

APPENDIX TO POWER REACTOR TRANSITION FROM OPERATIONS TO DECOMMISSIONING LESSONS LEARNED REPORT

1. LICENSING TOPICS

1.1 Decommissioning Planning

1.1.1. Post-Shutdown Decommissioning Activities Report

Requirements

Title 10 of the *Code of Federal Regulations* (10 CFR) 50.82(a)(4)(i) specifies the requirements regarding the contents of the post-shutdown decommissioning activities report (PSDAR).

The regulation in 10 CFR 50.82(a)(4)(ii) specifies the requirements regarding the notice of receipt of the PSDAR and opportunities to make the PSDAR available for public comment, including the required public meeting in the vicinity of the facility.

Type of Action

Prior to or within 2 years following permanent cessation of operations, the licensee must submit the PSDAR to the U.S. Nuclear Regulatory Commission (NRC). The NRC staff issues a closeout letter to the licensee documenting the results of the NRC staff's review—but not regulatory approval—of the contents of the PSDAR with respect to the requirements of 10 CFR 50.82(a)(4).

For the review of the PSDAR, the project manager (PM) should consult with the following branches (and others as necessary, based on the submittal) early in the process to determine if safety evaluation input or concurrence is required:

- Financial Analysis and International Projects Branch (NRR/DIRS/IFIB)
- Environmental Review and Project Management Branch (NRR/DLR/RERB)
- Reactor Decommissioning Branch (NMSS/DUWP/RDB)
- Regional Division of Nuclear Materials Safety (DNMS)

In addition, the PM may need to consult with additional branches in the Office of Nuclear Reactor Regulation (NRR) or other offices as the PM considers specific comments on the PSDAR provided by members of the public and other stakeholders.

Discussion

In accordance with 10 CFR 50.82(a)(4), licensees are required to submit a report that contains a description of the planned decommissioning activities along with the schedule for their accomplishment, a discussion of the reasons for concluding that the environmental impacts associated with site-specific decommissioning activities will be bounded by the previously issued environmental impact statement (EIS), and a site-specific decommissioning cost estimate (DCE), including the projected cost of managing irradiated fuel. The regulation at

10 CFR 50.82(a)(5) stipulates that licensees shall not perform “major decommissioning activities,” as that phrase is defined in 10 CFR 50.2, “Definitions,” until 90 days after the NRC has received the PSDAR and until the certifications required under 10 CFR 50.82(a)(1) have been submitted. In addition, release of funds from the decommissioning trust fund (DTF) beyond the 3 percent allowed for decommissioning planning is restricted until the PSDAR is received by the NRC. When performing changes allowed under 10 CFR 50.59, “Changes, Tests, and Experiments,” the licensee is required to notify the NRC and the affected States before performing any decommissioning activity inconsistent with, or that would result in a significant schedule change from, those actions described in the PSDAR.

The NRC staff is required to notice the PSDAR in the *Federal Register* (FR) and make it available for public comment. In addition, the staff is required to hold a public meeting in the vicinity of the site. Although the staff does perform a review of the PSDAR’s content against the requirements in 10 CFR 50.82(a)(4)(i), the regulations do not require that the NRC staff approve the licensee’s PSDAR.

The NRC staff review compares the content of the PSDAR with the requirements of 10 CFR 50.82(a)(4)(i). Technical experts from the Office of Nuclear Material Safety and Safeguards (NMSS), NRR/Division of Inspection and Regional Support (DIRS)/IFIB, NRR/Division of License Renewal (DLR)/RERB, and the appropriate regional inspection staff perform the technical review of the PSDAR. If the NRC staff cannot determine whether the PSDAR meets the requirements, they would issue a letter to the licensee with questions related to the specific requirements. Public comments received at the public meeting and in response to the *Federal Register* notice (FRN) are shared with the technical reviewers for their consideration during their review of the PSDAR. The PSDAR closeout letter is then issued as soon as practical following the completion of the staff’s review. Examples of PSDAR review closeout letters are included as references to this section (References 1, 2, and 3). Some technical reviewers may provide safety evaluation (SE) inputs following their reviews of the PSDAR. It is at the project manager’s (PM’s) discretion how to incorporate the staff’s findings into the closeout letter. Guidance on the staff’s review of the PSDAR is in Regulatory Guide (RG) 1.185, “Standard Format and Content for Post-Shutdown Decommissioning Activities Report” (Reference 7). It is also important that the staff’s review confirm that environmental considerations in the PSDAR are bounded by the Generic Environmental Impact Statement in NUREG-0586 (Reference 8).

Any decommissioning activities that could preclude release of the site for possible unrestricted use, impact a reasonable assurance finding that adequate funds will be available for decommissioning, or potentially result in a significant environmental impact not previously reviewed must receive prior NRC approval. Specifically, the licensee is required to submit a license amendment request (LAR) for NRC review and approval, which provides an opportunity for public comment and a public hearing. Unless the NRC staff approves the LAR, the licensee is not permitted to conduct the requested activity.

Managing the review of the PSDAR can be challenging. The NRC staff may have a short timeframe (i.e., 90 days) in which to review the PSDAR to ensure it meets the requirements of 10 CFR 50.82(a)(4)(i) before the licensee is authorized to perform major decommissioning activities and have access to funds within the DTF. The NRC staff informs the licensee within this 90-day period when its review identifies concerns with the proposed PSDAR. The NRC staff should notice the PSDAR in the FR, conduct the public meeting, perform an initial review,

and communicate questions and comments on the licensee's PSDAR during this timeframe (References 4, 5, and 6). As NRC approval is not required, the PSDAR closeout letter does not have to be issued within this timeframe, but should be issued as soon as practical following the completion of the staff's review.

Lessons Learned

The following lessons were aggregated based on the experience of the most recent PSDAR reviews. These lessons represent the sequence of licensing actions in which the receipt of the PSDAR starts the 90-day period, after which time the licensee can begin performing major decommissioning activities (when the PSDAR is submitted after the § 50.82(a)(1) certifications).

Noticing the PSDAR and Public Meeting

- **Prior to PSDAR submission**

Given the uncertainty associated with the submittal date and the associated 90-day timeframe, the PM should:

- maintain close communications with the licensee concerning the timing of the PSDAR submittal;
- prepare a draft FRN package in anticipation of the licensee's submittal. The FRN will request comments and notify the public about the date, time, and location of the public meeting (Reference 4); and
- contact the appropriate regional Office of Public Affairs (OPA) representative to determine which newspapers should be used to notice the meeting.

- **Subsequent to PSDAR submission, the PM should:**

- consult with NRR and NMSS managers, regional counterparts, and the licensee about the date to hold the public meeting. The target date for the meeting should be approximately 30 days after receipt of the PSDAR. The DORL PM should coordinate with their NMSS counterparts for assistance in the planning and implementation of the PSDAR public meeting;
- contact the local newspaper legal notice department to get cost and schedule information (i.e., determine how far in advance the notice must be sent to the paper to allow the notice to appear on the correct date). Prepare the newspaper notice (see Template d, in the References section below). Payment for newspaper advertisements is coordinated through NRR;
- contact appropriately sized meeting venues in the vicinity of the reactor site to hold the public meeting. If there is uncertainty about the size of the venue, consult with the regional management and licensee about the anticipated public participation at this meeting. Consult with the licensee and the regional OPA representative about appropriate facilities to hold the public meeting. Note:

availability of adequate free parking for the meeting attendees should be considered when selecting a venue;

- contact the Office of Administration (ADM) if the cost of the facility (including room fee, audiovisual (AV) equipment, telephone, and internet connection fees) is expected to exceed the maximum allowed under office petty cash limits;
- consider conducting a separate government-to-government meeting with any community engagement panels established to enhance communications about decommissioning with the public. These meetings should be coordinated through NMSS;
- as required, submit requests for an NRC facilitator, contract transcription services, and security (local law enforcement) early in the meeting planning phase; and
- issue the FRN package as soon as practical upon receipt of the PSDAR to give the public the maximum time to review the information. In addition, add the meeting to the NRC's public meeting notification system (References 5 and 6).
Note: The content in Reference 5 (the meeting notice) is sufficient; however, this notice was issued prior to the updated NRC Public Meeting System.

PSDAR Work Planning

- Upon receipt of the PSDAR, request a Cost Activity Code (CAC) number for the review.
- Include NMSS, NRR/DIRS/IFIB, NRR/DLR/RERB, and appropriate regional decommissioning inspection staff in the review. Due to the short turnaround, be sure to alert reviewers to the compressed schedule. When establishing the review schedule, the PM should be aware that licensee responses to requests for additional information (RAIs) could affect the ability of the NRC staff to complete its review of the PSDAR before the licensee's 90-day waiting period (for commencing major decommissioning activities) has expired, and thus, should schedule accordingly. This will give the NRC staff the opportunity to communicate with the licensee if there are any concerns about the content of the PSDAR before the licensee begins any major decommissioning activities.

PSDAR Public Meeting

- Finalizing Meeting Preparations—after completing the meeting logistics discussed above:
 - Conduct a pre-meeting/dry run with the NRC presenters and NRC staff to ensure the appropriateness of content and flow of the meeting.
 - Prepare hard copies of the PSDAR and have electronic copies (compact discs) prepared by ADM (reproduction) for distribution at the meeting.

- Meeting Followup:
 - Upon completion of the meeting and submission of the transcript, have the meeting speakers review the transcript for errors, and ensure a raw version of the transcript and an edited version (if required for accuracy) are added to the Agencywide Documents Access and Management System (ADAMS). All versions should be made publicly available.
 - If the meeting was video-recorded, provide a copy of the recording to the NRC's Administrative Service Center (ADM/DAS/ASC/ASMCT) and request that the recording be placed on the NRC's public Web site. Note: Video recordings to be placed on the NRC public Web site must be closed captioned.

PSDAR Review Documentation

- The PM should document the results of the NRC staff's review in a letter to the licensee. The four areas of review (i.e., planned activities, schedule, cost, and environmental statement) should be addressed in the letter (References 1, 2, and 3).
- Public comments received at the public meeting and through the FRN process are collected by the PM and considered by the cognizant technical staff during the review of the PSDAR. The comments will not be individually addressed in the closeout documentation prepared by the NRC staff. The PM should summarize the comments in the closeout letter, generally listing those comments that were considered by the NRC staff and those that were found to be outside the regulatory purview or outside the scope of the review, and thus, not considered. The letter may include the basis for not considering some public comments (i.e., the reason they were not within the scope of the review) during the NRC staff review.
- Conclude that the PSDAR meets the content requirements of 10 CFR 50.82, "Termination of License," as appropriate; however, the NRC staff does not formally "approve" the PSDAR.

Recommendations

As part of the update to NRR Office Instruction (OI) COM-101, "NRR Interfaces with NMSS," specifically related to communications and planning, the NRC staff should proceduralize planning discussions with the licensee related to the sequencing of the PSDAR submittal and the 10 CFR 50.82 certifications and the 90-day timeframe for initiating decommissioning activities, which starts after the PSDAR and the certifications are submitted. Furthermore, this discussion should explain the expectation that the required NRC noticing and holding a public meeting on the PSDAR and the conduct of an initial review of the PSDAR should occur prior to the licensee's initiating decommissioning activities. The NRC should encourage the licensee to submit the PSDAR in advance of its 10 CFR 50.82 certifications. As a result, the NRC would not be constrained to hold the public meeting nor complete an initial review within 90 days of the receipt of the PSDAR.

If the licensee plans to submit the PSDAR after the 10 CFR 50.82 certifications, then the NRC staff should have a good understanding of when the application will be provided. Submittal of the PSDAR after 10 CFR 50.82 certifications will result in a much more compressed timeframe for organizing and conducting the associated PSDAR public meeting.

As part of the planned integrated reactor decommissioning rulemaking, the NRC staff is considering revisions to 10 CFR 50.82 that could:

- change the review process for the PSDAR
- clarify whether the DCE must be submitted with the PSDAR, or that the PSDAR is not considered complete until the site-specific DCE is submitted (i.e., the documents can be submitted separately and at different times) (see 10 CFR 50.82(a)(4)(i) and 10 CFR 50.82(a)(8)(ii))

References

1. Wengert, Thomas J., U.S. Nuclear Regulatory Commission, letter to Mr. Thomas J. Palmisano, Southern California Edison Company, San Onofre Nuclear Generating Station Units 2 and 3—Review of Post-Shutdown Decommissioning Activities Report (TAC Nos. MF4892 and MF4893), August 20, 2015, ADAMS Accession No. ML15204A383 (closeout letter example).
2. Orenak, Michael D., U.S. Nuclear Regulatory Commission, letter to Mr. Terry D. Hobbs, Crystal River Nuclear Plant, Crystal River Unit 3 Nuclear Generating Plant Post-Shutdown Decommissioning Activities Report, March 11, 2015, ADAMS Accession No. ML14321A751 (closeout letter example).
3. Wengert, Thomas J., U.S. Nuclear Regulatory Commission, letter to Mr. David A. Heacock, Dominion Energy Kewaunee, Inc., Kewaunee Power Station—Post-Shutdown Decommissioning Activities Report (TAC MF1045), April 10, 2015, ADAMS Accession No. ML15036A528 (closeout letter example).
4. U.S. Nuclear Regulatory Commission, Notice of receipt, availability, public meeting, and request for public comment, “Duke Energy Florida, Inc., Crystal River Unit 3 Nuclear Generating Plant Post-Shutdown Decommissioning Activities Report,” *Federal Register*, Vol. 78, No. 251, December 31, 2013, pp. 79709–79710.
5. Gratton, Christopher, U.S. Nuclear Regulatory Commission, memorandum to Douglas Broadus, Forthcoming Meeting in the City of Crystal River, Florida, To Discuss and Accept Public Comments regarding the Crystal River Unit 3 Nuclear Generating Station Post-Shutdown Decommissioning Activities Report (PSDAR), December 18, 2013, ADAMS Accession No. ML13350A400.

6. Gratton, C., U.S. Nuclear Regulatory Commission, letter to Mr. Terry Hobbs, Crystal River Nuclear Plant, Crystal River Unit 3—Notification of the Availability of the Post-Shutdown Activity Report in the *Federal Register*, December 23, 2013, ADAMS Accession No. ML13339A660 (transmittal Letter for the Crystal River Unit 3 Nuclear Generating Plant (CR-3) FRN). U.S. Nuclear Regulatory Commission, FRN, “Duke Energy Florida, Inc., Crystal River Unit 3 Nuclear Generating Plant Post-Shutdown Decommissioning Activities Report,” notice of receipt, availability, public meeting, and request for public comment, December 22, 2013, ADAMS Accession No. ML13339A664 (CR-3 FRN for public meeting, and transmittal letter).
7. U.S. Nuclear Regulatory Commission, “Standard Format and Content for Post-Shutdown Decommissioning Activities Report,” Regulatory Guide 1.185, June 2013, ADAMS Accession No. ML13140A038.
8. U.S. Nuclear Regulatory Commission, “Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities: Regarding the Decommissioning of Nuclear Power Reactors,” NUREG-0586, Supplement 1, Volume 1: Main Report, Appendices A through M, November 2002, ADAMS Accession No. ML023470304.

