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# **Status of the Decommissioning Program**

**2020 Annual Report**

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**Division of Decommissioning, Uranium Recovery, and Waste Programs  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001**

Enclosure 1

# CONTENTS

Abbreviations .....	iii
1. Introduction .....	2
2. Decommissioning Sites .....	3
2.1 Nuclear Power Reactor Decommissioning .....	5
2.1.1 Summary of Fiscal Year 2020 Activities .....	5
2.1.2 Fiscal Year 2020 Trends and Areas of Focus .....	7
2.2 Research and Test Reactor Decommissioning .....	11
2.2.1 Summary of Fiscal Year 2020 Activities .....	11
2.2.2 Fiscal Year 2021 Trends and Areas of Focus .....	11
2.3 Complex Materials Facility Decommissioning .....	13
2.3.1 Summary of Fiscal Year 2020 Activities .....	13
2.3.2 Fiscal Year 2021 Trends and Areas of Focus .....	18
2.4 Uranium Recovery Facility Decommissioning .....	21
2.4.1 Summary of Fiscal Year 2020 Activities .....	21
2.4.2 Fiscal Year 2021 Trends and Areas of Focus .....	23
2.5 Fuel Cycle Facility Decommissioning .....	27
2.5.1 Summary of Fiscal Year 2020 Activities .....	27
2.5.2 Fiscal Year 2021 Activities and Areas of Focus .....	27
3. Guidance and Rulemaking Activities .....	28
4. Research Activities .....	30
5. International Activities .....	33
6. Program Integration and Improvement .....	34
7. Agreement State Activities .....	36
8. Fiscal Year 2021 Planned Programmatic Activities .....	40

## TABLES

Table 2.1-a. Power and Early Demonstration Reactors Undergoing Decommissioning .....	8
Table 2.1-b. Decommissioned Power Reactors That Have Independent Spent Fuel Storage Installations .....	10
Table 2.2. Research and Test Reactors Undergoing Decommissioning .....	12
Table 2.3. Complex Decommissioning Sites .....	19
Table 2.4-a. Decommissioning Title I Uranium Recovery Sites .....	25
Table 2.4-b. Decommissioning Title II Uranium Recovery Sites .....	26
Table 2.4-c. Title II Uranium Recovery Sites – DOE Licensed Under 10 CFR 40.28 .....	26
Table 7.1. Agreement State Decommissioning Sites .....	37

## ABBREVIATIONS

ADAMS	Agencywide Documents Access and Management System
ALARA	As low as reasonably achievable
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	<i>Code of Federal Regulations</i>
COVID-19 PHE	Coronavirus Disease 2019 Public Health Emergency
CRR	Completion Review Report
DandD	Decontamination and Decommissioning
DECON	Power Reactors Undergoing Active Decommissioning
DOE	U.S. Department of Energy
DOE-WVDP	U.S. Department of Energy – West Valley Demonstration Project
DoD	U.S. Department of Defense
DP	Decommissioning Plan
DU	Depleted Uranium
EIS	Environmental impact statement
EMC	Essential Mission Critical
EPA	U.S. Environmental Protection Agency
FRS	Fuel Receiving and Storage
FRTR	Federal Remediation Technologies Roundtable
FSSR	Final Status Survey Report
FUSRAP	Formerly Utilized Sites Remedial Action Program
FY	Fiscal Year
GE	General Electric
GETR	General Electric-Hitachi Test Reactor
IAEA	International Atomic Energy Agency
ICEMM	Interagency Collaborative on Environmental Modeling and Monitoring
IMC	Inspection Manual Chapter
ISFSI	Independent Spent Fuel Storage Installation
LM	Department of Energy, Office of Legacy Management
LTP	License termination plan
LTR	License Termination Rule
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual

MDC	Minimum Detectable Concentration
MOU	Memorandum of Understanding
MPPB	Main Plant Process Building
N/A	Not applicable
NEA	Nuclear Energy Agency
NFS	Nuclear Fuel Services
NMED	New Mexico Environment Department
NMSS	Office of Nuclear Material Safety and Safeguards
NOW	New Opportunities of Waterbury, Inc.
NPS	National Park Service
NRC	U.S. Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
NYSERDA	New York State Energy and Research Development Authority
PSDAR	Post-shutdown Decommissioning Activities Report
RAMP	Radiation Protection Computer Code, Analysis, and Maintenance Program
RDFA	Reactor Decommissioning Financial Assurance
RES	Office of Nuclear Regulatory Research
RESRAD	Residual Radioactivity
RP	Reclamation plan
SAFSTOR	Power Reactors in Long-Term Safe Storage
SDMP	Site Decommissioning Management Plan
SEIS	Supplemental Environmental Impact Statement
SLDA	Shallow Land Disposal Area
SSSB	Surface Ship Support Barge
TBD	To be determined
TCEQ	Texas Commission on Environmental Quality
TRIGA	Training, Research, Isotopes General Atomics
UMTRCA	Uranium Mill Tailings Radiation Control Act
UNC	United Nuclear Corporation
USACE	U.S. Army Corps of Engineers
WVDP	West Valley Demonstration Project

# 1. INTRODUCTION

This report provides a summary of decommissioning activities at nuclear facilities in the United States. Its purpose is to provide a reference document that summarizes the U.S Nuclear Regulatory Commission's (NRC) decommissioning activities in fiscal year 2020, including the decommissioning of power reactors, research and test reactors, complex materials sites, uranium recovery facilities, and fuel cycle facilities. As such, this report discusses the current progress and accomplishments with respect to the NRC's Decommissioning Program, provides information supplied by Agreement States on the status of decommissioning activities at sites within their States, and identifies key Decommissioning Program activities that the NRC staff will undertake in the coming year. Unless specified otherwise, the information contained in this report is current as of September 30, 2020.

As of September 30, 2020, 25 nuclear power and early demonstration reactors, 4 research and test reactors, 10 complex materials facilities,<sup>1</sup> 5 Title II<sup>2</sup> uranium recovery facilities, and part of 1 fuel cycle facility are undergoing decommissioning or are in long-term safe storage under NRC jurisdiction. In addition, 20 of the 22 Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I legacy uranium recovery sites and 6 UMTRCA Title II sites are under general license with the U.S. Department of Energy.<sup>3</sup> Of the 25 power and early demonstration reactors in decommissioning, 12 have elected the SAFSTOR (long-term storage) option and 13 have elected the DECON (active decommissioning) option. In Fiscal Year 2020, active decommissioning was completed at Humboldt Bay, LaCrosse and Zion Unit 1 and Unit 2 and the staff began reviewing the Final Status Survey Reports. The inventory of decommissioning power reactor sites increased in 2020 as Duane Arnold and Indian Point Unit 2 permanently ceased power operations. Licensees for eight additional reactors have announced their intent to shut down by 2025: Byron Units 1 and 2, Dresden Units 2 and 3 and Indian Point Unit 3 (2021), Palisades (2022), and Diablo Canyon Units 1 and 2 (2024 and 2025, respectively).

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<sup>1</sup> Complex materials sites are defined as sites where the complexity of the decommissioning process will require more than minimal technical and administrative support from the headquarters program office.

<sup>2</sup> "Title I" in this report refers to facilities under the Uranium Mill Tailings Radiation Control Act of 1978, as amended, that were inactive, unregulated processing sites when the act was passed, while "Title II" refers to facilities that were licensed by the NRC or an Agreement State in 1978 or after UMTRCA was enacted.

<sup>3</sup> Two of the 22 Title I sites are former processing sites and general licenses under Title 10 of the *Code of Federal Regulations* 40.27 are not in effect at those sites because UMTRCA only addresses the licensing of mill tailings disposal sites.

## 2. DECOMMISSIONING SITES

The U.S. Nuclear Regulatory Commission (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 under NRC authority, 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 decommissioning process, as appropriate. This report summarizes a broad spectrum of activities associated with the program's functions.

Each year, the NRC terminates approximately 100 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 the site's license is not a routine licensing action.

The NRC public Web site contains status summaries for the facilities managed in the Decommissioning Program (<http://www.nrc.gov/waste/decommissioning.html>). These summaries, which are updated annually or when significant changes in status occur, describe the status of each site and identify the major technical and regulatory issues affecting the completion of decommissioning. For those licensees or responsible parties that have submitted a decommissioning plan (DP) or license termination plan (LTP), the schedules for completion of decommissioning are based on an assessment of the complexity of the DP or LTP review. For those that have not submitted a DP or LTP, the schedules are based on other available site-specific information and on the anticipated decommissioning approach. The processes for decommissioning reactors, materials facilities and uranium recovery sites can be found at <http://www.nrc.gov/waste/decommissioning/process.html>.

Through the Agreement State Program, 39 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, which are licensed under either Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," or 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," over fuel cycle facilities, or over Federal materials facilities in the state. Section 7 of this report discusses the NRC's coordination with the Agreement States' decommissioning programs.

### **Response to the COVID-19 Public Health Emergency**

In response to the Coronavirus Disease 2019 Public Health Emergency (COVID-19 PHE), the NRC took several steps to ensure that licensees at sites undergoing decommissioning maintained a safe work environment, while providing relief from certain regulatory requirements.

In April 2020, the NRC issued "U.S. Nuclear Regulatory Commission Methods for Providing Regulatory Relief During the Coronavirus Disease 2019 Public Health Emergency" which described the regulatory options for licensees (including byproduct material, uranium recovery, material and reactor decommissioning, fuel facilities, and spent fuel storage facilities) to seek regulatory relief that may be necessary during the COVID-19 PHE (Agencywide Documents Access and Management (ADAMS) Accession Number ML20094G166).

In April 2020, the NRC issued "U.S. Nuclear Regulatory Commission Planned Actions Related to the Requirements for Part 73, Appendix B, Section VI During the Coronavirus Disease 2019 Public Health Emergency" which provided information regarding licensee requests for exemptions from certain 10 CFR Part 73, Appendix B, Section VI security requirements during the COVID-19 PHE, and the process that the NRC put in place for reviewing such requests (ADAMS Accession Number ML20105A483).

In April 2020, the NRC Issued "U.S. Nuclear Regulatory Commission Planned Actions Related to the Respiratory Protection Requirements for All Licensees During the Coronavirus Disease 2019 Public Health Emergency" which outlines the process for receiving expedited review of exemption requests from medical evaluation frequency and respirator fit-testing frequency requirements in 10 CFR 20.1703(c)(5)(iii) and 10 CFR 20.1703(c)(6) (ADAMS Accession Number ML20099G757).

