



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON NUCLEAR WASTE AND MATERIALS
WASHINGTON, D.C. 20555-0001**

February 28, 2008

The Honorable Dale E. Klein
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: NRC DECOMMISSIONING REQUIREMENTS AND GUIDANCE

Dear Chairman Klein:

The Advisory Committee on Nuclear Waste and Materials (the Committee) has closely examined specific decommissioning topics and the regulatory approach of the NRC staff to license termination since the promulgation of the License Termination Rule (LTR) in 1997. The Committee first heard a staff briefing on the development of guidance to implement the LTR at its 99th meeting in March 1998. The enclosed table shows the activities of the Committee on decommissioning since that March 1998 meeting.

Following both the January 11 and December 14, 2006, Committee briefings to the Commission, the Commission issued staff requirements memoranda (SRM) that directed the Committee to study and report on specific decommissioning technical issues. In particular, the February 9, 2006, SRM¹ (SRM-M060111B), resulting from the January 11, 2006, briefing, included the following direction to the Committee:

The Committee should review best practices in decommissioning to look for ways to improve the design and construction of reactor and materials facilities that would lead to less environmental impact and more efficient decommissioning.

The Committee conducted several activities, summarized below, to address this requirement in SRM-M060111B.

At the Committee's 170th meeting (May 2006), the Committee's working group on low-level waste management heard a briefing on decommissioning experiences with disposal of low-level waste. The Committee documented the results of the working group in NUREG-1853, "Framework of Commercial Low-Level Radioactive Waste Management in the United States," issued August 2007, and issued a letter report² to the Commission on August 16, 2006.

¹ Memorandum to John T. Larkins, Executive Director, Advisory Committee on Reactor Safeguards/Advisory Committee on Nuclear Waste (ACRS/ACNW), from Andrew Bates, Acting Secretary, "Staff Requirements—Meeting with Advisory Committee on Nuclear Waste (ACNW), 2:00 p.m., Wednesday, January 11, 2006, Commissioners' Conference Room, One White Flint North, Rockville, Maryland," SRM-M060111B, February 9, 2006.

² Letter Report, Michael T. Ryan, Advisory Committee on Nuclear Waste, to Dale E. Klein, Chairman, U.S. Nuclear Regulatory Commission, "Observations from the ACNW Low-Level Waste Working Group Meeting of May 23–24, 2006," August 16, 2006.

At the Committee's 172nd meeting (July 2006), the staff briefed the Committee on its preliminary plans for a rulemaking intended to prevent decommissioning legacy sites. Following this briefing, the Committee sent a letter report³ to the Commission dated October 17, 2006.

The Committee held a working group on decommissioning lessons learned during its 174th meeting (November 2006), after which it sent a letter report⁴ to the Commission dated January 8, 2007.

At the Committee's 176th meeting (February 2007), the Committee heard a briefing from NRC staff on decommissioning lessons learned that were presented and discussed at the International Atomic Energy Agency Conference, "Lessons Learned from the Decommissioning of Nuclear Facilities and the Safe Termination of Nuclear Activities," held in Athens, Greece, in December 2006.

The 180th meeting (June 2007) of the Committee included a working group on implementation of Title 10, Section 20.1406, "Minimization of Contamination," of the *Code of Federal Regulations* (10 CFR 20.1406). As part of this working group session, the Committee heard a presentation from the staff on Draft Regulatory Guide 4012 (DG-4012), "Minimization of Contamination and Radioactive Waste Generation in Support of Decommissioning." The Committee wrote a letter report⁵ to the Commission dated June 28, 2007, providing observations and recommendations on DG-4012.

The Executive Director for Operations (EDO) wrote an August 7, 2007, response⁶ to the Committee explaining the revisions to DG-4012 made by the staff to address the Committee's recommendations. The staff issued DG-4012⁷ for public comment on August 21, 2007.

The Committee reviewed the August 7, 2007, EDO letter and DG-4012 issued for public comment and issued another letter report⁸ on DG-4012, dated November 27, 2007, responding to the August 7, 2007, EDO letter to the Committee and the revisions by the staff to address the

³ Letter Report, Michael T. Ryan, Advisory Committee on Nuclear Waste, to Dale E. Klein, Chairman, U.S. Nuclear Regulatory Commission, "Prevention of Legacy Sites," October 17, 2006.

