

COMMISSION BRIEFING SLIDES/EXHIBITS

**BRIEFING ON DECOMMISSIONING
ACTIVITIES AND STATUS**

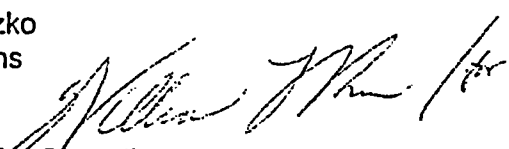
OCTOBER 18, 2005



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 22, 2005

MEMORANDUM TO: Chairman Diaz
Commissioner Merrifield
Commissioner Jaczko
Commissioner Lyons

FROM: Luis A. Reyes 
Executive Director for Operations

SUBJECT: STATUS OF DECOMMISSIONING PROGRAM - 2005 ANNUAL REPORT

This memorandum provides the Commission with the staff's 2005 Annual Report on the Status of the Decommissioning Program. This report provides a comprehensive summary of the U.S. Nuclear Regulatory Commission's (NRC's) Decommissioning Program. Its purpose is to provide a stand-alone reference document that summarizes the status of all decommissioning activities since the last report, through September 1, 2005, including the decommissioning of complex decommissioning materials sites, commercial reactors, research and test reactors, uranium mill tailings facilities, and fuel cycle facilities. In addition, this report discusses accomplishments in the Decommissioning Program since last year's report (NUREG-1814), and it informs the Commission of decommissioning issues that the staff will address in the coming year.

In the Staff Requirements Memorandum to SECY-04-0024, "Recommended Changes to NRC's Decommissioning Program and Annual Decommissioning Program Report", March 12, 2004, the Commission approved several changes to the Annual Decommissioning Report, including the publication of the Annual Report as a NUREG every two years. In the odd numbered years the Commission directed the staff to publish the report as a shortened report to the Commission, referencing the decommissioning website.

Site summaries for all decommissioning sites are accessible to the Commission and the public through the NRC's Decommissioning website. To ensure that the website is current, information on sites undergoing decommissioning is reviewed bi-monthly, and updated as necessary. Updates are performed by the respective Project Managers in the Office of Nuclear Material Safety and Safeguards, the Office of Nuclear Reactor Regulation and the Regions.

CONTACT: John Buckley, NMSS/DWMEP
(301) 415-6607

Starting in 2006, the staff plans to revise the reporting period for the Annual Report. Currently, the staff provides the Annual Report to the Commission in September, resulting in a reporting period which spans parts of two fiscal years. To simplify the reporting process in future years, the staff will submit the Annual Report in November and brief the Commission in December, allowing the staff to report on decommissioning activities for one entire fiscal year.

Attachment: 2005 Annual Report

cc: SECY
OGC
DOC
OCA
OPA
CFO

Status of the NRC Decommissioning Program

2005 Annual Report

**Division of Waste Management and Environmental Protection
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001**

TABLE OF CONTENTS

ABBREVIATIONS	iii
ALPHABETICAL LISTING OF DECOMMISSIONING SITES BY SITE CATEGORY	iv
1. Introduction	1
2. Decommissioning Sites	1
2.1 Reactor Decommissioning	
2.1.1 Power Reactors	2
2.1.2 Research and Test Reactors	4
2.2 Materials Facilities Decommissioning	
2.2.1 Complex Decommissioning Materials Facilities	5
2.2.2 Uranium Recovery Facilities	9
2.2.3 Fuel Cycle Facilities	11
3. Guidance and Rulemaking Activities	11
4. Research Activities	12
5. International Activities	13
6. Program Integration	15
7. Programmatic Decommissioning Activities Since Previous Report	15
8. Resources	17
9. FY 2006 Planned Programmatic Activities	17

TABLES

2-1 Power Reactors Undergoing Decommissioning	3
2-2 Research and Test Reactors Undergoing Decommissioning	4
2-3 Current Complex Material Sites Undergoing Decommissioning	6
2-4 Title II Uranium Recovery Sites Undergoing Decommissioning	10
2-5 Fuel Cycle Facilities Undergoing Decommissioning	11

ABBREVIATIONS

CFR	<i>Code of Federal Regulations</i>
DP	Decommissioning Plan
DWMEP	Division of Waste Management and Environmental Protection
EA	environmental assessment
EPA	U.S. Environmental Protection Agency
FSSR	final status survey report
FTE	full-time equivalents
FY	fiscal year
IAEA	International Atomic Energy Agency
IDIP	Integrated Decommissioning Improvement Plan
ISCORS	Interagency Steering Committee on Radiation Standards
ISFSI	Independent Spent Fuel Storage Installation
LTP	License Termination Plan
LTR	License Termination Rule
MOU	memorandum of understanding
mrem	millirem
NMSS	Office of Nuclear Material Safety and Safeguards
NRC	U.S. Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
OIG	Office of the Inspector General
OIP	Office of International Programs
OMB	Office of Management and Budget
PART	Program Assessment Rating Tool
SER	Safety Evaluation Report
RES	Office of Nuclear Regulatory Research
SDMP	Site Decommissioning Management Plan
TAG	Technical Advisory Group
SRM	staff requirements memorandum
TBD	to be determined
WIR	Waste Incidental to Reprocessing

ALPHABETICAL LISTING OF DECOMMISSIONING SITES BY SITE CATEGORY

DECOMMISSIONING POWER REACTORS

1. BIG ROCK POINT
2. DRESDEN – UNIT 1
3. FERMI – UNIT 1
4. HADDAM NECK – CONNECTICUT YANKEE
5. HUMBOLDT BAY
6. INDIAN POINT – UNIT 1
7. LACROSSE
8. MILLSTONE – UNIT 1
9. NUCLEAR SHIP SAVANNAH
10. PEACH BOTTOM – UNIT 1
11. RANCHO SECO
12. SAN ONOFRE – UNIT 1
13. SAXTON
14. THREE MILE ISLAND – UNIT 2
15. VALLECITOS BOILING WATER REACTOR (VBWR)
16. YANKEE ROWE
17. & 18. ZION – UNITS 1 & 2

RESEARCH AND TEST REACTORS

1. CORNELL UNIVERSITY – TRIGA
2. CORNELL UNIVERSITY – ZPR
3. FORD NUCLEAR REACTOR
4. GENERAL ATOMICS – TRIGA MARK I
5. GENERAL ATOMICS – TRIGA MARK F
6. GENERAL ELECTRIC CO. – GETR
7. GENERAL ELECTRIC CO. – EVESR
8. MANHATTAN COLLEGE
9. NASA – MOCKUP
10. NASA – PLUM BROOK
11. UNIVERSITY OF BUFFALO
12. UNIVERSITY OF ILLINOIS
13. UNIVERSITY OF VIRGINIA
14. UNIVERSITY OF VIRGINIA – CAVALIER
15. UNIVERSITY OF WASHINGTON
16. VETERANS ADMINISTRATION
17. WESTINGHOUSE

CURRENT COMPLEX MATERIAL SITES UNDERGOING DECOMMISSIONING

1. AAR MANUFACTURING, INC
2. ABB PROSPECTS, INC. (FORMERLY C.E. WINDSOR)
3. BABCOCK & WILCOX (SHALLOW LAND DISPOSAL AREA)
4. BATTELLE COLUMBUS LABORATORIES
5. CABOT PERFORMANCE MATERIALS, INC
6. CURTISS-WRIGHT CHESWICK
7. DEPARTMENT OF THE ARMY - FT. BELVOIR
8. DEPARTMENT OF THE ARMY - FT. MCCLELLAN
9. DOW CHEMICAL COMPANY (DOW)
10. EGLIN AIR FORCE BASE
11. ENGELHARD MINERALS – GREAT LAKES
12. FMRI (FANSTEEL), INC.
13. HERITAGE MINERALS, INC
14. HOMER LAUGHLIN CHINA
15. JEFFERSON PROVING GROUND
16. KAISER ALUMINUM
17. KERR McGEE – CIMARRON
18. KERR McGEE – CUSHING REFINERY SITE
19. KIRTLAND AIR FORCE BASE
20. MALLINCKRODT CHEMICAL, INC. (MALLINCKRODT)
21. MOLYCORP INC. – WASHINGTON
22. NWI BRECKENRIDGE
23. PATHFINDER
24. QUEHANNA (FORMERLY PERMAGRAIN PRODUCTS, INC.)
25. ROYERSFORD WASTEWATER TREATMENT FACILITY
26. SAFETY LIGHT CORPORATION (SLC)
27. SALMON RIVER
28. SC HOLDINGS, INC.
29. SHIELDALLOY METALLURGICAL CORPORATION (SMC)
30. STEPAN CHEMICAL COMPANY
31. SUPERIOR STEEL (FORMERLY SUPERBOLT)
32. UNC NAVAL PRODUCTS
33. UNION CARBIDE CORPORATION
34. WEST VALLEY
35. WESTINGHOUSE ELECTRIC COMPANY - BLAIRSVILLE
36. WESTINGHOUSE ELECTRIC COMPANY (HEMATITE FACILITY)
37. WESTINGHOUSE ELECTRIC COMPANY, WALTZ MILL
38. WHITTAKER CORPORATION

TITLE II SITES UNDERGOING DECOMMISSIONING

1. AMERICAN NUCLEAR CORPORATION
2. BEAR CREEK
3. EXXONMOBIL HIGHLANDS
4. HOMESTAKE
5. PATHFINDER – LUCKY MC
6. PATHFINDER – SHIRLEY BASIN
7. RIO ALGOM – AMBROSIA LAKE
8. UMETCO MINERALS CORPORATION
9. UNITED NUCLEAR CORPORATION (UNC)
10. WESTERN NUCLEAR, INC. – SPLIT ROCK
11. COGEMA MINING, INC
12. SEQUOYAH FUELS CORPORATION (SFC)

FUEL CYCLE FACILITIES UNDERGOING DECOMMISSIONING

1. FRAMATOME RICHLAND
2. GENERAL ATOMICS
3. HONEYWELL

1. Introduction

This report provides a comprehensive summary of the U.S. Nuclear Regulatory Commission's (NRC's) decommissioning program. Its purpose is to provide a reference document that summarizes the decommissioning activities in fiscal year (FY) 2005, including the decommissioning of complex material sites, commercial reactors, research and test reactors, uranium mill tailings facilities, and fuel cycle facilities. In addition, this report discusses accomplishments in the decommissioning program since last year's report (NUREG-1814), and identifies key decommissioning program issues that the staff will address in the coming year. The 2004 Annual Report was published as a NUREG in accordance with Commission direction provided in the Staff Requirements Memorandum (SRM) to SECY 03-0161. The SRM to SECY-04-0024 approved several changes to the Annual Decommissioning Report including publishing the annual report as a NUREG in the even years, and in odd years, as a shortened report to the Commission, using references to the decommissioning website. This 2005 Annual Report is the first report using the shortened format.