Attachment to Section 1.1.1, Supplemental information related to PSDAR meeting

In support of the SONGS, Units 2 and 3, PSDAR meeting, the following planning templates were developed:


(a) PSDAR Activity Checklist

- (1) FRN
- (2) newspaper advertising
- (3) request for security support—Form 876
- (4) request for transcription from digital video disc—Form 30
- (5) contract for facilitator
- (6) request for 2nd facilitator
- (7) compact discs and hard copies of PSDAR
- (8) addition of “confidence monitor” to venue contract—coordinate with NRR/Program Management, Policy Development and Analysis (PMDA) staff
- (9) tables for lobby at venue
- (10) work planning for review of PSDAR
- (11) NRC public meeting notice

- (12) public meeting feedback forms
- (13) meeting comment forms
- (14) multiple copies of NUREG/BR-0521: "Decommissioning Nuclear Power Plants"

SONGS PSDAR Public Meeting Checklist Status				
File Date: 10/17/2014				
Item No.	Description	Action	Status	Remarks
1	Venue/AV Contract	Tom W.	Complete	Omni La Costa/PSAV purchase order in place;
	Contract modification for "confidence monitor"	Tom W.	In progress	Region IV providing AV/IT support at meeting.
2	Noticing			ADM (N. Lamon-Kritikos) adding to P.O.
2a	Federal Register Notice	Jim K.	Complete	79 FR 61668 dtd 10/14/14
2b	NRC Public meeting Notice	Tom W.	Complete	On public website 10/9/14
2c	Newspaper Advertisements	Jim K.	Complete	Purchase orders completed. Will be noticed in SD U-T and OC Register on 10/23 and 10/26.
3	Teleconferencing	---	---	Teleconferencing will not be provided.
4	Request for Security	Tom W.	In progress	Forms 8768 and 877 submitted on 10/7.
5	Request transcription of meeting	Tom W.	Complete	Coordinating with G. Simpler (NRC Security). Need to provide final contact list of NRC staff. Form 857 submitted on 10/6. Provide DVD to Matina Solomakos (ACRS) following meeting, requested via sole source
6	Facilitator	Tom W.	In progress	acquisition. Working with PMDA (N. Valentine) and ADM (V. Whipple/N. Lamon-Krit.).
7	Reprographics/shipping	Marleyana	Shipment In progress	Documents/CDs/supplies shipped to Greg Warner via UPS on 10/17. UPS tracking: 1Z 20X 733 03 5297 4053
8	Public meeting feedback forms	Tom W.	Complete	1Z 20X 733 03 5423 7640
9	Comment cards	Tom W.	Complete	Provided 50 copies to MV on 10/16 for shipment.
10	Sign-in Sheet	Tom W.	Complete	Provided index cards to MV on 10/16 for shipment.
11	NRC Seal	Tom W.	Complete	Provided copies to MV on 10/16 for shipment.
12	Presentation Slides (NRR)	DB/TW	In progress	Greg Warrick will bring seal to meeting. DB provided Rev. 4 to MV on 10/15; TW comments to DB on 10/17

(b) PSDAR Attendance Sheet

<div style="text-align: center;">U.S.NRC United States Nuclear Regulatory Commission <i>Protecting People and the Environment</i></div>				
Public Meeting to Receive Comments on the San Onofre Nuclear Generating Station (SONGS) Post-Shutdown Decommissioning Activities Report (PSDAR)				
Carlsbad, California				
Monday, October 27, 2014				
	First Name	Last Name	Affiliation or Organization	Making Comments? Y or N

(c) PSDAR Meeting Facilitation Scope of Work

U.S. Nuclear Regulatory Commission

San Onofre Nuclear Generating Station, Units 2 and 3

Post-Shutdown Decommissioning Activities Report

Public Meeting Facilitation Services

Statement of Work

A. BACKGROUND

The U.S. Nuclear Regulatory Commission (NRC), Office of Nuclear Reactor Regulation (NRR) will be hosting the San Onofre Nuclear Generating Station (SONGS) Post-Shutdown Decommissioning Activities Report (PSDAR) Public Meeting. These periodic meetings have occurred over the last 2 years within the vicinity of SONGS (San Clemente, CA). Similarly, this year's meeting will provide the general public the opportunity to discuss and comment on the planned SONGS post-shutdown activities. The purpose of this Statement of Work is to contract with a meeting facilitator in support of the upcoming SONGS public meeting, which is scheduled for October 27, 2014.

B. OBJECTIVE

The objective of this contract is to acquire meeting facilitation services from an experienced and qualified contractor.

C. MEETING VENUE AND DATE

The meeting will occur at the Poinsettia Ballroom at the Omni La Costa Resort in Carlsbad, California, for the duration of 1 business day in the evening. The date of the meeting will be October 27, 2014. The scheduled setup for this meeting will occur between 2:00 p.m. and 5:30 p.m. on the date of the meeting. The meeting will occur following the setup between 6:00 p.m. and 9:30 p.m. The facility will be open at 5:30 p.m. for registration/sign-in on the date of the meeting.

D. NUMBER OF ATTENDEES

The venue will be able to host up to approximately 500 attendees. The NRC is anticipating approximately 300–400 people will participate in the public PSDAR meeting at this time. The meeting will consist of individuals from the general public and NRC staff.

The participation rate is only an estimate based on past attendance at similar meetings. The NRC does not warrant the accuracy of these estimates nor will the NRC obligate funds or make up the difference if this estimate is not achieved.

E. MEETING FORMAT

The meeting proper will start approximately 6:00 p.m. and end approximately 9:00 p.m. The first hour of the meeting will consist of PowerPoint presentations by the NRC staff and the SONGS licensee from the stage in the front of the room. The last 2 hours of the meeting will consist of comments from the public and a question-and-answer session between the NRC staff and members of the public. The facilitator will have a hand-held wireless microphone. A second hand-held microphone will be available for meeting attendees to use. The facilitator will moderate and facilitate the dialogue between the NRC staff and the members of the public throughout the meeting. The meeting will be video-recorded, but not webcast or teleconferenced.

F. MEETING SPACE (for Information)

The meeting venue will accommodate up to 500 people in a single room, with multiple rows of theater-style seating. The seats will generally be arranged in a maximum of 5 sections consisting of 12 to 15 seats per row with approximately 10 columns of seats within each section. The aisles will be at least 4 feet wide.

The venue contractor will provide a room arrangement and equipment that includes:

- riser/stage at the front of the room for panel members
 - two sets of tables that can seat four (possibly five) at each table
 - table sets separated and formed into a slight “V” shape
 - four tabletop microphones on each table (minimum of three microphones per table)
- house audio
 - in addition to the six to eight tabletop microphones and podium microphone, two wireless hand-held microphones for meeting facilitators
 - 12-port media/press box connected to an AUX output on the mixer
Note: should be able to mute all audio to the press box when needed
 - speakers to project the audio to the room audience
- house video
 - video camera with audio input capabilities from the house audio mixer, static shot camera of the panel, including the microphone stand for public comment
 - video camera tripod

- riser at the back of the room for a video camera
- camera operator
- Media table for laptop that will be running the PowerPoint presentations
- Projector and large video screen for presentations

The hotel will set up the meeting room (attendee chairs, head tables, staging, AV tech tables, etc.) at least 90 minutes prior to the start of the meeting session and provide final AV equipment testing. The AV contractor will record the meeting, including panel members and audience questioning.

During the meeting session, the hotel will provide pads, pencils, and water service in the meetings room.

G. MEETING SECURITY

The NRC will provide security personnel to monitor the SONGS PSDAR public meeting. The contractor (facilitator) should be willing to cooperate and coordinate with the NRC security personnel, as needed, to ensure the safety and security of both NRC staff and meeting attendees. The contractor shall participate in a security briefing with the NRC staff at 4:00 p.m. on the day of the meeting.

H. DEPOSIT WAIVER

The contractor agrees to waive any advance deposit requirement for the NRC.

I. AMENDING THE CONTRACT

This contract may be amended, in writing, by mutual consent of the parties involved.

(d) PSDAR Newspaper Ad (example)

NRC TO HOST PUBLIC MEETING ON SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2 AND 3, DECOMMISSIONING

The Nuclear Regulatory Commission (NRC) is hosting a public meeting to discuss and receive comments on the decommissioning plans for the San Onofre Nuclear Generating Station (SONGS), Units 2 and 3, on Monday evening, October 27, 2014, from 6 p.m.–9 p.m. at the Omni La Costa, 2100 Costa Del Mar Road, Carlsbad, CA 92009.

The NRC will provide a brief overview of the SONGS Unit 2 and Unit 3 Post-Shutdown Decommissioning Activities Report (PSDAR) submitted by the plant owner, Southern California Edison Company, and then accept public comments.

The PSDAR, which includes a site-specific cost estimate, is available online in two files at ADAMS Package No. ML14272A121 (<http://pbadupws.nrc.gov/docs/ml1427/ml14272A121.html>).

A limited number of hard copies and compact discs of the PSDAR will be available at the meeting. For additional information about the public meeting, contact [the project manager], [301-415-xxxx], or by e-mail at [the project manager@nrc.gov].

1.1.2. Irradiated Fuel Management Program

Requirements

The regulation in 10 CFR 50.54(bb) specifies the requirements for the program by which the licensee intends to manage and provide funding for the management of all irradiated fuel at the reactor following permanent cessation of operation of the reactor until title to the irradiated fuel and possession of the fuel is transferred to the Secretary of Energy for its ultimate disposal in a repository.

The regulation in 10 CFR 50.82(a)(4)(i) specifies the requirements for the PSDAR submittal and the DCE, which includes the projected cost of managing irradiated fuel.

Type of Action

The licensee must submit the irradiated fuel management program (IFMP) to the Commission for review and preliminary approval. If approved, the NRC staff will issue a letter to the licensee, preliminarily approving the IFMP (References 1 and 2).

Discussion

As specified in 10 CFR 50.54(bb), the licensee shall, within 2 years following permanent cessation of operation of the reactor or 5 years before expiration of the reactor operating license, whichever occurs first, submit written notification to the Commission for its review and preliminary approval of its program by which the licensee intends to manage and provide funding for the management of all irradiated fuel at the reactor following permanent cessation of operation of the reactor until title to the irradiated fuel and possession of the fuel is transferred to the Secretary of Energy for its ultimate disposal in a repository. Final Commission review will be undertaken as part of any proceeding for continued licensing under 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," or 10 CFR Part 72, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater than Class C Waste."

As part of the IFMP submittal, the licensee must demonstrate to the NRC that the elected actions will be consistent with NRC requirements for licensed possession of irradiated nuclear fuel and that the actions will be implemented on a timely basis.

The timeframe for the PSDAR/DCE submittal is prior to or within 2 years following permanent cessation of operation. This is consistent with the IFMP submittal timeframe. Additional information on the review of the PSDAR/DCE can be found in Section 1.1.1 of this Appendix.

During implementation, for actions that require NRC authorization, the licensee shall verify in the notification that submittals for such actions have been or will be made to the NRC and shall identify them. A copy of the notification shall be retained by the licensee as a record until

expiration of the reactor operating license. The licensee shall notify the NRC of any significant changes in the proposed waste management program, as described in the initial notification.

Lessons Learned

- The reviews of the IFMP and the PSDAR/DCE are performed separately. Therefore, the NRC staff should ensure consistency between the two reviews since they involve the same financial information and data.
- As stated, in part, in 10 CFR 50.54(bb), “The licensee must demonstrate to the NRC that the elected actions will be consistent with NRC requirements for licensed possession of irradiated nuclear fuel and that the actions will be implemented on a timely basis.” For example, in its evaluation of the licensee’s submittals for SONGS Units 2 and 3, the NRC staff has relied on the selected methods of storage being consistent with those described in the Continued Storage of Spent Nuclear Fuel Rule (79 FR 56238) and NUREG-2157, “Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel,” Volumes 1 and 2, dated September 2014 (Reference 3). These actions must be implemented on a timely basis and should be consistent with the expected timeframe of decommissioning within 60 years.
- The criteria used to evaluate the financial portion of the review were used in previous licensing reviews by the NRC staff but have not been formalized in regulatory guidance.
- While there does not appear to be any anticipated proceeding for continued licensing under 10 CFR Part 50 or 10 CFR Part 72 that would necessitate the need for the NRC staff to provide final Commission review of the IFMP, the staff will still make a “preliminary approval” conclusion, if appropriate. However, it is worth noting that, in accordance with 10 CFR 50.82(a)(8)(vii), licensees of decommissioning plants must submit to the NRC, on an annual basis, a report on the status of its funding for managing irradiated fuel. Further, in accordance with 10 CFR 50.54(bb), such licensees shall notify the NRC of any significant changes to the IFMP. Accordingly, the regulations provide a means of informing the NRC staff of fluctuations in the reported DTF balance and significant changes to the IFMP.
- The NRC staff does not make a regulatory finding surrounding the inclusion of costs for irradiated fuel management as part of the site-specific DCE—other than the demonstration that adequate funds are available to complete the decommissioning of the facility. Therefore, the NRC staff should ensure consistency between the two reviews since they involve the same financial information and data.
- Licensees may request exemptions concerning the use of the DTF for spent fuel management for their plants. If a DTF exemption has been approved by the NRC staff, the staff’s analysis and conclusions should be considered and acknowledged in the staff’s review of the IFMP.

Recommendation

The NRC staff should consider formalizing IFMP review guidance to promote efficiency and regulatory consistency.

References

1. Wengert, Thomas J., U.S. Nuclear Regulatory Commission, letter to Mr. Thomas J. Palmisano, Southern California Edison Company, San Onofre Nuclear Generating Station, Units 2 and 3—Review and Approval of the Irradiated Fuel Management Plan (TAC Nos. MF4894 and MF4895), August 19, 2015, ADAMS Accession No. ML15182A256.
2. Orenak, Michael D., U.S. Nuclear Regulatory Commission, letter to Mr. Terry D. Hobbs, Crystal River Nuclear Plant, Crystal River Unit 3 Nuclear Generating Plant—Review of Spent Fuel Management Program and the Preliminary Decommissioning Cost Estimate (TAC No. ME7831), December 19, 2014, ADAMS Accession No. ML14344A408.
3. U.S. Nuclear Regulatory Commission, “Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel,” NUREG-2157, Volumes 1 and 2, September 2014, ADAMS Accession Nos. ML14196A105 and ML14196A107.

1.2 Financial

1.2.1. Decommissioning Trust Fund

Requirements

The regulations in 10 CFR 50.75, “Reporting and Recordkeeping for Decommissioning Planning,” establish requirements for indicating to the NRC how a licensee will provide reasonable assurance that funds will be available for the decommissioning process.

The regulation in 10 CFR 50.82(a) provides requirements related to the specific decommissioning activities that can be performed following permanent cessation of operations and permanent removal of fuel from the reactor vessel, including that an initial 3 percent of the generic amount, specified in 10 CFR 50.75, may be used for decommissioning planning.

The regulations in 10 CFR 50.2 state, in part, that “Decommission means to remove a facility or site safely from service and reduce residual radioactivity to a level that permits: (1) Release of the property for unrestricted use and termination of the license; or (2) Release of the property under restricted conditions and termination of the license.”

Type of Action

The licensee’s exemption requests relate to the usage of the DTF, including the use of the DTF for spent fuel management and site restoration activities.

Discussion

The Commission's regulations at 10 CFR 50.75 include the reporting requirements for providing reasonable assurance that sufficient funds will be available for the decommissioning process. The regulations at 10 CFR 50.82 contain, in part, requirements on the use of decommissioning funds. Every 2 years, each operating power reactor licensee must report to the NRC the status of the licensee's decommissioning funding to provide assurance to the NRC that the licensee will have sufficient financial resources to accomplish radiological decommissioning. After decommissioning has begun, licensees must annually submit a financial assurance status report to the NRC.

The NRC's authority is limited to ensuring that licensees adequately decommission their facilities with respect to cleanup and removal of radioactive material prior to license termination. Licensees must use the radiological DTFs that are under NRC jurisdiction for activities directly related to radiological decontamination or dismantlement of the facility or site. Under 10 CFR 50.2 and 50.82(a)(8), a licensee cannot use radiological DTFs for activities that are not part of removing a facility or site safely from service and reducing residual radioactivity to a level that permits: (1) release of the property for unrestricted use and termination of the license or (2) release of the property under restricted conditions and termination of the license. As explained, in part, in RG 1.184, "Decommissioning of Nuclear Power Reactors" (Reference 1):

[F]unds collected and set aside in the decommissioning trust for decommissioning are exclusively for radiological decommissioning as defined in 10 CFR 50.2. Therefore, the amount set aside for radiological decommissioning, as required by 10 CFR 50.75, should not be used for: (1) the maintenance and storage of spent fuel in the spent fuel pool, (2) the design, construction, or decommissioning of spent fuel dry storage facilities directly related to permanent disposal, (3) other activities not directly related to radiological decontamination, or dismantlement of the facility or site.

Thus, radiological decommissioning funds cannot be directly used for spent fuel management, greenfield, or any costs other than radiological decommissioning costs, decommissioning planning costs and ordinary administrative costs of maintaining the fund (see 10 CFR 50.75(h)(1)(iv) and (2)). In addition, radiological decommissioning funds cannot be used to pay for exemption requests seeking to use funds in the decommissioning trust for spent fuel management or emergency planning (EP). This is because neither spent fuel management nor EP is directly related to decommissioning, as defined above.

However, there has been a need to better define "legitimate decommissioning activities," especially in the context of 10 CFR 50.82(a)(8)(ii), which allows for 3 percent of the generic amount, as specified in 10 CFR 50.75, to be used for decommissioning planning. After review of the Commission's regulations and Statements of Consideration (SOC) for various rulemakings as well as staff guidance documents related to decommissioning to determine which activities would be considered "legitimate decommissioning activities," as contemplated by the Commission's regulations, the NRC staff has determined that, while the determination of "legitimate decommissioning expenses" should be done on a case-by-case basis, there are clearly expenses that should not be considered legitimate at this time, subject to change,—for planning or other decommissioning activities (i.e., spent fuel management planning, legal fees, and Nuclear Energy Institute (NEI) membership).

Licensees may possess other funds in the decommissioning trust that are not dedicated to NRC 10 CFR 50.75 requirements for decommissioning. The NRC guidance in RG 1.184 (Reference 1) and Regulatory Issue Summary (RIS) 2001-07, Revision 1, "10 CFR 50.75 Reporting and Recordkeeping for Decommissioning Planning," dated January 8, 2009 (Reference 2), describes how licensees can commingle such funds into one account so long as the subaccounts can be identified.