⁴ Letter Report, Michael T. Ryan, Advisory Committee on Nuclear Waste, to Dale E. Klein, Chairman, U.S. Nuclear Regulatory Commission, "Working Group Meeting on Decommissioning Lessons Learned," January 8, 2007.

⁵ Letter Report, Michael T. Ryan, Advisory Committee on Nuclear Waste and Materials, to Dale E. Klein, Chairman, U.S. Nuclear Regulatory Commission, "Working Group Meeting on 10 CFR 20.1406, 'Minimization of Contamination,' and Draft Regulatory Guide 4012," June 28, 2007.

⁶ Letter, Luis A. Reyes, U.S. Nuclear Regulatory Commission, to Michael T. Ryan, Advisory Committee on Nuclear Waste and Materials, "Working Group Recommendations on Draft Regulatory Guide 4012 Regarding Implementation of 10 CFR 20.1406, 'Minimization of Contamination,'" August 7, 2007.

⁷ U.S. Nuclear Regulatory Commission, Draft Regulatory Guide DG-4012, "Minimization of Contamination and Radioactive Waste Generation—Life-Cycle Planning," issued for public comment, August 21, 2007 (72 FR 41794).

⁸ Letter Report, Michael T. Ryan, Advisory Committee on Nuclear Waste and Materials, to Dale E. Klein, Chairman, U.S. Nuclear Regulatory Commission, "Review of Draft Regulatory Guide 4012," November 27, 2007.

Committee's recommendations. The EDO responded⁹ to the second Committee letter report on DG-4012 on January 14, 2008.

In August 2007, the Committee visited the Three Mile Island Nuclear Generating Station in Middleburg, Pennsylvania, and the Westinghouse Hematite Facility in Festus, Missouri. The purpose of the visits was to learn first hand the important lessons and challenges in decommissioning NRC-licensed facilities.

At the Committee's 183rd meeting (October 2007), the staff provided a briefing on the proposed rulemaking for prevention of legacy sites, recently renamed, "Decommissioning Planning." The Committee wrote a letter report¹⁰ on the proposed rulemaking dated November 20, 2007. The Commission directed staff to address the Committee's recommendation in a new 10 CFR 20.1406 rulemaking in SRM-SECY-07-0177,¹¹ dated December 10, 2007.

In three different Committee meetings (the 175th meeting in December 2006, 178th meeting in April 2007, and 179th meeting in May 2007), the Committee heard presentations on revisions to chapters related to waste management (Chapters 11.2 through 11.5) of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," issued March 2007 (hereafter referred to as the SRP) for operating license applications for new nuclear power plants that include newer designs. Each of these three briefings involved discussion of the inclusion of 10 CFR 20.1406 as an acceptance criterion in the SRP chapters, as well as SRP guidance on how an NRC reviewer determines that the requirement to minimize contamination at the time of decommissioning is being met. The Committee wrote a letter report¹² to the Commission on the SRP chapters on August 1, 2007.

OBSERVATIONS

The Committee believes that it has a comprehensive understanding of the decommissioning activities conducted by the NRC staff and the regulatory requirements and guidance under the LTR. The Committee thanks the staff for involving the Committee early in the deliberative process.

The Committee believes the inclusion in 10 CFR 20.1406 of requirements for licensees to remediate residual radioactive contaminated areas, as required by SRM-SECY-07-0177, will minimize environmental impact and reduce the number of legacy sites. The improvements being made in DG-4012, which is currently out for public comment, are an excellent start to

⁹ Letter, Luis A. Reyes, U.S. Nuclear Regulatory Commission, to Michael T. Ryan, Advisory Committee on Nuclear Waste and Materials, "Draft Regulatory Guide 4012 Regarding Implementation of 10 CFR 20.1406, 'Minimization of Contamination,'" January 14, 2008.