In May 2020, the NRC issued "U.S. Nuclear Regulatory Commission Planned Actions Related to Certain Fire Protection Requirements for Operating and Decommissioning Reactor Licensees During the Coronavirus Disease 2019 Public Health Emergency" which provided information regarding NRC's planned actions related to requirements contained in 10 CFR Part 50.48, "Fire protection," for fire brigades during the COVID-19 PHE (ADAMS Accession Number ML20122A022).

In April 2020, the NRC issued a temporary exemption to Homestake Mining Company of California for radiation safety technician qualifications and in May 2020 the NRC approved a 120-day extension of the due date for corrective action pursuant to a Confirmatory Order for their Grants, New Mexico (NM) facility. In April 2020, the NRC issued a temporary exemption from monthly groundwater monitoring requirements to the Rio Algom Ambrosia Lake West, NM, site and in June 2020, the NRC issued a similar exemption to the General Electric Nuclear Corporation for their Church Rock, NM, site. In May 2020, the NRC issued exemptions to the Oyster Creek Nuclear Generating Station and, in June 2020 to the Pilgrim Nuclear Power Station from certain 10 CFR Part 73 Appendix B. Additional information and these exemptions can be found at <https://www.nrc.gov/about-nrc/covid-19/materials/decommissioning.html>.

## **2.1 Nuclear Power Reactor Decommissioning**

The NRC's power reactor decommissioning activities include project management, technical review of licensee submittals in support of decommissioning, core inspections, support for the development of rulemaking and guidance, public outreach efforts, international assistance and cooperation, and participation in industry conferences and workshops. In addition, the NRC staff routinely processes license amendments and exemptions to support the progressive stages of decommissioning. The Decommissioning Program staff regularly coordinates with other offices on issues affecting decommissioning power reactors, and with the Division of Fuel Management in the Office of Nuclear Material Safety and Safeguards (NMSS) regarding the independent spent fuel storage installations (ISFSIs) at reactor sites undergoing decommissioning.

As of September 30, 2020, the 25 nuclear power and early demonstration reactors identified in Table 2.1-a are undergoing decommissioning. Table 2.1-a 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/>. Table 2.1-b lists the decommissioned power reactors that have ISFSIs onsite.

### **2.1.1 Summary of Fiscal Year 2020 Reactor Decommissioning Activities**

- In January 2020, project management responsibility for the Pilgrim site transferred from the Office of Nuclear Reactor Regulation (NRR) to NMSS. In July 2020, project management responsibility for Three Mile Island Unit 1 (TMI Unit 1) was transferred from NRR to NMSS. Region I inspection responsibility for the TMI Unit 1 site was internally transferred from the Division of Reactor Projects to the Division of Nuclear Materials Safety in October 2019.
- Physical decommissioning work at the La Crosse site is complete, and EnergySolutions has submitted all Final Status Survey Reports (FSSR) for review. The transfer from Energy Solutions to Dairyland has been delayed due to the review of the FSSR.
- In September 2019, an Interagency Agreement between the NRC and Naval Reactors was approved by both Department of Energy (DOE)-Naval Reactors and the NRC, commencing NRC technical support services for the decommissioning of nuclear navy surface ships, starting with the Surface Ship Support Barge (SSSB) as a first of a kind project. Naval Reactors awarded a decommissioning contract for the SSSB to APTIM Corporation in June 2020. The NRC staff began the technical review of the Decommissioning Work Plan in September 2020.
- During Fiscal Year (FY) 2020, the NRC staff continued its review of the FSSR for the Zion Nuclear Power Station as decommissioning work is complete.
- Physical decommissioning work at the Humboldt Bay Unit 3 site is complete and Pacific Gas and Electric has submitted approximately half of the FSSRs for review.
- Indian Point Unit 2 permanently ceased operations and transferred to decommissioning status in May 2020. Region 1 inspection responsibility for Unit 2 was internally transferred from NRR's Division of Reactor Projects to the NMSS's Division of Nuclear Materials Safety in May 2020.



- The NRC staff continued its evaluation of a request for an alternate decommissioning schedule for the reactors at the General Electric (GE) Vallecitos facility, which proposes to extend the schedule for decommissioning beyond the 60-year timeline required for power reactor licensees in 10 CFR 50.82(a)(3).
- The NRC regional staff held annual assessment meetings for licensees that have announced their intent to shut down within the next 3 years, including Indian Point Units 2 and 3 and Duane Arnold. NMSS staff supported these assessment meetings.
- To ensure openness during the regulatory process, the NRC staff participated in several public meetings supporting the Reactor Decommissioning Financial Assurance Working Group and Section 108 of the Nuclear Energy Information and Modernization Act Section.
- The NRC staff participated in government-to-government meetings to discuss the future decommissioning of Palisades reactor and delivered a presentation regarding spent fuel safety at Pilgrim for a Massachusetts Nuclear Decommissioning Citizens Advisory Panel meeting.
- The NRC staff participated in a government-to-government meeting for San Onofre concerning the non-licensed Mesa lands and a California Coastal Commission meeting on Southern California Edison's spent fuel inspection and maintenance plan.

#### Reactor Decommissioning Financial Assurance Working Group

The Reactor Decommissioning Financial Assurance (RDFA) Working Group was established in September 2019 to ensure effective regulation and oversight of financial assurance of reactors in decommissioning. RDFA Working Group participants include Branch Chiefs and senior staff with expertise and responsibility for key aspects of the reactor decommissioning financial assurance process from NRR, NMSS as well as Regions I, III and IV's Divisions of Nuclear Materials Safety, as well as the Office of the General Counsel. The objectives of the RDFA Working Group were to: (1) summarize the current reactor decommissioning financial assurance regulations, licensing processes, and oversight processes; (2) identify any gaps in the regulations or gaps in the licensing and oversight processes that would preclude the reactor decommissioning financial assurance program from continuing to provide reasonable assurance of adequate funds for decommissioning; (3) identify any potential enhancements to improve the efficiency, effectiveness, and transparency of the reactor decommissioning financial assurance program; (4) identify any unique planning or resource considerations related to the anticipated future reactor decommissioning landscape; and (5) make recommendations to address any identified gaps or enhancements including recommending changes to applicable licensing and oversight guidance documents, such as Office Instructions, Inspection Manual Chapters, etc.

The RDFA Working Group issued a final report on May 1, 2020, which concluded that the NRC has a robust regulatory, licensing, and oversight framework for power reactor decommissioning financial assurance and that the oversight framework continues to be robust for all current and anticipated approaches for accomplishing decommissioning (ADAMS Accession Number ML20120A550). The RDFA Working Group final report also recommended enhancements to the NRC power reactor decommissioning financial assurance guidance and procedures

implementing the licensing and oversight processes to improve program effectiveness, efficiency, and transparency of the reactor decommissioning financial assurance program. The final report included a total of nine recommended enhancements. These were to:

1. Clarify Oversight of Decommission Trust Fund Expenditures as Part of Reviews of Annual Decommissioning Funding Status Reports;
2. Develop Periodic Cost-Baselining;
3. Develop 30-Day Notification Guidance;
4. Revise Inspection Procedures;
5. Develop Reactor Decommissioning Financial Assurance Spot Check Program for Licensees of Power Reactors in Decommissioning;
6. Establish Reactor Decommissioning Financial Assurance Training Program;
7. Clarify Post-shutdown decommissioning activities report (PSDAR) Update Triggers;
8. Clarify the Applicability of the Formula Amount; and,
9. Provide Irradiated Nuclear Fuel Funding Guidance for use of Provisional Trust Funds.

### Nuclear Energy Innovation and Modernization Act Section 108 Activities

Section 108 of the Nuclear Energy Innovation and Modernization Act, signed into law on January 14, 2019, required the NRC to provide a report to the U.S. Congress identifying best practices for establishing and operating local community advisory boards, including lessons learned from existing boards. The report entitled “Best Practices for Establishment and Operation of Local Community Advisory Boards Associated with Decommissioning Activities at Nuclear Power Plants” (ADAMS Accession Number ML20122A112) was issued to Congress on July 1, 2020. The report included: (1) a description of the type of topics that could be brought before a community advisory board; (2) how the board's input could inform the decisionmaking process of stakeholders for various decommissioning activities; (3) how the board could interact with the NRC and other Federal regulatory bodies to promote dialogue between the licensee and affected stakeholders; and, (4) how the board could offer opportunities for public engagement throughout all phases of the decommissioning process. The report included a discussion of the composition of existing community advisory boards and best practices identified during the establishment and operation of such boards, including logistical considerations, frequency of meetings, and the selection of board members.

#### **2.1.2 Fiscal Year 2021 Areas of Focus**

The reactor decommissioning program is adapting to the industry trend of license transfer and sale of reactor units from utilities to specialized decommissioning companies. The NRC staff will continue to internally coordinate, as necessary, to provide support with public outreach and ensure high quality safety reviews of submittals consistent with NRC's mission to protect public health and safety and the environment. The staff will also continue to work toward the termination of licenses at sites where decommissioning has been completed such as Humboldt Bay, Zion Units 1 and 2 and La Crosse. In September 2020, the staff approved the Order for the license transfer request for the Crystal River Unit 3 plant and ISFSI to Accelerated Decommissioning Partners to facilitate the decommissioning of the reactor site and management of the dry fuel storage facility. The staff will continue reviewing a request for the license transfer of TMI Unit 2 to TMI-2 Solutions, LLC to allow for the accelerated decommissioning of the damaged reactor and the license application to transfer the Indian Point site to Holtec Decommissioning International to facilitate the decommissioning of Units 1, 2 and 3.