The NRC has not precluded the commingling of the funds in a single trust fund account to address radiological decommissioning, spent fuel management, and site restoration, as long as the licensee is able to identify and account for these specific funds. In the 1996 decommissioning rule (61 FR 39278), published in the *Federal Register* July 29, 1996, the Commission indicated that the rule "does not prohibit licensees from having separate subaccounts for other activities in the decommissioning trust fund if minimum amounts specified in the rule are maintained for radiological decommissioning." Similarly, in the 2002 decommissioning trust provisions rule (67 FR 78350), the Commission stated that it appreciates the benefits that some licensees may derive from their use of a single trust fund for all of their decommissioning costs, both radiological and not, but, as stated above, a licensee must be able to identify the individual amounts contained within its single trust. Thus, where a licensee has not separately identified and accounted for monies related to nonradiological decommissioning in its DTF, licensees are required to request exemptions from 10 CFR 50.82(a)(8)(i)(A) and either 10 CFR 50.75(h)(1)(iv) or 10 CFR 50.75(h)(2) to gain access to monies in the DTF for purposes other than decommissioning (e.g., spent fuel management).

The NRC has approved exemptions from the requirements of 10 CFR 50.82 and 10 CFR 50.75 allowing withdrawals to be made from DTFs for spent fuel management in instances where the level of funding needed to complete decommissioning is not adversely affected. In each instance, the NRC found, pursuant to 10 CFR 50.12, "Specific Exemptions," the exemptions were authorized by law, presented no undue risk to public health and safety, and were consistent with the common defense and security. The NRC also found that the application of the rules was unnecessary to achieve the underlying purpose of the rules.

If a licensee can clearly demonstrate that (1) its decommissioning trust includes State-required funds and (2) those State-required funds exceed the amount of money estimated to be needed for radiological decommissioning in the licensee's site-specific DCE, so that reasonable assurance of adequate radiological decommissioning funding still exists after removal of the State-required funds, then the licensee does not need an exemption to use those State-required funds. The NRC does not have jurisdiction over State-required funds. However, the NRC has statutory authority to regulate spent fuel management and exercises this authority by requiring licensees to comply with several requirements, including those in 10 CFR 50.54(bb), 10 CFR 50.82(a)(4)(i), and 10 CFR 50.82(a)(8)(vii).

The NRC issued RIS 2001-07, Revision 1 (Reference 2), to clarify the need for licensees to preserve the distinction in their decommissioning trust accounts between the radiological decommissioning fund balance and amounts accumulated for other purposes, such as paying for spent fuel management and site restoration, when using the trust for commingled funds. However, based on NRC experience with the power reactors that have recently and permanently shut down and entered into decommissioning, licensees continue to report funds

they have accumulated to address spent fuel management and site restoration as part of the amount of funds reported for radiological decommissioning.

Most recently, NEI submitted NEI 15-06, "Use of the Nuclear Decommissioning Trust Fund," dated November 30, 2015 (Reference 3), for NRC staff consideration. The staff review of this is ongoing.

Lesson Learned

NRC past precedents in this area may not be appropriate moving forward. The guidance contained in the discussion above should be taken into consideration and used in lieu of some former decisions.

Recommendations

- As part of the planned integrated decommissioning rulemaking, the NRC staff is considering defining "legitimate decommissioning activities" and revising the associated NRC guidance, accordingly.
- Through its course of updating NRC regulatory guidance, the NRC staff should consider clarifying ambiguous language in RG 1.184 (Reference 1), which states, in part:

The staff recognizes that during planning for decommissioning, it is necessary to consider activities leading to license termination and the storage of spent fuel; therefore, the staff's interpretation of the appropriate use of these planning funds will permit planning for all issues related to the decommissioning of the facility.

Seemingly in contrast to that acknowledgment, RG 1.184 also states, in part, "Requirements for the storage and management of spent fuel, and for financial assurance are separate from site decommissioning activities and are contained in 10 CFR 50.54(bb)."

- The NRC staff plans to review the comments received on the advance notice of proposed rulemaking (ANPR) and determine whether it can pursue review of NEI 15-06, Revision 0, in parallel, without predisposition of the rulemaking efforts.

References

1. U.S. Nuclear Regulatory Commission, "Decommissioning of Nuclear Power Reactors," Regulatory Guide 1.184, Revision 1, October 2013, ADAMS Accession No. ML13144A840.
2. U.S. Nuclear Regulatory Commission, "10 CFR 50.75 Reporting and Recordkeeping for Decommissioning Planning," Regulatory Issue Summary 2001-07, Revision 1, January 8, 2009, ADAMS Accession No. ML083440158.

3. Nuclear Energy Institute, Draft Guidance NEI 15-06, "Use of the Nuclear Decommissioning Trust Fund," Revision 0, November 30, 2015, ADAMS Package Accession No. ML15344A107.

1.2.2. Insurance Requirements for Permanently Shutdown Reactors

Requirements

The regulations in 10 CFR 50.54(w) specify the requirements for onsite insurance. The regulation in 10 CFR 50.54(w)(1) requires each licensee to have and maintain onsite property damage insurance to stabilize and decontaminate the reactor and reactor site in the event of an incident. The onsite insurance coverage must be either \$1.06 billion or whatever amount of insurance is generally available from private sources, whichever is less.

The regulations in 10 CFR 140.11, "Amounts of Financial Protection for Certain Reactors," specify the requirement for offsite insurance. The regulation in 10 CFR 140.11(a)(4) requires each licensee to have and maintain financial protection. For a single-unit reactor site that has a rated capacity of 100,000 kilowatts electric (kWe) or more, 10 CFR 140.11(a)(4) requires the licensee to maintain \$375 million in primary financial protection. In addition, the licensee is required to participate in a secondary retrospective rating pool (secondary financial protection) that commits each licensee to additional indemnification for damages that may exceed primary insurance coverage.

Type of Action

The requirements for onsite and offsite insurance are not automatically waived when a facility transitions from an operating reactor phase to a decommissioning phase. Therefore, licensees may request exemptions from 10 CFR 50.54(w)(1) (Reference 1) and 140.11(a)(4) (Reference 2) in order to reduce insurance coverage commensurate with the significantly reduced risks associated with a permanently defueled reactor.

For the reviews of licensing actions concerning insurance requirements, the PM should consult with the Balance of Plant Branch (SBPB) in the Division of Safety Systems (DSS) (NRR/DSS/SBPB) early in the process, in addition to NRR/DIRS/IFIB, to determine if a detailed review will be performed, with an associated SE, to establish whether the applicable thermal-hydraulic criteria are met.

Discussion

The technical basis for granting onsite and offsite insurance exemptions is based on the significantly reduced risk that a nuclear power reactor incurs after it permanently defuels and shuts down, specifically, the determination that there are no possible design-basis events at a licensee's facility that could result in an offsite radiological release exceeding the limits established by the U.S. Environmental Protection Agency's (EPA's) early-phase protective action guidelines (PAGs) of 1 rem at the exclusion area boundary (EAB). In addition, the exemptions are predicated on the licensee's demonstrating that the heat generated by the spent fuel in the spent fuel pool (SFP) has decayed to the point at which the decay heat can be removed by air cooling. Specifically, if all coolant were drained from the SFP as the result of a highly unlikely beyond-design-basis accident (beyond-DBA), the fuel assemblies would remain

below a temperature of incipient cladding oxidation for zirconium based on air-cooling alone. In SECY-93-127, "Financial Protection Required of Licensees of Large Nuclear Power Plants during Decommissioning," dated May 10, 1993 (Reference 3), the NRC staff recognized that the most significant accident sequence at a permanently defueled and shutdown reactor involves the complete loss of water in an SFP since this sequence could result in zirconium fuel cladding combustion. For a postulated situation in which the cooling configuration of a highly unlikely beyond-DBA results in an unknown cooling configuration of the spent fuel, analysis should demonstrate that, even with no cooling of any kind (conduction, convection, or radiative heat transfer), the spent fuel stored in the SFP would not reach the zirconium ignition temperature in fewer than 10 hours starting from the time at which the accident was initiated. The NRC has considered 10 hours sufficient time to take mitigative actions to cool the spent fuel. Consistent with precedent, this exemption relies on the same type of beyond design basis zirconium fire accident scenario analyses that are used to assess offsite EP exemptions.

Note that, in the staff requirements memorandum (SRM) "SECY-93-127—Financial Protection Required of Licensees of Large Nuclear Power Plants during Decommissioning," dated July 13, 1993 (Reference 4), as well as in the SRM "Staff Requirements—SECY-96-256—Changes to the Financial Protection Requirements for Permanently Shutdown Nuclear Power Reactors, 10 CFR 50.54(w) and 10 CFR 140.11," dated January 28, 1997 (Reference 5), the Commission agreed with the criterion that insurance should be reduced at sites where an analysis demonstrates that the spent fuel could be maintained below 565 degrees Celsius (C) by air cooling, if the SFP were completely drained. The Commission has not changed or updated this policy, in part because the rulemaking effort was discontinued after the events of September 11, 2001 (Reference 6).

Exemptions from Onsite Insurance Requirements

An exemption from 10 CFR 50.54(w)(1) (e.g., Reference 7) would permit decommissioning reactors to reduce their onsite insurance requirement from \$1.06 billion to \$50 million. SECY-96-256 (Reference 8) provides the NRC staff's basis as to why it considers \$50 million to be an adequate level of onsite property damage insurance for a decommissioning reactor.

Exemptions in to onsite insurance coverage requirements are based on the same qualifying DBA and beyond-DBA spent fuel heat-up analyses considered for offsite insurance and offsite EP exemptions. In addition, the staff also postulates that there is still a potential for other radiological incidents at a decommissioning reactor that could result in significant onsite contamination besides a zirconium fire. Specifically, in SECY-96-256, the NRC staff cited the rupture of a large contaminated liquid storage tank, causing soil contamination and potential groundwater contamination, as the most costly postulated event to decontaminate and remediate. The postulated large liquid radiological waste storage tank rupture event was determined to have a bounding onsite cleanup cost of approximately \$50 million.

Pursuant to 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant such exemptions from the requirements of the regulations in 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," that are: (a) authorized by law, (b) will not present an undue risk to public health and safety, (c) are consistent with the common defense and security, and (d) only if special circumstances are present.

- (a) The exemption is authorized by law—The legal and associated technical basis for granting exemptions from 10 CFR Part 50 is set forth in SECY-96-256, “Changes to the Financial Protection Requirements for Permanently Shutdown Nuclear Power Reactors, 10 CFR 50.54(w) and 10 CFR 140.11”; and SECY-97-186, “Changes to the Financial Protection Requirements for Permanently Shutdown Nuclear Power Reactors, 10 CFR 50.54(w) and 10 CFR 140.11” (References 9 and 10). SECY-96-256 and SECY-97-186 conclude that, upon a technical finding that lesser potential hazards exist after termination of operations, the Commission has the discretion to allow a licensee undergoing decommissioning to lower its onsite insurance level to \$50 million if spent fuel can be air-cooled to less than 565 °C if the SFP were completely drained.
- (b) The exemption will not present an undue risk to public health and safety—The requirements of 10 CFR 50.54(w)(1) concerning onsite insurance coverage are predicated on the assumption that the reactor is operating. However, for a permanently shutdown and defueled facility, there is a significant reduction in the number and severity of potential accidents, and correspondingly, a significant reduction in the potential for and severity of onsite property damage. A reduction in the amount of onsite insurance coverage does not impact the probability or consequences of potential accidents and is commensurate with the reduced risk and reduced cost consequences of potential nuclear accidents.
- (c) The exemption is consistent with the common defense and security—An exemption from 10 CFR 50.54(w)(1) would not eliminate any physical security (PS) requirements and would not affect a licensee’s ability to physically secure a site or protect special nuclear material.
- (d) Special circumstances are present—Pursuant to 10 CFR 50.12(a)(2), the NRC will not consider granting an exemption to onsite insurance requirements unless special circumstances are present. The special circumstances of 10 CFR 50.12(a)(2)(ii) are present in that the application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule. According to SECY-96-256 (Reference 8), the proposed reduced amount of onsite insurance should be sufficient to stabilize conditions and cover onsite cleanup costs associated with site decontamination, following an accident that results in the release of a significant amount of radiological material. The NRC staff concluded that the special circumstances of 10 CFR 50.12(a)(2)(iii) are present in that, if the licensee was required to continue to maintain an onsite insurance level of \$1.06 billion, the associated insurance premiums would be in excess of those necessary and commensurate with the radiological contamination risks posed by the site. In addition, such insurance levels would be significantly in excess of other decommissioning reactor facilities that have been granted similar exemptions by the NRC.

Offsite Insurance Requirements

The Price-Anderson Act (PAA) requires licensees of facilities with a rated capacity of 100,000 kWe or more to have the primary and secondary insurance coverage, as described above, which the NRC establishes in 10 CFR Part 140, “Financial Protection Requirements and Indemnity Agreements.” Typically, the NRC will issue a decommissioning licensee a license amendment to remove the rated capacity of the reactor from the license. This has the effect of

removing the reactor licensee from the category of licensees that are required to maintain the primary and secondary insurance amounts under the PAA and 10 CFR Part 140. Removal of the rated capacity from the facility of a decommissioning licensee, thus, allows the NRC to take the reactor licensee out of the category of reactor licensees that are required to maintain the maximum available insurance and to participate in the secondary retrospective insurance pool under the PAA, subject to a technical finding that lesser potential hazards exist at the facility after termination of operations.

As a technical matter, the fact that a reactor has permanently ceased operation is not itself determinative as to whether a licensee may cease providing the offsite liability coverage required by the PAA and 10 CFR 140.11(a)(4). Although the probability of a beyond-DBA accident that could result in leakage of the SFP that would expose the spent fuel is very low, precedent for previous insurance exemptions has also conservatively confirmed the ability of the spent fuel to air cool and demonstrated a mitigation response time of at least 10 hours assuming no cooling mechanism of any kind. Therefore, these qualifying analyses of the spent fuel decay heat levels are necessary to determine the appropriate time when offsite insurance post-shutdown, can be reduced in accordance with the Commission's discretionary authority under the PAA to establish an appropriate level of required financial protection for such shutdown facilities.

Pursuant to 10 CFR 140.8, "Specific Exemptions," the Commission may, upon application of any interested person or upon its own initiative, grant such exemptions from the requirements of the regulations in 10 CFR Part 140, "Financial Protection Requirements and Indemnity Agreements" (Reference 11), as it determines are: (a) authorized by law and (b) are otherwise in the public interest.

- (a) Authorized by law—The legal and technical basis for granting exemptions from 10 CFR Part 140 is set forth in SECY-93-127, "Financial Protection Required of Licensees of Large Nuclear Power Plants during Decommissioning" (Reference 3). SECY-93-127 concludes that, upon a technical finding that lesser potential hazards exist after termination of operations, the Commission has the discretion to relieve a licensee with a plant undergoing decommissioning from having to carry the full amount of primary financial protection and to withdraw from participation in the secondary layer of financial protection.

In SECY-93-127, the NRC staff used the liability claims experience achieved at Three Mile Island, Unit 2, as a reasonable basis to recommend setting the liability insurance level at \$100 million for permanently shutdown reactors that have completed their respective spent fuel cooling periods. The NRC has previously granted similar exemptions allowing licensees to lower their primary insurance levels and withdraw from the secondary retrospective premium pool.

- (b) Otherwise in the public interest—Participation in the secondary insurance pool is problematic for decommissioning plants that are not producing revenue because of the potential financial liability of up to \$121.255 million for any nuclear incident—not just at the decommissioning plant where the incident occurs, but also for any operating or decommissioning reactor incident. In SECY-93-127, the NRC staff considered decommissioning plants' potential financial liability and the low likelihood of a zirconium fire to determine that, once a decommissioning plant's spent fuel has sufficiently

decayed, the overall risk at decommissioning plants does not justify the full insurance coverage that operating reactors have.

Lessons Learned

- As noted in the Discussion section above, the current policy for exemptions for insurance reductions requires, in part, that licensees demonstrate that the spent fuel can be maintained below 565 °C by air cooling, if the SFP were completely drained. Kewaunee Power Station (KPS) and CR-3 provided this analysis with their EP exemption requests. Vermont Yankee Nuclear Power Station (VY) did not provide an analysis, but a generic boiling-water reactor (BWR) analysis documented by the NRC staff in NUREG-2161, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor," dated September 2014 (Reference 12) was applicable to VY. In its EP analysis, SONGS credited operation of the fuel building ventilation system. Since the fuel handling building at SONGS is a robust structure, it offers little potential for natural air exchange with the environment for cooling. Therefore, the licensee for SONGS may need to provide some additional technical justification to demonstrate that the air-cooling criterion, as described in SECY-93-127 and SECY-96-256, for insurance reduction exemptions can be met. As of the development of this document, the NRC staff was still evaluating SONGS' exemption request.
- NRR/DSS/SBPB should be included in the reviews of exemption requests for insurance reductions to verify that the air-cooling criterion is met, as noted above.

Recommendations

- As part of the planned integrated decommissioning rulemaking, the NRC staff is considering revisions to requirements for offsite liability protection and onsite damage protection insurance for decommissioning power reactors.
- The NRC should consider whether to pursue legislation related to U.S. Government indemnity implications associated with decommissioning reactors.

References

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2. Wamser, Christopher J., Entergy Nuclear Operations, Inc., letter to U.S. Nuclear Regulatory Commission, Request for Exemption from 10 CFR 140.11(a)(4), Vermont Yankee Nuclear Power Station, Docket No. 50-271, License No. DPR-28, April 17, 2014, ADAMS Accession No. ML14111A400.