2. Decommissioning Sites

NRC regulates the decontamination and decommissioning of materials and fuel cycle facilities, power reactors, research and test reactors, and uranium recovery facilities, with the ultimate goal of license termination. A broad spectrum of activities associated with these program functions is summarized in this report.

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

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

Currently, there are 18 nuclear power reactors, 17 research and test reactors, 38 complex decommissioning materials facilities, three fuel cycle facilities (partial decommissioning), and 12 uranium recovery facilities that are undergoing non-routine decommissioning or are in long-term safe storage, under NRC jurisdiction.

Through the Agreement State Program, 33 States have signed formal agreements with NRC, by which those States have assumed regulatory responsibility over certain byproduct, source, and small quantities of special nuclear material, including decommissioning of some complex materials sites. Agreement States do not have regulatory authority over operating or decommissioning nuclear power plants.

2.1 Reactor Decommissioning

2.1.1 Power Reactors

Power reactor decommissioning activities include: (a) project management for decommissioning power reactors and technical review responsibility for licensee submittals in support of decommissioning; (b) core inspection; and (c) support for development of rulemaking and guidance.

The Office of Nuclear Material Safety and Safeguards (NMSS) currently has regulatory project management responsibility for 13 decommissioning power reactors. The Office of Nuclear Reactor Regulation (NRR) has project management responsibility for two decommissioning reactors (Indian Point – Unit 1; Millstone – Unit 1). Because of extensive stakeholder interest in these sites (for both the operating and decommissioning units), it is more efficient for NRR also to perform project management responsibilities for the permanently shutdown units. In addition, NRR has decommissioning project management for three early demonstration reactors—Vallecitos, Nuclear Ship Savannah, and Saxton. Table 2–1 identifies the power reactors undergoing decommissioning. Plant status summaries for all decommissioning reactors can be viewed on-line by accessing NRC's Decommissioning website (<http://www.nrc.gov/what-we-do/regulatory/decommissioning/power-reactor-sites.html>).

In FY 2005, decommissioning activities were completed at two power reactors. In December 2004, the Trojan Nuclear Plant completed decommissioning activities, submitted the last supplement of its Final Status Survey Report (FSSR), and submitted an application for termination of its Facility Operating License. The staff terminated Trojan Nuclear Plant's 10 CFR Part 50 Operating License No. NPF-1 on May 23, 2005. The site was released for unrestricted use. The Trojan Nuclear Plant still holds a 10 CFR Part 72 Independent Spent Fuel Storage Installation (ISFSI) license.

Maine Yankee Atomic Power Company (Maine Yankee) also completed decommissioning activities and submitted its FSSR in FY 2005. The FSSR demonstrated that the Maine Yankee site successfully met the 25 mrem/yr unrestricted release criteria of 10 CFR Part 20, Subpart E. The staff expects to amend the Maine Yankee's License No. DPR-36, to reduce the site boundaries to approximately the footprint of the ISFSI in September 2005.

Also in FY 2005, NMSS approved the License Termination Plans (LTPs) for Big Rock Point and Yankee Rowe. Table 2–1 provides a schedule for current reactor decommissioning activities.

In FY 2005, Regional inspectors continued to support local decommissioning advisory panel meetings at Yankee Rowe, Haddam Neck, and Maine Yankee.

Table 2-1
Power Reactors Undergoing Decommissioning

Reactor		Location	PSDAR** Submitted	LTP Submitted	LTP Approved	Completion of Decom.
1	Big Rock Point	Charlevoix, MI	3/98	4/03	3/05	12/12
2	Dresden – Unit 1	Dresden, IL	6/98	TBD	TBD	TBD
3	Fermi – Unit 1	Newport, MI	4/98	2006*	2007	2008
4	Haddam Neck – Connecticut Yankee	Meriden, CT	8/97	7/00	11/02	2007
5	Humboldt Bay	Eureka, CA	2/98	2007*	2008	TBD
6	Indian Point – Unit 1	Buchanan, NY	1/96	TBD	TBD	TBD
7	Lacrosse	LaCrosse, WI	5/91	TBD	TBD	TBD
8	Millstone – Unit 1	Waterford, CT	6/99	TBD	TBD	TBD
9	Nuclear Ship Savannah	Newport News, VA	TBD	TBD	TBD	TBD
10	Peach Bottom – Unit 1	Delta, PA	6/98	2012*	2013	2014
11	Rancho Seco	Sacramento, CA	12/94	2005*	2006	2008
12	San Onofre – Unit 1	San Clemente, CA	12/98	TBD	TBD	TBD
13	Saxton	Saxton, PA	1996	2/00	3/03	2005
14	Three Mile Island – Unit 2	Harrisburg, PA	2/79	TBD	TBD	TBD
15	Vallecitos - Boiling Water Reactor (VBWR)	Sunol, CA	7/66	TBD	TBD	TBD
16	Yankee Rowe	Greenfield, MA	11/94	4/04	7/05	2008
17	Zion – Units 1 & 2	Waukegan, IL	2/00	TBD	TBD	TBD
<p>* estimated date ** PSDAR or DP equivalent</p> <p>NOTE: DP - Decommissioning Plan; LTP - License Termination Plan; PSDAR - Post Shutdown Decommissioning Activities Report; TBD - To Be Determined</p>						

2.1.2 Research and Test Reactors

NRR provides project management and inspection oversight for 17 decommissioning research and test reactors. Currently, 14 research and test reactors have decommissioning orders or amendments. Additionally, three research and test reactors are in "possession-only" status, either waiting for shutdown of another research or test reactor at the site, or for removal of the fuel from the site by the U.S. Department of Energy. Table 2-2 identifies the research and test reactors undergoing decommissioning. Plant status summaries for research and test reactors can be viewed on-line by accessing NRC's Decommissioning website (<http://www.nrc.gov/what-we-do/regulatory/decommissioning/res-test-reactor-sites.html>).

Table 2-2
Research and Test Reactors Undergoing Decommissioning

Reactor	Location	Status	Completion of Decom.
1 Cornell University – ZPR	Ithaca, NY	DECON-Amendment	2010
2 Cornell University – TRIGA	Ithaca, NY	DECON-Amendment	2010
3 Ford Nuclear Reactor	Ann Arbor, MI	DECON-Amendment	2008
4 General Atomics – TRIGA Mark F	San Diego, CA	DECON-Approved	TBD
5 General Atomics – TRIGA Mark I	San Diego, CA	DECON-Approved	TBD
6 General Electric Co. – GETR	Sunol, CA	Possession-Only	TBD ¹
7 General Electric Co. – EVESR	Sunol, CA	Possession-Only	TBD ¹
8 Manhattan College	Bronx, NY	DECON-Approved	2005
9 NASA - Mockup	Sandusky, OH	DECON-Approved	2010
10 NASA - Plum Brook	Sandusky, OH	DECON-Approved	2010
11 University of Buffalo	Buffalo, NY	Possession-Only	>2012 ²
12 University of Illinois	Urbana, IL	DECON-Approved	TBD ³

¹Because of "the presence of other nuclear facilities at the site," decommissioning held in abeyance in accordance with 10 CFR 50.82(b)(4)(i).

²Currently, there is no firm date for DOE to accept shipment of the spent fuel. A DP has not been submitted.

³The licensee is developing a final DP that will be submitted to NRC for approval.

Reactor		Location	Status	Completion of Decom.
13	University of Virginia – Cavalier	Charlottesville, VA	DECON-Approved	2005
14	University of Virginia	Charlottesville, VA	DECON-Approved	2005
15	University of Washington	Seattle, WA	DECON-Approved	2010
16	Veterans Administration	Omaha, NE	DECON-Amendment	2010
17	Westinghouse	Waltz Mill, PA	DECON-Approved	2008

2.2 Materials Facilities Decommissioning

2.2.1 Complex Materials Sites Undergoing Decommissioning

Currently, there are 38 complex materials sites undergoing decommissioning (see Table 2–3). Since last year's status report, one site was added to the complex site list (Department of Army - Ft. Belvoir), and six sites were removed from the complex site list through license termination or completion of decommissioning: (1) Alliant Ordinance and Ground Systems; (2) Augustana College; (3) Engelhard Minerals - Ravenna; (4) Kerr McGee Technical Center; (5) Kiski Valley Water Pollution Control Authority; and (6) Michigan Department of Natural Resources.

Table 2-3 identifies the clean-up criteria for each complex site as either License Termination Rule 10 CFR Part 20, Subpart E or SDMP Action Plan criteria. The LTR authorized two different sets of cleanup criteria—the concentration-based SDMP Action Plan criteria and the dose-based LTR criteria. Under the provisions of 10 CFR 20.1401(b), any licensee that submitted its decommissioning plan (DP) before August 20, 1998, and received NRC approval of that DP before August 20, 1999, could use the SDMP Action Plan criteria for site remediation. In the SRM on SECY-99-195, the Commission granted an extension of the DP approval deadline, for 12 sites, to August 20, 2000. In September 2000, the staff notified the Commission that all 12 DPs were approved by the deadline. All other sites must use the dose-based criteria of the LTR. Status summaries for the Complex Materials Sites undergoing decommissioning can be viewed on-line by accessing NRC's Decommissioning website (<http://www.nrc.gov/what-we-do/regulatory/decommissioning/complex-sites.html>). These summaries describe the status of each site and identify the current technical and regulatory issues impacting completion of decommissioning. For those licensees that have submitted a DP, the schedules are based on an assessment of the complexity of the DP review. For those licensees that have not submitted a DP, the schedules are based on other licensee information available, and the anticipated decommissioning approach.

Activities associated with the complex materials site decommissioning program include: (a) review and approval of DPs; (b) conduct of pre-DP development meetings with licensees; (c) review of licensee FSSRs and conduct of confirmatory surveys; (d) conduct of in-process inspections; and (e) preparation of Environmental Assessments (EAs) and Safety Evaluation

Reports (SER)(s). In FY 2005, the staff approved DPs for three sites: Michigan Department of Natural Resources, Pathfinder, and Ft. Belvoir. The staff currently is reviewing DPs that were submitted in FY 2005 for Cabot Corporation, Dow Chemical Company, Eglin Air Force Base, Mallinckrodt Chemical, Inc., SC Holdings Inc., and Westinghouse Electric Company (Hematite Facility).

In addition, the staff routinely reviews financial assurance submittals for materials and fuel cycle facilities, and maintains a financial instrument security program. Approximately 50 financial assurance submittals were reviewed in FY 2005.