**Table 2.1-a. Power and Early Demonstration Reactors Undergoing Decommissioning**

	<b>Reactor</b>	<b>Location</b>	<b>Status</b>	<b>Date of Shutdown</b>	<b>Date PSDAR* Submitted</b>	<b>Date LTP Submitted</b>	<b>Date LTP Approved</b>	<b>Date of Decommissioning Completion **</b>
1	Crystal River Unit 3	Crystal River, FL	DECON	2/13	12/13****	TBD	TBD	2074
2	Dresden Unit 1	Morris, IL	SAFSTOR	10/78	6/98	TBD	TBD	2036
3	Duane Arnold	Palo, IA	SAFSTOR	8/20	4/20	TBD	TBD	TBD
4	Fermi Unit 1	Newport, MI	SAFSTOR	9/72	4/98	2011***	TBD	2032
5	Fort Calhoun	Blair, NE	DECON	10/16	3/17	TBD	TBD	2065
6	GE-EVESR	Sunol, CA	SAFSTOR	2/67	N/A	TBD	TBD	2025
7	GE-Vallecitos Boiling Water Reactor	Sunol, CA	SAFSTOR	12/63	7/66	TBD	TBD	2025
8	Humboldt Bay	Eureka, CA	DECON	7/76	2/98	5/13	5/16	2021
9	Indian Point Unit 1	Buchanan, NY	SAFSTOR	10/74	1/96	TBD	TBD	2026
10	Indian Point Unit 2	Buchanan, NY	SAFSTOR	2020	TBD	TBD	TBD	TBD
11	Kewaunee	Kewaunee, WI	SAFSTOR	5/13	5/13	TBD	TBD	2073
12	La Crosse	La Crosse, WI	DECON	4/87	5/91	7/16	5/19	2021
13	Millstone Unit 1	Waterford, CT	SAFSTOR	7/98	6/99	TBD	TBD	2056
14	Nuclear Ship Savannah	Baltimore, MD	DECON	11/70	12/08	TBD	TBD	2031
15	Oyster Creek	Forked River, NJ	DECON	9/18	6/18	TBD	TBD	2035
16	Peach Bottom Unit 1	Delta, PA	SAFSTOR	10/74	6/98	TBD	TBD	2034
17	Pilgrim	Plymouth, MA	DECON	5/19	11/18	TBD	TBD	2027
18	San Onofre Unit 1	San Clemente, CA	DECON	11/92	12/98	TBD	TBD	2030
19	San Onofre Unit 2	San Clemente, CA	DECON	6/13	9/14	TBD	TBD	2031

**Table 2.1-a. Power and Early Demonstration Reactors Undergoing Decommissioning**

Reactor	Location	Status	Date of Shutdown	Date PSDAR* Submitted	Date LTP Submitted	Date LTP Approved	Date of Decommissioning Completion **	
20	San Onofre Unit 3	San Clemente, CA	DECON	6/13	9/14	TBD	TBD	2031
21	Three Mile Island Unit 1	Middletown, PA	SAFSTOR	9/19	4/19	TBD	TBD	2079
22	Three Mile Island Unit 2	Middletown, PA	SAFSTOR	3/79	6/13****	TBD	TBD	2036
23	Vermont Yankee	Vernon, VT	DECON	12/14	4/17	TBD	TBD	2030
24	Zion Unit 1	Zion, IL	DECON	2/97	2/00	12/14	9/18	2021
25	Zion Unit 2	Zion, IL	DECON	9/96	2/00	12/14	9/18	2021

GE General Electric  
 DECON Power Reactors Undergoing Active Decommissioning  
 EVESR ESADA (Empire State Atomic Development Associates) Vallecitos Experimental Superheat Reactor  
 SAFSTOR Power Reactors in Long-Term Safe Storage  
 TBD To Be Determined

\* PSDAR or DP equivalent. Prior to August 28, 1996, the effective date of Final Rule “Decommissioning of Nuclear Power Reactors” (61 *Federal Register* 39278; July 29, 1996), licensees submitted DPs (or equivalent).

\*\* Anticipated year of completion of decommissioning. For decommissioning reactors with no ISFSI or an ISFSI licensed under the specific license provisions of 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 general license provisions of 10 CFR 72.210, completion of decommissioning will result in reducing the 10 CFR Part 50 license boundary to the footprint of the ISFSI.

\*\*\* Licensing action put on hold at licensee’s request.

\*\*\*\* The staff expects to receive a revised PSDAR with a new decommissioning schedule, contingent on a license transfer for the site.

**Table 2.1-b. Decommissioned Power Reactors That Have Independent Spent Fuel Storage Installations**

	<b>Reactor</b>	<b>Onsite Fuel Status</b>	<b>Cask Vendor</b>	<b>Model</b>
1	Big Rock Point	10 CFR 50 ISFSI	EnergySolutions, Inc.	Fuel Solutions W74
2	Connecticut Yankee	10 CFR 50 ISFSI	NAC International, Inc.	NAC-MPC
3	Fort St. Vrain (DOE site)	10 CFR 72 ISFSI	Foster Wheeler Energy Applications, Inc.	Modular Vault Dry Store
4	Maine Yankee	10 CFR 50 ISFSI	NAC International, Inc.	NAC-UMS
5	Rancho Seco	10 CFR 72 ISFSI	Transnuclear, Inc.	NUHOMS-24P
6	Trojan	10 CFR 72 ISFSI	BNFL Transtor/Holtec International	HI-STORM 100
7	Yankee Rowe	10 CFR 50 ISFSI	NAC International, Inc.	NAC-MPC

## **2.2 Research and Test Reactor Decommissioning**

The NRC research and test reactor decommissioning activities include project management, technical review of licensee submittals in support of decommissioning, inspections, support for the development of rulemaking and guidance, public outreach, and participation in industry conferences and workshops. In addition, the NRC staff routinely processes license amendments and exemptions to support the progressive stages of decommissioning.

As of September 30, 2020, the four research and test reactors identified in Table 2.2 were in decommissioning status. The NRC staff expects to terminate the licenses for the two General Atomics “Training, Research, Isotopes General Atomics” (TRIGA) reactors in 2021. 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 Summary of Fiscal Year 2020 Activities**

General Atomics has nearly completed physical decommissioning work at its two research reactors in San Diego, California. In August 2019, independent verification surveys of the site were conducted. The NRC staff expects General Atomics to request license termination early 2021. In FY 2020 inspections were conducted at the GE and General Atomics research reactors.

### **2.2.2 Fiscal Year 2021 Areas of Focus**

The NRC staff expects to work toward the termination of licenses for the two General Atomics research reactors. The AeroTest Radiography and Research Reactor is expected to be transferred to NMSS after NRR issues the possession-only license.

**Table 2.2. Research and Test Reactors Undergoing Decommissioning**

<b>Reactor</b>		<b>Location</b>	<b>Date of Shutdown</b>	<b>Status</b>	<b>Date of Decommissioning Completion</b>
1	AeroTest	San Ramon, CA	12/2011	TBD	TBD
2	General Atomics TRIGA Mark F	San Diego, CA	9/94	DP Approved	2021
3	General Atomics TRIGA Mark I	San Diego, CA	12/96	DP Approved	2021
4	General Electric-Hitachi GETR	Sunol, CA	1/85	Possession-Only	2025
GETR		General Electric Test Reactor			
TRIGA		Training, Research, Isotopes General Atomics			

## **2.3 Complex Materials Facility Decommissioning**

Decommissioning activities associated with materials facilities 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 and sites in Agreement States that have exclusive Federal jurisdiction; interacting with the U.S. Environmental Protection Agency (EPA), DOE, and 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 NRC 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, 2020, 10 complex materials sites are undergoing decommissioning (see Table 2.3).

Complex materials sites are defined as sites where the complexity of the decommissioning process will require more than minimal technical and administrative support from the headquarters program office. It is expected that for these sites, it will take more than a year to complete the decommissioning process. Examples of complex materials sites include sites with groundwater contamination, sites containing significant soil contamination, sites in which the owners are in bankruptcy, any site where a DP is required, all fuel cycle facilities undergoing decommissioning, and sites where there is significant public and/or congressional interest.

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 Fiscal Year 2020 Activities**

- The NRC staff continued to coordinate with the USACE Pittsburgh office for the cleanup of the Shallow Land Disposal Area (SLDA) site in Vandergrift, Pennsylvania.
- The NRC, U.S. Department of Justice, Oklahoma Department of Environmental Quality, and EPA are involved in the Fansteel bankruptcy proceedings and are monitoring the situation as it develops. The Federal and State regulatory agencies are continuing to work with Fansteel as it develops its liquidation plan. The EPA is considering whether the site is eligible for listing on the National Priorities List pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund) as well as interim remedial actions to provide site stability. The Decommissioning Trust funds, which are now being used to fund public health and safety activities at the site, may suffice for general maintenance and security through 2023 before being depleted.
- In April 2020, Sigma Aldrich (in Missouri) submitted a request for license termination and requested that it to be reviewed concurrently with the revised DP. In July 2020, the NRC staff accepted the requests for license termination and the revised DP for a detailed technical review, which is ongoing.
- The NRC staff has coordinated with the DOE, the State of Connecticut, and other stakeholders to complete the cleanup of the former United Nuclear Corporation (UNC) Naval Products facility in New Haven, Connecticut. Cleanup activities were completed in late FY 2020 and waste shipments are in progress. GE's Final Status



Survey Plan has been reviewed and the Final Status Survey and confirmatory sampling began in October. Successful completion of both surveys with no residual contamination found should lead to site release by the end of calendar year 2020.

- In November 2019, the University of Missouri Pickard Hall submitted a DP to NRC staff for review and approval. The NRC staff determined further characterization of the site is required. Currently, the licensee is performing additional characterization work in support of the DP.

### Radium Activities

Activities associated with discrete sources of radium and associated contamination, for which NRC's authority was established by the Energy Policy Act of 2005, include maintaining various levels of regulatory oversight at sites with identified discrete sources of radium or associated contamination; examining issues and funding options to facilitate remediation of sites in Non-Agreement States; interacting with the states, EPA, the U.S. Department of Defense (DoD), and the National Park Service (NPS) at their respective sites; inspecting service providers at the sites that are subject to exclusive Federal jurisdiction; conducting public outreach; and participating in industry conferences and workshops. NRC staff activities involve varying levels of oversight at both military and non-military sites. The NRC and the DoD finalized a Memorandum of Understanding (MOU) on April 28, 2016, describing roles in the cleanup of radium and other unlicensed radioactive materials at military sites (ADAMS Accession Number ML16092A294). More information on the staff's radium activities is available at <http://www.nrc.gov/materials/radium.html>.

### Summary of Fiscal Year 2020 Military Radium Activities

- The NRC staff continued monitoring activities at the ongoing cleanups by the U.S. Army at Dugway Proving Grounds in Dugway, Utah, and by the U.S. Navy at Long Beach Naval Shipyard in Long Beach, California; Mare Island Naval Shipyard in Vallejo, California; and Treasure Island Naval Station in San Francisco, California. In FY 2020, the NRC completed reviews for two military radium cleanup reports for the Treasure Island Naval Station and two cleanup reports for the Dugway Proving Ground. The NRC staff also held coordination calls with the DoD to determine upcoming activities and schedules at a programmatic and site-specific level. The NRC staff has regular communication with the DoD to ensure that: 1) implementation of the MOU is going well at these sites; and, 2) that the DoD's remedies will meet the NRC 25 millirem-per-year (0.25 millisieverts-per-year) dose criterion in 10 CFR 20.1402 for sites that will be released for unrestricted use or is consistent with the requirements in 10 CFR 20.1403(b) for sites that will be released for restricted use.
- The NRC staff held discussions regarding the status of, and issues associated with, site cleanup with the military, EPA and the States. The staff continued implementing the "stay-informed" approach for remediation by the U.S. Navy at the Hunters Point Shipyard site in San Francisco, California, and the Alameda Naval Air Station in Alameda, California; the U.S. Air Force at the McClellan Air Force Base, in Sacramento, California; and the U.S. Army at the Sharpe Depot in Lathrop, California. The staff plans to continue its reliance on the CERCLA process and EPA oversight at these sites.