3. U.S. Nuclear Regulatory Commission, "Financial Protection Required of Licensees of Large Nuclear Power Plants during Decommissioning," Commission Paper SECY-93-127, May 10, 1993, ADAMS Accession No. ML12257A628.
4. U.S. Nuclear Regulatory Commission, Staff Requirements Memorandum, "SECY-93-127—Financial Protection Required of Licensees of Large Nuclear Power Plants during Decommissioning," July 13, 1993, ADAMS Accession No. ML003760936.
5. U.S. Nuclear Regulatory Commission, Staff Requirements Memorandum, "SECY-96-256—Changes to the Financial Protection Requirements for Permanently Shutdown Nuclear Power Reactors, 10 CFR 50.54(w) and 10 CFR 140.11," January 28, 1997, ADAMS Accession No. ML15062A454.
6. Travers, William D., U.S. Nuclear Regulatory Commission, memorandum to the Commissioners, "Status of Regulatory Exemptions for Decommissioning Plants," August 16, 2002, ADAMS Accession No. ML030550706.
7. Wengert, Thomas J., U.S. Nuclear Regulatory Commission, letter to Mr. David A. Heacock, Dominion Energy Kewaunee, Inc., Kewaunee Power Station—Exemption from the Requirements of Title 10 of the *Code of Federal Regulations*, Part 50, Section 50.54(w)(1) concerning Insurance for Post-Accident Site Decontamination (TAC No. MF3915), April 3, 2015, ADAMS Accession No. ML15033A245.
8. U.S. Nuclear Regulatory Commission, "Changes to the Financial Protection Requirements for Permanently Shutdown Nuclear Power Reactors, 10 CFR 50.54(w) and 10 CFR 140.11," Commission Paper SECY-96-256, December 17, 1996, ADAMS Accession No. ML15062A483.
9. U.S. Nuclear Regulatory Commission, "Changes to the Financial Protection Requirements for Permanently Shutdown Nuclear Power Reactors, 10 CFR 50.54(w) and 10 CFR 140.11," Commission Paper SECY-97-186, August 13, 1997, ADAMS Accession No. ML992930019.
10. U.S. Nuclear Regulatory Commission, staff requirements memorandum, "SECY-97-186—Changes to the Financial Protection Requirements for Permanently Shutdown Nuclear Power Reactors, 10 CFR 50.54(w) and 10 CFR 140.11," October 6, 1997, ADAMS Accession No. ML003753155.
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12. U.S. Nuclear Regulatory Commission, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor," NUREG-2161, September 2014, ADAMS Accession No. ML14255A365.

13. U.S. Nuclear Regulatory Commission, staff requirements memorandum, "SECY-14-0066—Request by Dominion Energy Kewaunee, Inc. for Exemptions from Certain Emergency Planning Requirements," August 7, 2014, ADAMS Accession No. ML14219A366 (not referenced).
14. U.S. Nuclear Regulatory Commission, staff requirements memorandum, "SECY-14-0118—Request by Duke Energy Florida, Inc., for Exemptions from Certain Emergency Planning Requirements," December 30, 2014, ADAMS Accession No. ML14364A111 (not referenced).
15. U.S. Nuclear Regulatory Commission, "Exemption Requests To Reduce Liability Insurance Coverage for Decommissioning Reactors after Transfer of All Spent Fuel Pool to Dry Cask Storage," Commission Paper SECY-04-0176, September 29, 2004, ADAMS Accession No. ML040850518 (not referenced).
16. Pacific Northwest Laboratory, "Revised Analyses of Decommissioning for the Reference Pressurized Water Reactor Power Station: Effects of Current Regulatory and Other Considerations on the Financial Assurance Requirements of the Decommissioning Rule and on Estimates of Occupational Radiation Exposure," NUREG/CR-5884, Volumes 1 and 2, November 1995, ADAMS Accession No. ML14008A187 (not referenced).
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1.2.3. Reduction in Annual Licensing Fees for Decommissioning Power Reactors in Accordance with 10 CFR 171.15

Requirement

The regulations in 10 CFR 171.15, "Annual Fees: Reactor Licenses and Independent Spent Fuel Storage Licenses," state, in part:

- (a) Each person holding an operating license for a power, test, or research reactor; each person holding a combined license under part 52 of this chapter after the Commission has made the finding under 10 CFR 52.103(g); each person holding a part 50 or part 52 power reactor license that is in decommissioning or possession only status, except those that have no spent fuel onsite; and each person holding a part 72 license who does not hold a part 50 or part 52 license and provides notification in accordance with 10 CFR 72.80(g), shall pay the annual fee for each license held during the Federal fiscal year [FY] in which the fee is due. This paragraph does not apply to test or research reactors exempted under § 171.11(a).
- (b)(1) The FY 2015 annual fee for each operating power reactor which must be collected by September 30, 2015, is \$5,030,000.

- (c)(1) The FY 2015 annual fee for each power reactor holding a 10 CFR part 50 license that is in a decommissioning or possession-only status and has spent fuel onsite, and for each independent spent fuel storage 10 CFR part 72 licensee who does not hold a 10 CFR part 50 license, is \$223,000.

Type of Action

A licensee that has docketed its certifications of permanent cessation of operation and permanent removal of fuel from the reactor vessel, pursuant to 10 CFR 50.82(a)(1)(i) and (1)(ii), is entitled to a reduction in its annual license fees pursuant to 10 CFR 171.15.

However, the decommissioning licensee may not know how to have its fees reclassified in accordance with 10 CFR 171.15 and, thus, may inquire about the process to the NRC PM. Alternatively, the licensee may formally request that it be reclassified as a "power reactor holding a 10 CFR Part 50 license that is in a decommissioning or possession-only status and has spent fuel [stored] on site..." (see 10 CFR 171.15(c)(1)), and assessed annual fees accordingly (References 1 and 2).

In addition, licensees will likely have previously submitted payment of fees associated with an operating reactor for a portion of the year. Therefore, licensees may also request that the NRC appropriately prorate the annual fees paid for the third fiscal quarter in accordance with 10 CFR 171.17(a)(2), "Terminations."

Discussion

By regulation, a decommissioning or possession-only power reactor licensee is entitled to license fee reduction as soon as both certifications pursuant to 10 CFR 50.82(a)(1)(i) and (1)(ii) have been submitted and docketed. The NRC's Office of the Chief Financial Officer (OCFO) will automatically reduce the licensee's fees after it has been notified that all fuel has been permanently removed from the reactor vessel and the 10 CFR 50.82 certifications have been properly submitted by the licensee, received by the NRC, and are on the docket.

The process for reclassifying the annual license fee from an operating reactor to a decommissioning reactor is currently informal. The responsible branches within the OCFO are: Division of Planning and Budget (DPB), License Fee Policy Team; and Division of the Controller (DOC), Accounts Receivable Branch. Notification of OCFO of docketing of the 10 CFR 50.82 certifications may come from the PM, the NRR/Division of Operating Reactor Licensing (DORL) technical assistant, or directly from the licensee to a counterpart in the OCFO. The OCFO will use the date that all fuel was permanently removed from the reactor vessel to stop charging annual fees. OCFO will then inactivate the licensee's power reactor fee class and reclassify the annual fee to a decommissioning status. OCFO will then invoice the licensee at a prorated amount based on how many days of the quarter or FY it operated.

Lesson Learned

Power reactor decommissioning licensees may expend unnecessary resources preparing a formal request for license fee reductions. Such submittals are not required by regulation and do

not receive a response or formal acknowledgment from the NRC. All that is necessary is that the responsible branches of the OCFO be informed that the 10 CFR 50.82 certifications of permanent cessation of operation and permanent removal of fuel from the reactor vessel have been received and docketed.

Recommendations

As part of the update to NRR OI COM-101, specifically related to communications and planning, the NRC staff should proceduralize informing the licensee of the process of how the license fee reduction occurs and that a formal request to the NRC is unnecessary.

With respect to internal business processes, the NRC staff should proceduralize the role of the PM such that, upon receipt of the 10 CFR 50.82 certifications, the PM should send an e-mail to the OCFO Branch Chiefs (BCs) in the DPB License Fee Policy Team, and DOC Accounts Receivable Branch to take actions, as appropriate, to reduce and prorate the annual license in accordance with 10 CFR 171.15 and 10 CFR 171.17, "Proration." Furthermore, it is recommended that the e-mail be made publicly available in ADAMS through the e-capture process.

References

1. Stoddard, Daniel G., Dominion Energy Kewaunee, Inc., letter to U.S. Nuclear Regulatory Commission, Dominion Energy Kewaunee, Inc., Kewaunee Power Station, Request to Reclassify Kewaunee Power Station under 10 CFR 171.15, "Annual Fees: Reactor Licenses and Independent Spent Fuel Storage Licenses," May 31, 2013, ADAMS Accession No. ML13162A401.
2. Wamser, Christopher J., Entergy Nuclear Operations, Inc., letter to U.S. Nuclear Regulatory Commission, Request to Reclassify Vermont Yankee Nuclear Power Station under 10 CFR 171.15, "Annual Fees: Reactor Licenses and Independent Spent Fuel Storage Licenses," January 12, 2015, ADAMS Accession No. ML15014A041.

1.3 Staffing

1.3.1. Operations Staff and Qualifications

Requirements

The regulations at 10 CFR 50.54(m) specify the minimum licensed operator staffing levels for operating reactors (e.g., minimum staff per shift for licensed operators and senior operators) but do not address licensees that have certified that they are permanently shut down and defueled under 10 CFR 50.82(a)(1).

The regulations at 10 CFR 50.54(i), 54(i-1), 54(k), and 54.(l) all contain licensed operator requirements that do not address decommissioning plants.

The regulations at 10 CFR 50.54(y) state that departures from a license condition or a technical specification (TS) in accordance with 10 CFR 50.54(x) shall be approved, as a minimum, at a nuclear power reactor facility for which the certifications required under 10 CFR 50.82(a)(1)

have been submitted, by either a licensed senior operator or a certified fuel handler (CFH), prior to taking the action.

The regulations at 10 CFR 50.2 state, in part, “*Certified fuel handler* means, for a nuclear power reactor facility, a non-licensed operator who has qualified in accordance with a fuel handler training program approved by the Commission.”

The regulations at 10 CFR 50.120, “Training and Qualification of Nuclear Power Plant Personnel,” apply to nonlicensed operators (among other plant personnel). Since the CFH is a nonlicensed operator, this regulation defines CFH training requirements.

Type of Action

- request for approval of CFH program
- LAR regarding staffing at a decommissioned or decommissioning unit

Description

Licensing precedent at decommissioning reactors shows the NRC has approved license amendments to the TSs Administrative Controls Section that discontinue the staffing requirements for licensed operators and, instead, specify shift staffing consisting of a CFH (certified by an NRC-approved program) and one additional nonlicensed operator. Typically, the Administrative Controls Section of TSs and 10 CFR 50.54(m) as discussed above may specify certain staffing and related functions that require a licensed operator. Therefore, until these TSs are amended, use of licensed operators may remain required by TSs.

The licensee will need to submit its CFH training and retraining program for the NRC’s approval. The CFH must meet the applicable requirements of 10 CFR 50.120. The NRC staff has performed several reviews that can be used as precedent in absence of regulatory guidance (e.g., Reference 1). Until the CFH training and retraining program is approved by the NRC and the TS Administrative Controls Section is amended and implemented to remove any requirements for licensed operators, the necessary number of licensed operators must be retained. The request for the CFH program approval can be made long before planned decommissioning, as all plants will eventually need a CFH program. Early submittal of the program may prevent costly delays to licensees in the case of premature or unplanned decommissioning.

During decommissioning, the principal safety concern is the storage of spent fuel in the SFP. The skills of the operations staff needed to maintain safe storage of spent fuel are not typically comparable to the skills needed for operating a nuclear power plant. Overall safety at decommissioning reactors is primarily dependent on the procedural and configuration controls exercised by the licensee over often varied and unique dismantlement and decontamination activities. The NRC staff’s technical study on SFP risk at decommissioning nuclear power plants did not recommend any minimum staffing levels or training requirements inherent in supporting the risk conclusions. However, based on conservatism and precedent, it is the NRC staff’s judgment that there is a sufficient basis for establishing a baseline staffing and training level at decommissioning nuclear power plants while spent fuel is stored in the SFP. In addition, the staff is also requiring licensees to maintain minimum staffing and training needed to support prompt implementation of SFP mitigating actions, consistent with the mitigating

strategy order license condition B.5.b (see discussions in Appendix Section 1.4.7 concerning 10 CFR 50.54(hh)(2)).

Because the 10 CFR 50.54 staffing requirements do not explicitly address facilities that are no longer authorized to operate, licensees have been requesting amendments to their defueled TSs to eliminate the need to maintain licensed operators on their staff. Furthermore, the associated licensed operator training programs are being discontinued for decommissioning plants. In place of the licensed operators, decommissioning plant licensees have required the presence of a CFH and a nonlicensed operator as the minimum staffing for each shift. The CFH is a staffing position specified in the decommissioning rulemaking changes to 10 CFR Part 50 that were issued in 1996. It was the intent of that rulemaking to formalize the CFH position. The CFH will be the on-shift management representative responsible for supervising and directing the monitoring, storage, handling, and cooling of irradiated nuclear fuel, and responding to facility emergencies, in a manner consistent with ensuring adequate protection of the health and safety of the public. The CFH has the requisite knowledge and experience to evaluate plant conditions and make these judgments. The CFH is a nonlicensed operator, replacing the licensed operators (i.e., SROs and reactor operators) of an operating reactor. Although the CFH is not licensed, the training program is reviewed and approved by the NRC. The 1996 rulemaking did not establish requirements with respect to the CFH's functions and responsibilities or directly associate the position with decommissioning activities.

On November 30, 2015, NEI submitted NEI 15-04, "Guidelines for a Certified Fuel Handler Training and Retraining Program" (Reference 3) for the NRC staff's consideration.

Lessons Learned

Regarding 10 CFR 50.54(m), the NRC staff determined that the staffing requirements are not applicable to facilities that have submitted certifications under 10 CFR 50.82(a)(1)(i) and (1)(ii). The staff had received requests for exemption from several licensees, and accordingly, the staff determined the exemptions were not necessary (e.g., Reference 4).

A licensee's application to modify its license (e.g., to amend TS Section 5.0, "Administrative Controls") may be used as the vehicle for engagement between the licensee and the NRC to transition from operating reactor staffing requirements to staffing for a decommissioning facility. When the NRC approves the licensee's CFH program, and a nonlicensed operator has qualified under that program, and the proposed Administrative Controls TS amendment are acceptable, the licensee can implement the staffing changes. In one case, the licensee terminated its licensed operators prior to implementation of its CFH training and retraining program. Until the NRC puts interim and long-term measures in place to close the "regulatory gap," the following sequence of activities should be used to maintain appropriate regulatory oversight of the safety issue:

- (1) Licensee submits its CFH training and retraining program for NRC approval.
- (2) The NRC staff reviews the CFH training and retraining program and, if appropriate, approves the program.
- (3) Nonlicensed operators qualify as CFHs.

- (4) Licensee certifies permanently shutdown and defueled status.
- (5) If the licensee desires to amend the license, it will file an application for an amendment fully describing the changes desired, and following as far as applicable, the form prescribed for original applications. In determining whether an amendment to the license will be issued to the applicant, the Commission will be guided by the considerations which govern the issuance of initial licenses to the extent applicable and appropriate
- (6) Licensee terminates operator and senior operator licenses at the facility, if the licensee chooses to do so.

Note: Steps 1, 2, and 3, can be accomplished prior to certification of permanent shutdown. The preferred position of Probabilistic Risk Assessment Operations and Human Factors Branch in the Division of Risk Assessment is that these programs be submitted long before planned decommissioning. If sufficient advance planning time is not available to the licensee to develop, submit, and receive approval of the CFH training and qualification program, then these steps will likely occur soon after permanent shutdown.

The NRC staff acknowledges that some of the recent LARs requesting revisions to TS Section 5.0 "Administrative Controls," introduced new terminology, (e.g., "certified operator" and "non-certified operator"), in order to differentiate between a CFH and a nonlicensed operator who is not qualified as a CFH. The NRC staff understands that such terminology is not consistent with the current regulatory definitions and guidance.

Recommendations

As part of the planned integrated decommissioning rulemaking, the NRC staff is considering revisions that would define appropriate levels of staffing, training, and qualifications for operators at decommissioning nuclear power plants. The recommended minimum staffing levels and training requirements would help ensure that decommissioning facilities are properly maintained, systems are safely operated, and radiological activities are safely performed.

Specifically, for staffing and training, the rule would:

- Clarify that licensed operators are not required for permanently shutdown and defueled reactors subject to exceptions based on plant-specific TSs.
- Clarify the responsibilities for the CFH.
- Clarify the timing of submittal for the CFH program for NRC review.
- Specify the minimum staffing level of CFHs and other nonlicensed operators and training requirements for facility staff at permanently shutdown and defueled reactors.