Table 2-3
Current Complex Materials Sites Undergoing Decommissioning

Name	Location	Date DP Submitted	Date DP Approved	Cleanup Criteria	Completion of Decom.
1 AAR Manufacturing, Inc.	Livonia, MI	10/97 Revised 7/05	5/98 2/06*	LTR-RES	1/07
2 ABB Prospects, Inc.	Windsor, CT	4/03	6/04	LTR-UNRES	12/07
3 Babcock & Wilcox (Shallow Land Disposal Area)	Vandergrift, PA	2/07*	5/07*	LTR-UNRES	10/09
4 Battelle Columbus Laboratories	Columbus, OH	8/00	2001	Action-UNRES	12/05
5 Cabot Performance Materials, Inc. (Cabot)	Reading, PA	11/02 Revised 6/05	7/06*	LTR-UNRES	4/07
6 Curtis-Wright Cheswick	Cheswick, PA	6/05	TBD	LTR-UNRES	12/08
7 Department of the Army	Fort Belvoir, VA	4/04	6/05	LTR-UNRES	11/05
8 Department of the Army	Fort McClellan, AL	3/99	3/01	LTR-UNRES	12/05
9 Dow Chemical Company	Bay City, MI	10/95 Revised 12/03	7/97 9/05*	LTR-UNRES	7/06

Table 2-3
Current Complex Materials Sites Undergoing Decommissioning

Name		Location	Date DP Submitted	Date DP Approved	Cleanup Criteria	Completion of Decom.
10	Eglin Air Force Base	Walton County, FL	8/03	9/05*	LTR-UNRES	12/05
11	Engelhard Minerals	Great Lakes, IL	NA	NA	LTR-UNRES	TBD
12	FMRI (Fansteel) Inc.	Muskogee, OK	8/99 Revised 5/03	12/03	LTR-UNRES	6/23
13	Heritage Minerals	Lakehurst, NJ	11/97	10/99	Action- UNRES	1/06
14	Homer Laughlin	Newell, WV	1/95	1/95	LTR-UNRES	12/06
15	Jefferson Proving Ground (Department of Army)	Madison, IN	8/99 Revised TBD	TBD	LTR-RES	9/10
16	Kaiser Aluminum	Tulsa, OK	(Phase 1) 8/98 (Phase 2) 5/01	2/00 6/03	Action- UNRES LTR-UNRES	3/06
17	Kerr-McGee	Cimarron, OK	4/95	8/99	Action- UNRES	5/07
18	Kerr-McGee	Cushing, OK	8/98	8/99	Action- UNRES	12/05
19	Kirtland Air Force Base	Albuquerque, NM	11/02	1/03	LTR-UNRES	12/05
20	Mallinckrodt Chemical Inc. (Mallinckrodt)	St. Louis, MO	(Phase 1) 11/97 (Phase 2) 5/03	5/02 10/05*	LTR-UNRES	7/08
21	Molycorp, Inc. – Washington	Wash., PA	6/99	8/00	Action- UNRES	10/07

Table 2-3
Current Complex Materials Sites Undergoing Decommissioning

Name		Location	Date DP Submitted	Date DP Approved	Cleanup Criteria	Completion of Decom.
22	NWI Breckenridge	Breckenridge, MI	3/04	8/04	LTR-UNRES	TBD
23	Pathfinder	Souix Falls, SD	2/04	7/05	LTR-UNRES	12/06
24	Quehanna (formerly Permagrain Products, Inc.)	Media, PA	4/98, Revised 3/03	7/98 9/03	Action-UNRES	TBD
25	Royersford Wastewater Treatment Facility	Royersford, PA	TBD	TBD	LTR-UNRES	TBD
26	Safety Light Corp. (SLC)	Bloomsburg, PA	12/00	12/01	LTR-UNRES	12/07
27	Salmon River	Salmon, ID	TBD	TBD	LTR-UNRES	5/12
28	SC Holdings, Inc.	Kawkawlin, MI	11/03	12/05*	LTR-UNRES	1/09
29	Shieldalloy Metallurgical Corp.	Newfield, NJ	10/05*	1/07*	LTR-RES	11/10
30	Stepan Chemical Company	Maywood, NJ	NA	NA	LTR-UNRES	12/08
31	Superior Steel (formerly Superbolt)	Pittsburgh, PA	TBD	TBD	LTR-UNRES	TBD
32	Union Carbide	Lawrenceberg, TN (Buildings) (Soil)	8/98	7/00 12/00	Action-UNRES LTR-UNRES	10/07
33	UNC Naval Products	New Haven, CT	8/98	4/99	LTR-UNRES	TBD
34	West Valley	West Valley, NY	8/06*	11/07*	LTR-UNRES**	TBD
35	Westinghouse Electric	Blairsville, PA	NA	NA	LTR-UNRES	3/06
36	Westinghouse Electric (Hematite Facility)	Jefferson City, MO	8/05	8/06*	LTR-UNRES	3/10

Table 2-3
Current Complex Materials Sites Undergoing Decommissioning

Name		Location	Date DP Submitted	Date DP Approved	Cleanup Criteria	Completion of Decom.
37	Westinghouse Electric	Madison, PA	4/97	1/00	LTR-UNRES	9/06
38	Whittaker Corp.	Greenville, PA	12/00 Revised 12/05*	4/06*	LTR-UNRES	8/06
<p>* Estimated Date</p> <p>** The West Valley DP has not yet been submitted. The staff anticipates the DP will include plans to release a large portion of the site for unrestricted use, and the remainder of the site may have a perpetual license or be released with restrictions.</p> <p>NOTES:</p> <p>1. The cleanup criteria identified in this table presents the staff's most recent information, but does not necessarily represent the final outcome.</p> <p>2. Abbreviations used in this table include: (1) Action - SDMP Action Plan Criteria; (2) LTR - LTR Criteria; (3) RES - Restricted Use; (4) UNRES - Unrestricted Use; (5) TBD - To Be Determined; and (6) NA - Not Applicable</p> <p>3. A DP submittal date of NA means a DP will not be submitted because remediation is being performed under a Record of Decision.</p>						

2.2.2 Uranium Recovery Facilities

NMSS provides project management and technical review for decommissioning and reclamation of facilities regulated under 10 CFR Part 40, Appendix A. These licensees include conventional uranium mills and in-situ leach facilities. Currently, there are 12 NRC-licensed [Uranium Mill Tailings Radiation Control Act Title II] sites in decommissioning. Table 2-4 identifies the Title II decommissioning sites. Site status summaries can be viewed on-line by accessing NRC's Decommissioning website (<http://www.nrc.gov/what-we-do/regulatory/decommissioning/uran-recov-sites.html>).

Uranium recovery decommissioning activities in the Division of Fuel Cycle Safety and Safeguards include: (a) regulatory oversight of decommissioning uranium recovery (milling) sites; (b) review of site characterization plans and data; (c) review and approval of DPs; (d) preparation of EAs; (e) inspection of decommissioning, including confirmatory surveys; (f) decommissioning cost estimate reviews (including annual surety updates); and (g) oversight of license termination.

In FY 2005, the Uranium Recovery staff completed over 35 licensing actions. The most significant of the decommissioning actions included:

- Termination of licenses for two Title II uranium mills (Sohio Western L-Bar and Petrotomics) and transfer of these sites to Department of Energy under a NRC general license, pursuant to 10 CFR 40.28.
- Approval of an application for alternate concentration limits for Pathfinder - Shirley Basin.
- Approval of ground-water monitoring plans for Western Nuclear, Inc, and Sequoyah Fuels Corporation.
- Approval of the relocation and closure of evaporation ponds for Rio Algom.

In SECY-05-0047, "Status of Efforts by Western Nuclear, Inc., to Acquire Off-Site Properties in Conjunction with Decommissioning Its Uranium Recovery Site," the staff reported that Western Nuclear, Inc., had acquired all but one of the off-site properties. As stated in that Commission Paper, staff is currently evaluating this submittal and is preparing a separate Commission Paper containing the results of that review.

Table 2-4
Decommissioning Title II Uranium Recovery Sites

	Name	Location	DP Approved	License Termination
1	American Nuclear Corporation	Gas Hills, WY	10/88, Revision 2006*	2007
2	Bear Creek	Converse County, WY	5/89	2004
3	ExxonMobil Highlands	Converse County, WY	1990	2005
4	Homestake	Grants, NM	Revised plan - 3/95	2015
5	Pathfinder -Lucky MC	Gas Hills, WY	Revised plan - 6/96	2005
6	Pathfinder -Shirley Basin	Shirley Basin, WY	Revised plan - 12/97	2007
7	Rio Algom - Ambrosia Lake	McKinley Co., NM	2003 (mill) 2005 (soil)*	2008
8	Umetco Minerals Corp.	East Gas Hills, WY	Revised soil plan - 4/01	2006
9	United Nuclear Corporation	Church Rock, NM	3/91, Revision 2006*	2015
10	Western Nuclear Inc. – Split Rock	Jeffrey City, WY	1997	2007
11	COGEMA Mining Inc.	Johnson & Campbell Counties, WY	12/01	2007
12	Sequoyah Fuels Corporation	Gore, OK	2006*	2010
* Projected approval date				

2.2.3 Fuel Cycle Facilities

NMSS provides licensing oversight and decommissioning project management to fuel cycle facilities, including conversion plants, enrichment plants, and fuel manufacturing plants. Most of these facilities have been in operation for 20 or more years. As technology improves and operations at these facilities change, there are often unused areas on the sites that have residual contamination. The NRC staff continues to work closely with the States and Environmental Protection Agency (EPA) to regulate remediation of unused portions of fuel cycle facilities.

Table 2-5 identifies the fuel cycle facilities with current decommissioning activities. Regulation of fuel cycle facilities is accomplished through a combination of: (a) regulatory requirements; (b) licensing; (c) safety oversight, including inspection, assessment of performance, and enforcement; (d) operational experience evaluation; and (e) regulatory support activities. Summaries of the decommissioning activities at fuel fabrication facilities can be viewed online by accessing NRC's Decommissioning website (<http://www.nrc.gov/what-we-do/regulatory/decommissioning/fuel-cycle-fac.html>).

In 2005, one conversion facility (Honeywell) and two fuel manufacturers (Framatome Richland and General Atomics) continued some decommissioning activities.

Table 2-5
Fuel Cycle Facilities Undergoing Decommissioning

Name		Location	Status
1	Framatome Richland	Richland, WA	Active
2	General Atomics	San Diego, CA	Active
3	Honeywell	Metropolis, IL	Active

3. Guidance and Rulemaking Activities

In previous years, the staff considered broad-scope regulatory improvements for decommissioning nuclear power plants in the areas of security, emergency planning, and insurance. However, because of continuing staff efforts to reassess vulnerabilities and redefine the threats in the area of safeguards and security, the priority for decommissioning regulatory improvements for decommissioning reactors has been reduced. A relatively small number of nuclear power plants are undergoing decommissioning, and the staff does not anticipate additional nuclear power plants decommissioning soon. Given that additional nuclear power plant decommissionings are not anticipated, resources are being deferred for future nuclear power plant decommissioning rulemakings that are currently in progress or related to security matters. Resources for nuclear power plant decommissioning rulemakings that are not currently in progress or related to security matters were not included in the FY 2005 budget and are not included in the FY 2006 budget. If any plants do unexpectedly shut down permanently,

decommissioning regulatory issues would continue to be addressed through the amendment and exemption process in a manner similar to the current practice.