- In December 2019, the NRC responded to the Greenaction for Health and Environmental Justice regarding their 2.206 petition to revoke Tetra Tech’s EC Incorporated’s service provider license due to falsification of records at the Hunters Point Shipyard. The NRC stated that the petition will be held in abeyance and will be reassessed after the legal resolution of the Department of Justice’s civil complaint against Tetra Tech EC Incorporated (ADAMS Accession Number ML19309F257).

### Summary of Fiscal Year 2020 Non-Military Radium Activities

As of September 30, 2020, the NRC staff had dispositioned all the sites<sup>4</sup> that were identified with potential contamination from historic radium use in non-Agreement States. Five of the sites identified had calculated doses from radium contamination that exceed unrestricted use standards, requiring remediation. Moving forward, the effort has, and will continue to be, focused on working with the site owners on site remediation. Remediation at each of the five sites with contamination levels that exceed the NRC’s unrestricted use standards is at a different stage as discussed below:

- The former Benrus Clock Company, in Waterbury, Connecticut, completed remediation activities. Waste was shipped offsite in 2018, and the NRC staff issued a closeout letter in March 2019 (ADAMS Accession Number ML19077A037). Remediation activities at the former New Haven Clock Company began on August 27, 2018 and are ongoing. Due to funding and COVID-19 PHE issues, site cleanup is now anticipated to be completed in December 2020. After the site cleanup is complete, the NRC staff will prepare a closeout letter that will be shared with State of Connecticut’s Department of Energy and Environmental Protection prior to issuance.
- The NRC staff approved the Cleanup Plan for New Opportunities of Waterbury, Inc. (NOW), in Waterbury, Connecticut, in April 2019 (ADAMS Accession Number ML19044A522) and met with the site owner and Federal, State, and local partners to discuss the status of remediation planning and funding. In addition, the staff has been exercising a monitoring role at the portion of the NOW site formerly under the EPA’s Brownfields program. The State of Connecticut has requested EPA Region I perform an emergency removal action at this site due to structural concerns about portions of the site. In January 2020, EPA Region I staff completed a preliminary assessment of the site and determined that an emergency removal action is not warranted. EPA continues to assess the site for listing on the National Priorities List and remedial actions under Superfund.
- The NRC staff received a cleanup plan in November 2019 from the site owner of the former Seth Thomas Clock Company in Thomaston, Connecticut, on remediation planning efforts (ADAMS Accession Number ML19326B980). In January 2020, the staff requested additional information on the cleanup plan (ADAMS Accession Number ML20030A128). In April 2020, at the site owner’s request due to the COVID-19 PHE,

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<sup>4</sup> As described in SECY-16-0020, the staff originally identified 29 historic sites in non-Agreement States for follow-up. A site can have multiple property owners, and as such, from these 29 historical sites, there are 47 unique site owners. Subsequently, as part of continuing coordination efforts with the states on naturally occurring and accelerator-produced radioactive material, 11 additional sites with potential radium contamination were identified. State of Michigan officials informed the NRC staff of 9 additional sites, and, during preparations for the site visit to a former clock factory in Connecticut, the NRC staff identified 2 additional sites in Connecticut.

staff placed its review of the cleanup plan on hold and will revisit the schedule for planned remediation activities at the site's next periodic update in FY 2021 (ADAMS Accession Number ML20108E856).

- In April 2019, EPA completed all site activities at the former Sessions Clock Company in Bristol, Connecticut, and issued a final report in August 2019. The NRC staff used the EPA's report to issue a closeout letter to the site owner in November 2019 (ADAMS Accession Number ML19263A650).
- In FY 2020, the NRC and the NPS staffs continued to coordinate efforts, in accordance with the NRC-NPS MOU (ADAMS Accession Number ML20239A731), for the ongoing environmental response actions at Great Kills Park, in Staten Island, New York, and Spring Creek Park, in Queens, New York, that NPS previously identified with confirmed radium contamination. Specifically, in August 2020, the NRC staff provided comments to NPS on a sampling and analysis plan associated with its environmental response actions for Great Kills Park (ADAMS Accession Number ML19212A698).
- In June 2019, the NPS confirmed the presence of radium-contaminated artifacts at a third site, Dead Horse Bay, in Brooklyn, New York. In September 2020, NRC and NPS amended the previous NRC-NPS MOU to include this site (ADAMS Accession Number ML19198A281).

The NRC staff continues to coordinate with Agreement State partners as they work to resolve non-military radium issues within their jurisdictions. As of September 30, 2020, 25 of 39 Agreement States have completed their investigation activities, have dispositioned all the sites on their lists, and have no further plans for additional investigations. The remaining Agreement States continued to conduct prioritized reviews of the sites within their jurisdictions, focusing on the most risk-significant sites.

#### Depleted Uranium at U.S. Army Installations

In February 2019, the NRC staff issued its plan to identify depleted uranium (DU) spent munitions, armor, and other items used on U.S. military ranges (for training and other purposes) and determine its licensing status. The plan's primary objective is to provide the strategy that will enable the NRC to confirm that all DU on active or inactive military ranges is either authorized by an NRC license or addressed through the NRC/DoD MOU for Coordination on CERCLA Response Actions at DoD Sites with Radioactive Materials (ADAMS Accession Number ML16092A294). In developing the implementation plan, the staff was informed by previous DU licensing (i.e., the NRC's previous approach related to unlicensed Davy Crockett DU) and established a strategy to provide appropriate oversight for any unlicensed DU that is identified. The staff developed a process to work with the U.S. Navy Master Materials Licensee, the U.S. Air Force Master Materials Licensee, and the U.S. Department of the Army (Army), to provide regulatory oversight for the DU that remains on active and inactive ranges, while minimizing unnecessary regulatory burden.

In May 2019, the NRC staff formally rolled out the plan with a public webinar outlining the background components and schedule of the plan. The staff completed its document reviews by December 2019. In January 2020, the staff requested the Navy, Air Force, and Army to confirm the staff's findings that all such DU is: (1) authorized by an NRC license; or (2) addressed through the DoD MOU. In February, March, and April 2020, respectively, the Navy,

Air Force, and Army agreed with NRC staff's conclusions. In September 2020, the staff presented the results of the implementation plan (ADAMS Accession Number ML20188A173). Based on the staff's extensive review of its own historical records and the reviews performed by the military as documented in their responses, the staff has concluded that current military possession of DU is appropriately authorized by an NRC license or being addressed through the MOU between the NRC and DoD for Coordination on CERCLA Response Actions at DoD Sites with Radioactive Materials.

### West Valley Demonstration Project

The West Valley Reprocessing Plant licensees' (New York State Energy Research and Development Authority [NYSERDA] and the U.S. Department of Energy – West Valley Demonstration Project's [DOE-WVDP's] preferred environmental impact statement (EIS) alternative for decommissioning and long-term stewardship of the West Valley Demonstration Project (WVDP) & Western New York Nuclear Service Center near Buffalo, New York, employs a two-phased approach.

Phase 1 involves the decommissioning of most WVDP site facilities, including demolition of the Main Plant Process Building (MPPB) and vitrification facility, clean-up of contamination soil, and studies to reduce uncertainties associated with decommissioning the remaining facilities (referred to as Phase 1 studies). Phase 1 of the decommissioning approach is being conducted in accordance with the NRC-approved DP, which estimated approximately 10 years for completion. The DOE is in the process of providing the NRC with an updated schedule by the end of 2020.

Phase 2 involves the completion of the decommissioning process and long-term management decisionmaking for the site. In FY 2020, DOE-WVDP and NYSERDA continued to work on the Draft Supplemental EIS for Phase 2 Decommissioning. The State-licensed disposal area will also be included to allow a comprehensive view of dose contributions from the entire licensed premises.

### Summary of Fiscal Year 2020 West Valley Demonstration Project Activities

The DOE-WVDP achieved progress during 2020 overall, despite the work adjustments due to the COVID-19 PHE. Before the COVID-19 PHE in 2020, the DOE-WVDP continued its deactivation, characterization, and demolition preparation work in the MPPB and the Fuel Receiving and Storage (FRS) Facility. For the decommissioning of the MPPB ancillary support buildings, the MPPB Office Building and waste removal was completed in February 2020. Further, for the FRS Facility, asbestos containing material removal, characterization, and stabilization of pool water circulation piping was completed.

In response to the COVID-19 PHE, DOE-WVDP shifted to Essential Mission Critical (EMC) work only in late March 2020. The EMC work only status continued through early July 2020 when DOE-WVDP transitioned to Resumption of Work from the COVID-19 EMC status. Transition to this phase added additional high-priority operations/activities to those authorized at during the COVID-19 EMC phase. The Utility Room, an MPPB ancillary support building, demolition started in July 2020 under COVID-19 PHE protocols and was completed in September 2020.

In FY 2020, the NRC staff conducted a monitoring visit covering the continuing deactivation of the MPPB to include the aggressive decontamination of the Product Purification Cell - South.

Further DOE-WVDP activities of note in FY 2020 were:

- In April 2020, the DOE, Office of Environmental Management has extended the DOE-WVDP's prime decommissioning contractor cleanup contract by an additional 39 months, to June 29, 2023. This extension is to enable the prime demolition contractor to safely and efficiently complete deactivation, demolition and removal of the MPPB, and other facility disposition activities.
- In May 2020, DOE-WVDP changed its strategy for the MPPB demolition and submitted Revision 4 to its work plan for NRC review. Key changes related to source reduction and work sequencing for efficiency.
- In July 2020, DOE-WVDP and publicly announced that the schedule for the joint DOE-WVDP and NYSERDA Supplemental Environmental Impact Statement (SEIS) for WVDP was delayed due to complexities in the Probabilistic Performance Assessment. The NRC is one of multiple SEIS cooperating agencies.
- NRC staff revised Inspection Manual Chapter 0111, "Region I Monitoring Activities for the DOE West Valley Demonstration Project" (ADAMS Accession Number ML20210M356).

