <b>Project Complete</b> | <b>Additional Notes</b>   |
|--------------|-------------------------------|-----------------|--------------------------|-------------------------|-----------------------------|-------------------------|---|
| CO           | Redhill Forest                | Fairplay, CO    | Pending                  | TBD                     | 25 mrem                     | TBD                     | Water treatment facility; radium removal  |
| CO           | Clean Harbors                 | Deer Trail, CO  | 2005                     | 2006                    | 25 mrem                     | TBD                     | Hazardous waste disposal facility   |
| CO           | Amax Research and Development | Golden, CO      | 01/01/2005               | 05/01/2005              | 5 pCi/g Ra-226 > background | 2007                    | Under Colorado environmental covenant; Water Treatment Facility; radium removal |
| FL           | Mosaic Fertilizer, LLC        | Nichols, FL     | 6/3/05                   | Pending                 | <25 mrem/yr                 | 2007                    |   |
| FL           | U.S. Agri-Chemicals Corp.     | Fort Meade, FL  | 3/13/06                  | Pending                 | <25 mrem/yr                 | TBD                     |   |
| FL           | C.F. Industries, Inc.         | Bartow, FL      | Pending                  | N/A                     | N/A                         | N/A                     |   |
| FL           | Mosaic                        | Mulberry, FL    | 4/10/07                  | Pending                 | TBD                         | TBD                     |   |
| FL           | Piney Point Phosphates, Inc.  | Bradenton, FL   | Pending                  | TBD                     | TBD                         | TBD                     |   |

Table 7-1

Decommissioning and Uranium Recovery Sites in Agreement States

| State | Name   | Location            | Date DP Submitted | Date DP Approved | Cleanup Criteria   | Project Complete   | Additional Notes                         |
|-------|--|---------------------|-------------------|------------------|--|--|--|
| IL    | Chicago Magnesium                                      | Blue Island, IL     | 11/02/02          | 02/01/04         | Surface- and concentration-based criteria                                    | Phase 1—<br>12/04<br>Phase 2—<br>8/06<br>Phase 3—<br>TBD |  |
| IL    | Tronox (Kerr-McGee)<br>(Uranium Recovery Site)         | West Chicago,<br>IL | 09/01/93          | 09/01/94         | Concentration-based criteria   | Complete<br>11/05  |  |
|       |  |                     |                   |                  | Ground water:<br>Part 332.230<br>references<br>10 CFR Part 40,<br>Appendix A | Unknown  |  |
| KS    | Air Capitol Dial                                       | Wichita, KS         | TBD               | TBD              | TBD  | TBD  | Added in anticipation of NARM Final Rule |
| KS    | Aircraft Instrument & Development/RC Allen Instruments | Wichita, KS         | TBD               | TBD              | TBD  | TBD  | Added in anticipation of NARM Final Rule |

**Table 7-1**

**Decommissioning and Uranium Recovery Sites in Agreement States**

| <b>State</b> | <b>Name</b>                     | <b>Location</b> | <b>Date DP Submitted</b> | <b>Date DP Approved</b> | <b>Cleanup Criteria</b> | <b>Project Complete</b> | <b>Additional Notes</b>                  |
|--------------|---------------------------------|-----------------|--------------------------|-------------------------|-------------------------|-------------------------|--|
| KS           | Century Instruments Corporation | Wichita, KS     | TBD                      | TBD                     | TBD                     | TBD                     | Added in anticipation of NARM Final Rule |
| KS           | Instrument and Flight Research  | Wichita, KS     | TBD                      | TBD                     | TBD                     | TBD                     | Added in anticipation of NARM Final Rule |
| KS           | Kelley Instruments, Inc.        | Wichita, KS     | TBD                      | TBD                     | TBD                     | TBD                     | Added in anticipation of NARM Final Rule |
| KS           | Instrument, Inc.                | Wichita, KS     | TBD                      | TBD                     | TBD                     | TBD                     | Added in anticipation of NARM Final Rule |

Table 7-1

Decommissioning and Uranium Recovery Sites in Agreement States

| State | Name                            | Location   | Date DP Submitted | Date DP Approved | Cleanup Criteria                        | Project Complete | Additional Notes  |
|-------|---------------------------------|------------|-------------------|------------------|---|------------------|---|
| MA    | Shpack Landfill                 | Norton, MA | 09/04             | 09/04            | <10 mrem/yr                             | 12/08            | FUSRAP site— completion dependent on funds from the USACE. Cleanup started 8/05 and stopped 10/05 due to lack of funds. |
| MA    | Yankee Rowe Nuclear Power Plant | Rowe, MA   | 12/05             | 12/05            | <10 mrem/yr<br><20,000 pCi/L<br>H-3(GW) | 9/07             | ISFSI will remain   |