Furthermore, the NRC staff is considering revisions to 10 CFR 73.55(p)(1)(i) so that they are consistent with 10 CFR 50.54(y), as part of the planned integrated decommissioning rulemaking, in that a CFH, in addition to an SRO, as a minimum, may suspend any security

measures in an emergency when the action is immediately needed to protect the public health and safety and no action, consistent with license conditions and TSs that can provide adequate or equivalent protection, is immediately apparent. Similar authorization should be given for severe weather conditions, when the suspension of affected security measures is immediately needed to protect the personal health and safety of security force personnel as described in 10 CFR 73.55(p)(1)(ii). Currently, CFHs are not authorized to take such action.

The NRC staff plans to review the comments received on the ANPR and determine whether it can pursue review of NEI 15-04, Revision 0, in parallel, without predisposition of the rulemaking efforts.

The NRC staff should ensure consistency in terminology with regulatory definitions and guidance or that any new terminology is appropriately defined in the licensee technical specifications.

References

1. Gratton, Christopher, U.S. Nuclear Regulatory Commission, letter to Mr. Terry D. Hobbs, Crystal River Nuclear Plant, Crystal River Unit 3—Review of Certified Fuel Handler Training and Retraining Program (TAC No. MF1458), June 26, 2014, ADAMS Accession No. ML14155A181.
2. Gratton, Christopher, U.S. Nuclear Regulatory Commission, letter to Mr. Terry D. Hobbs, Crystal River Nuclear Plant, Crystal River Unit 3—Issuance of Amendment to the Facility Operating License regarding Changes to the Administrative Controls Section of the Technical Specifications (TAC No. MF1504), July 11, 2014, ADAMS Accession No. ML14097A145.
3. Richter, Mark A., Nuclear Energy Institute, letter to Ms. Meena Khanna, U.S. Nuclear Regulatory Commission, Submittal of NEI 15-04 “Guidelines for a Certified Fuel Handler Training and Retraining Program” and NEI 15-08 “Managing Personnel Fatigue at Decommissioning Reactors,” November 30, 2015, ADAMS Package Accession No. ML15350A129.
4. Gratton, Christopher, U.S. Nuclear Regulatory Commission, letter to Mr. David A. Heacock, Dominion Energy Kewaunee, Inc., Kewaunee Power Station—Request for Exemption from the Requirements of 10 CFR 50.54(m) (TAC No. MF2743), May 21, 2014, ADAMS Accession No. ML14127A340.

1.3.2. Alternate Control Room (or Central Monitoring Station)

Requirement

The regulation in 10 CFR Part 50, Appendix A, “General Design Criteria for Nuclear Power Plants,” Criterion 19, “Control Room,” specifies the design requirements for the main control room (MCR). General Design Criterion (GDC) 19 requires that an MCR be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in a safe condition under accident conditions. In addition, 10 CFR 50.34, “Contents of Applications; Technical Information,” indicates that licensees need to use a state-of-the-art

human factors assessment before fabricating or altering the control room. It restricts the licensee from changing, without considering the tasks that will be completed in, the new control room.

Type of Action

- license amendment requests in accordance with 10 CFR 50.90 concerning relocation of the MCR during decommissioning
- 10 CFR 50.59 reviews concerning relocation of the MCR during decommissioning

Discussion

The design requirements for the MCR are specified in GDC 19 or a plant-specific equivalent for a non-GDC plant. GDC 19 requires that an MCR be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in a safe condition under accident conditions, including loss-of-coolant accidents. During the transition to decommissioning, while spent fuel is being stored in the SFP, the controls for the equipment supporting SFP cooling and inventory management will be local to the equipment. The MCR may not have the capability to remotely operate the equipment and the SFP level, and temperature indications may only be available locally. GDC 19 also requires that adequate radiation protection be provided to permit access and occupancy of the control room under accident conditions. The potential for a radiological release or toxic gas release requiring protection would be site-specific, but would likely be rare for any permanently shutdown and defueled reactor DBAs.

Although GDC 19 sets the design criteria for the reactor control room, the criterion is devoid of language related to decommissioning and only discusses operation under “normal conditions” and “accident conditions.” There is no indication based on the current language of GDC 19 that it applies beyond operation into the decommissioning phase of a reactor. Further, the history of GDC 19 likewise does not indicate that the regulation, in any of its versions, was intended to apply to reactors in decommissioning. Discussions about GDC 19 and its intended role are all related to reactor operation and accident response occurring during operation.

Consideration of 10 CFR 50.34 may be needed in any relocation of the control room. This regulation indicates that licensees need to use a state-of-the-art human factors assessment before fabricating or altering the control room. It restricts the licensee from changing, without considering the tasks that will be completed in, the new control room. However, 10 CFR 50.34(f)(2)(iii) requires Commission review of the control room design with an emphasis on incorporation of “state-of-the-art human factor principles.” By the regulation’s plain language, 10 CFR 50.34(f)(2)(iii) applies to license applicants and does not apply to reactors in decommissioning. Further, 10 CFR 50.34(f)(2)(iii) was implemented as a response to Three Mile Island Action Item I.D.1 and is focused on the preliminary evaluations of the control room interface with special attention to human factors engineering. There is no indication from the history of the regulation that it applies to reactors in a decommissioning phase. Some licensees may plan to immediately proceed to decontamination and dismantlement prior to relocation of the spent fuel to a dry fuel storage facility (i.e., the DECON method of decommissioning). To minimize the risk that decommissioning activities could have an adverse effect on the safe storage of spent fuel and to facilitate decommissioning activities, licensees may elect to

establish a “fuel pool island,” whereby all equipment needed for SFP makeup and cooling is skid mounted, furnished with dedicated power, and isolated from the operating plant cooling system. In this configuration, the licensee can facilitate prompt decommissioning by establishing an alternate decommissioning control room, turning over the balance of the plant to the decommissioning operations contractor, and dismantling the existing MCR structure (Reference 1).

In 10 CFR 50.54(m), the NRC specifies the control room staffing requirements for licensed operators at an operating reactor with a fueled reactor vessel. No such requirements exist for the location of operations staff at a permanently shutdown and defueled reactor. The control room at an operating reactor contains the controls and instrumentation necessary for complete supervision and response needed to ensure safe operation and shutdown of the reactor and support systems during normal, off-normal, and accident conditions and, therefore, is the location of the shift command function. Following permanent shutdown and removal of fuel from the reactor, operation of the reactor is no longer permitted, and the control room no longer performs all of the functions that are required for an operating reactor. There are no longer any activities at a permanently shutdown and defueled reactor that require quick decisionmaking and response by operations staff in the control room.

For most decommissioning reactors, the NRC has approved license amendments to the TSs that require at least one nonlicensed operator to remain in a control room. The primary functions of the “control” room at a permanently shutdown reactor are monitoring, response, communications, and coordination. Specifically, the control room at a decommissioning reactor is where many plant systems and equipment parameters are monitored (e.g., for operating status and conditions, radiation levels, electrical anomalies, or fire alarms). Control room personnel assess plant conditions; evaluate the magnitude and potential consequences of abnormal conditions; determine preventative, mitigating, and corrective actions; and perform notifications. The control room provides a central location from where the shift command function can be conveniently performed because of the availability of existing monitoring and assessment instrumentation, communication systems and equipment, office computer equipment, and ready access to reference material. The control room, also referred to as the command center, provides a central location for the timely assessment and classification of an emergency event, notification of the NRC and offsite agencies of an emergency event, and from which emergency response activities are coordinated. When activated, the emergency response organization (ERO) reports to the control room, as described in the permanently defueled emergency plan (PDEP). PDEP requirements must be evaluated when considering an alternate control room and appropriate changes to the PDEP processed in accordance with 10 CFR 50.54(q). Most decommissioning reactors can likely demonstrate that the command, communications, and monitoring functions performed in the MCR could be readily performed at an alternate onsite location, based on the site-specific needs of a licensee during its decommissioning process.

During reactor decommissioning, the control room may be subject to extensive changes, which are evaluated by the licensee for safety implications under the 10 CFR 50.59 process. There is precedent among some previous decommissioning reactor licensees to design and construct an alternate control room or command center that is independent of the original operating control room (see Zion Nuclear Power Station, Units 1 and 2 (Zion), License Amendment Nos. 183 and 170, respectively, dated January 31, 2003, ADAMS Accession No. ML022130511).

In 2003, the NRC issued license amendments for Maine Yankee Atomic Power Station (Maine Yankee) and Zion Nuclear Power Station to eliminate the technical specification requirement for continuous control room watch by a qualified individual when irradiated nuclear fuel is stored in the spent fuel pool. In both cases a spent fuel pool nuclear island, separate from the main control room of the reactor, was created. Spent fuel cooling and support systems were isolated from other plant systems and related controls and indications were localized. In both cases, neither of the main controls rooms contained remote controls or operator manipulation elements required to fulfill the safety functions of the spent fuel pool storage. The NRC staff's SEs in these cases discussed the diminished significance of the main control room in a decommissioned reactor.

The NRC staff also evaluated Industry Decommissioning Commitments (IDCs) and Staff Decommissioning Assumptions (SDAs) identified in NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants." This NUREG identified IDCs and SDAs as design and operational characteristics assumed in the risk analysis that led the staff to conclude that risks of accidents at spent fuel pools are low at decommissioning facilities. For Zion and Maine Yankee, the staff did not make any of the practices and procedures discussed in the technical justification part of the licensing basis for either of the reactors, but the staff relied on the practices and procedures in place that fulfilled the IDCs and SDAs identified in NUREG-1738. The ultimate conclusion reached by the staff therefore was dependent on both the change in circumstances due to the decommissioned state of the reactors as well as the licensees' commitments to implement appropriate practices and procedures for spent fuel pool monitoring and control.

Lesson Learned

While fuel is stored in the fuel pool, monitoring of the fuel pool conditions can be accomplished from an alternate decommissioning control room. However, because the relationship between the alternate control room/command center and the MCR established for operating plants is unspecified in the regulations, licensees may be uncertain of the applicability of GDC 19 to decommissioning reactors.

Recommendation

As part of the planned integrated decommissioning rulemaking, the NRC staff is considering regulatory changes to resolve the ambiguities discussed above concerning the meaning of and requirements for the control room for decommissioning reactors.

Reference

1. Wengert, Thomas J., U.S. Nuclear Regulatory Commission, meeting summary to Southern California Edison, Summary of September 24, 2014, Meeting with Southern California Edison Re: Meeting on the Control Room/Command Center Function Options for the San Onofre Nuclear Generating Station, Units 2 and 3 (TAC Nos. MF4778 and MF4779), February 24, 2015, ADAMS Accession No. ML14321A708.

1.4 Changes to the License

1.4.1. Technical Specifications

Requirements

The regulations in 10 CFR 50.36 specify the requirements for a nuclear power plant's TSs.

Type of Action

Upon submission of the 10 CFR 50.82 letters, declaring that a plant is permanently shut down and defueled, the licensee submits an LAR to revise the operating license and associated TSs to reflect the permanent cessation of reactor operations and the permanently defueled condition of the reactor vessel.

For the review of the permanently defueled TSs, the PM should consult with the following branches (others as necessary, based on the requested changes) early in the process to determine if safety evaluation input or concurrence is required:

- Reactor Systems Branch (NRR/DSS/SRXB)
- Balance of Plant Systems Branch (NRR/DSS/SBPB)
- Technical Specifications Branch (NRR/DSS/STSB)
- Electrical Engineering Branch (NRR/DE/EEEB)
- Instrumentation and Controls Branch (NRR/DE/EICB)
- Probabilistic Risk Assessment Operations and Human Factors Branch (NRR/DRA/APHB)
- Radiation Protection and Consequence Branch (NRR/DRA/ARCB)

Discussion

In the permanently defueled technical specification (PDTS) LAR, licensees request changes to the TSs to account for the permanently shutdown and defueled status of the reactor. A majority of an operating plant's TSs indicate modes for which the TS is applicable. Modes, as defined in TSs, correspond to any one inclusive combination of core reactivity condition, power level, average reactor coolant temperature, and reactor vessel head closure bolt tensioning with fuel in the reactor vessel. The reference to modes for a permanently shutdown and defueled reactors has no meaning and is not relevant. Any reactor that has submitted certifications pursuant to 10 CFR 50.82(a)(2) is prohibited from operating the reactor or placing fuel in the reactor vessel and is no longer in a configuration or a condition under which the TS modes apply. Consequently, most TSs applicable to a reactor authorized to operate are no longer needed for a permanently shutdown and defueled reactor (References 1, 2, 3, and 4).

Licensees will often submit the following licensing actions related to staffing prior to submitting the PDTS LAR: (1) a request for NRC approval of the CFH program, (2) an LAR to modify the Administrative Controls TS section, and (3) a fuel handling LAR. When a plant permanently shuts down, maintaining NRC-licensed operators is no longer necessary but continues to be required by regulations. The CFH program provides training and a certification for licensee staff to move fuel and make appropriate plant decisions in the place of NRC-licensed operators.

Once the CFH program is approved by the NRC, the licensee can submit an LAR requesting changes to the Administrative Controls TS section to align the plant staffing and staff qualification requirements with the permanently shutdown status of the facility (References 5, 6, and 7). Additional information specific to staffing is contained in the Appendix, Section 1.3, "Staffing," of this lessons learned report. Additionally, if the licensee plans to transfer the spent fuel to dry storage shortly after permanent shutdown, a separate LAR might be required to permit the fuel movement (References 8 and 9). Submitting these LARs prior to submission of the PDTS LAR significantly reduces the complexity, and consequently the time, of the PDTS LAR review.

The PDTS LAR contains changes to many sections of the TSs. In a permanently shutdown and defueled reactor, operating modes are not relevant; therefore, the PDTS changes eliminate those TSs applicable in operating modes. Licensees requested the removal of the modes definition from the TSs and proposed to delete the following TS sections that contain operating modes:

- Safety Limits
- Reactivity Control Systems
- Power Distribution Limits
- Instrumentation
- Reactor Coolant System
- Emergency Core Cooling Systems
- Containment Systems
- Balance of Plant (except for Fuel Handling and SFP TSs)
- Electrical Power Systems
- Refueling Operations

Additionally, other sections of the TS that are often modified due to the permanently shutdown and defueled status of the facility are:

- Definitions
- Completion Times
- Administrative Controls

Lessons Learned

Due to the size and complexity of the LAR, the review can take 12 to 18 months.

- Having an NRC-approved CFH program and NRC-approved changes to the Administrative Controls TS section, prior to the submittal of the PDTS LAR, reduces the review time and complexity.
- A separate fuel handling LAR might be required if the licensee plans on moving fuel in the near term to dry storage and the current TSs do not allow such movement.

Recommendations

As part of the update to NRR OI COM-101, specifically related to communications and planning, the NRC staff should:

- Proceduralize planning discussions with the licensee regarding the possibility of a separate LAR involving the TS Administrative Controls section. The approval of these revisions to the Administrative Controls will reduce the complexity and length of the PDTs LAR review.
- Similarly, the licensee should consider whether a separate fuel handling LAR will be submitted.

As part of NRC planned interactions with industry representatives and NEI, the NRC staff should encourage industry's Technical Specifications Task Force to develop a traveler to reduce the review time of the commonly eliminated TS sections submitted in the PDTs LARs.

References

PDTs License Amendments

1. Wengert, Thomas J., U.S. Nuclear Regulatory Commission, letter to Mr. David A. Heacock, Dominion Energy Kewaunee, Inc., Kewaunee Power Station—Issuance of Amendment for Permanently Shutdown and Defueled Technical Specifications and Certain License Conditions (TAC No. MF1952), February 13, 2015, ADAMS Accession No. ML14237A045.
2. Wengert, Thomas J., U.S. Nuclear Regulatory Commission, letter to Mr. Thomas J. Palmisano, Southern California Edison Company, San Onofre Nuclear Generating Station, Units 2 and 3—Issuance of Amendment for Permanently Shutdown and Defueled Operating License and Technical Specifications (TAC Nos. MF3774 and MF3775), July 17, 2015, ADAMS Accession No. ML15139A390.
3. Orenak, Michael D., U.S. Nuclear Regulatory Commission, letter to Mr. Terry D. Hobbs, Crystal River Nuclear Plant, Crystal River Unit 3 Nuclear Generating Plant—Issuance of Amendment for Permanently Shutdown and Defueled Operating License and Technical Specifications (TAC No MF3089), September 4, 2015, ADAMS Accession No. ML15224B286.
4. Kim, James, U.S. Nuclear Regulatory Commission, letter to Vice President, Operations, Entergy Nuclear Operations, Inc., Vermont Yankee Nuclear Power Station—Issuance of Amendment for Defueled Technical Specifications and Revised License Conditions for Permanently Defueled Condition (CAC No. MF3714), October 7, 2015, ADAMS Accession No. ML15117A551.