### **2.3.2 Fiscal Year 2021 Areas of Focus**

In FY 2021, the NRC staff will work with the Oklahoma Department of Environmental Quality to evaluate funding options for the decommissioning of the FMRI (Fansteel) site and work with the EPA to determine if the site is eligible for cleanup under CERCLA. The staff will review the new work plans for the SLDA in FY 2021 and will conduct site visits and confirmatory measurement surveys during the cleanup activities at the UNC Naval site in future years.

The NRC staff intends to continue implementing the MOU with the DoD for military radium by prioritizing its activities based on available resources. Factors for consideration in prioritizing annual monitoring activities include: (1) involvement of other regulatory agencies; (2) use of engineered controls and/or land use controls as remedies; (3) contamination in buildings for reuse; (4) amount or type of material and how transportable it is; and (5) previous monitoring activities.

The NRC staff plans to continue its efforts on non-military radium by working with site owners on risk-informed approaches for site cleanup. Additionally, the staff will continue to implement the MOU with the NPS as remediation activities progress at the parks.

**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>Date of Decommissioning Completion</b>
1	Alameda Naval Air Station*	Alameda, CA	N/A	N/A	MOU**	N/A
2	Cimarron (Kerr-McGee)	Cimarron, OK	4/95 revised 11/18	8/99	Action-UNRES***	2039
3	Department of the Army, U.S. Armament Research, Development, and Engineering Center	Picatinny, NJ	11/13 Revised 8/19	04/17	LTR-UNRES	TBD
4	FMRI (Fansteel), Inc.	Muskogee, OK	8/99, revised 5/03	12/03	LTR-UNRES	TBD
5	Hunter's Point Naval Shipyard* (former Naval shipyard)	San Francisco, CA	N/A	N/A	MOU**	N/A
6	McClellan* (former Air Force base)	Sacramento, CA	N/A	N/A	MOU**	N/A
7	Shallow Land Disposal Area (BWX Technologies, Inc.)****	Vandergrift, PA	N/A	N/A	LTR-UNRES	TBD
8	Sigma-Aldrich	Maryland Heights, MO	10/08, revision pending	5/09, revised TBD	LTR-UNRES	2021
9	UNC Naval Products	New Haven, CT	8/98, revised 2004,12/06 revised 3/19	4/99, revised 10/07 revised 5/19	LTR-UNRES	2020
10	West Valley Demonstration Project	West Valley, NY	Phase 1 3/09	Phase 1 2/10	LTR-UNRES†	TBD

\* The Hunter's Point Shipyard and Alameda Naval Air Station sites are being remediated by the U.S. Navy, and the McClellan site is being remediated by the U.S. Air Force, under the CERCLA process and EPA oversight. It is assumed that some licensable material might be present at both sites; however, the NRC has not licensed these sites. Instead, the Commission has approved a "limited involvement approach to stay informed" and the NRC staff will rely on the ongoing CERCLA process and EPA oversight. More information is available on this approach in SECY-08-0077, "Options for U.S. Nuclear Regulatory Commission Involvement with the U.S. Navy's Remediation of the Hunters Point Naval Shipyard Site in California," (ADAMS Accession Number ML080800110).

\*\* "Memorandum of Understanding Between the U.S. Nuclear Regulatory Commission and the U.S. DoD for Coordination on CERCLA Response Actions at DoD Sites with Radioactive Materials," dated April 2016 (ADAMS Accession Number ML16092A294).

\*\*\* 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 Site Decommissioning Management Plan (SDMP) action plan criteria for site remediation.

USACE's remediation approach for the Shallow Land Disposal Area site is to follow the CERCLA process and adhere to the MOU between the NRC and USACE for coordination, remediation, and decommissioning of Formerly Utilized Sites Remedial Action Program sites with NRC-licensed facilities, "Memorandum of Understanding Between the U.S. Nuclear Regulatory Commission and The U.S. Army Corps of Engineers for Coordination of Cleanup & Decommissioning of the [FUSRAP] Sites with NRC-Licensed Facilities," 66 FR 36606. A Supplemental MOU between USACE, DOE, and the NRC was signed in June 2014, and complements the existing MOU by incorporating the relevant requirements of 10 CFR Parts 70, 73, and 74, and stipulates the specific roles of each Federal entity throughout the remainder of the remediation process.

† 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.

#### Notes:

- The compliance criteria identified in this table reflect the information in the most recent NRC-approved DP or approach. The compliance criteria may change if the NRC approves alternate compliance criteria requested by the licensee.
- Abbreviations used in this table include: "Action" for SDMP action plan criteria, "ADAMS" for Agencywide Documents Access and Management System, "CERCLA" for Comprehensive Environmental Response, Compensation, and Liability Act, "CFR" for *Code of Federal Regulations*, "DP" for decommissioning plan, "DOE" for U.S. Department of Energy, "EPA" for U.S. Environmental Protection Agency, "FY" for fiscal year, "FR" for *Federal Register*, "LTR" for License Termination Rule criteria, "MOU" for memorandum of understanding, "N/A" for not applicable, "NRC" for U.S. Nuclear Regulatory Commission, "RES" for restricted use, "TBD" for to be determined, "UNRES" for unrestricted use, and "USACE" for U.S. Army Corps of Engineers.
- Reasons for multiple DP submittals range from changes in the favored decommissioning approach, to the phased implementation of decommissioning, to poor quality submittals.

## **2.4 Uranium Recovery Facility Decommissioning**

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 (Title I). 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) (Title II). Additional information on the UMTRCA can be found at: <https://www.nrc.gov/reading-rm/doc-collections/fact-sheets/mill-tailings.html>

The NRC's uranium recovery decommissioning activities include project management, technical review of licensee and DOE submittals in support of decommissioning or long-term care and maintenance, the development of rulemaking and guidance, public outreach efforts, international assistance and cooperation, and participation in industry conferences and workshops.

Table 2.4-a identifies the 22 Title I sites: 19 that are under general license with the DOE; the Moab, Utah, mill undergoing decommissioning; and the former mill sites at Riverton, Wyoming, and Monument Valley, Utah, which have been designated as Title I sites by Congress. The regulation at 10 CFR 40.27, "General License for Custody and Long-Term Care of Residual Radioactive Material Disposal Sites," governs the long-term care of Title I disposal sites under a general license held by either DOE or the State in which the site is located, after decommissioning is complete. Additional information on the status of Title I sites can be found at <https://www.energy.gov/lm/sites/lm-sites>.

Table 2.4-b identifies the Title II sites that are no longer operating and in decommissioning status. As of September 30, 2020, five Title II uranium recovery facilities are undergoing decommissioning. The regulation at 10 CFR 40.28, "General License for Custody and Long-Term Care of Uranium or Thorium Byproduct Materials Disposal Sites," governs the long-term care of Title II conventional uranium mill disposal sites under a general license held by either DOE or the State in which the site is located, after decommissioning is complete. The six Title II sites that have been transferred for long-term care to DOE are identified in Table 2.4-c.

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

### **2.4.1 Summary of Fiscal Year 2020 Activities**

#### UMTRCA Title I Sites

- In FY 2020 the NRC staff reviewed and provided comments to the DOE on: (1) the final Seep Monitoring Report (ADAMS Accession Number ML20008C672), and Radiation Monitoring Report (ADAMS Accession Number ML19336A053) for the Mexican Hat, Utah, site; (2) the Performance Report (ADAMS Accession Number ML20195B108) and Groundwater Compliance Action Plan workplan (ADAMS Accession Number ML20190A065) for the Shiprock, Arizona, site; and (3) the Interim Treatment System Evaluation Report for the Tuba City, Arizona, site (ADAMS Accession Number ML19331A004).
- In November 2019, the NRC staff participated in a meeting with DOE to discuss a potential change to an evapotranspirative cover for the Crescent Junction disposal cell.



The NRC staff continued its participation with other Federal agencies and the Navajo Nation in implementing the 5-year plan to address uranium contamination on the Navajo Nation. The staff is working with the Federal agencies and the Navajo Nation to develop the next plan. The NRC participated in a government-to-government consultation with the Navajo Nation President, Vice President and Navajo Counsel on August 18, 2020, to discuss the new 10-year plan. The staff continued to work with the Navajo Technical University to develop a 2-year degree program in radiation safety and to share courseware to conduct pilot training on the fundamentals of health physics. In addition, the staff continued participation in Navajo Nation/Hopi/DOE quarterly meetings and community outreach activities.

### UMTRCA Title II Sites

- The NRC staff continued inspection and review of licensee actions as required for license SUA-1471 and by the confirmatory order EA-16-114 issued in March 2017 at the Homestake Mining Company of California, Grants Reclamation Project (GRP) in Grants, New Mexico. In December 2019, the licensee submitted an updated Groundwater Corrective Action Program and license amendment request for NRC staff review, as required by the confirmatory order. The Environmental Report was submitted in February 2020. The staff responded to the request in June 2020 with a request for supplemental information. In June, at the licensee's request, the NRC staff held a publicly noticed meeting with the licensee to discuss a possible future alternate concentration limit license amendment application submission to the NRC for review. The repair and relining of Evaporation Pond 1 have been put on hold from April 2020 to April 2021 due to the impacts to site operations from the COVID-19 PHE. The loss of evaporative capacity from Evaporation Pond 1 has reduced the groundwater restoration capacity at the GRP. The staff participates in monthly site status calls with the licensee and other regulators. The staff continues communications between the EPA, DOE, New Mexico Environment Department (NMED), and New Mexico Office of State Engineer through monthly teleconferences to discuss coordination and alignment between the regulatory agencies. The staff also participates in monthly teleconferences with interested members of the community to provide an update on all activities at the GRP.
- In July 2020, the NRC staff completed the review of the Wyoming Department of Environmental Quality's (WDEQ) draft Completion Review Report (CRR) for the Western Nuclear Incorporated (WNI) site in Wyoming and provided comments to WDEQ on the CRR. The staff also initiated the review of the DOE's Long-Term Surveillance Plan for the site.
- In September 2020, the NRC issued a license amendment to Rio Algom to modify their license to accurately reflect current site conditions and operations at the Ambrosia Lake West, NM, facility. The Rio Algom site is located in the San Mateo Creek Basin and the San Mateo Creek Basin is on the National Priorities List of sites under CERCLA. Staff has been attending regular meetings with EPA staff since the spring of 2020 in preparation of larger meetings with Rio Algom, EPA, NRC, and the State of New Mexico to address the overlapping regulatory authority at the site for commingled contamination from the Rio Algom Ambrosia Lake West facility and historical uranium mines within the San Mateo Creek Basin.