In FY 2005, the staff continued guidance development resulting from the LTR Analysis. Stakeholder input on staff guidance development and rulemaking efforts was received during a two-day public workshop on decommissioning held by the Division of Waste Management and Environmental Protection (DWMEP) in April 2005. The workshop was attended by approximately 200 people, consisting of NRC staff, licensees, industry representatives, consultants, representatives from other Federal agencies, and State representatives. During the workshop, staff received stakeholder input on topics related to the LTR analysis. Major guidance development activities in FY 2005 included:

- In September 2005, the staff completed draft revised guidance for the following LTR Analysis issues: (a) restricted use/institutional controls; (b) on-site disposal; (c) removal of material after license termination; (d) realistic scenarios; and (e) intentional mixing of soil. This guidance addresses the specific recommendations approved by the Commission to resolve the LTR Analysis issues (SRM-SECY-03-0069). Draft revised guidance was also developed for other topics, including engineered barriers, and use of Multi-Agency Radiation Laboratory Analytical Protocols. Early input from stakeholders at the Decommissioning Workshop in April, a State working group, and an Advisory Committee on Nuclear Waste working group contributed to the staff's development of the draft guidance. The draft revised guidance is scheduled to be published for public comment in September 2005, and the staff will inform the Commission of public comments on the restricted use/institutional control issue and other issues before the guidance is finalized in FY 2006.
- During FY 2005 the staff used a risk-informed approach to inventory and evaluate information from 82 decommissioning sites to identify which of these sites had subsurface contamination and what caused the contamination. This information was used to identify the types of facilities, components, and operational activities that could have a higher "risk", or potential, for subsurface contamination. Based on these results, general inspection guidance is scheduled to be completed in September 2005. This guidance will be used in FY 2006 to develop specific inspection and enforcement procedures tailored to the types of facilities, components, and activities identified in FY 2005. The general guidance will also be used for developing the FY 2006 proposed rulemaking and supporting draft decommissioning guidance. The rulemaking, guidance, and procedures address the LTR Analysis issues related to preventing future legacy sites.
- The staff began limited work, during FY 2005, for the proposed rulemaking and supporting guidance related to preventing future legacy sites planned for FY 2006. This work centered around preparing for, and obtaining, early input from stakeholders at the Decommissioning Workshop.

4. Research Activities

The Office of Nuclear Regulatory Research (RES) continued providing information, to NMSS, to support dose modeling of releases of radioactive material from decommissioning sites. In addition to research activities, RES staff provided technical support for three specific case reviews (Cimarron, Jefferson Proving Ground, and West Valley) and developed input for

revised decommissioning guidance on the use of engineered barriers. Several examples of this research information provided are discussed in the following paragraphs.

RES is supporting development or modification of a number of computer codes useful for site decommissioning analyses. The RES is modifying dose-assessment codes to incorporate added realism; RESRAD-OFFSITE is being enhanced to enable assessment of more-realistic scenarios for potential future human exposure; FRAMES (Framework for Risk Assessment of Multimedia Environmental Systems); and GMS (the Department of Defense Groundwater Modeling System) are being linked to enable the assessment of complex ground-water systems or sites with existing groundwater contamination; and new data and models for food pathways are being developed to support improved dose calculations. The SADA (Spatial Analysis and Decision Assistance) is being supported to provide aid for characterizing a contaminated site, assessing risk, determining the location of future samples, or designing remedial action. During the past year, RES also has provided training to NMSS on use of RESRAD-OFFSITE, GENII (the Hanford Environmental Radiation Dosimetry Software System) in FRAMES, and SADA. These codes currently are under testing, evaluation, and verification for beneficial application to ongoing reviews at complex decommissioning sites. For example, RESRAD-OFFSITE and FRAMES are being tested for dose modeling analysis of the hybrid Jefferson Proving Ground site. Further, the SADA code is being used to simulate source terms at complex sites in a more realistic fashion, and is being applied in the evaluation of the source term of residual activity at the West Valley Demonstration Project and Mallinckrodt decommissioning sites.

In 2005, RES has advanced the modeling of geochemical processes during radionuclide transport through complex subsurface environments, provided an improved technical basis for estimating financial assurance requirements for the decommissioning on in-situ leach mines, and reported on the advantages and limitations of applying more realistic modeling of geochemical processes to decommissioning. RES also is advancing the understanding of the evolution and degradation of clay covers through laboratory testing.

RES has initiated two technical advisory groups (TAGs) that include NMSS decommissioning staff. These TAGs serve to enhance communication on issues important to site decommissioning and provide feedback to RES on research direction. The TAGs are the "Technical Advisory Group on Ground-Water and Performance Monitoring," and the "Technical Advisory Group on Assessing Uncertainty in Simulation Modeling of Environmental Systems."

During the past year, RES staff also continued to support interagency cooperative activities. One example was the development of the draft Multi-Agency Radiological Survey Assessment for Materials and Equipment. The RES staff along with NMSS staff, continued participation in activities of the Interagency Steering Committee on Radiation Standards (ISCORS) and the Interagency Steering Committee on Multimedia Environmental Models. An example of this work is NUREG-1783, "ISCORS Assessment of Radioactivity in Sewage Sludge: Modeling to Assess Radiation Doses."

5. International Activities

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

IAEA Activities

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

- Participating in the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. Staff activities included: (a) revision of the U.S. National Report; (b) coordination and support of regional workshops to promote ratification of the Joint Convention by other IAEA Member States; and (c) preparation of a revised spent fuel and radioactive waste program review process to be considered for the 3rd cycle of the Joint Convention review process.
- Performing a Member State review of Review of DS172, "Implementation of the Remediation Process for Past Activities and Accidents." Comments were forwarded to the IAEA by the OIP in February 2005.
- Performing a Member State review of DS-333, "Safety Requirements for the Decommissioning of Nuclear Facilities." In May 2005, decommissioning staff participated in a Consultant Services Meeting at the IAEA headquarters in Vienna, Austria to review and address Member State comments on DS-333.
- Performing a Member State review of DS-332, "Safety Guide on the Removal of Sites and Buildings from Regulatory Control upon the Termination of Practices." The review was completed and forwarded to the IAEA, by OIP, in May 2005.
- Participating in twice-yearly meetings of the IAEA Waste Safety Standards Committee, which addresses decommissioning specifically, as part of the waste safety activities of the IAEA. Safety Standards series publications, such as DS-172, DS-333, and DS-332, undergo review by this committee after preparation and revision of the draft standards.

- Participating in a meeting in June 2005, to assist in the development of a draft Safety Report on Decommissioning Strategies (Region IV staff).

OECD/NEA

The NEA Radioactive Waste Management Committee (RWMC) Working Party on Decommissioning and Dismantling (WPDD) facilitates information exchange and cooperation among the regulators and implementers in the decommissioning field. The work program analyzes issues from decommissioning projects conducted world wide and promotes the sharing of experience on technical and stakeholder issues. Among its products, the WPDD maintains a compilation of national fact sheets on decommissioning in each member country and has released a pamphlet which demonstrates accomplishments in the decommissioning of a range of fuel cycle facilities. The WPDD has also produced technical products which are of use to the NRC including work on the decommissioning safety case and decommissioning waste volumes. Also, a successful workshop was held in September 2004 in cooperation with NEA standing committees, the European Union and the IAEA. The workshop highlighted technical, regulatory and implementation issues which would benefit from international cooperation. It also identified recent successes in stakeholder involvement. This input will be considered in formulating the program of work for the WPDD. NRC will have an opportunity to influence this program of work to benefit our needs.

DWMEP staff and management participated on the RWMC WPDD which continued work on:

- a. A Decommissioning Safety Case document;
- b. A Status paper on Release of Sites; and
- c. A Status paper on Decommissioning Strategy Selection.

And published:

- a. A booklet entitled "The Decommissioning and Dismantling of Nuclear Facilities: Status, Approaches, Challenges" which provides, in non-specialist terminology, a concise overview of the status of decontamination and dismantlement of nuclear facilities and of the associated issues in NEA Member countries; and
- b. A NEA brochure which looks at decommissioning across the spectrum of nuclear power facilities and shows worldwide examples of successful projects.

Bilateral and Trilateral Exchanges with Other Countries

Delegations from France, Spain, and Indonesia visited NRC in FY 2005 to discuss many topics associated with radioactive waste management. Facility decommissioning, especially for nuclear power plants, is usually of significant interest to the visiting delegations.

In addition to hosting individual delegations, the staff participates in a bilateral exchange with the French Directorate General for Nuclear Safety Agency. Decommissioning is one of the many topics discussed during the exchange. The bilateral exchange with the French takes place twice a year; once in the United States and once in France. On October 14-15, 2004, NRC representatives met with representatives from the General Directorate for Nuclear Safety

and Radiological Protection and Electricite de France in Lyon, France. The objective was to focus on comparing the French and U.S. regulatory approaches for reactor decommissioning.

Developing and Providing Workshops to Requesting Countries

On June 24-30, 2005, DWMEP staff conducted a workshop on decommissioning for the Russian Rostekhnadzor in Moscow. The purpose of this meeting was to familiarize the NRC-equivalent organization of Russian regulators with the process that NRC uses for decommissioning NRC-licensed sites.

6. Program Integration

The staff continues to take steps to ensure integration of decommissioning activities. First, NMSS and RES mutually track and coordinate decommissioning activities. Second, the Decommissioning Management Board meets bi-monthly to provide management input on decommissioning activities and issues. The Board, composed of managers from NMSS, RES, NRR, and the regions, along with the Office of the General Counsel, serves as an effective mechanism for integrating inter office and inter regional program activities and issue resolution. The Board is a mechanism by which the staff has enhanced intra agency communication, and it ensures that NRC's regulatory processes are integrated. In addition, RES, NRR, the regions, and Agreement States participate on review teams to comment on draft decommissioning guidance.

7. Programmatic Decommissioning Activities Since Previous Report

In March 2005, the staff published the Integrated Decommissioning Improvement Plan (IDIP), Rev. 1, which describes how the staff plans to implement recommendations from the Decommissioning Program Evaluation, the LTR Analysis recommendations approved by the Commission, Commission direction resulting from the 2004 annual decommissioning briefing, and other improvements. The plan includes a description of each improvement and associated milestones, schedules, and staff assignments.