¹⁰ Letter Report, Michael T. Ryan, Advisory Committee on Nuclear Waste and Materials, to Dale E. Klein, Chairman, U.S. Nuclear Regulatory Commission, "Proposed Rulemaking to Prevent Legacy Sites," November 20, 2007.

¹¹ Memorandum to Luis A. Reyes, Executive Director for Operations, from Annette L. Vietti-Cook, Secretary, "Staff Requirements—SECY-07-0177—Proposed Rule: Decommissioning Planning (10 CFR Parts 20, 30, 40, 50, 70, and 72; RIN: 3150-AH45)," SRM-SECY-07-0177, December 10, 2007.

¹² Letter Report, Michael T. Ryan, Advisory Committee on Nuclear Waste and Materials, to Dale E. Klein, Chairman, U.S. Nuclear Regulatory Commission, "Chapters 11.2 through 11.5 of NUREG-0800, 'Standard Review Plan (SRP) for the Review of Safety Analysis Reports for Nuclear Power Plants,'" August 1, 2007.

incorporating design and operational considerations for decommissioning into NRC guidance documents.

The nuclear power reactor SRP for the newly designed facilities does not yet include the guidance in DG-4012, because the staff completed the SRP revisions before it developed DG-4012. The Committee also observes that to date neither the nuclear power plant licensees nor the NRC staff have experience in implementing 10 CFR 20.1406.

The Committee believes that guidance similar to that in DG-4012 is required in the SRPs for other types of NRC-licensed facilities, especially those where complex nuclear material handling and processing activities are conducted (e.g., fuel fabrication and nuclear fuel reprocessing facilities) in order to prevent decommissioning legacy sites.

RECOMMENDATIONS

The Committee recommends that the staff revise DG-4012 to include additional guidance for all licensees regarding the revisions to 10 CFR 20.1406 to include remediation of spills and leaks.

The Committee recommends that the staff include additional guidance in the SRP for review of the design and operation of systems, structures, and components for new nuclear power reactors to enable the staff to make a finding that the new designs for reactors meet the requirements of 10 CFR 20.1406.

Sincerely,

/RA/

Michael T. Ryan
Chairman

Enclosure:
Table of Decommissioning Activities of the Committee

incorporating design and operational considerations for decommissioning into NRC guidance documents.

The nuclear power reactor SRP for the newly designed facilities does not yet include the guidance in DG-4012, because the staff completed the SRP revisions before it developed DG-4012. The Committee also observes that to date neither the nuclear power plant licensees nor the NRC staff have experience in implementing 10 CFR 20.1406.

The Committee believes that guidance similar to that in DG-4012 is required in the SRPs for other types of NRC-licensed facilities, especially those where complex nuclear material handling and processing activities are conducted (e.g., fuel fabrication and nuclear fuel reprocessing facilities) in order to prevent decommissioning legacy sites.

RECOMMENDATIONS

The Committee recommends that the staff revise DG-4012 to include additional guidance for all licensees regarding the revisions to 10 CFR 20.1406 to include remediation of spills and leaks.

The Committee recommends that the staff include additional guidance in the SRP for review of the design and operation of systems, structures, and components for new nuclear power reactors to enable the staff to make a finding that the new designs for reactors meet the requirements of 10 CFR 20.1406.

Sincerely,

/RA/

Michael T. Ryan
Chairman

Enclosure:
Table of Decommissioning Activities of the Committee

Distribution:

RidsSecyMailCenter	RidsEDOMailCenter	RidsNRROD	
RidsNMSSOD	RidsFSMEOD	RidsOCAMailCenter	
RidsNSIROD	RidsRESOD	RidsNROOD	
RidsOIGMailCenter	RidsOGCMailCenter	RidsASLBPMailCenter	
RidsOCAAMailCenter	RidsOPAMailCenter	RidsRGN1MailCenter	
RidsRGN2MailCenter	RidsRGN3MailCenter	RidsRGN4MailCenter	
BChamp ABates JPerry MLee	CLBrown NColeman YDiaz-Sanabria LHamdan VMurphy	JFlack CJaegers DPelton ADias SChey	SMcKelvin LMike PTressler SJones DWidmayer