- In 2020, the NRC staff continued to work with DOE and the WDEQ to develop a path forward for completing the decommissioning of the American Nuclear Corporation site in Jeffery City, Wyoming.
- In September 2020, the NRC staff issued the Safety Evaluation Report for the license amendment request for the UNC Church Rock NM site to construct a disposal cell for mine spoils atop the existing mill tailings cell. The Draft EIS was completed in November 2020. The Final EIS is scheduled for August 2021. The staff expects to complete concurrence process with the appropriate Federal and State Entities and issue the amendment in January 2022.
- In 2020, the NRC staff continued its review of Colorado's CRR for the Durita site and continued to work to resolve issues related to the groundwater at the site that has delayed the staff's completion of its review of the CRR.
- In August 2020, the NRC staff provided comments to the Texas Commission on Environmental Quality (TCEQ) on the CRR for the Panna Maria site in Hobson, Texas (ADAMS Accession Number ML20225A026). The staff identified several issues related to the CRR and worked with TCEQ to resolve the issues.

#### UMTRCA Title II Sites that have been Transferred to DOE for Long-Term Care

- The NRC staff continues to discuss options with DOE to resolve two technical concerns associated with the Bluewater site in Grants, New Mexico, that involve: (1) several feet of subsidence of approximately 40 acres of the cover causing ponding of several acres of water on the tailings impoundment after heavy rains; and (2) contaminants in the groundwater plume from the site that have impacted a portion of a regional drinking water aquifer. The DOE is working cooperatively with USACE on a solution to the impoundment subsidence and with the DOE National Labs on long-term solutions to groundwater characterization and impacts of contaminated groundwater at the site. The DOE continues to maintain a cooperative agreement with the NMED to sample groundwater wells outside of the long-term care boundary.
- Throughout FY 2020, the NRC staff continued interactions with DOE regarding those sites that are generally licensed under 10 CFR 40.27 and 40.28. The staff has continued to hold quarterly telephone conference calls with DOE to discuss overarching policy and technical issues associated with managing the generally licensed sites. The staff also continued its participation in DOE meetings with the Navajo Nation and Hopi Tribe pertaining to the sites on the Navajo Nation and Hopi Reservation.

#### **2.4.2 Fiscal Year 2021 Areas of Focus**

In FY 2021, the NRC staff will continue its participation in the activities associated with the Navajo Nation 10-year plan and the DOE/Navajo Nation/Hopi quarterly meetings. Additionally, the staff will review DOE reports and plans for the reclamation and management of these sites. The staff will continue its review of the UNC license amendment request and the reviews of the Groundwater Corrective Action Plans for the Gunnison and Rifle sites in Colorado and the Green River site in Utah. The staff will continue to work with DOE to resolve issues associated with the Bluewater site and will work with the State of Wyoming to explore and implement

options for decommissioning the ANC site. The staff will also work with Wyoming, Colorado and Texas to complete the reviews of the CRRs for the WNI, Durita and Panna Maria sites and DOE for the Long-Term Surveillance Plan for the WNI site.

**Table 2.4-a. Decommissioning Title I Uranium Recovery Sites**

	<b>Name</b>	<b>Location</b>	<b>Status</b>
1	Ambrosia Lake	Grants, NM	Monitoring
2	Burrell	Blairsville, PA	Monitoring
3	Canonsburg	Canonsburg, PA	Monitoring
4	Durango	Durango, CO	Monitoring
5	Falls City	Falls City, TX	Monitoring
6	Grand Junction	Grand Junction, CO	Monitoring
7	Green River	Green River, UT	Monitoring
8	Gunnison	Gunnison, CO	Monitoring
9	Lakeview	Lakeview, OR	Monitoring
10	Lowman	Lowman, ID	Monitoring
11	Maybell	Maybell, CO	Monitoring
12	Mexican Hat	Mexican Hat, UT	Monitoring
13	Monument Valley	Monument Valley, AZ	Monitoring
14	Moab Mill	Moab, UT	Active – surface and groundwater remediation
15	Naturita	Naturita, CO	Monitoring
16	Rifle	Rifle, CO	Monitoring
17	Riverton	Riverton, WY	Monitoring
18	Salt Lake City	Salt Lake City, UT	Monitoring
19	Shiprock	Shiprock, NM	Active – groundwater remediation
20	Slick Rock	Slick Rock, CO	Monitoring
21	Spook	Converse Co., WY	Monitoring
22	Tuba City	Tuba City, AZ	Active – groundwater remediation (currently suspended*)

\* DOE has suspended active remediation, except for evaporation, and is evaluating several new remediation approaches.

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 long-term surveillance plan or a groundwater compliance action plan.

**Table 2.4-b. Decommissioning Title II Uranium Recovery Sites**

	<b>Name</b>	<b>Location</b>	<b>Date DP/RP Approved</b>	<b>Date of Decomm. Completion</b>
1	American Nuclear Corporation	Gas Hills, WY	10/88, Revision 2006	TBD
2	Homestake Mining Company	Grants, NM	Revised plan – 3/95 Revision pending	TBD
3	Rio Algom–Ambrosia Lake	Grants, NM	2003 (mill); 2004 (soil)	2025
4	Sequoyah Fuels Corporation	Gore, OK	2008	2025
5	United Nuclear Corporation	Church Rock, NM	3/91, Revision 2018	TBD
TBD to be determined				

**Table 2.4-c. Title II Uranium Recovery Sites – DOE Licensed Under 10 CFR 40.28**

	<b>Name</b>	<b>Location</b>	<b>Date Transferred to DOE</b>
1	Bluewater (Arco)	Grants, NM	1997
2	Edgemont	Edgemont, SD	1996
3	L-Bar	Seboyeta, NM	2005
4	Maybell West	Maybell, CO	2010
5	Sherwood	Wellpinit, WA	2001
6	Shirley Basin South	Shirley Basin, WY	2005

## **2.5 Fuel Cycle Facility Decommissioning**

There is one fuel cycle facility undergoing partial decommissioning, the Nuclear Fuel Services (NFS) site in Erwin, Tennessee, in accordance with applicable provisions of 10 CFR 70.38. The NRC's public Web site at <http://www.nrc.gov/info-finder/decommissioning/fuel-cycle/> summarizes additional information about the status of the facility.

### **2.5.1 Summary of Fiscal Year 2020 Activities**

During FY 2020, NFS continued to work toward releasing different areas within its site. Decommissioning activities outside the Protected Area include groundwater remediation of the North Site and the Industrial Park Facility. Decommissioning activities inside the Protected Area include decommissioning of the 234 Excavation Facility and Building 111, decommissioning in support of fuel modernization, groundwater monitoring groundwater remediation, and miscellaneous decommissioning tasks. Demolition of Buildings 225, 230, 233, and 234 as part of decommissioning activities is complete. The 234 Tent houses facilities and equipment to excavate soil beneath the former 234 Wet Cell and 234B is for storage.

### **2.5.2 Fiscal Year 2021 Areas of Focus**

In FY 2021, the NRC staff expects remediation work to continue at the NFS site.

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

In Fiscal Year (FY) 2020, the U.S. Nuclear Regulatory Commission (NRC) staff worked to increase the effectiveness of the Decommissioning Program through a rulemaking effort for reactor decommissioning and updates to decommissioning guidance.

#### Decommissioning Rulemaking

In Staff Requirements Memorandum SECY-14-0118, "Request by Duke Energy Florida, Inc., for Exemptions from Certain Emergency Planning Requirements," (ADAMS Accession Number ML14364A111) the Commission directed the staff to proceed with rulemaking on reactor decommissioning.

The NRC's goals in amending these regulations would be to provide a more efficient decommissioning process, reduce the need for exemptions from existing regulations, and support the principles of good regulation, including openness, clarity, and reliability.

The NRC staff submitted the draft proposed rule package to the Commission for vote in May 2018. If the Commission approves the proposed rule, then any Commission-directed changes will be incorporated, and the proposed rule package, including the draft guidance documents intended to help implement the new rule, will be published for a public comment period. The staff will consider any comments received during this period in developing the draft final rule package.

#### Decommissioning Guidance

In FY 2020, the NRC staff continued its multi-year effort to update decommissioning guidance documents including Volumes 1 and 2 of the Consolidated Decommissioning Guidance, NUREG-1757.

NUREG-1757, Volume 2, "Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria," was last revised on September 2006. The current update includes enhanced guidance and detailed examples of methods used to perform decommissioning dose modeling and radiological surveys and reflects lessons learned from recent decommissioning experience. These updates are expected to improve the quality of licensee decommissioning plans and license termination plans and improve the efficiency of the staff's review of these documents. Revisions related to dose modeling reviews include additional guidance on topics such as model abstraction and simplification, consideration of uncertainty, use of distribution coefficients, consideration of intrusion scenarios for residual radioactivity, and consideration of elevated areas or "hot spots." Revisions related to radiological surveys include new or updated guidance on composite sampling, subsurface surveys (e.g., excavations), and Scenario B final status survey designs. Revisions also include updated guidance on conducting "as low as reasonably achievable (ALARA)" reviews. The NUREG is expected to be issued for public comment in Calendar Year 2020.

Similarly, the NRC staff continued its efforts to update NUREG-1757, Volume 1, "Consolidated Decommissioning Guidance: Decommissioning Process for Materials Licensees," which was last revised in September 2006. Draft Revision 3 of NUREG-1757, Volume 1 was issued to the Agreement States for review in July 2020.

In August 2020, the NRC staff completed and published its revision to NUREG-1507, “Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions” (ADAMS Accession Number ML20233A507).

#### Self-Evaluation of Dose Modeling

The NRC staff continued to evaluate of the uses and applicability of computer codes employed in carrying out licensing activities, particularly those codes used for the demonstration of compliance with the decommissioning dose criteria. This evaluation is intended for NRC’s use when assessing ways to enhance the efficiency of the use of codes and models and to establish consistency and relevance in the selection of these computer codes and models. This activity is expected to continue into FY 2021.



## 4. RESEARCH ACTIVITIES

The Office of Nuclear Regulatory Research (RES) and the Office of Nuclear Material Safety and Safeguards (NMSS) continue to coordinate activities focusing on key decommissioning issues, including updating computer codes, development of a Memorandum of Understanding (MOU) with the Department of Energy (DOE) on the roles, responsibilities, and processes related to implementation of the Radiation Protection Computer Code, Analysis, and Maintenance Program (RAMP), supporting international activities related to decommissioning, studying aging effects of engineered earthen covers, and developing guidance for cover construction and for surveys of subsurface residual contamination.