The IDIP will be updated periodically based on staff assessments, staff decommissioning experience, and independent program reviews such as the Office of the Inspector General (OIG) audits and the Office of Management and Budget (OMB) Performance Assessment Rating Tool (PART) review. This iterative approach of program assessment, followed by improvements, implements a process of "continuous improvement" in the Decommissioning Program.

Major IDIP improvement activities completed in FY 2005 include:

- Preparation of draft revised guidance for public comment that will resolve LTR Analysis issues: (a) restricted use; (b) onsite disposal; (c) realistic scenarios; (d) removal of material after license termination; and (e) intentional mixing of soil;
- Development of a risk-informed approach and guidance for revising inspection and enforcement procedures to reduce potential decommissioning problems at operating sites;

- Enhancement of communications and meaningful involvement of all stakeholders involved with the decommissioning program. The staff's efforts included: (a) significantly updating and improving the Decommissioning Web Page; (b) developing a Decommissioning Brochure; (c) conducting a stakeholder workshop, in April 2005, to seek early input for guidance and suggestions for improving the program; and (d) using a State working group to help develop draft guidance;
- Initiation of improvements to collect, document, and disseminate decommissioning lessons-learned including: (a) developing a decommissioning web page for lessons learned; (b) exchanging information on lessons-learned with stakeholders at the April Decommissioning Workshop; and, (c) beginning to explore a collaborative approach to lessons-learned with industry and Agreement States;
- Revision and expansion of the Decommissioning Directorate Operations Manual to put in place new procedures that implement program improvements including: (a) staff expenditure tracking; (b) prioritization of work; (c) operating plan management; (d) planning for revised guidance; (e) sharing information; (f) updating the IDIP; (g) independent reviews; and, (h) defining the roles of the Offices and Divisions involved with the Comprehensive Decommissioning Program;

All the IDIP improvements that the staff has implemented during FY 2004 and FY 2005 are summarized in the Decommissioning Program Improvements Report which will be issued in September 2005. Although many of the IDIP activities will realize improvements and efficiencies in coming years, there already have been observed efficiencies from programmatic improvements. For example, the recent LTP review for Yankee Rowe, was completed in less time than all previous LTP reviews, because process lessons learned were applied before and during the review.

In addition, the staff continues to implement communication plans for all complex sites. Site-specific communication plans are useful tools to ensure that the appropriate stakeholders are identified and contacted and focuses the staff on messages NRC wants to convey. One of the activities identified in the communication plans for each site is participation in public meetings to inform the public about major licensing actions. During the past year, the staff participated in public meetings for Kiski Valley Water Pollution Control Authority and Ft. Belvoir. Staff also supported an EPA Public Meeting on the proposed listing of the Safety Light site on the EPA National Priorities List.

Further, NRC staff continued to implement the 2002 Memorandum of Understanding between NRC and EPA on Consultation and Finality on Decommissioning and Decontamination of Contaminated Sites. On October 27, 2004, a second set of three Notification letters was sent to the EPA informing them of sites undergoing decommissioning that would have triggered Level 1 Consultation under the memorandum of understanding (MOU) if the DPs for the sites had been submitted after the MOU was signed. The three letters concerned the Kaiser Aluminum site in Oklahoma, the Kerr-McGee, Cimarron site in Oklahoma, and the Union Carbide Corporation site in Tennessee. Further, the staff developed background information and began the process for conducting a Level 2 consultation under the MOU concerning the Cushing Refinery Site in Oklahoma. The staff also continued to develop guidance for implementing the MOU to be included in the revised NUREG-1757 and in the revised Decommissioning Directorate Operations Manual.

The staff also participated in a number of industry conferences and workshops. Examples of conferences and workshops attended by the staff during the past year include Waste Management '05, American Nuclear Society conferences, Fuel Cycle Facilities Forum Meeting, TLG Conference, and Health Physics Society meetings.

8. Resources

The total decommissioning program staff budget, for FY 2005 and FY 2006, is 85 full-time equivalents (FTEs) and 99 FTEs, respectively. These resource figures include: (a) licensing casework directly related to decommissioning sites; (b) inspections; (c) project management and technical support for decommissioning power reactors, uranium mill tailings facilities, and fuel cycle facilities; (d) development of rules and guidance; (e) environmental impact statements and EAs; (f) research to develop more realistic analytical tools to support licensing and rulemaking activities; and (g) Waste Incidental to Reprocessing. These figures also include supervisory and non-supervisory indirect FTE, and training and travel associated with the decommissioning program.

9.0 FY 2006 Planned Programmatic Activities

Follow up actions to implement the IDIP are planned for FY 2006. These actions include:

- Publishing final revised guidance on the LTR issues: restricted use; onsite disposal; realistic scenarios; removal of material after license termination; intentional mixing;
- Revising the IDIP based on OIG review and decommissioning lessons-learned;
- Preparing for, and participating in, an OMB PART review, including a reevaluation of the decommissioning program and effectiveness of improvements;
- Publishing a proposed rule and draft guidance, for public comment, in September 2006, for the rulemaking and supporting guidance on measures to prevent future legacy sites (changes to financial assurance and licensee operations); and
- Continuing to develop decommissioning lessons-learned in conjunction with stakeholders.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON NUCLEAR WASTE
WASHINGTON, DC 20555 - 0001

ACNWR-0226

August 12, 2005

The Honorable Nils J. Diaz
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Chairman Diaz:

SUBJECT: DRAFT REVISED DECOMMISSIONING GUIDANCE TO IMPLEMENT THE
LICENSE TERMINATION RULE

The NRC staff is developing revised decommissioning guidance to implement the License Termination Rule (LTR). In support of this effort, NRC staff and the ACNW (the Committee) have participated in two meetings. The first was an April 2005 decommissioning workshop organized by the NRC staff. The entire Committee attended this workshop. The second was a 1-day working group meeting on June 15, 2005, during the 160th meeting of the Committee.

In its working group meeting, the Committee had the benefit of discussions with the NRC staff and five invited experts selected to provide the perspective of experienced practitioners.¹ During the meeting, the Committee provided comments and suggestions that the staff is considering while developing the draft guidance. Since the staff participated in the working group meeting and subsequent Committee deliberations, the Committee is confident that its comments and suggestions have been conveyed.

The working group discussed a range of guidance revisions in several different areas. The Committee has not seen the revised document since it is still being developed. However, observations and recommendations that have been discussed with the staff are provided in the rest of this letter.

OBSERVATIONS AND RECOMMENDATIONS

- The Committee supports the issuance of generic guidance implementing the LTR. However, site-specific factors are especially important to consideration of partial restricted release under the long-term control (LTC) license and intentional soil mixing.

¹ The invited experts were Eric Abelquist, Director of the Radiological Assessments and Training Program, Oak Ridge Institute for Science and Education; Virgil Autry, Consultant, Department of Health and Environmental Control, State of South Carolina; Eric Darois, Radiation Safety and Control Services in New Hampshire; Tracy Ikenberry, Associate and Senior Health Physicist, Dade Moeller & Associates; and Thomas Nauman, Vice President, Shaw Environmental and Infrastructure.

- Groundwater monitoring should be a prime consideration in the revised guidance and should address ways to determine the requirements for subsurface characterization and monitoring. The guidance should also address subsurface characterization, monitoring plans, and contingency plans should groundwater contamination occur.
- The Committee recognizes that the lessons learned from decommissioning projects provide valuable information for designing new facilities (designing with the end in mind). In addition to developing protocols and mechanisms for information collection and dissemination, the staff will need to devise a process to evaluate the accuracy and reliability of the information that is disseminated.

The Committee has participated in the staff's information-gathering activities for the revised decommissioning guidance to be published at the end of September 2005. Therefore, the staff need not respond to the issues discussed in this letter. The Committee has discussed these issues with the staff and plans to interact with the staff again after the draft guidance is published. The Committee believes that these early and ongoing interactions have helped the Committee and the staff meet their respective obligations on schedule.

The Committee plans to comment on the draft guidance when it is published.

Sincerely,

/RA/

Michael T. Ryan
Chairman

- Groundwater monitoring should be a prime consideration in the revised guidance and should address ways to determine the requirements for subsurface characterization and monitoring. The guidance should also address subsurface characterization, monitoring plans, and contingency plans should groundwater contamination occur.
- The Committee recognizes that the lessons learned from decommissioning projects provide valuable information for designing new facilities (designing with the end in mind). In addition to developing protocols and mechanisms for information collection and dissemination, the staff will need to devise a process to evaluate the accuracy and reliability of the information that is disseminated.

The Committee has participated in the staff's information-gathering activities for the revised decommissioning guidance to be published at the end of September 2005. Therefore, the staff need not respond to the issues discussed in this letter. The Committee has discussed these issues with the staff and plans to interact with the staff again after the draft guidance is published. The Committee believes that these early and ongoing interactions have helped the Committee and the staff meet their respective obligations on schedule.

The Committee plans to comment on the draft guidance when it is published.

Sincerely,

Michael T. Ryan
Chairman

DOCUMENT NAME: E:\Filenet\ML052270028.wpd

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" =
Copy with attachment/enclosure "N" = No copy

Accession #: ML052270028

OFFICE	ACRS/ACNW	Y	ACRS/ACNW	Y	ACRS/ACNW	Y	ACRS/ACNW	Y	ACRS/ACNW	Y	ACRS/ACNW	Y
NAME	RMajor		SSteele		MScott		AThadani		JLarkins		JTLforMTRyan	
DATE	08/11/05		08/11/05		08/11/05		/ /05		08/12/05		08/12/05	

OFFICIAL RECORD COPY

**ADVISORY COMMITTEE ON
NUCLEAR WASTE (ACNW)
INVOLVEMENT IN
DECOMMISSIONING AND THE
LICENSE TERMINATION RULE
(LTR)**

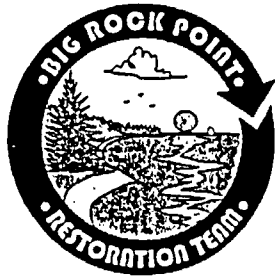
**DR. MICHAEL T. RYAN,
CHAIRMAN
ADVISORY COMMITTEE ON
NUCLEAR WASTE**

FISCAL YEAR 2005

- **Participated in NRC Staff's Decommissioning Guidance Stakeholder Workshop in April**
- **ACNW Working Group Meeting - June**
- **ACNW Report on Decommissioning Guidance - August**

FISCAL YEAR 2006

- **West Valley Demonstration Project Working Group Meeting, October 19-20, 2005**
- **NRC Staff Spring 2006 License Termination Rule Guidance-Final Draft**
- **Summer 2006 West Valley Demonstration Project**