ADAMS ML080450211

OFFICE	ACNW&M	SUNSI	ACNW&M	ACNW&M	ACNW&M
NAME	DWidmayer	DWidmayer	ADias	FPGillespie /Santos For/	FPG for MTR /Santos For/
DATE	02/27/08	02/27/08	02/28/08	02/28/08	02/28/08

Committee Activities on Decommissioning Topics*
[with associated Committee Letter Reports (when issued)]

<u>CMT Mtg #</u>	<u>Date</u>	<u>Title of Briefing or Working Group</u> <u>[Title of Committee Letter Report (Date of Letter)]</u>
185th	Dec. 2007	Briefing on Tritium Task Force Actions To Revise the Significance Determination Process (SDP) To Address Spills and Leaks. [†]
183rd	Oct. 2007	Briefing on Mallinckrodt Site Decommissioning Plan. <hr/> Briefing on Draft Proposed Rule/Guidance on Prevention of Legacy Sites. <hr/> [Letter Report Issued: Proposed Rulemaking To Prevent Legacy Sites. (November 20, 2007)] <hr/> [Letter Report Issued: Review of Draft Regulatory Guide 4012. (November 27, 2007)]
-----	Aug. 2007	Visits to Reactor (Three Mile Island), which included Licensee Briefing on Tritium Task Force Activities [†] , and Complex Materials Site (Westinghouse Hematite) for Decommissioning Lessons Learned.
180th	June 2007	Working Group Meeting on Implementation of 10 CFR 20.1406. [Letter Report Issued: Working Group Meeting on Implementation of 10 CFR 20.1406, "Minimization of Contamination," and Proposed Regulatory Guide 4012. (June 28, 2007)]
178th	April 2007	Briefing on Update of West Valley Draft Environmental Impact Statement.
177th	March 2007	Briefing on Shieldalloy, New Jersey, Site Decommissioning Plan.
176th	Feb. 2007	Briefing on International Conference on Decommissioning.
174th	Nov. 2006	Briefing on Results from the Liquid Radioactive Release Lessons Learned Task Force. [†] Working Group Meeting on Decommissioning Lessons Learned. [Letter Report Issued: Working Group Meeting on Decommissioning Lessons Learned. (January 8, 2007)]
173rd	Sept. 2006	Working Group Meeting on Using Monitoring To Build Model Confidence. [Letter Report Issued: Working Group Meeting on Using Monitoring To Build Model Confidence. (December 27, 2006)]
172nd	July 2006	Briefing on Preliminary Plans for Legacy Site Rulemaking. [Letter Report Issued: Prevention of Legacy Sites. (October 17, 2006)]
170th	May 2006	Briefing on Low-Level Waste Definitions and Decommissioning Experience

Committee Activities on Decommissioning Topics*
[with associated Committee Letter Reports (when issued)]

<u>CMT Mtg #</u>	<u>Date</u>	<u>Title of Briefing or Working Group</u> <u>[Title of Committee Letter Report (Date of Letter)]</u>
		(Part of Working Group Meeting on Low-Level Waste Management Issues). [Letter Report Issued: Observations from the ACNW Low-Level Waste Working Group Meeting of May 23–24, 2006. (August 16, 2007)]
168th	May 2006	2nd Working Group on License Termination Rule Guidance Revisions. [Letter Report Issued: Revised Decommissioning Guidance to Implement the License Termination Rule. (June 9, 2006)]
164th	Oct. 2005	Working Group Meeting on the Application of the Commission’s Final Policy Statement on Decommissioning Criteria for the West Valley Demonstration Project. [Letter Report Issued: West Valley Demonstration Project (WVDP)—ACNW Working Group Meeting. (December 23, 2005)]
160th	June 2005	Working Group Meeting on License Termination Rule Draft Guidance Revisions. [Letter Report Issued: Draft Revised Decommissioning Guidance to Implement the License Termination Rule. (August 12, 2005)]
-----	April 2005	Participated in Office of Nuclear Material Safety and Safeguards (NMSS) Decommissioning Workshop.
152nd	July 2004	Briefing on License Termination Rule Analysis—Intentional Mixing of Contaminated Soil. [Letter Report Issued: Review the LTR Analysis—Intentional Mixing of Contaminated Soil. (July 30, 2004)]
149th	April 2004	Briefing on Update on West Valley and Performance Assessment Plans. [Letter Report Issued: Decommissioning the West Valley Site and the Application of Performance Assessment to Demonstrate Compliance with the License Termination Rule. (June 9, 2004)]
142nd	May 2003	Briefing on License Termination Rule Analysis.
140th	March 2003	Briefing on NRC/EPA Memorandum of Understanding Related to Decommissioning and Decontamination of Contaminated Sites.
135th	June 2002	Briefing on Entombment Option for Decommissioning Power Reactors.