Table 7-1

Decommissioning and Uranium Recovery Sites in Agreement States

| State | Name                                    | Location          | Date DP Submitted  | Date DP Approved | Cleanup Criteria        | Project Complete | Additional Notes  |
|-------|---|-------------------|--|------------------|-------------------------|------------------|---|
| MA    | Engelhard Corporation                   | Plainville, MA    | 06/06<br>(possible new submittal for unrestricted release) | Pending          | <10 mrem/yr             | TBD              | Former SDMP site transferred to MA on 3/97. Now a RCRA Corrective Action Site. Assessing restricted release scenario. |
| MA    | Starmet Corp. (Formerly Nuclear Metals) | Concord, MA       | Pending  | TBD              | <10 mrem/yr             | TBD              | Superfund site  |
| MA    | Wyman Gordon Co.                        | North Grafton, MA | None   | TBD              | Most likely <10 mrem/yr | TBD              | Transferred from SDMP to MA on 3/97. Ground water monitoring, no plans to D&D. No unforeseen factors delaying D&D.    |

Table 7-1

Decommissioning and Uranium Recovery Sites in Agreement States

| State | Name              | Location      | Date DP Submitted | Date DP Approved | Cleanup Criteria        | Project Complete | Additional Notes   |
|-------|-------------------|---------------|-------------------|------------------|-------------------------|------------------|--|
| MA    | Texas Instruments | Attleboro, MA | None              | TBD              | Most likely <10 rem/yr  | TBD              | Former SDMP site transferred to MA on 3/97. Still has Ra-226 in some buildings. Former uranium fuel fabrication plant. |
| MA    | Norton/St. Gobain | Worcester, MA | None              | TBD              | Most likely <10 mrem/yr | TBD              | On the DOE list of facilities covered under the Energy Employees Occupational Illness Compensation Act of 2000.        |

Table 7-1

Decommissioning and Uranium Recovery Sites in Agreement States

| State | Name  | Location        | Date DP Submitted | Date DP Approved | Cleanup Criteria                          | Project Complete | Additional Notes                         |
|-------|---|-----------------|-------------------|------------------|---|------------------|--|
| NE    | LLWR Disposal Site (University of Nebraska—Lincoln)                 | Mead, NE        | TBD               | TBD              | TBD                                       | TBD              |  |
| OH    | Metallurg Vanadium Corp. (Formerly Shieldalloy Metallurgical Corp.) | Cambridge, OH   | 7/13/99           | 3/6/02           | Concentration-based criteria              | TBD              | Project completion estimated at 12/31/07 |
| OH    | Advanced Medical Systems, Inc.                                      | Cleveland, OH   | 5/25/04           | 7/5/05           | Surface- and concentration-based criteria | TBD              |  |
| OR    | TDY Industries Dbw Wah Chang  | Albany, OR      | 6/11/03           | 3/08/06          | <25 mrem/yr                               | TBD              | Smelting/ refining metals                |
| OR    | PCC Structurals, Inc.   | Portland, OR    | 6/10/06           | 9/14/06          | <25 mrem/yr                               | TBD              | Large parts-metals manufacturer          |
| TX    | ASARCO—Federated Metals   | Houston, TX     | NA                | NA               | ≤25 mrem/yr                               | TBD              | State Superfund                          |
| TX    | Iso-Tex   | Friendswood, TX | NA                | NA               | ≤25 mrem/yr                               | TBD              | Litigation/ mediation                    |
| TX    | Pearland-Manvel   | Pearland, TX    | NA                | NA               | ≤25 mrem/yr                               | TBD              | Site under investigation                 |