Big Rock Point Restoration Project

Kurt M. Haas
Site General Manager
Consumers Energy

Big Rock Point Restoration Project

- Project Overview
- Project Vision
- Decommissioning
Process Opportunities





Big Rock Point Restoration Project Overview

- 240 Mwt BWR. Constructed in 1960-61.
Cost \$ 27 million
- Shutdown August 1997 and began decommissioning activities
- Removing all buildings (including foundations)
- Final Site Survey by Fall 2006
- “NRC Radiological Cleanup” Project Cost \$358 million (YOE)
- Total Project Cost \$469 million (YOE)





Big Rock Point Vision

Conduct the site restoration in a manner which brings praise from all stakeholders:

- The local community
- The nuclear community
- Regulatory agencies
- Our critics
- The public at large
- Our employees and their families
- Our company

Opportunities

- ☺ Operating Plant Inspection to Reduce Future Decommissioning Problems
- ☺ Risk Informed Inspection of Decommissioning Sites

Opportunities

- ☹ Continue to Improve License Termination Plan Approval Process
- ☹ Continue to Improve Final Site Survey Process
- ☹ Continue to Improve Communication with Local Stakeholders

Opportunities

- ☹ Capturing Lessons Learned
- ☹ Radwaste Disposal Options
- ☹ Spent Fuel and Greater than Class C Waste Disposal

DECOMMISSIONING LESSONS LEARNED

Jeff Lux, Project Manager

Kerr-McGee Corporation

October 18, 2005

Introduction

Kerr-McGee appreciates the opportunity to present lessons learned during decommissioning to NRC. We believe NRC's efforts to gain input from the regulated community, as well as other stakeholders, will enhance NRC's ability to expedite the decommissioning of licensed sites, saving money without sacrificing quality or the safety of workers or the public. During this presentation, I will describe some of the lessons learned not only at the sites for which Kerr-McGee has performed decommissioning operations, but for other fuel cycle facilities of which I am aware.

Flexibility is Needed

It appears that NRC personnel sometimes "default" to the most rigid interpretation of regulations and/or regulatory guidance. This may be the most "secure" position for NRC staff, but it often impedes progress in decommissioning. NRC must be willing to exercise discretion when allowed to expedite the decommissioning process, while ensuring that safety and quality are not compromised.

Some fuel cycle facilities are undergoing decommissioning in accordance with decommissioning plans which were approved prior to August 20, 1999. These plans are "grandfathered" under Subpart E of 10 CFR 20, the License Termination Rule (LTR). 10 CFR 70.38 addresses the need for a "new" decommissioning plan, a circumstance which would "trigger" the LTR. Unnecessarily conservative interpretation of 10 CFR 70.38 has brought the decommissioning of one facility to a virtual halt.

Inconsistent interpretation of the timeliness rule has resulted in some licensees being forced to decommission interior portions of their facility when it would have been more appropriate to perform "source removal", deferring decommissioning until cessation of operation. Fortunately, the Decommissioning Directorate has recommended a solution to some of the timeliness rule problems expressed by licensees, which fuel cycle licensees believe may address this problem.

Many licensees do not release solid materials unless it is indistinguishable from background because of uncertainty regarding what NRC would consider releasable. Kerr-McGee was able to combine "final status survey" quality measurements with the concept of unrestricted release to expedite decommissioning of volumetrically contaminated waste at the Cushing site. Basing release of volumetrically contaminated solid materials on DCGLs calculated for soils alleviated this problem in this situation.

Characterize with the Process in Mind

At Kerr-McGee's Cushing site, MARSSIM survey methodology was used to delineate material exceeding decommissioning criteria. For soils, this proved to be a relatively unsuccessful effort. Scanning instruments are only capable of identifying licensed

material in shallow soils (top eight inches or less). Consequently, the systematic scanning and sampling described in MARSSIM can not delineate heterogeneously distributed licensed material if it extends below the surface.

Because of the heterogeneous distribution of licensed material at the Cushing site (typical for fuel cycle facilities), the systematic characterization sampling required excavation of volumes of material averaging below the decommissioning criteria; characterization samples often represented a small "hot spot" in the midst of mostly low-activity or background-level soil. Because the decommissioning process required scanning of excavations in-process, material not identified during characterization was discovered in discrete layers or trenches; this material also required removal. As a result, the volume of material removed far exceeded estimates based on site characterization, and most of the material shipped did not exceed the decommissioning criteria.

Though millions of dollars were spent on characterization, the result was a false impression of accuracy in defining and quantifying material requiring decommissioning. The lesson learned was that decommissioning process must be considered in the development of site characterization plans. If in-process measurements are to be used, characterization should only identify "starting points" for decommissioning, not attempt to quantify the material exceeding the criteria. Kerr-McGee could have saved substantial time and money on characterization with no effect on the end result if site characterization were designed only to identify the "starting points" for excavation.

Plan for "In-Process" Measurement and Material Segregation

NRC has begun utilizing in-process inspections and confirmation of measurements to verify that the licensee's program and measurements ensure compliance with requirements. At one of our sites, NRC has discontinued confirmatory surveys after final status survey because our program has consistently proven to generate good measurements supported by an effective QA/QC program. The decision to rely on these "in-process" measurements, rather than post-decommissioning confirmatory surveys will expedite license termination – with no degradation in NRC's confidence that the site complies with decommissioning criteria.

At the Cushing site, approving in-process (post-excavation) segregation of material resulted in a substantial reduction in the amount of "clean" material shipped for disposal, which translates to substantial cost savings – once again, with no reduction in safety or impact to human health or the environment. NRC should provide for in-process segregation both to minimize cost and to minimize the amount of "clean" material disposed of in facilities with limited capacity.

In one phase of decommissioning performed in 2002, the NRC-approved decommissioning plan required scanning of excavations to determine if licensed material exceeding decommissioning criteria (not identified during characterization) was present. All material excavated on the basis of characterization, as well as all material

identified by in-process scans, was shipped off site for disposal at a licensed facility. Characterization indicated that 20,078 cubic yards of material required removal and shipment. Of this volume, 13,625 cubic yards had previously been stockpiled and could be accurately quantified. The actual volume shipped was 26,908 cubic yards, meaning that the less than 7,000 cubic yards estimated in the field grew to over 13,000 cubic yards actually removed.

In the final phase of decommissioning, performed in 2003 and 2004, still more extensive characterization (in accordance with MARSSIM) indicated that 10,077 cubic yards required removal and shipment. The actual volume shipped was 19,820 cubic yards.

Fortunately, in the late stages of this final phase of decommissioning, NRC approved a Kerr-McGee proposal to modify the decommissioning process. Each bucket of soil was scanned during excavation; material that exceeded a pre-determined threshold was shipped, and the rest was spread in lifts. The lifts were scanned for material exceeding the threshold, and higher activity material was segregated for disposal. Over 5,400 cubic yards of soil were processed by this method, from which 1,249 cubic yards were "culled out" for shipment. This resulted in reducing the amount of material shipped by over 4,000 cubic yards. Even with this additional segregation effort, only 53% of the containers shipped yielded an average activity exceeding decommissioning criteria.

At the Cushing site, NRC twice approved changes in the decommissioning process that reduced the cost and time required for decommissioning portions of the site - with no reduction in safety or impact to human health or the environment. The lesson learned is that licensees and NRC need to provide for modifications to decommissioning processes when alternate methods offer potential for substantial savings in cost, time, or quantity of material segregated for disposal. This not only saves money and time, but can reduce the quantity of material being sent to disposal facilities with limited capacity.

Focus on Performance-Based Decommissioning

We recognize that NRC must ensure that licensees:

- Utilize qualified personnel,
- Implement an effective radiation safety program,
- Perform decommissioning activities in a manner protective of workers and the public,
- Control the use and spread of licensed material, and
- Are able to adequately fund decommissioning.

NRC must also ensure that DCGLs are appropriate, and that DCGLs are met prior to license termination.

Licensees must develop and implement plans that will decommission the site safely and in compliance with regulatory requirements. Licensees must continue decommissioning until they are able to demonstrate compliance with decommissioning criteria.

NRC requires that licensees provide and NRC approve site decommissioning plans before licensees can decommission sites. However, regulations do not specify the level of detail required by the plans, or the level of detail NRC must approve. NRC review and approval of detailed aspects of the decommissioning process (e.g, specified processes or procedures) reduces the licensee's flexibility to improve decommissioning processes or adjust to changed conditions. As long as licensees demonstrate organizational competence and technical proficiency, NRC should require that licensees safely meet established decommissioning criteria and provide licensees the greatest flexibility possible to plan and perform decommissioning.

A related principle is the concept that inactivity is expensive. When NRC reviews are performed at a detailed technical level, approval of decommissioning plans can take years. I am aware of one licensee whose decommissioning plan has been under review for five years, through two changes in project management. For licensees who have ceased operation, the cost of "being under license" can exceed one million dollars per year, even if little or no field work is being performed on site.

Licensees are beginning to fear the "rotational duty" announcement, which implies that they will be educating yet another project manager on their site, their license amendment requests, and any other proposals or approvals they need to get the job done. NRC must ensure that sufficient manpower, knowledgeable about site conditions, are available for timely review of submittals. Protracted review time delays decommissioning and increases costs with no commensurate benefit.

Derive Reasonable Multi-Media DCGLs

For naturally occurring radionuclides, DCGLs based on default exposure scenarios can be, for all practical purposes, indistinguishable from variability in background. This was demonstrated by a joint NRC/ORISE/EML research project conducted at the Cushing site in 1996. During that project, two background areas were surveyed as well as one impacted area. One of the two background areas was selected as the "reference" survey unit to which the others were statistically compared. The report concluded that, had the other background area been selected as the "reference" area, the first background area would have required remediation. In other words, MARSSIM methodology can statistically distinguish between even very small differences in the radioactivity of two areas, but it cannot tell if the difference is due to contamination or variability in background.

Because of this inability, inherent in statistical comparisons such as those performed for MARSSIM, NRC must ensure that reasonable exposure scenarios are employed in the derivation of DCGLs for naturally occurring radionuclides. In essence, DCGLs must be high enough that contamination can be distinguished from variability in background.

Reasonable distributions for key parameters must be utilized to develop probabilistic DCGLs rather than deterministic DCGLs, if only to minimize the potential for decommissioning unimpacted soils.

Although NUREG-1757 provides flexibility, it has been NRC's practice not to approve derived DCGLs until characterization is complete. This is problematic, because licensees cannot be sure that characterization is complete until they know the DCGL. DCGLs can be determined without extensive site characterization. Licensees need only know the isotopes of concern, the affected media, the exposure scenario, and in some cases certain hydrogeological and/or geochemical parameters, to calculate DCGLs. DCGLs should be established prior to characterization, because characterization can be most effectively planned based upon known DCGLs.