**Computer Codes.** In Fiscal Year (FY) 2020, the staff continued activities with DOE National Laboratories for the development or modification of computer codes useful for decommissioning analyses, including the upgrade of several codes. This includes the following activities:

- Completing the Residual Radioactivity (RESRAD) family of computer codes deliverables to include: 1) RESRAD-OFFSITE Version 4.0; 2) NUREG/CR-7268, RESRAD-OFFSITE User's Manual; and 3) NUREG/CR-7267, Default parameter Values and Distributions in RESRAD-ONSITE V7.2, RESRAD-BUILD V3.5 and RESRAD-OFFSITE 4.0. NUREG/CR-7268 and NUREG/CR-7267 are expected to be published in Fall 2020.
- Completing the update to MILDOS-AREA computer code version 4.2 and its associated user manual and quality assurance documents. Benchmarking the MILDOS-AREA version 4.2 computer code to the EPA AERMOD atmospheric dispersion modeling computer code system. Publishing NUREG/CR-7258, "Technical Manual and User's Guide for MILDOS, Version 4.1" and NUREG/CR-7259, "MILDOS Computational Verification Report, Version 4.1" in November 2019.
- Adding eight new features to Visual Sample Plan computer code based on the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) final survey protocols, including improved data entry functions, data evaluation, total dose calculation tool, data visualization tools, data inconsistency notification, alpha scan minimum detectable concentration (MDC) calculation, volume/areal sampling module, and composite sampling options. Also, an additional task for developing a methodology to calculate the scanning MDC for post-processed radiological surveys.
- Distributing and maintaining the Decommissioning and Decontamination (DandD) computer code, which is used by licensees to develop adequate or appropriate Derived Concentration Guideline Levels for cleanup and demonstrate compliance with the dose criteria of Title 10 of the Code of Federal Regulations Part 20, Subpart E.
- Supporting the development of the VARSKIN computer code, used for skin decontamination events in a decommissioning setting. An updated version of VARSKIN will be released in FY 2021 which will include alpha and neutron dosimetry models, a dosimetry model for dose to the lens of the eye, and a wound model.

Additionally, on May 6, 2020, the U.S. Nuclear Regulatory Commission (NRC) entered into an MOU with DOE which describes the roles, responsibilities, and processes related to adding the RESRAD family of computer codes into RAMP (ADAMS Accession Number ML20127H888).

RAMP provides the nuclear energy and radiation protection community with access to the distribution, development, and use of radiation protection computer codes, including MILDOS-AREA and DandD, while ensuring sustainability of code development. This MOU is specific to the portion of RAMP in which NRC and DOE jointly conduct cooperative research and DOE provides programmatic support to DOE National Laboratories to manage the RESRAD family of computer codes.

The RES staff supports international activities through participation in the Information System on Occupational Exposure management board that oversees the Working Group on Radiological Aspects of Decommissioning Activities in Nuclear Power Plants. This working group's objective is to provide a forum for experts to develop a process to better share operational radiation protection data and experience for nuclear power plants in some stage of decommissioning, or in preparation for decommissioning. The staff also participated in the Modeling Data for Radioactive Impact Assessment program which is an International Atomic Energy Agency-sponsored technical meeting that brings together modelers of computer codes to assess and benchmark them.

**Engineered Covers and Subsurface Residual Contaminants.** The RES staff continues to work on a research program that was created to study the effects of changes in properties of in-service engineered earthen covers over uranium mill tailings as these covers age. The purpose of this study is to evaluate the impact of abiotic and biotic processes on the hydraulic conductivity and gaseous diffusivity of radon barriers, how structural development varies with depth and thickness of the radon barrier, and how structure influences transmission of radon and seepage carrying groundwater contaminants. This research is a collaborative effort between the DOE Legacy Management and the NRC, with investigators at the University of Wisconsin, University of Virginia, University of California, Berkeley, and Navarro Engineering (the DOE contractor). Four mill tailing sites were visited by the research team in previous years to support the research, Falls City in Texas, Bluewater in New Mexico, Shirley Basin South in Wyoming, and Lakeview in Oregon. Currently, data are being prepared and interpreted from these sites and a NUREG/CR is being finalized. A paper was published in *Applied Geochemistry* titled "Lead-210 Profiles in Radon Barriers, Indicators of Long-term Radon-222 Transport." Other papers are in preparation.

The RES staff also continued to provide direct assistance to NMSS efforts through participating in the MARSSIM Interagency Working Group. The Working Group has finished draft revisions to the MARSSIM guidance document. A *Federal Register* notice seeking public comments on the revised document has been prepared and will be published by the Environmental Protection Agency (EPA). At the same time the document will be submitted to EPA's Science Advisory Board for peer review.

RES staff are working with NMSS to evaluate, along with EPA, the co-mingling of soil contaminants around the Rio Algom/Ambrosia Lake uranium mines and mills near Grants, NM. The goal is for the team to develop approaches to distinguish between mill generated and mine generated contamination that has been found over several square miles in the San Mateo Creek Basin.

**Collaboration and Outreach.** Staff participated in the Federal Remediation Technologies Roundtable (FRTR) and organized FRTR meetings on the use of "*Modeling in Support of Site Remediation*," and "*Synthesizing Evolving Conceptual Site Models (CSMs) with Applicable Remediation Technologies*." Presentations focused on development and testing of Conceptual Site Models and numerical models for selecting and implementing remediation methods. NRC

staff organized and co-chaired an *ad hoc* FRTR subcommittee to develop a “Bibliography of Guidance and Information Sources on Subsurface Modeling to Support Site Remediation.” Copies of the Bibliography have been shared with the NMSS and the Office of Nuclear Reactor Regulation (NRR) licensing staff and the NRC Technical Library under Knowledge Management.

Staff worked with the U.S. Geological Survey senior scientists under the MOU of the Interagency Collaborative on Environmental Modeling and Monitoring (ICEMM) to conduct the “USGS-NRC Technical Workshop on Subsurface Modeling and Monitoring of Radionuclide Transport at the Site-Scale.” Over 25 NMSS, NRR, and RES staff attended the workshop to discuss technologies and information sources by the United States Geological Survey to assist in licensing reviews. On March 17 and 18, 2020, the ICEMM held its annual public meeting with the theme of “Integrated Modeling, Monitoring, and Working with Nature.” Working with the ICEMM Steering Committee, NRC staff helped organize and conduct the meeting. RES staff led a discussion panel on lessons learned in environmental monitoring and modeling.

Staff participated in the fourth domestic RAMP Users Group Meeting from October 28 to November 1, 2019, at NRC Headquarters in Rockville, Maryland. The NRC welcomed the largest number of RAMP meeting attendees thus far with over 150 registered participants, instructors, and support staff including international regulators from 10 countries. The RAMP Users Group Meeting included a day long RESRAD Technical Session and a 2-day long VARSKIN Technical Session which included training on the respective computer codes and technical presentations by the NRC staff, international regulators and industry users of the codes.

## 5. INTERNATIONAL ACTIVITIES

The U.S. Nuclear Regulatory Commission (NRC) participates in multiple international activities to fulfill U.S. commitments to international conventions, treaties, and bilateral/multilateral agreements. The NRC staff is also actively engaged in reviewing, developing, and updating international radiation safety standards and technical support documents through interaction with international organizations, including the International Atomic Energy Agency (IAEA) and the Organization for Economic Co-operation and Development's Nuclear Energy Agency (NEA), as well as foreign governments. The NRC participates in bilateral and trilateral exchanges with other countries in coordination with the U.S. Department of State and other Federal and State agencies. This is accomplished by hosting foreign assignees and participating in reciprocal assignments, developing and providing workshops to requesting countries, and providing technical support as needed. The NRC is generally recognized in the international nuclear community as an experienced leader in the regulation and safety of decommissioning, spent fuel management and storage, radioactive waste management and disposal, site remediation, and environmental protection. Interaction with international organizations and governments allows the NRC to share insights about lessons learned and successful, safe, and effective decommissioning approaches. This interaction also allows the NRC staff to provide input for various international guidance documents and standards that benefit the U.S. and other countries in establishing and implementing safe decommissioning strategies. In addition, the staff gains insight into approaches and methodologies, lessons learned, and new technologies used in the international community, and considers these approaches as it continues to risk-inform the NRC Decommissioning Program and gain further insights into the decommissioning process.

In 2020, the NRC staff participated in the review and development of IAEA Safety Standards; participated in multinational projects, conferences, peer reviews, and workshops related to decommissioning and waste disposal; and advised on the development of other countries' regulatory programs for decommissioning. For example, the staff: (1) conducted reviews and updates of IAEA standards related to decommissioning and low-level waste during the Waste Safety Standards Committee 48<sup>th</sup> review cycle; (2) participated in the annual meetings of the NEA's Regulators Forum, Committee on Decommissioning and Legacy Management and Radioactive Waste Committee; (3) participated in development of safety publications relative to uranium production facilities including their operation and decommissioning as well as the decommissioning of small facilities; and (4) provided support in several organizational meetings related to the 7<sup>th</sup> Cycle meeting of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. Additionally, the NRC hosted several technical meetings with international regulatory counterparts and support organizations, as well as supported international workshops hosted by other U.S. Federal agencies and provided opportunities for staff from international regulatory agencies to observe inspections at facilities undergoing decommissioning.

## 6. PROGRAM INTEGRATION AND IMPROVEMENT

Given the scope of the decommissioning functional area, the Decommissioning Program has undertaken many initiatives to improve its efficiency and effectiveness.

### Power Reactor Decommissioning Program Improvements

The Decommissioning Program has historically sought opportunities to improve its processes in order to accomplish decommissioning activities more effectively. In response to an anticipated increase in workload due to early reactor shutdowns, the Office of Nuclear Material Safety and Safeguards (NMSS) staff conducted a program evaluation of its power reactor decommissioning regulatory function. The 2014 Power Reactor Decommissioning Program evaluation (Agencywide Documents Access and Management System (ADAMS) Accession Number ML20247J607) was an outgrowth of the U.S. Nuclear Regulatory Commission (NRC) staff's Integrated Decommissioning Improvement Plan efforts and part of its initiative to foster continuous improvement to the decommissioning program. The evaluation resulted in a set of recommendations to update guidance and policy documents within the Power Reactor Decommissioning Program to capture program improvements and lessons learned. In March 2018, the staff published a revision of Inspection Manual Chapter (IMC) 2561, "Decommissioning Power Reactor Inspection Program" (ADAMS Accession Number ML17348A400), which reflects updates to the overall decommissioning reactor inspection program and changes to the core and discretionary inspection procedures.