Committee Activities on Decommissioning Topics*
[with associated Committee Letter Reports (when issued)]

<u>CMT Mtg #</u>	<u>Date</u>	<u>Title of Briefing or Working Group</u> <u>[Title of Committee Letter Report (Date of Letter)]</u>
125th	March 2001	Briefing on Partial Release of a Reactor Facility or Site for Unrestricted Use. <hr/> Briefing on License Termination Plan Review—Lessons Learned.
-----	Jan. 2001	Joint ACRS/ACNW Working Group on Risk-Informed Regulation Briefing on Status of Risk-Informed Regulatory Activities in NMSS and the NMSS Risk Task Group. <u>[Letter Report Issued: Risk-Informed, Performance-Based Regulation of Waste Management and Decommissioning. (June 29, 2001)]</u>
124th	Jan. 2001	Briefing on Entombment Option for Decommissioning Power Reactors. <u>[Letter Report Issued: Advisory Committee on Nuclear Waste Comments on Entombment. (May 24, 2001)]</u> <hr/> Briefing on Institutional Control Status.
122nd	Oct. 2000	Briefing on Entombment Option for Decommissioning Power Reactors. <u>[Letter Report Issued: (See 124th meeting)]</u> <hr/> Briefing on West Valley License Termination Report. <u>[Letter Report Issued: Comments on NRC Draft Policy Statement on Decommissioning Criteria for the West Valley Demonstration Project and West Valley Site. (November 1, 2000)]</u>
120th	July 2000	Briefing on Status of the NRC's Decommissioning Program.
119th	June 2000	Briefing on West Valley Policy. <u>[Letter Report Issued: (See 122nd meeting)]</u>
114th	Nov. 1999	Briefing on Rubblization. <u>[Letter Report Issued: Rubblization—A Decommissioning Option. (January 24, 2000)]</u>
112th	Sept. 1999	Briefings on Decommissioning Standard Review Plan Status and Dose Modeling. <hr/> Briefing on Division of Waste Management Operating Plan Overview for Decommissioning Program.

Committee Activities on Decommissioning Topics*
[with associated Committee Letter Reports (when issued)]

<u>CMT Mtg #</u>	<u>Date</u>	<u>Title of Briefing or Working Group</u> <u>[Title of Committee Letter Report (Date of Letter)]</u>
109th	May 1999	Joint ACRS/ACNW Working Group on Risk-Informed Regulation. [Letter Report Issued: (See January 2001 Joint ACRS/ACNW Working Group on Risk-Informed Regulation)]
108th	March 1999	Briefing on Decommissioning Standard Review Plan Status.
105th	Dec. 1998	Briefing on Overview of the Staff's Decommissioning Plans for Fiscal Year 1999. [Letter Report Issued: Development of a Standard Review Plan for Decommissioning. (January 11, 1999)]
103rd	Aug. 1998	Briefing on Input Parameters to Decommissioning Dose Models. [Letter Report Issued: (See 105th meeting)]
102nd	July 1998	Briefing on Decommissioning Standard Review Plan. [Letter Report Issued: (See 105th meeting)]
99th	March 1998	Briefing on Decommissioning Guidance.

* Includes Committee working groups, joint Advisory Committee on Nuclear Waste/Advisory Committee on Reactor Safety (ACNW/ACRS) working groups, and Committee participation in NRC program office workshops.

† Activity associated with Tritium Task Force Report and staff/industry initiatives in response to the report.