Finally, DCGLs should be developed for all media, and should consider the interrelationships between media. For example, DCGLs have at times been derived for soils without knowledge concerning what concentration of licensed material in soil would generate groundwater exceeding groundwater DCGLs. As a result, areas were decommissioned from a "buildings and soils" perspective, only to later find that the decommissioned area continues to be a source of impact to groundwater. It appears that both licensees and the NRC are just beginning to understand the impact of one media on the others, and to address these "holistically".

Involve Licensees in the EPA MOU Notification Process

Kerr-McGee is the licensee for two of the sites for which some type of notification is being made in accordance with the NRC-EPA Memorandum of Understanding. We believe the process, as implemented to date, can have a direct impact on the decommissioning process.

It is in all parties' interest (NRC, EPA, licensee) to ensure that information transmitted in both notifications and consultations is accurate and relevant. Licensee input into NRC's notification could have avoided the transmittal of inaccurate information at one of our sites. Obviously, inaccurate information is a concern to licensees, particularly if that information incorrectly implies that residual contamination could be of concern to EPA.

In addition, NRC could provide information which may not influence NRC's decision to approve a decommissioning plan or terminate a license, but which could be meaningful to EPA. Examples include:

- the involvement of State environmental regulatory agencies in the development of a decommissioning plan or the decommissioning of a site,
- development of DCGLs using both NRC guidance for dose-based limit derivation and EPA guidance for risk-based limit derivation, and
- previous or existing EPA involvement in the licensed site.

Licensees would be willing to provide such information to NRC, should NRC not already be aware of such issues. Including this type of information in notifications and consultations can only enhance the effectiveness of the implementation of the Memorandum of Understanding, and provide licensees greater assurance that their site is being fairly represented from both NRC's and EPA's perspectives.

Finally, NRC must understand that licensees are very concerned about the information NRC provides EPA. Inaccurate or misleading information could cause licensees to consider license termination little more than an invitation to EPA to force further remedial action under CERCLA. For this reason, inaccurate or misleading information could cause licensees to slow down or defer decommissioning to delay license termination until they are assured that EPA has an appropriate understanding regarding conditions at the site. This is certainly neither NRC's nor the licensees' desire, and only ensuring that EPA is provided an accurate, complete, and relevant description of the site is likely to alleviate this concern.

Interact with the Regulated Community

As a member of the Fuel Cycle Facilities Forum (FCFF), I appreciate the fact that NRC Decommissioning Directorate staff, as well as other NRC personnel, sometimes attend these meetings. This voluntary industry group is composed of fuel cycle licensees who meet to discuss decommissioning issues. Regulatory developments, implementation of regulatory guidance, technical issues associated with decommissioning, and "lessons learned" are all topics which the FCFF addresses at essentially every meeting. Members of the Nuclear Energy Institute and the National Mining Association often attend these meetings as well.

When NRC personnel attend these meetings, licensees and NRC staff are able to discuss technical and regulatory concerns, the potential impact of pending regulatory developments, and approaches that licensees or NRC have proposed in an effort to overcome obstacles to effective decommissioning. As a result, licensees gain a better understanding of and appreciation for NRC concerns. I believe NRC staff gain a better understanding of the issues confronting licensees.

I encourage the Commission to support the continued involvement by NRC personnel in these and other similar vehicles, which provide an opportunity for effective interchange.

Continue to Identify and Address Problematic Issues Through the IDIP

The Integrated Decommissioning Improvement Program (IDIP) has already identified several issues for which NRC must take action to facilitate licensees' efforts to decommission their facilities and sites. Examples already being addressed in the recent revision of NUREG-1757, Consolidated Decommissioning Guidance, include:

- Intentional mixing
- The use of reasonable exposure scenarios
- Alternatives to restricted release

Other issues are and will continue to be identified, and I believe the IDIP is the appropriate vehicle through which to develop resolutions to these issues. A few examples follow.

For operating facilities, decommissioning has been required for discontinued operation in a portion of a facility, when source removal would have been more appropriate, such as when the area was surrounded by other licensed operations.

Some licensees have had portions of their sites released, only to discover later that the release may be removed if the LTR is triggered, or if the residual dose from portions of the site which have not yet been released are too high. Obviously, this causes licensees concern regarding finality.

Although it is often reasonable to subdivide sites into discrete areas for decommissioning purposes (MARSSIM provides for this), NRC allows this in some cases and disallows it in others. Once again, it appears to licensees that the difference usually lies in the interpretation of regulations or regulatory guidance rather than in substantive differences in the technical basis of the approach.

There appears to be confusion regarding licensees' ability to dispose of licensed material at non-licensed facilities regulated by EPA or State environmental regulatory agencies. NRC's policy regarding such disposition needs clarification.

Conclusions

Both NRC and licensees are "learning lessons" as we gain experience in decommissioning.

Challenges still lie ahead. These challenges represent opportunities for both NRC and licensees to improve the process.

The Integrated Decommissioning Improvement Program may prove to be an effective vehicle for continued progress.

DECOMMISSIONING LESSONS LEARNED

Jeff Lux, Project Manager
Kerr-McGee Corporation
October 18, 2005

FLEXIBILITY IS NEEDED

- LTR vs. SDMP
- Timeliness Rule
- Release of Solid Materials

CHARACTERIZE WITH THE PROCESS IN MIND

- Extensive site characterization can give a false impression of “accuracy”.
- If in-process measurements will be used, extensive characterization is not cost-justifiable.
- Characterization should be designed with the decommissioning process in mind.

IN-PROCESS vs. POST- PROCESS CONSIDERATIONS

- NRC confirmation of licensee measurements
- Segregation of materials
- Modification of the decommissioning process

PERFORMANCE-BASED DECOMMISSIONING

- NRC ensures that decommissioning is safe and achieves an acceptable endpoint.
- The licensee implement approved plans and programs.
- NRC must provide timely review and maximum flexibility in process to expedite decommissioning.

DCGL DERIVATION

- DCGLs must be based on reasonable exposure scenario.
- DCGLs can be developed prior to completion of site characterization.
- DCGLs should be developed for all appropriate media and locations.
- DCGLs must consider “inter-media” relationships.

NRC-EPA MOU PROCESS

- Involve licensee in development of notification.
- Provide information that would be relevant to EPA.
 - State environmental agency involvement.
 - Risk-based limits.
 - Previous or existing EPA involvement.

INTERACT WITH THE REGULATED COMMUNITY

- Enhances NRC staff understanding of licensee concerns.
- Enhances licensee understanding of basis for regulatory requirements and NRC concerns.
- Provides an informal forum for new ideas and regulatory developments.

REGULATORY ISSUES

- Source term removals vs. decommissioning under timeliness rule.
- Release of portions of sites.
- Subdivision of sites.
- Disposition of licensed material below DCGL in non-licensed facilities.

CONCLUSIONS

- Both NRC and licensees are “learning lessons” as we gain experience in decommissioning.
- Challenges ahead represent opportunities for both NRC and licensees to improve the process.
- The IDIP can provide an effective vehicle for continued progress.

ACRONYMS

- LTR – License Termination Rule
- SDMP – Site Decommissioning Management Program
- DCGL – Derived Concentration Guidance Level
- MOU – Memorandum of Understanding
- IDIP – Integrated Decommissioning Improvement Program

Decommissioning a Radium Facility for Unrestricted Use

The Flannery (Vanadium) Building, located in Pittsburgh, PA, has a long history with radium production and use. Built circa 1911 by Mr. Joseph Flannery, President of the Vanadium Corp. of America and the Standard Chemical Company (SCC), the building was a major processing and refining facility for radium from the SCC- Canonsburg, PA facility through the 1920's and 30's. Flannery pioneered the first major commercial production of radium from U.S. ores. Refinement into self-luminous paint and concentrated radium compounds for medical, industrial and commercial uses were carried out in the fifth floor facilities of the building. At one time the Flannery Building was said to contain the major portion of the world's inventory of processed radium. News articles from 1921 showed photographs of a visit by Madam Marie Curie. An estimated 180 grams (or curies) of radium-226 was refined in this facility.

As a result of radium production, residual radium contamination existed on all levels, including the roof. After use as a radium production facility, the building passed through numerous owners and most recently was utilized primarily as office space. Interaction through the 1960's and 70's between the state regulatory agency and property owners led to limited decontamination efforts in selected areas of the building. However, due to the lack of a formal radioactive materials license being in place and no approved decommissioning plan, a comprehensive characterization or decontamination was not carried out during that time.

A local banking institution purchased the building in the 1980's and operated a branch of their bank on the ground floor for many years. Following a failed sale of the building by the bank to another business, involving litigation over the presence of residual radium contamination, the Pennsylvania Department of Environmental Protection (PADEP) Bureau of Radiation Protection (BRP) was asked to provide guidance that would lead to an unqualified unrestricted release for

the building. The owner agreed to accept the issuance of a decommissioning license by PADEP/BRP that stipulated the restrictive cleanup criteria prescribed in Regulatory Guide 1.86 and NUREG/CR-5849.

PADEP/BRP gave this remediation project priority attention in early 2003, providing guidance to the licensee to ensure this building would finally be cleaned up, after more than 80 years of being contaminated. The licensee worked closely with PADEP/BRP staff to reach the agreed-upon clean-up criteria. It was necessary to use a special approach in certain areas of the building in order to obtain an unrestricted release. Portions of the building could not be remediated to the original release criteria due to issues with structural integrity, inaccessibility, and/or safety concerns. These areas required a special set of dose assessments to evaluate each area of concern. The license was terminated in September 2003 after meeting the criteria. In 2004, the bank sold this building to a local developer for use as an upscale restaurant and office space. This successful remediation project ensures this historic building will remain in productive use for future generations.