Table 7-1

Decommissioning and Uranium Recovery Sites in Agreement States

| State | Name   | Location                     | Date DP Submitted     | Date DP Approved | Cleanup Criteria             | Project Complete                           | Additional Notes      |
|-------|--|------------------------------|-----------------------|------------------|------------------------------|--|-----------------------|
| TX    | ExxonMobil   | Live Oak Co., TX             | 4/85                  | 9/82             | Concentration-based criteria | TBD  | Uranium recovery site |
| TX    | ConocoPhillips   | Karnes Co., TX               | 11/87                 | 9/80             | Concentration-based criteria | TBD  | Uranium recovery site |
| TX    | Rio Grande Resources   | Karnes Co., TX               | 4/93<br>ACL—<br>11/97 | 11/96            | Concentration-based criteria | TBD  | Uranium recovery site |
| TX    | COGEMA   | Duval Co., TX                | 11/03                 | 4/06             | Concentration-based criteria | GW complete<br><br>Surface ongoing         | Uranium recovery site |
| TX    | Intercontinental Energy Corp.  | Live Oak Co., TX             | 3/03                  | Ongoing          | Concentration-based criteria | GW complete<br><br>Surface TBD             | Uranium recovery site |
| TX    | Everest Exploration, Inc. (decommissioning of Tex-1 Mt. Lucas sites) | Karnes and Live Oak Counties | 8/01                  | Ongoing          | Concentration-based criteria | GW complete<br><br>Surface cleanup ongoing |                       |

**Table 7-1**

**Decommissioning and Uranium Recovery Sites in Agreement States**

| <b>State</b>  | <b>Name</b>            | <b>Location</b>   | <b>Date DP Submitted</b> | <b>Date DP Approved</b> | <b>Cleanup Criteria</b>      | <b>Project Complete</b> | <b>Additional Notes</b> |
|---|------------------------|-------------------|--------------------------|-------------------------|------------------------------|-------------------------|-------------------------|
| UT  | Rio Algom Uranium Mill | Lisbon Valley, UT |                          |                         | Concentration-based criteria | TBD                     | Uranium recovery site   |
| WA  | Dawn Mining Company    | Ford, WA          | 05/94                    | 02/95                   | Concentration-based criteria | 12/13                   | Uranium recovery site   |
| <p>Note:</p> <p>* Criterion 6(6) denotes Agreement State regulations compatible with technical criteria in 10 CFR part 40, Appendix A, Criteria 6(6), which apply to areas contaminated with radium or other byproduct material benchmarked to doses equivalent to these radium levels.</p> |                        |                   |                          |                         |                              |                         |                         |

## **8. Resources**

The total Decommissioning Program staff budget, for FY 2007 and FY 2008, is 88 full-time equivalents (FTE) and 77 FTE, respectively. These resource figures include personnel to perform licensing casework directly related to decommissioning sites; inspections; project management and technical support for decommissioning power reactors, uranium mill tailings facilities, and fuel cycle facilities; development of rules and guidance; EISs and EAs; research to develop more realistic analytical tools to support licensing and rulemaking activities; Office of the General Counsel support; and waste incidental to reprocessing. These figures also include supervisory and nonsupervisory indirect FTE associated with the Decommissioning Program.

## **9. FY 2008 Planned Programmatic Activities**

The staff has planned a number of programmatic activities for FY 2008. The most significant of these activities are the implementation of the enhanced Comprehensive Decommissioning Program, continuation of IDIP improvement activities, continuation of international activities, implementation of the naturally occurring and accelerator-produced radioactive material (NARM) rule, identification of sites contaminated with depleted uranium, and the evaluation of the decommissioning of the Hunter's Point Shipyard in California.

An enhanced Comprehensive Decommissioning Program will allow the NRC to compile in a centralized location more complete information on the status of decommissioning and decontamination of complex sites and uranium recovery sites in the United States in order to provide a national perspective on decommissioning. The NRC will make the information available to the public to ensure openness and promote communication and thus enhance public confidence in the national Decommissioning Program. In support of this effort, the staff presented a poster of this program at the 39<sup>th</sup> Annual National Conference on Radiation Control and discussed this program with the Agreement States via multiple teleconferences. The staff is currently in the process of obtaining an OMB clearance for an information collection to initiate this program.

Section 3 of this report identifies IDIP improvement activities completed in FY 2007. In addition to the completed activities, the staff is making progress on a number of IDIP activities planned for completion in FY 2008. Major IDIP improvement activities planned for FY 2008 include the following:

- completing a final rule and supporting guidance on measures to prevent future legacy sites (changes to financial assurance and licensee operations)
- finalizing inspection and enforcement guidance to enhance monitoring and reporting procedures to prevent future legacy sites
- continuing to work with licensees to facilitate decommissioning pursuant to the restricted release provisions in the LTR at the AAR Manufacturing, Jefferson Proving Ground, and Shieldalloy sites

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

The Energy Policy Act of 2005 expanded NRC regulatory authority over accelerator-produced radioactive materials, discrete sources of radium, and discrete sources of naturally occurring radioactive material. The staff is working with Department of Defense personnel to gain a better understanding of the types of material containing radium-226 used in the past, the number of old disposal sites, and the extent of radium-226 contamination at these sites. The staff will be working to implement the NARM rule to address the decommissioning of these facilities through the upcoming year.