During Fiscal Year (FY) 2020, with the Coronavirus Disease 2019 Public Health Emergency travel restrictions, NMSS staff and regional inspectors continued to risk-inform the IMC 2561 core reactor decommissioning inspection procedures. To improve efficiency, staff consolidated three procedures and deleted two and updated the Decommissioning Fire Protection inspection procedure to be consistent with the latest revision of Regulatory Guide 1.91, "Fire Protection Program for Nuclear Power Plants During Decommissioning and Permanent Shutdown." Staff anticipates completing the inspection procedures and a comprehensive revision to IMC 2561 in Calendar Year 2020.

In preparation for the new decommissioning work providing oversight and inspections services to U.S. Department of Energy (DOE)-Naval Reactors, NMSS staff and Region 1 developed and published the initial issuance in August 2020, IMC 2565, "Regional Inspection Activities for Naval Reactors Naval Vessels Undergoing Decommissioning." The IMC was created to ensure NRC activities for technical support oversight and inspection services are consistent with the NRC-DOE-Naval Reactors Memorandum of Understanding for the decommissioning of one of the non-combatant vessels, the Surface Ship Support Barge.

In response to an Office of the Inspector General Audit Recommendation, staff revised NMSS Policy and Procedure 5.1, "Reactor Decommissioning Procedure for Interfacing with NRR" and supported the Office of Nuclear Reactor Regulation's revision of the companion procedure, COM-101. NMSS conducted a knowledge management training session on the reactor transition procedures.

### Materials and Uranium Recovery Decommissioning Program Improvements

The NRC staff has continued with the implementation of an enhanced Comprehensive Decommissioning Program, which allows the staff to compile, in a centralized location,

information on the status of decommissioning and decontamination of complex sites and uranium recovery sites in the United States.

In FY20 and 21, NRC staff has and will continue to risk-inform IMC 2801 and 2602 the materials decommissioning inspection program. Region IV will lead a working group that will include Agreement States representation to further risk-inform the inspections of materials sites undergoing decommissioning focusing on major risks such as groundwater and soil contamination.

In August 2020, staff published NUREG-1507, Revision 1, “Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions” (ADAMS Accession Number ML20233A507). This revision updated new survey technologies with applicability to operating facilities and decommissioning licensees.

### Evaluation of Materials and Waste Business Lines

During FY 2020, the NRC staff continued to implement several recommendations from the evaluation of the Materials and Waste Business Lines to improve effectiveness of licensing and oversight. Examples of these improvements include adjustments to the uranium recovery inspection program through the extension of inspection intervals, revisions to inspection procedures for decommissioning power reactors, continuing its updated process for completing financial surety reviews for uranium recovery licenses and streamlining its review processes for new uranium recovery application reviews. For example, staff used risk insights from existing NRC guidance and first-hand experience to focus uranium recovery facility inspection activities on risk significant activities such as spill response, radiological emergencies, yellowcake dryer operations and accidents, and groundwater contamination. These revisions also enhance the oversight program by adding more performance-based concepts to the inspection guidance and providing more direction to inspectors on where to focus their time.

## 7. AGREEMENT STATE ACTIVITIES

In addition to the sites undergoing decommissioning that are regulated by the U.S Nuclear Regulatory Commission (NRC), many complex materials sites are being decommissioned under the regulatory oversight of Agreement States. Thirty-nine States have signed formal agreements with the NRC and assumed regulatory responsibility over certain byproduct, source, or small quantities of special nuclear material, including the decommissioning of some complex materials sites.

Formal interactions with Agreement States in Fiscal Year (FY) 2020 included the following:

- In September 2020, NRC staff held a virtual workshop on the development and review of Completion Review Reports (CRR) and SA-900 “Termination of Uranium Milling Licenses in Agreement States.” There was open discussion between the NRC and the States of Colorado, Utah, Washington, Wyoming, and Texas and the Department of Energy Legacy Management on the process for the review of CRRs and the uranium recovery site license termination process. In addition, the staff discussed revisions to SA-900.
- The staff worked with the Agreement States to revise the information on the NRC’s public Web site about complex materials decommissioning sites and uranium recovery facilities undergoing decommissioning that are under the regulatory purview of the Agreement States. Rather than detailed site summaries, a list of decommissioning sites and a site contact in each Agreement State will be used so that an interested individual can obtain current, up-to-date information from the Agreement State on a site. The site list will be available at <http://www.nrc.gov/info-finder/decommissioning/complex/> and <http://www.nrc.gov/info-finder/decommissioning/uranium/> for complex materials sites and uranium recovery sites, respectively.
- Integrated Materials Performance Evaluation Program reviews that included an assessment of the decommissioning functional area were conducted in several Agreement States in FY 2020: California, Arizona, Kentucky, Wyoming, Georgia, and Virginia.

Table 7.1 identifies the decommissioning and uranium recovery sites in the Agreement States.

**Table 7.1. Agreement State Decommissioning Sites**

<b>State</b>	<b>Name</b>	<b>Location</b>	<b>Date DP Submitted</b>	<b>Date DP Approved</b>
CA	Eberline Services	Richmond, CA	TBD	TBD
CO	Colorado Legacy Land – Schwartzwalder Mine	Jefferson County, CO	11/16	6/17
CO	Colorado Legacy land - Cotter Uranium Mill	Canon City, CO	9/03	1/05
CO	Hecla Mining Company – Durita	Naturita, CO	10/91	3/92
CO	Umetco Uravan	Uravan, CO	6/93	6/93
FL	Iluka Resources	Green Cove Springs, FL	TBD	TBD
IL	Weston Solutions (formerly Kerr-McGee)	West Chicago, IL	9/93	2/94
MA	Norton/St. Gobain	Worcester, MA	TBD	TBD
MA	Starmet Corp. (formerly Nuclear Metals)	Concord, MA	10/06	TBD
MA	Texas Instruments	Attleboro, MA	TBD	TBD
MA	Wyman-Gordon Co.	North Grafton, MA	TBD	TBD
NJ	Shieldalloy Metallurgical Corp.	Newfield, NJ	12/16	1/17
OH	Advanced Medical Systems, Inc.	Cleveland, OH	6/04	5/05
OH	Ineos USA (formerly BP Chemical)	Lima, OH	4/92	6/98
OR	PCC Structurals, Inc.	Portland, OR	6/06	9/06
OR	TDY Industries d/b/a Wah Chang	Albany, OR	6/03	3/06
PA	Global Tungsten & Powders Corp.	Towanda, PA	6/13	9/13
PA	Karnish Instruments	Lock Haven, PA	TBD	TBD



**Table 7.1. Agreement State Decommissioning Sites**

<b>State</b>	<b>Name</b>	<b>Location</b>	<b>Date DP Submitted</b>	<b>Date DP Approved</b>
PA	Keystone Metals Reduction	Cheswick, PA	TBD	TBD
PA	Remacor	West Pittsburg, PA	TBD	TBD
PA	Safety Light Corporation	Bloomsburg, PA	TBD	TBD
PA	Superbolt (formerly Superior Steel)	Carnegie, PA	TBD	TBD
PA	Westinghouse Electric (Waltz Mill)	Madison, PA	4/97	1/00
PA	Whittaker Corporation	Greenville, PA	12/00, revised 8/03, 10/06	5/07
SC	Starmet CMI	Barnwell, SC	TBD	TBD
TX	Ascend Performance Materials	Alvin, TX	5/14	7/17
TX	ConocoPhillips (Conquista Project)	Falls City, TX	11/87	9/89
TX	ExxonMobil (Ray Point Mill)	Three Rivers, TX	4/85	9/86
TX	Intercontinental Energy Corp.	Three Rivers, TX	10/18	1/19
TX	Pearland-Manvel Landfill	Pearland, TX	2/02	TBD
TX	Rio Grande Resources	Hobson, TX	4/93, revised 5/97	5/97

**Table 7.1. Agreement State Decommissioning Sites**

<b>State</b>	<b>Name</b>	<b>Location</b>	<b>Date DP Submitted</b>	<b>Date DP Approved</b>
TX	Solvay USA, Inc.	Freeport, TX	7/15 updated 9/20	9/15 and update 9/20
UT	Rio Algom Uranium Mill	Lisbon Valley, UT	9/02	7/04
WA	Dawn Mining Company	Ford, WA	6/94	1/95
WY	Bear Creek	Converse County, WY	11/91	12/91
WY	ExxonMobil Highlands	Converse County, WY	12/84	1990
WY	Pathfinder – Lucky MC	Gas Hills, WY	3/92	7/98
WY	Umetco Minerals Corporation	Gas Hills, WY	12/80	3/91
WY	Western Nuclear, Inc. – Split Rock	Jeffrey City, WY	2/94	1997
N/A not applicable				
TBD to be determined				

## **8. FISCAL YEAR 2021 PLANNED PROGRAMMATIC ACTIVITIES**

The Power Reactor Decommissioning Program evaluation resulted in a set of recommendations, including the recommendation to review all guidance and policy documents within the program to identify guidance documents in need of updating as well as other potential improvements. Subsequently, the Office of Nuclear Material Safety and Safeguards (NMSS) management reviewed the tasks identified as part of this program evaluation to promote programmatic enhancement and set task priorities. Throughout Fiscal Year (FY) 2021, the staff will continue to work on these programmatic enhancement tasks and evaluate their applicability to the materials decommissioning program. The staff will also continue its multi-year effort to update decommissioning guidance documents including Volumes 1 and 2 of the Consolidated Decommissioning Guidance, NUREG-1757.

To address recommendations in the U.S. Nuclear Regulatory Commission Office of the Inspector General's August 23, 2019, report, "Audit of NRC's Transition Process for Decommissioning Power Reactors" (OIG--19--A--16), in FY 2020, the staff developed internal interim guidance documents to address the new decommissioning license transfer business models and the applicable recommendations of the 2016 Power Reactor Transition From Operations to Decommissioning Lessons Learned Report (Agencywide Documents Access and Management System Accession Number ML16085A029), and to provide further clarification regarding the reactor decommissioning transition process from Office of Nuclear Reactor Regulation (NRR) to NMSS. The interim guidance checklist was incorporated into the final versions of the revisions to NMSS Policy and Procedure 5.1 and NRR procedure COM-101. The interim guidance was validated with the transfers of Pilgrim and Three Mile Island Unit 1.