Administrative Controls Section License Amendments

5. Wengert, Thomas J., U.S. Nuclear Regulatory Commission, letter to Mr. Thomas J. Palmisano, Southern California Edison Company, San Onofre Nuclear Generating Station, Units 2 and 3—Issuance of Amendments regarding Changes to the Administrative Controls Section of the Technical Specifications (TAC Nos. MF2954 and MF2955), September 30, 2014, ADAMS Accession No. ML14183B240.
6. Gratton, Christopher, U.S. Nuclear Regulatory Commission, letter to Mr. Terry D. Hobbs, Crystal River Nuclear Plant, Crystal River Unit 3—Issuance of Amendment to the Facility Operating License regarding Changes to the Administrative Controls Section of the Technical Specifications (TAC No. MF1504), July 11, 2014, ADAMS Accession No. ML14097A145.
7. Kim, James, U.S. Nuclear Regulatory Commission, letter to Site Vice President, Entergy Nuclear Operations, Inc., Vermont Yankee Nuclear Power Station—Issuance of Amendment to Renewed Facility Operating License Re: Changes to the Administrative Controls Section of the Technical Specifications (TAC No. MF2991), December 22, 2014, ADAMS Accession No. ML14217A072.

Fuel Movement License Amendments

8. Gratton, Christopher, U.S. Nuclear Regulatory Commission, letter to Mr. David A. Heacock, Dominion Energy Kewaunee, Inc., Kewaunee Power Station—Amendment to Technical Specifications Needed To Support Fuel Handling Activities (TAC No. MF4146), June 9, 2014, ADAMS Accession No. ML14111A234.
9. Kim, James, U.S. Nuclear Regulatory Commission, letter to Vice President, Operations, Entergy Nuclear Operations, Inc., Vermont Yankee Nuclear Power Station—Issuance of Amendment to Renewed Facility Operating License Re: Eliminate Operability Requirements for Secondary Containment when Handling Sufficiently Decayed Irradiated Fuel or a Fuel Cask (TAC No. MF3068), February 12, 2015, ADAMS Accession No. ML14304A588.

1.4.2. Maintenance and Aging Management of Passive, Long-Lived Components during Reactor Decommissioning

The regulations in 10 CFR 50.51 state, in Subsection (b)(1), that all permanently shutdown and defueled reactor licensees shall continue to take actions to maintain the facility, and the storage and control and maintenance of spent fuel, in a safe condition beyond the license expiration date until the Commission notifies the licensee in writing that the license is terminated.

The NRC has recently focused on the licensee's maintenance of long-lived, passive structures and components at decommissioning reactors. The NRC expects that many long-lived, passive structures and components may generally not have performance and condition characteristics that can be readily monitored, or could be considered inherently reliable by licensees and, thus, do not need to be monitored under 10 CFR 50.65(a)(1). There may be few, if any, actual maintenance activities (e.g., inspection or condition monitoring) that a licensee conducts for such structures and components. Treatment of long-lived, passive structures and components under the maintenance rule is likely to involve minimal preventive maintenance or monitoring to

maintain functionality of such structures and components in the original licensing period. The NRC is interested in the need to provide reasonable assurance that certain long-lived, passive structures and components (e.g., neutron-absorbing materials (NAMs), SFP liner) are maintained and monitored during the decommissioning period while spent fuel is in the SFP. Consideration of aging management at decommissioning reactors, especially related to NAMs used in the SFP, received special attention from certain technical staff. See Section 1.4.3 of this Appendix for additional details.

NRR/DLR initiated an assessment regarding whether there is a need for the NRC to further consider or require the maintenance and management of passive, long-lived structures, systems, and components (SSCs) that are in operation at nuclear power plants during the potential 60-year transition to decommissioning. The evaluation in draft is in ADAMS under Accession No. ML13058A128 (not publicly available).

1.4.3. Aging Management of Spent Fuel Pool Neutron Absorbing Materials

Requirements

The regulations in 10 CFR 50.68 detail the requirements for SFPs regarding the prevention of criticality accidents.

The regulation in 10 CFR 50.51(b)(1) requires licensees to “[t]ake actions necessary to decommission and decontaminate the facility and continue to maintain the facility, including, where applicable, the storage, control and maintenance of the spent fuel, in a safe condition....”

The regulation in 10 CFR 50.82(a)(3) requires licensees to complete decommissioning within 60 years from the time of permanent cessation of operation. This regulation also allows for the Commission to approve extensions beyond 60 years to complete decommissioning activities only when necessary to protect public health and safety.

Type of Action

Licensees addressed the aging management aspects of SFP neutron absorbing materials in their PDTs LARs (Reference 1). An NRC staff member initiated a nonconcurrence regarding the NRC staff’s review of the long-term degradation of the spent fuel pool NAM for the CR-3 and VY PDTs license amendment requests (References 2 and 3).

Discussion

During the transition to the decommissioning process for several reactors (KPS, SONGS, CR-3, and VY), the NRC staff became concerned with the aging management of the long-lived, passive components necessary for the safe operation of the facilities. The structures and components required to maintain the safe operation of the facility during the decommissioning period may remain operational beyond the licensed operating period of 40 years. Under the provisions of 10 CFR 50.82, the licensee must complete decommissioning within 60 years of permanent cessation of operations. Therefore, structures and components, such as those used to maintain the SFP, could conceivably remain in operation for up to 60 years after the permanent cessation of operations.

Specifically, the NRC staff was concerned with the degradation of the NAM in the SFP racks because test data demonstrate that certain materials will break down over time. The 10 CFR Part 50-licensed SFPs utilized one of three types of NAMs: boral, Boraflex, and Carborundum. Historical inspection data have demonstrated that boral and Boraflex are both susceptible to degradation over the 60-year lifespan allowed for decommissioning (see information notice 96-04, "Boraflex Degradation in SFP Storage"). Therefore, the NRC staff sought reasonable assurance that adequate provisions would be in place to monitor degradation of SFP NAM during the period of operation beyond the plants' original 40-year licenses, as applicable.

The four decommissioning reactor sites each resolved the potential NAM degradation concerns through different methods involving licensing actions.

Kewaunee Power Station

KPS has had a NAM monitoring program for over 20 years for its Carborundum racks. Additionally, KPS received a license renewal on February 24, 2011, which added the NAM monitoring program as a commitment in its updated final safety analysis report (UFSAR). Following the NRC staff's review of the licensee's LAR to remove license renewal conditions from the KPS operating license, the following license condition was incorporated into the license through License Amendment No. 213, issued June 23, 2014 (Reference 4):

If all spent fuel assemblies have not been removed from the spent fuel pool by December 31, 2017, the licensee shall request, prior to that date, an amendment to the license, pursuant to 10 CFR 50.90, to incorporate boron carbide and Boral surveillance programs (specified as Items 38 and 39 in Appendix A of NUREG-1958, 'Safety Evaluation Report Related to the License Renewal of Kewaunee Power Station,' dated January 2011) into the Technical Specifications.

San Onofre Nuclear Generating Station, Units 2 and 3

In its September 21, 2014, IFMP submittal, the licensee stated that SONGS expects to complete the transfer of all of the spent fuel to dry storage before the end of the original 40-year licenses for Units 2 and 3. In a supplement to its defueled TS LAR, SONGS proposed the following license condition for Unit 2:

Prior to February 16, 2021, if all spent fuel has not been removed from the Unit 2 spent fuel pool, an aging-management program shall be submitted for NRC approval. The scope of the program shall include those long-lived, passive structures and components that are needed to provide reasonable assurance of the safe condition of the spent fuel in the spent fuel pool. Once approved, the program shall be described in the Updated Final Safety Analysis Report and shall remain in effect for Unit 2 until such time that all spent fuel has been removed from the Unit 2 spent fuel pool.

SONGS proposed a similar license condition for Unit 3. These license conditions require SONGS to submit an aging management program for NRC review and approval 1 year prior to

the end of the original 40-year licenses for Units 2 and 3 if all fuel is not moved to dry storage by the respective date (Reference 5).

Crystal River Unit 3 Nuclear Generating Plant

CR-3 has two SFPs. SFP "A" has Carborundum NAM and has a surveillance program. SFP "B" uses boral NAM and does not have a surveillance program. CR-3 did not receive a license renewal, and its 40-year license would have ended in December 2016. In its supplemental letter for the CR-3 defueled TS amendment request, dated March 6, 2015 (Reference 1), the licensee provided a technical rationale for not needing an aging management program for the SFP NAM, the fire service system, and the radiation monitoring system prior to December 31, 2019. Additionally, the licensee provided the following "Regulatory Commitment" concerning the degradation monitoring of the SFP rack NAM (Reference 6):

If all spent fuel assemblies have not been removed from the spent fuel pool, the licensee shall request, prior to that date [December 31, 2019], an amendment to the license, pursuant to 10 CFR 50.90, to incorporate Boral and Carborundum surveillance programs into the CR-3 Technical Specifications.

The licensee stated in its supplemental letter that an SFP NAM aging management program was not within the scope of the defueled TS amendment request and that the existing maintenance and surveillance procedures are adequate. Additionally, the licensee agreed to incorporate the associated regulatory commitment into the CR-3 UFSAR. After reviewing the response, the NRC staff determined that a regulatory commitment provided adequate assurance of the effectiveness of the CR-3 NAM monitoring program. Subsequent to this determination, an NRC technical staff member submitted a nonconcurrence regarding the staff's acceptance of a Regulatory Commitment as a provision for assuring adequate monitoring of SFP NAM degradation. The NRC management reviewed the nonconcurrence and provided a response on July 15, 2015 (Reference 2).

Vermont Yankee Nuclear Power Station

VY instituted a NAM monitoring program, described in its UFSAR, as part of its license renewal amendment, issued March 21, 2011. Holders of renewed operating licenses issued under 10 CFR Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," are required to maintain the effectiveness of their aging management programs and activities. Therefore, licensees are obligated to maintain the effectiveness of the NAM monitoring programs described in their UFSARs. The following license condition was added to the VY operating license during the defueled TS amendment, issued October 7, 2015 (Reference 7):

Actions have been identified and have been or will be taken with respect to: (1) managing the effects of aging on the functionality of structures and components that have been identified to require review under 10 CFR 54.21(a)(1) during the period of extended operation, and (2) time-limited aging analyses that have been identified to require review under 10 CFR 54.21(c), such that there is reasonable assurance that the activities authorized by this license will continue to be conducted in accordance with the current licensing basis, as defined in 10 CFR 54.3 for the facility, and that any changes made to the facility's current licensing basis in order to comply with

10 CFR 54.29(a) are in accordance with the Act and the Commission's regulations.

This license condition reinforces the requirement to monitor the SFP NAM at VY. An NRC technical staff member continued to have concerns regarding the SFP NAM and the associated monitoring program and submitted another nonconcurrency. NRC management reviewed and responded to the nonconcurrency on July 14, 2015 (Reference 3).

Lessons Learned

- Long-lived passive structures, and especially the SFP NAM, continue to be important to safety for the NRC. Licensees that are in the transition to decommissioning must adequately address the aging management of their SFP NAM.
- If a nonconcurrency is submitted by an NRC staff member, plan for up to an additional 3-months of review time for resolution.

Recommendation

As part of the update to NRR OI COM-101, specifically related to communications and planning, the NRC staff should proceduralize the initial planning with the licensee that should include raising awareness of the concern over the plant's SFP NAM and the associated monitoring program, especially if the licensee does not have a renewed operating license for the facility.

References

1. Reising, Ronald R., Duke Energy, letter to U.S. Nuclear Regulatory Commission, Crystal River Unit 3—Response to Requests for Additional Information and Supplement 3 to License Amendment Request #316, Revision 0, March 6, 2015, ADAMS Accession No. ML15076A035.

Nonconcurrency Documents

2. Non-Concurrence Process, Response to Crystal River, Unit 3, Defueled Technical Specifications, July 15, 2015, ADAMS Accession No. ML15212A946.
3. Non-Concurrence on Safety Evaluation regarding Vermont Yankee License Amendment Request, July 14, 2015, ADAMS Accession No. ML15229A339 (not publically available; sensitive internal information).

Licensing Actions Addressing the NAM Monitoring Programs

4. Gratton, Christopher, U.S. Nuclear Regulatory Commission, letter to Mr. David A. Heacock, Dominion Energy Kewaunee, Inc., Kewaunee Power Station—Issuance of Amendment to Renewed Facility Operating License Related to License Conditions Associated with Extended Operation (TAC No. MF1771), June 23, 2014, ADAMS Accession No. ML14008A297.

5. Wengert, Thomas J., U.S. Nuclear Regulatory Commission, letter to Mr. Thomas J. Palmisano, Southern California Edison Company, San Onofre Nuclear Generating Station, Units 2 and 3—Issuance of Amendment for Permanently Shutdown and Defueled Operating License and Technical Specifications (TAC Nos. MF3774 and MF3775), June 17, 2015, ADAMS Accession No. ML15139A390.
6. Orenak, Michael D., U.S. Nuclear Regulatory Commission, letter to Mr. Terry D. Hobbs, Crystal River Nuclear Plant, Crystal River Unit 3 Nuclear Generating Plant—Issuance of Amendment for Permanently Shutdown and Defueled Operating License and Technical Specifications (TAC No. MF3089), September 4, 2015, ADAMS Accession No. ML15224B286.
7. Kim, James, U.S. Nuclear Regulatory Commission, letter to Vice President, Operations, Entergy Nuclear Operations, Inc., Vermont Yankee Nuclear Power Station—Issuance of Amendment for Defueled Technical Specifications and Revised License Conditions for Permanently Defueled Condition (CAC No. MF3714), October 7, 2015, ADAMS Accession No. ML15117A551.

1.4.4. Fukushima Dai-ichi Lessons Learned-Based Actions

Requirement

On March 12, 2012, the NRC staff issued three orders to certain operating power reactor licensees (including holders of construction permits) following an evaluation of the earthquake, tsunami, and resulting reactor accidents at the Fukushima Dai-ichi complex. Two of the orders (EA-12-049 and EA-12-051) were issued to all power reactor licensees to address immediate safety concerns highlighted by the accident. The third order, EA-12-050, “Order Modifying Licenses with regard to Reliable Hardened Containment Vents,” was issued to BWRs with Mark I and Mark II containments. Order EA-12-050 was subsequently superseded by Order EA-13-109 in a letter dated June 6, 2013. The requirements of the three active orders were immediately effective and are expected to remain in place until relaxed, rescinded, or superseded by order or rule.

- Order EA-12-049, “Order Modifying Licenses with regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,” ordered licensees to develop and implement strategies to maintain or restore core cooling, containment cooling, and SFP cooling capability during beyond-design-basis external events.
- Order EA-12-051, “Order Modifying Licenses with regard to Reliable Spent Fuel Pool Instrumentation,” ordered licensees to provide a means of reliable, remote SFP level indication to support effective prioritization of event mitigation and recovery actions in the event of a beyond-design-basis external event.
- Order EA-13-109, “Order Modifying Licenses with regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions,” ordered licensees to install hardened containment venting systems that can be maintained functional during severe accident conditions.

Type of Action

Licensee requests for rescission of the Fukushima-related orders.

Discussion

The orders apply to power reactor licensees and do not distinguish between operating plants and plants transitioning to decommissioning. Licensees that have decided to decommission have requested rescission of the orders. Once a licensee's certifications under 10 CFR 50.82(a)(1) are docketed by the NRC, the licensee is no longer authorized to operate the reactor or emplace or retain fuel in the reactor vessel. The plant conditions related to the reactor vessel and primary containment assumed in the development of the order would no longer be applicable to the decommissioning plant. The NRC staff's review of the licensees' requests is documented in letters to the licensees rescinding the subject orders. For requests received to date, the NRC staff review can be summarized as follows:

- For Order EA-12-049:
 - Regarding the containment¹ and reactor vessel, the NRC staff concluded that the lack of fuel in the reactor vessel and the absence of challenges to the containment render the development of related guidance and strategies unnecessary.
 - Regarding the SFP, the NRC staff concluded that, following the verification of low decay heat levels and slow heatup rate at decommissioning reactors, the reliance on the SFP inventory for passive cooling provides an equivalent level of protection, which would be provided by the initial phase of the guidance and strategies for maintaining or restoring SFP cooling capabilities that would be necessary for compliance with Order EA-12-049. In addition, the long time-to-boil of the SFP inventory to a point at which makeup water would be necessary for radiation shielding purposes eliminates the need for a transitional phase of guidance and strategies for the SFP. Further, the low decay heat rate and long boil-off period provide sufficient time for the licensee to obtain offsite resources on an ad hoc basis to sustain cooling indefinitely, eliminating the need for the final phase of the guidance and strategies that would be necessary for compliance with the order.
 - Consequently, the NRC staff concluded that these showings provide good cause for rescission of the order.
 - Examples of rescission of Order EA-12-049 are provided in References 1, 2, and 3.

¹ The proposed MBDBE rule published at 80 FR 70609 includes a distinction between the treatment of containment functions relied upon for the prevention of release of fission products from the reactor vessel and secondary containment functions for those licensees that rely upon secondary containment for the retention of fission products from the SFP. As used here, the containment functions under discussion are the former ones, related to the retention of reactor vessel fission products.