The Department of Army has recently identified the existence of depleted uranium contamination at two Army bases from the use of depleted uranium spotter round munitions in the 1960s (Schofield Army Barracks, HI and Fort Hood, TX). These use locations are not currently licensed by the NRC. The Army has also indicated that as many as seven additional potential use locations have been identified at other Army bases, which will be further investigated. During the upcoming year, the staff will be working with the Army on the need for licensing the contaminated sites and plans for future remediation as may be required.

In July 2007, at the request of the Navy, the NRC began discussions with the Navy about what, if any, NRC involvement is necessary during the Navy's decommissioning of the Hunter's Point Shipyard (HPS) site in San Francisco, California. From 1941 until 1969, various radiological operations were conducted at HPS under the authority of either the Department of Defense or 22 different Atomic Energy Commission (AEC) and NRC licenses. In 1974, the NRC reviewed the AEC license termination records and found that the termination efforts met the standards at the time. Currently, the NRC is not directly involved in the Navy's decommissioning activities. Most residual radioactivity is from formerly licensed activities (e.g., radioluminescent devices, radiography) and early atomic weapons testing activities (e.g., ship decontamination and animal tests). In 1989, the EPA placed the HPS site on the National Priority List of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) because of chemical contamination found at shipyard locations. In 1992, EPA signed a Federal Facilities Agreement with the Navy and the State of California to better coordinate the environmental investigation and cleanup. Therefore, the Navy is currently remediating the HPS under the CERCLA process with EPA and the State of California as the lead regulatory agencies. The Navy's contractors perform the remediation work and surveys under the oversight of the Navy's Master Materials License issued by NRC. The Navy anticipates transferring the property to San Francisco. Some of the property will be released for unrestricted use, while other areas will use institutional controls with both Federal and State enforcement to restrict selected future land uses. Currently, there is interest in using a portion of the HPS as the location for a new football stadium for the San Francisco 49ers. Based on discussions with the Navy and review of remediation plans, the staff is preparing a Commission paper with options and recommendations for a Commission decision regarding potential NRC involvement at the HPS site.

As the NRC's Decommissioning Program matures and more complex materials sites complete decommissioning, the program is redefining its role to focus on the prevention of future sites that are unable to complete decommissioning (legacy sites). NRC regulations in

10 CFR 20.1406, "Minimization of Contamination," specifically require that new applications describe how design and operations will minimize contamination and facilitate eventual decommissioning. To help prevent future legacy sites, the NRC staff prepared SECY-07-0177, "Proposed Rule: Decommissioning Planning (10 CFR Parts 20, 30, 40, 50, 70 and 72: RIN: 3150-AH45)," dated October 3, 2007, which is a two-pronged approach consisting of financial assurance and monitoring. One aspect of the rulemaking would focus on ensuring that the licensee has adequate financial assurance to complete decommissioning, while the other would ensure that the licensee has in place an adequate ground water monitoring program and will minimize contamination. Additionally, in certain cases, licensees will have new recordkeeping requirements documenting spills, leaks, and unplanned releases. The staff will be working on this rulemaking through FY 2008. In another effort to prevent future legacy sites, the staff is assessing the level of understanding of and compliance with the Decommissioning Timeliness Rule (10 CFR 30.36, "Expiration and Termination of Licenses and Decommissioning of Sites and Separate Buildings or Outdoor Areas") by broad-scope licensees, as discussed in Section 6 of this report.

Since its inception as the SDMP Program in the late 1990's the Decommissioning Program has been successful in completing decommissioning at legacy sites, developing guidance to facilitate decommissioning at future sites and working with the domestic and international nuclear community to disseminate guidance and the lessons learned from decommissioning in the U.S. However, this success, coupled with many States becoming Agreement States, and the nature of the decommissioning of nuclear reactors is expected to result in a significant reduction in the number of active NRC decommissioning sites after FY 2010. In FY 2008 the staff will evaluate the resource and staffing implications of this reduction in sites, as well as the increasing number of uranium recovery licensing activities (uranium recovery is also managed under the Decommissioning and Low-Level Waste Tier II Program) to identify whether modifications to the current Decommissioning Program are warranted.