[Statement by R. Maiers for 10/18/05 NRC Commission Briefing]

Decommissioning a Radium Facility for Unrestricted Use

**Robert C. Maiers, PE
PA Bureau of Radiation
Protection**

(717) 783-8979

Rmaiers@state.pa.us

Pennsylvania Radium History

- **Radium was processed at numerous Pennsylvania sites in the early 1900's**
- **The primary use of radium was in medicine**
- **Standard Chemical Company (SCC) was founded in Canonsburg, PA to make sufficient quantities of radium readily available for medical treatments**

“Flannery Building” History

- **Built by Joseph Flannery, president of SCC in 1911**
- **Building constructed of steel frame and masonry, consists of 5 stories, a mezzanine and basement.**
- **Approximately 50,000 sq. ft. of floor space.**

Circa 1913



2002



Radium Processing



- **Historical photos courtesy of Oak Ridge Associated Universities**

Radium Vault



**Radium cost ~ \$100,000 per gram
at the time**

Prior Decontamination Efforts

- **Residual radium contamination existed on all levels of the building as a result of radium production**
- **Limited decontamination efforts in the 1960's and early 1970's were unsuccessful due to the lack of a comprehensive characterization and a decommissioning plan**

Decommissioning Under BRP License

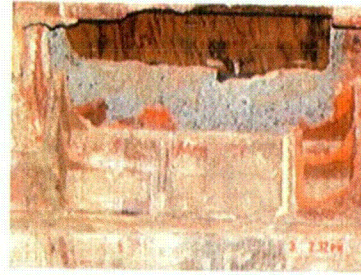
- **Presence of contamination resulted in litigation and a failed sale of the building in 1998**
- **After litigation, the owner wanted assurance that a cleanup would result in no restrictions on future use**
- **Bureau of Radiation Protection (BRP) issued a decommissioning license stipulating RG 1.86 and NUREG/CR-5849 criteria in September 1999**

Decommissioning Under BRP License

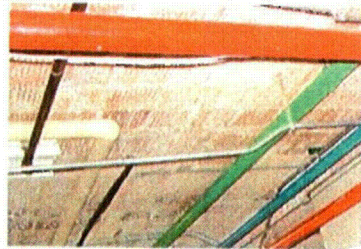
- **Limited, discrete areas of the building could not be remediated to meet the cleanup criteria due to issues with structural integrity, inaccessibility, and/or safety concerns**
- **BRP allowed the application of dose assessments to evaluate these areas**



4th Floor Terra Cotta

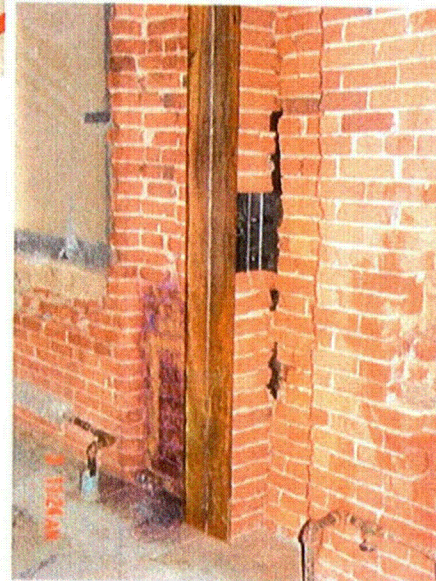


5th Floor Terra Cotta
(Cutaway View)



Basement Terra Cotta

Terra Cotta



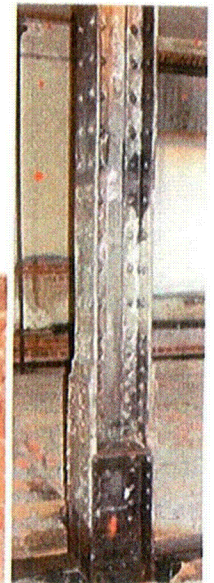
Column in West Wall



Fire Retardant Material
on Steel Column



Base of Column with
Hazard Assessment Area



Steel Column after
Remediation

Steel Columns

Building Footer



Structural Steel Column

11



**Interior Side of
Exterior Wall**



← **View from First Floor**

**Near Column A-6
↓ in Basement**



Main Pipe Chase

Decommissioning Results

- **License was terminated with no restrictions on current or future use**
- **Building has since been sold to a developer**
- **Commercial use is planned by current owner**
- **Successful remediation ensures this historic building remains in productive use**

DECOMMISSIONING ACTIVITIES AND STATUS

Nuclear Regulatory Commission
One White Flint North
Rockville, Maryland

9:30 a.m. to 11:30 a.m.
18 October 2005

Stakeholder Panel Comments:

W. Donald Hudson, Jr., Ph.D
President
The Chewonki Foundation
Wiscasset, Maine

Vice Chairman
Community Advisory Panel for Decommissioning Maine Yankee Atomic Power Station
August 1997 to May 2005

REFLECTIONS ON DECOMMISSIONING

Good morning Chairman Diaz, Commissioners Merrifield, Jaczko, and Lyons, Nuclear Regulatory Commission staff and other guests. My name is Don Hudson and I am the President of the Chewonki Foundation, a non-profit educational institution that specializes in environmental education and wilderness travel. For the past eight years I served as the Vice-Chairman of the Community Advisory Panel for the Decommissioning of Maine Yankee Atomic Power Station, filling the role of a person with environmental and scientific background who lives and works within 10 miles of the plant. My academic training included French and Environmental Studies at Dartmouth College, and later Arctic/alpine plant ecology and ethnobotany at the University of Vermont and Indiana University respectively.

I came to the decommissioning process with nothing but the most rudimentary experience in nuclear physics, chemistry, and engineering. My willingness to participate and to become a stakeholder in the process was first and foremost a function of proximity. Over the years, however, I have come to believe that the nation's apparent paralysis with closing the nuclear cycle – at least for commercial plants – is, in part, the failure of adequate public participation at all stages of development. I remain engaged with the hope that a more permanent solution might soon be found for long-term storage of the 1400-plus fuel assemblies and GCC waste currently stored in 64 canisters above ground not far from my workplace and home.

What's the perspective of an environmental educator in nuclear power plant decommissioning?

Maine Yankee was built and dismantled in my lifetime, on a point of land not far from where I have worked for the past 33 years, and just seven miles from my family's home of the past 23 years. In July 1968 I stood on the observation platform at the height of land on Bailey Point and watched for hours as men worked on the steel skeleton of the rising containment building. A piece of that rebar now serves as a paperweight on my desk – officially released. The containment building came down a little more than a year ago, and with it the landmark that dominated Montsweag Bay for more than three decades. Chewonki Neck is just a mile or so down the bay from Bailey Point. The name 'Chewonki' is an Abanaki name that means *the place where the geese come by the shore*. Chewonki Foundation people have been canoeing and sailing in these tidal waters since 1918.

A Maine Yankee consultant called me in July 1997, nearly 30 years after that brief visit, to ask if I would be willing to serve as a member of an advisory panel if so appointed by the Governor. I was being considered for the position on the panel of someone with an environmental background living and working within 10 miles of the plant. Maine Yankee staff had introduced themselves to me six years earlier to ask for help with ospreys and other birds that had built nests on or around the yard crane outside containment. This was a first. Maine Yankee had never sought our advice, and we had generally only offered criticism from a distance. In this case, we found a straight forward approach to excluding ospreys from nest sites on the crane, and had maintained a working relationship ever since.

Decommissioning ended in September 2005, and I am pleased to be able to offer a few observations that might help to put the nearly eight-year process in perspective.

Observation #1: Advisory panels are not independent and they have no authority.

In our case, the Community Advisory Panel was a creature of the company. Those few of us who were appointed by the Governor were in fact selected by the company or by its consultants. Our advice was sought on a regular basis, and we had no authority to do anything more than speak our mind.

Notwithstanding Maine Yankee's role in establishing the Community Advisory Panel – or the Governor's lack of a role in the process, I believe that it worked most of the time as a good and productive forum for the exchange of information and ideas.

The clearest example of the company's willingness to open the process of decommissioning to public scrutiny came at our first meeting in July 1997. One of our members, representing the Friends of the Coast, rose near the end of the meeting to challenge the company about information not previously shared with anyone other than the NRC. The company president, Michael Selman, himself a member of the panel, took one look at his staff seated in several rows at the front of the hall, gathered his thoughts for no less than a few seconds, shrugged his shoulders, and invited Ray Shadis to come to the office at his earliest convenience to review the files in question.

As a result of Mr. Selman's overture, the Friends of the Coast eventually had a space to work at Maine Yankee – *an office*, and Ray Shadis spent countless hours and days reading, wrestling, and negotiating with the staff and managers of the decommissioning plant. The company's overture had a profound effect on decommissioning, and was the proximal cause of a number of wide ranging decisions, many captured in the 1998 Settlement Agreement before the Federal Energy Regulatory Commission. Decisions like surveying marine sediments beyond the physical and geographical limits of the license provided an extra measure of trust by the public in the process, for example.

Observation #2: Decommissioning power plants put a pretty big filter on the information that is shared at public meetings.

With a few notable exceptions, our committee was not privy to the details of conflicts and negotiations with the state or the NRC until a few moments before issues were made public. In a typical scenario, Maine Yankee spokesmen would explain the company's response to issues raised during routine NRC inspections moments before those inspection reports were to be summarized by a NRC representative in attendance. The violations in question frequently predated the meeting by months and occasionally more than a year. We came to understand that neither the company nor the NRC would present or discuss regulatory issues until they had been resolved – or nearly resolved.

Decommissioning a nuclear power station is a detailed and complicated process. Advisory panels that meet once every other month for two or three hours cannot expect to hear every argument replayed. Some of us on the panel did feel somewhat superfluous at times. Our job, more often than not, was to create an opportunity for the company to share important information and decisions outside of a highly structured official public hearing, a court of law, or even an innocuous press release.

To their credit, Maine Yankee never lost its focus on worker safety, or its attention to the most important bottom line – total dose. The initiation of corrective measures at the moment of discovery of a violation was routine by the end of decommissioning. Aggressive self-policing is an essential ingredient of a regulatory process with regular but staggered on-site inspections, as is the case of decommissioning nuclear power plants.

The company's self-imposed requirement to report at regular public meetings, as stingy as they were about some information, coupled with the NRC staff's willingness to summarize the results of routine inspections, combined to make this a safe, thorough, and complete decommissioning.

Observation #3: Community Advisory Panels will not be much more than window dressing unless all participants are open to advice and criticism.

Over the life of our Community Advisory Panel, the leadership of Maine Yankee, the office of the State Nuclear Inspector, and the NRC all made decisions based on information heard or questions raised at our panel meetings.

When the noise of fans installed to cool the spent fuel pool brought angry, sleep-deprived neighbors to tears at a hastily called special meeting of the advisory panel, Maine Yankee's president promised an overnight fix – to the chagrin of his engineers who said it couldn't be done for two months.

When the NRC was asked to make regular reports to a Community Advisory Panel with no authority and little collective expertise in nuclear matters, regional directors said "yes" on the spot. When later our panel insisted that the Environmental Protection Agency and the NRC review and discuss their differing approaches to setting regulatory limits for safety before an audience in Wiscasset, they both agreed on the spot.

Perhaps most poignantly, when the state nuclear safety inspector complained openly at one of our last meetings that he was not getting the support of the company to fulfill Maine's legislated standards for clean-up, the company president resolved, on the spot, to address the situation. The conflict upset the normal, congenial atmosphere of our meetings, yet it led to the successful resolution of an otherwise intractable problem.

In summary...

Community Advisory Panels provide an important window for the public in the process of decommissioning, and provide the opportunity for issues of local concern to be addressed both within and without the strict process defined by the regulations. As a result, in our decommissioning, a level of trust was gained that had evaded Maine Yankee for the previous 24 years of operation.