- For Order EA-12-051:
 - Once a licensee's certifications under 10 CFR 50.82(a)(1) are docketed by the NRC, the licensee is no longer authorized to operate the reactor or emplace or retain fuel in the reactor vessel, and the SFP becomes the primary safety concern for site personnel. In the event of a challenge to the safety of the stored fuel, decision makers would not have to prioritize actions, because there would be no fuel located in the reactor vessel and, thus, no concern for providing cooling to that location.
 - Consequently, the NRC staff concluded that these showings provide good cause for rescission of the order.
 - Examples of rescission of Order EA-12-051 are provided in References 4, 5, and 6.
- For Order EA-13-109:
 - The order includes two separate implementation phases. Phase 1 involved upgrading the venting capabilities from the containment wetwell to provide reliable, severe-accident-capable hardened vents to assist in preventing core damage and, if necessary, to provide venting capability during severe accident conditions. Phase 2 involved providing additional protections for severe accident conditions through installation of a reliable, severe-accident-capable drywell vent system or the development of a reliable containment venting strategy that makes it unlikely that a licensee would need to vent from the containment drywell during severe accident conditions. For plants who have requested rescissions to this order, the licensee provided justification that, upon docketing of the certification required under 10 CFR 50.82(a), the licensee is no longer authorized to operate the reactor or emplace fuel in the vessel. The underlying facts associated with these certifications obviate the need for the safety function of the primary containment and provide good cause for the order to be rescinded.
 - An example of a rescission of Order EA-13-109 is provided in Reference 7.

Lesson Learned

Licensees may request to rescind orders based on pursuing a transition to decommissioning. Examples of past order rescission closeout letters for reactors transitioning to decommissioning, including the safety basis for those decisions, are included in the Reference section below.

Recommendations

It is recommended that PMs coordinate with the licensee early in the decommissioning process to understand the licensee's plans concerning the Fukushima orders.

As part of the Mitigation of Beyond Design Basis Events proposed rule (80 FR 70610; November 13, 2015), which would make Orders EA-12-049 and EA-12-051 generically applicable through regulations, the NRC would include provisions for phasing out

decommissioning plants (considering spent fuel decay time, as appropriate) from these requirements for the reasons stated above.

The NRC staff that will be developing regulatory changes for decommissioning plants should monitor the progress of seismic and flooding studies. Thus far, no additional actions or further safety enhancements have been necessary for decommissioned reactors based on reevaluated seismic and flooding information. However, new information concerning the adequacy of design bases of SFPs will be evaluated by the NRC staff for applicability to decommissioning sites using existing NRC processes.

References

1. Leeds, Eric J., U.S. Nuclear Regulatory Commission, letter to Mr. Terry D. Hobbs, Crystal River Nuclear Plant, Crystal River Unit 3 Nuclear Generating Plant—Rescission of Order EA-12-049, “Order Modifying Licenses with regard to Requirements for Mitigation Strategies for Beyond Design Basis External Events,” August 27, 2013, ADAMS Accession No. ML13212A366.
2. Leeds, Eric J., U.S. Nuclear Regulatory Commission, letter to Mr. David A. Heacock, Dominion Energy Kewaunee, Inc., Kewaunee Power Station—Rescission of Order EA-12-049, “Order Modifying Licenses with regard to Requirements for Mitigation Strategies for Beyond Design Basis External Events” (TAC No. MF2774), June 10, 2014, ADAMS Accession No. ML14059A411.
3. Leeds, Eric J., U.S. Nuclear Regulatory Commission, letter to Mr. Thomas J. Palmisano, Southern California Edison Company, San Onofre Nuclear Generating Station, Units 2 and 3—Rescission of Order EA-12-049, “Order Modifying Licenses with regard to Requirements for Mitigation Strategies for Beyond Design Basis External Events” (TAC Nos. MF2657 and MF2658), June 30, 2014, ADAMS Accession No. ML14113A572.
4. Leeds, Eric J., U.S. Nuclear Regulatory Commission, letter to Mr. Terry D. Hobbs, Crystal River Nuclear Plant, Crystal River Unit 3 Nuclear Generating Plant—Rescission of Order EA-12-051, “Order Modifying Licenses with regard to Reliable Spent Fuel Pool Instrumentation” August 27, 2013, ADAMS Accession No. ML13203A161.
5. Leeds, Eric J., U.S. Nuclear Regulatory Commission, letter to Mr. David A. Heacock, Dominion Energy Kewaunee, Inc., Kewaunee Power Station—Rescission of Order EA-12-051, “Order Modifying Licenses with regard to Reliable Spent Fuel Pool Instrumentation” (TAC No. MF2776), June 10, 2014, ADAMS Accession No. ML14066A204.
6. Leeds, Eric J., U.S. Nuclear Regulatory Commission, letter to Mr. Thomas J. Palmisano, Southern California Edison Company, San Onofre Nuclear Generating Station, Units 2 and 3—Rescission of Order EA-12-051, “Order Modifying Licenses with regard to Reliable Spent Fuel Pool Instrumentation” (TAC Nos. MF0917 and MF0918), June 30, 2014, ADAMS Accession No. ML14111A069.

7. Leeds, Eric J., U.S. Nuclear Regulatory Commission, letter to Vice President, Operations, Entergy Nuclear Operations, Inc., Vermont Yankee Nuclear Power Station—Request for Rescission of and Schedule Relief from Commission Order EA-13-109, “Order To Modify Licenses with regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions” (TAC No. MF3225), April 15, 2014, ADAMS Accession No. ML14055A323.
8. Evans, Michele G., U.S. Nuclear Regulatory Commission, letter to Mr. Peter T. Dietrich, Southern California Edison Company, San Onofre Nuclear Generating Station, Units 2 and 3—NRC Response to Southern California Edison’s Final Response to the March 2012 Request for Information Letter, January 22, 2014, ADAMS Accession No. ML13329A826.

1.4.5. Changes to the License Conditions

Requirement

The regulation in 10 CFR 50.50, “Issuance of Licenses and Construction Permits,” states that the NRC can issue a license containing conditions and limitations as it deems appropriate and necessary.

Type of Action

Upon submission of the 10 CFR 50.82 letters declaring that a plant is permanently shut down and defueled, the licensee submits an LAR to revise the operating license and associated TSs to reflect the permanent cessation of reactor operations and the permanently defueled condition of the reactor vessel.

For the review of requested changes to license conditions, the PM should consult with the following branches (others as necessary, based on the requested changes) early in the process to determine if safety evaluation input or concurrence is required:

- Reactor Decommissioning Branch (NMSS/DUWP/RDB)
- Subsequent Renewal, Guidance, and Operations Branch (NRR/DLR/RSRG)
- Fire Protection Branch (NRR/DRA/AFP)

Discussion

All 10 CFR Part 50 reactor licenses contain license conditions that the NRC determined to be appropriate and necessary, in accordance with 10 CFR 50.50. When the licensee submits the 10 CFR 50.82 letters asserting that the reactor is permanently shut down and defueled, many of the license conditions are no longer relevant and can be modified or removed from the license.

As part of the PDTs LARs, licensees proposed changes to license conditions that can be categorized in four groups: (1) removal of references to “operation,” (2) removal or modification of conditions that are applicable to an operating plant, (3) removal of completed one-time conditions, and (4) addition of conditions.

The first group of license condition changes concerns the removal of references to plant operation. After submitting the 10 CFR 50.82 letters, the licensee is no longer allowed to load fuel or operate the reactor. However, the licensee must still be allowed to possess the special nuclear material that is still present on site as reactor fuel and use the systems required to support safe fuel storage (e.g., the SFP) during the decommissioning period, in accordance with the specified limitations for storage.

The second group of license condition changes is the removal or modification of the conditions related to the operation of the plant (e.g., maximum power level, plant component requirements). Since the licensee is no longer allowed to load fuel or operate the reactor, the operational license conditions are no longer applicable and should be removed for clarity and simplification.

The third group of license condition changes is the removal of one-time/single-action license conditions that have already been satisfied or completed. The removal of these conditions is for clarity and simplification of the license.

The fourth group of license condition changes are the additions. Two licensees, KPS and SONGS, proposed two types of license conditions. The first new condition concerns an aging management program for the SFP neutron absorbers. This license condition is discussed at length in the Aging Management Concerns section of this report (Section 1.4.3). The second new condition documents the current condition of the plant and summarizes the actions and requirements applicable to the facility by regulation (References 1, 2, 3, and 4).

Additionally, three license condition changes or removals in the recently transitioning reactors (i.e., KPS, CR-3, SONGS, and VY) deserve special mention: fire protection, cyber security, and mitigation strategies.

Most 10 CFR Part 50 licenses contain a license condition specifying that a fire protection be in accordance with a program for achieving and maintaining safe shutdown that has been reviewed and approved by the NRC staff. Upon permanent shutdown and permanent removal of fuel from the reactor vessel, achieving and maintaining safe shutdown in the event of a fire is no longer applicable. However, other elements of the fire protection program continue to be applicable during decommissioning to address fire events that could result in radiological hazards, per the requirements in 10 CFR 50.48(f). For the recently transitioning reactors, the NRC staff found that that reliance on 10 CFR 50.48(f) is appropriate to ensure that a fire protection program is maintained and, thus, approved the removal of the license condition.

Several licensees requested that the B.5.b mitigation strategies license condition be removed based on a reactor's permanent shutdown and defueled status. As discussed in Appendix 1.4.7 of this report, the NRC staff has determined that the applicability of the condition was never intended to be removed while spent fuel continued to be stored in the spent fuel pool. Furthermore, the staff relies on this condition as part of its justification for granting exemptions to remove certain offsite EP regulations. Based on further considerations, the decommissioning licensees supplemented their applications to reinstate the mitigating strategies license conditions (References 5 and 6).

Several licensees requested that the cyber security plan (CSP) license condition be removed from their licenses. These licensees based their request on the applicability of the cyber

security requirements of 10 CFR Part 73 to be only for licensees authorized to operate. As discussed in Appendix 1.6.3 of this report, there are certain critical data assets that are needed to maintaining the security of the facility while spent fuel is stored in the spent fuel pool. Based on further considerations, the decommissioning licensees supplemented their applications to reinstate the cyber security license conditions (References 5 and 6).

It should be noted that Section 1 of all 10 CFR Part 50 licenses contain the findings of the NRC that provide the NRC staff's licensing basis for issuing the original operating license. As part of their PDTs LARs, some licensees proposed to modify the staff's findings in Section 1 of the license. While certain wording in Section 1 may be modified for certain cases (e.g., when the name of the licensee changes), these findings represent the historical documented basis for the staff's conclusions that the licensee meets other conditions referenced in the license and, therefore, should remain unaltered in the license until license termination.

Finally, Dominion Energy Kewaunee proposed to remove the license conditions associated with license renewal and actions required during the period of extended operation. The purpose of the license renewal license conditions was to ensure that aging management programs (AMPs) and related commitments were implemented and inspection and testing activities were completed prior to or during the period of extended operation (PEO).

Since the licensee has permanently ceased operation and defueled, aging management activities associated with most reactor components were unnecessary, and many of the commitments to be accomplished during the PEO are no longer applicable. The requested removal the license renewal conditions was primarily to avoid any confusion concerning the use of the screening process set forth in 10 CFR 50.59 to manage changes to the license renewal commitments that have been incorporated into the updated safety analysis report.

The purpose of an AMP is, in part, to ensure the aging effects of equipment important to safe operation of the reactor are managed so that the functionality of systems, structures and components is maintained during the plant's PEO. For a permanently shutdown plant, most of the equipment subject to AMPs is no longer in use, and its functionality may not need to be maintained.

Some equipment used during decommissioning, such as equipment related to the operation of the spent fuel pool, the fire protection system and the radiation monitoring and protection system may operate anywhere from 10 to 60 years beyond certification of permanent cessation of operations and may be subject to AMPs.

The NRC staff found removal of the license conditions applicable to AMP commitments acceptable because; 1) all the license renewal commitments have been incorporated into the updated safety analysis report, and; 2) changes to the commitments in the updated safety analysis report must be evaluated under 10 CFR 50.59 (See Reference 7).

Lessons Learned

- The precedent LARs can be very instructive for successive licensees to propose acceptable license conditions.

- Licensees should not propose modifications to Section 1 of the operating license, since these consist of the NRC's findings associated with the original license.

Recommendation

As part of the update to NRR OI COM-101, specifically related to communications and planning, the NRC staff should proceduralize planning discussions with the licensee that include a review of the precedent license condition changes to facilitate a timely review of similar proposed changes.

References

PDTS License Amendments

1. Wengert, Thomas J., U.S. Nuclear Regulatory Commission, letter to Mr. David A. Heacock, Dominion Energy Kewaunee, Inc., Kewaunee Power Station—Issuance of Amendment for Permanently Shutdown and Defueled Technical Specifications and Certain License Conditions (TAC No. MF1952), February 13, 2015, ADAMS Accession No. ML14237A045.
2. Wengert, Thomas J., U.S. Nuclear Regulatory Commission, letter to Mr. Thomas J. Palmisano, Southern California Edison Company, San Onofre Nuclear Generating Station, Units 2 and 3—Issuance of Amendment for Permanently Shutdown and Defueled Operating License and Technical Specifications (TAC Nos. MF3774 and MF3775), July 17, 2015, ADAMS Accession No. ML15139A390.
3. Orenak, Michael D., U.S. Nuclear Regulatory Commission, letter to Mr. Terry D. Hobbs, Crystal River Nuclear Plant, Crystal River Unit 3 Nuclear Generating Plant—Issuance of Amendment for Permanently Shutdown and Defueled Operating License and Technical Specifications (TAC No. MF3089), September 4, 2015, ADAMS Accession No. ML15224B286.
4. Kim, James, U.S. Nuclear Regulatory Commission, letter to Vice President, Operations, Entergy Nuclear Operations, Inc., Vermont Yankee Nuclear Power Station—Issuance of Amendment for Defueled Technical Specifications and Revised License Conditions for Permanently Defueled Condition (CAC No. MF3714), October 7, 2015, ADAMS Accession No. ML15117A551.

Reinstatement of Mitigating Strategies and Cyber Security License Conditions

5. Sartain, Mark D., Dominion Energy Kewaunee, Inc., letter to U.S. Nuclear Regulatory Commission, Dominion Energy Kewaunee, Inc., Kewaunee Power Station, Supplement 4 and Response to Request for Additional Information regarding License Amendment Request 256, Permanently Defueled License and Technical Specifications, April 29, 2014, ADAMS Accession No. ML14126A005.

6. Elnitsky, John, Duke Energy, letter to U.S. Nuclear Regulatory Commission, Crystal River Unit 3—Response to Requests for Additional Information and Supplement 1 to License Amendment Request #316, Revision 0, May 7, 2014, ADAMS Accession No. ML14139A006.

Removal of License Renewal Conditions

7. Gratton, Christopher, U.S. Nuclear Regulatory Commission, letter to Mr. David A. Heacock, Dominion Energy Kewaunee, Inc., Kewaunee Power Station—Issuance of Amendment to Renewed Facility Operating License Related to License Conditions Associated with Extended Operation (TAC No. MF1771), June 23, 2014, ADAMS Accession No. ML14008A297

1.4.6. Applicability of 10 CFR 50.54(hh)(1) Requirements to Decommissioning Power Reactors

Requirements

The regulations in 10 CFR 50.54(hh) state, in part:

- (1) Each licensee shall develop, implement and maintain procedures that describe how the licensee will address the following areas if the licensee is notified of a potential aircraft threat:
 - (i) Verification of the authenticity of threat notifications;
 - (ii) Maintenance of continuous communication with threat notification sources;
 - (iii) Contacting all onsite personnel and applicable offsite response organizations;
 - (iv) Onsite actions necessary to enhance the capability of the facility to mitigate the consequences of an aircraft impact;
 - (v) Measures to reduce visual discrimination of the site relative to its surroundings or individual buildings within the protected area;
 - (vi) Dispersal of equipment and personnel, as well as rapid entry into site protected areas for essential onsite personnel and offsite responders who are necessary to mitigate the event; and
 - (vii) Recall of site personnel.

In accordance with 10 CFR 50.54(hh)(3), the requirements of 10 CFR 50.54(hh)(1) are not applicable to decommissioning facilities (i.e., those facilities that have submitted certifications pursuant to 10 CFR 50.82(a)(1)).

Type of Action

As stated above, 10 CFR 50.54(hh)(1) does not apply to decommissioning facilities. Therefore, licensees for decommissioning facilities are not required to have procedures in place for actions to be taken for a potential aircraft threat, including verification of the authenticity of threat notifications.

Discussion

In 10 CFR 50.54(hh)(1), the NRC establishes the requirements for preparatory actions to be taken in the event of a potential aircraft threat to a nuclear power reactor facility. The license condition in 10 CFR 50.54(hh)(1) does not apply to decommissioning facilities. Therefore, the NRC stopped providing the daily threat authentication information to one licensee that had recently transitioned to decommissioning. That licensee informally requested that the NRC continue to provide daily threat authentication information to its site. As a result, the NRC headquarters operations officer (HOO) continues to provide daily threat authentication information to all of the reactors that have recently entered into decommissioning.

Lesson Learned

Although 10 CFR 50.54(hh)(1) does not apply to decommissioning facilities, the NRC HOO will continue to send the daily threat authentication information to the licensees of decommissioning facilities. These licensees can voluntarily use this information, including verification of the authenticity of threat notifications. The HOO will continue to provide the daily threat authentication information to these licensees until NRR/DORL provides explicit directions that the threat information can be discontinued. If a licensee chooses to discontinue the use of the daily authentication threat information, then it can voluntarily use one of the alternative authentication methods.

Recommendations

- As part of the update to NRR OI COM-101, specifically related to communications and planning, the NRC staff should coordinate with the HOO such that the HOO could continue to send daily threat authentication information to the licensees of decommissioning facilities, if requested by the respective licensee.
- As part of the planned integrated decommissioning rulemaking, the NRC staff is considering revision to 10 CFR 50.54(hh)(1) in relation to decommissioning reactors.

1.4.7. Applicability of 10 CFR 50.54(hh)(2) Requirements to Decommissioning Power Reactors

Requirements

The regulations in 10 CFR 50.54(hh) state, in part:

- (2) Each licensee shall develop and implement guidance and strategies intended to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities under the circumstances associated with loss of

large areas of the plant due to explosions or fire, to include strategies in the following areas:

- (i) Firefighting;
 - (ii) Operations to mitigate fuel damage; and
 - (iii) Actions to minimize radiological release.
- (3) This section does not apply to a nuclear power plant for which the certifications required under § 50.82(a) or § 52.110(a)(1) of this chapter have been submitted.

The Commission added 10 CFR 50.54(hh)(3) in the Power Reactor Security Requirements final rule, published on March 27, 2009 (74 FR 13926), in response to a comment that the requirements of 10 CFR 50.54(hh) should not apply to “reactor facilities currently in decommissioning and for which the certifications required under § 50.82(a)(1) have been submitted” because “it is inappropriate that § 50.54(hh) should apply to a permanently shutdown and defueled reactor where the fuel was removed from the site or moved to an independent spent fuel storage installation (ISFSI).” (See, 74 FR 13926, 13933, March 27, 2009).

The resolution of this comment is inconsistent with 10 CFR 50.54(hh)(3), which makes the requirements of 10 CFR 50.54(hh) inapplicable following submission of the certifications under § 50.82(a)(1) and § 52.110(a) without regard to whether the fuel was removed from the site or to an ISFSI. The staff has determined that the applicability statement in 10 CFR 50.54(hh)(3) is inconsistent with the discussion of this issue in the SOCs and that requirements in 10 CFR 50.54(hh)(2) should continue to apply to a decommissioning facility as long as spent fuel remains in the SFP.

Although the current regulations under 10 CFR 50.54(hh)(2) do not apply to decommissioning power reactors, all current operating licenses² have the equivalent of 10 CFR 50.54(hh)(2) incorporated into the facility’s license (See, e.g., Arkansas Nuclear One, Unit No. 1, Renewed License DPR-51, License Condition 2.c.(9), “Mitigating Strategies”). Accordingly, the equivalent requirements of 10 CFR 50.54(hh)(2) are incorporated into the facility licenses, and this requirement applies until the Commission issues a license amendment to remove or revise the requirements.

Type of Action

While licensees may request a license amendment to remove the Mitigating Strategies License Condition on the basis that 10 CFR 50.54(hh)(2) is not applicable to decommissioning power reactors, the NRC is unlikely to accept removal of the license condition (see discussion below for how it was addressed in the recent decommissioning reviews). While fuel remains in the SFP, this inconsistency will exist until completion of the mitigation of beyond-design-basis events (MBDBE) rulemaking in approximately late 2017. This rulemaking is projected to move

² There is one exception: Watts Bar, Unit 2, which was licensed after the issuance of the B.5.b order. Watts Bar, Unit 2 is subject to the regulations at § 50.54(hh) without a B.5.b license condition. Similarly, new reactor licensees currently under construction do not have the B.5.b license conditions in their combined licenses, but are outside of the scope of this document; resolution of this issue for those licensees will be accomplished along with the resolution for currently operating power reactor licensees.

the § 50.54(hh)(2) requirements to new 10 CFR 50.155, “Mitigation of Beyond-Design-Basis Events,” which will include decommissioning provisions and is anticipated to include removal of the Mitigating Strategies License Condition based upon compliance with the new rule taking its place. In the event that the final MBDBE rule does not include removal of the license conditions, they could be removed—not because the strategies are being removed, but because there will be existing regulation that addresses this issue that makes the license condition moot (discussed further in the “Recommendation” section below).

Discussion

The capabilities that most licensees maintain for mitigating certain security-related events are captured in the Mitigation Strategies license condition. The B.5.b license condition requires a strategy for addressing large fires and explosions in or around the SFP, including the use of designated equipment and actions by the operations staff that will maintain the ability to mitigate a radiological release from fuel within the SFP due to a security-initiated event that could introduce kinetic energy into the SFP from an external source. The NRC staff has also reached a conclusion that certain beyond-design-basis events can be reasonably mitigated with the same equipment and procedures used to implement the Mitigating Strategies license condition. The NRC staff has also concluded that the availability of the B.5.b mitigation strategies and associated equipment is very important in the staff’s evaluation of exemptions from EP regulations at decommissioning reactors. Consequently, the need to maintain this license condition (or to provide an equivalent condition) is an important consideration if the licensee expects to be granted an exemption from certain standards of 10 CFR 50.47, “Emergency Plans,” and certain requirements of Appendix E to 10 CFR Part 50, “Emergency Planning and Preparedness for Production and Utilization Facilities.”

The issue was resolved by the NRC staff during the review of the EP exemption requests by the KPS, CR-3, SONGS, and VY licensees in parallel with the review of amendment requests at these facilities requesting the removal of the 10 CFR 50.54(hh)(2)-equivalent license condition. An LAR for KPS (Reference 1) proposed to modify the operating TSs to be consistent with the decommissioning (i.e., permanently shutdown and defueled) status of the reactor. The amendment request also included a request to remove the ICM Order B.5.b equivalent license condition. (Note that similar requests were made in the permanently shutdown TS amendment requests by Duke Energy Florida, Inc. (DEF), Entergy Nuclear Operations, Inc. (Entergy), and Southern California Edison Co. (SCE)). Given that the licensees must continue to provide adequate emergency response under 10 CFR 50.47 and that the spent fuel must be protected against the design-basis threat (DBT) of radiological sabotage under 10 CFR 73.55, “Requirements for Physical Protection of Licensed Activities in Nuclear Power Reactors against Radiological Sabotage,” the NRC did not approve these requests. Specifically, an RAI was developed (Reference 2) that requested the licensee to provide its strategy for addressing large fires and explosions in or around the SFP, regardless of ignition source. In addition, the RAI requested whether the operations staff will maintain the ability to mitigate a radiological release from fuel within the SFP due to a security-initiated event. This was further clarified in a follow-up teleconference (Reference 3). Given the implementation of requested exemptions and license amendments related to EP and security, the RAI requested that the licensee, for each element of the license condition, provide justification that the elimination of that element would not result in operations that would endanger the health and safety of the public or be inimical to the common defense and security.

As a result of this RAI, the licensee withdrew its request to remove the Mitigation Strategy License Condition (Reference 4). [Note that similar withdrawals were subsequently requested by DEF, SCE, and Entergy VY.]

Lesson Learned

The Mitigating Strategies license condition should be retained while spent fuel remains in the SFP. This license condition (or equivalent conditions) is important in the NRC staff's evaluation of requests for exemptions from EP requirements at decommissioning reactors.

Recommendation

The current regulations are being amended to require decommissioning reactors to maintain 10 CFR 50.54(hh)(2) requirements as part of the ongoing MBDBE rulemaking. In the ongoing rulemaking, which is currently in the final rule stage, the current 10 CFR 50.54(hh)(2) requirements will be moved to a new section, 10 CFR 50.155(b)(3), and will be made applicable to decommissioning power reactors as long as irradiated fuel is stored in the SFP.

References

1. Grecheck, Eugene S., Dominion Energy Kewaunee, Inc., letter to U.S. Nuclear Regulatory Commission, Kewaunee Power Station, License Amendment Request 256, Permanently Defueled License and Technical Specifications, May 29, 2013, ADAMS Accession No. ML13156A037.
2. Huffman, William, U.S. Nuclear Regulatory Commission, e-mail to Jack Gadzala, Dominion Energy Kewaunee, Inc., Draft RAI Related to Kewaunee Proposed Deletion of License Condition on Mitigation Strategy, April 1, 2014, ADAMS Accession No. ML14097A511.
3. Huffman, William, U.S. Nuclear Regulatory Commission, e-mail to Eric Bowman, Greg Casto, Steve Jones, Gary Purdy, Margaret Cervera, Joseph Anderson, Michael Norris, Michael Wasem, Christopher Gratton, James Kim, [Summary] of Kewaunee Mitigation Strategy Phone Call Last Week [with Dominion Kewaunee], April 7, 2014, ADAMS Accession No. ML14155A040.
4. Sartain, Mark D., Dominion Energy Kewaunee, Inc., letter to U.S. Nuclear Regulatory Commission, Dominion Energy Kewaunee, Inc., Kewaunee Power Station, Supplement 4 and Response to Request for Additional Information regarding License Amendment Request 256, Permanently Defueled License and Technical Specifications, April 29, 2014, ADAMS Accession No. ML14126A005.

1.4.8. Environmental Assessments for Exemptions for Decommissioning Power Reactors

Requirement

The regulation in 10 CFR 51.21, "Criteria for and Identification of Licensing and Regulatory Actions Requiring Environmental Assessments," specifies that an environmental

assessment (EA) be prepared for all regulatory and licensing activities subject to Appendix A to Subpart A of Part 51, "Format for Presentation of Material in Environmental Impact Statements," including exemptions, with some exceptions. The exceptions are identified in 10 CFR 51.20, "Criteria for and Identification of Licensing and Regulatory Actions Requiring Environmental Impact Statements," requiring EISs, those identified as a categorical exclusion in 10 CFR 51.22(c) and those actions described in 51.22(d) as not requiring an environmental review. On April 19, 2010 (75 FR 20248), the NRC published a revision to 10 CFR 51.22, "Criterion for Categorical Exclusion; Identification of Licensing and Regulatory Actions Eligible for Categorical Exclusion or Otherwise Not Requiring Environmental Review," to expand the scope of the categorical exclusions, including the criteria for exemptions, based on regulatory experience.

Specifically, 10 CFR 51.22 was revised to include criteria for categorical exclusion for exemptions in paragraphs 51.22(c)(9) and 51.22(c)(25). Consequently, if the licensee submits an exemption request and asserts categorical exclusion pursuant to 10 CFR 51.22, the NRC staff will review and assess whether the licensee's request meets the regulatory criteria for exclusion. If the staff confirms that the request meets the criteria for categorical exclusion, an environmental review is not necessary for the proposed action and the appropriate categorical exclusion can be applied.

Guidance on the preparation and use of EAs for exemptions is provided in NRR OI LIC-103, "Exemptions from NRC Regulations," Revision 1, dated July 6, 2006 (ADAMS Accession No. ML052590073; not publicly available).

Type of Action

For most of the exemption requests submitted for the most recent power reactors transitioning to decommissioning, licensees requested categorical exclusions. The NRC staff subsequently determined that a significant number of these exemptions did meet the criteria for categorical exclusion and, therefore, did not require environmental reviews.

However, concerning the EP exemptions associated with the recent decommissioning plants, the NRC staff made a decision, in consultation with the Office of the General Counsel (OGC), to take a more conservative approach by conducting an environmental review and preparing an EA and a finding of no significant impact (FONSI). This decision was made due to the increased public interest of this issue and to provide public confidence.

Discussion

The NRC staff issued EAs for the EP exemptions for KPS, CR-3, and SONGS Units 2 and 3 (References 1, 2, and 3).

Due to a high degree of public interest related to decommissioning licensing actions at the VY facility, the NRC staff decided to issue a draft EA with a 30-day public comment period for the VY EP exemption, as provided for in 10 CFR 51.33, "Draft Finding of No Significant Impact; Distribution" (Reference 4). The State of Vermont and several members of the public submitted comments, which the NRC staff addressed when it issued the final EA (Reference 5).

Lessons Learned

For future decommissioning EP exemption requests, PMs should consider continuing the practice of publishing EAs in the *Federal Register*.

For future EP exemption requests for decommissioning reactors associated with plants located in areas where there is a high degree of public interest in emergency planning changes associated with decommissioning, DORL should consider issuing a draft EA with a 30-day public comment period, addressing the public comments it receives, and then issuing the final EA/FONSI, as allowed for under 10 CFR 51.33 (References 4 and 5).

Pursuit of the above actions should be discussed by the applicable DORL PM and Branch Chief, in consultation with environmental staff, OGC, and DORL Senior Executive Service management, considering any plant-specific circumstances.

As part of the planned integrated decommissioning rulemaking, the NRC staff is considering revisions to EP requirements for decommissioning power reactors informed by the guidance in NSIR/DPR-ISG-02. Upon implementation of the rulemaking, exemptions from certain EP requirements, and the associated EAs, would not be required for reactors transitioning to decommissioning.

Recommendation

As part of the update to NRR OI LIC-103, the NRC staff should proceduralize considerations for EAs for EP changes for decommissioning reactors.

References

1. Wengert, Thomas J., U.S. Nuclear Regulatory Commission, letter to Mr. David A. Heacock, Dominion Energy Kewaunee, Inc., Kewaunee Power Station—Finding of No Significant Impact with the Associated Environmental Assessment Related to Request for Exemptions from Certain Emergency Planning Requirements (TAC No. MF2567), September 26, 2014, ADAMS Accession No. ML14251A371.
2. Orenak, Michael D., U.S. Nuclear Regulatory Commission, letter to Mr. Terry D. Hobbs, Crystal River Nuclear Plant, Crystal River Unit 3 Nuclear Generating Plant—Environmental Assessment and Finding of No Significant Impact Related to Request for Exemptions from Certain Emergency Planning Requirements (TAC No. MF2981), February 23, 2015, ADAMS Accession No. ML15013A181.
3. Wengert, Thomas J., U.S. Nuclear Regulatory Commission, letter to Mr. Thomas J. Palmisano, Southern California Edison Company, San Onofre Nuclear Generating Station, Units 1, 2, and 3 and the Independent Spent Fuel Storage Installation—Environmental Assessment and Finding of No Significant Impact Related to Request for Exemptions from Certain Emergency Planning Requirements (TAC Nos. MF3835, MF3836, and MF3837), April 9, 2015, ADAMS Accession No. ML15056A274.

4. Kim, James, U.S. Nuclear Regulatory Commission, letter to Site Vice President, Entergy Nuclear Operations, Inc., Vermont Yankee Nuclear Power Station—Draft Environmental Assessment and Finding of No Significant Impact Related to Request for Exemptions from Certain Emergency Planning Requirements (TAC No. MF3614), April 24, 2015, ADAMS Accession No. ML15103A419.
5. Kim, James, U.S. Nuclear Regulatory Commission, letter to Site Vice President, Entergy Nuclear Operations, Inc., Vermont Yankee Nuclear Power Station—Final Environmental Assessment and Finding of No Significant Impact Related to Request for Exemptions from Certain Emergency Planning Requirements (TAC No. MF3614), July 31, 2015, ADAMS Accession No. ML15180A067.

1.5 Emergency Preparedness

During the NRC staff's reviews of EP-related regulatory exemptions and license amendments, the staff should recognize the nexus between EP and security. EP is considered the final barrier in a defense-in-depth strategy and, as such, is not intended to preclude the initiation of any specific accident or event. Rather, EP is intended to provide reasonable assurance that actions can be taken to protect public health and safety from the consequences of a broad range of accidents or events. Changes to the staff's evaluation of an EP exemption assumes that any change to a licensee's physical security plan will continue to be evaluated by staff to provide high assurance of adequate protection. As such, the licensee's emergency plan will continue to address the classification of hostile action events and arrangements for requesting and effectively using assistance resources in response to an event.

1.5.1. Application of 10 CFR 50.54(q) at a Permanently Shutdown Reactor Transitioning to Decommissioning

Requirements

The regulation in 10 CFR 50.54(q)(3), specifies that "[t]he licensee may make changes to its emergency plan without NRC approval only if the licensee performs and retains an analysis demonstrating that the changes do not reduce the effectiveness of the plan and the plan, as changed, continues to meet the requirements in Appendix E to this part and, for nuclear power reactor licensees, the planning standards of § 50.47(b)."

The regulation in 10 CFR 50.59(c)(1), specifies criteria whereby "[a] licensee may make changes in the facility as described in the final safety analysis report (as updated), make changes in the procedures as described in the final safety analysis report (as updated), and conduct tests and experiments not described in the final safety analysis report (as updated) without obtaining a license amendment...."

Type of Action

When a licensee evaluates changes to its emergency plans, for permanently shutdown reactors transitioning to decommissioning, they should be using the regulation in 10 CFR 50.54(q).

For reviews of license amendment requests involving reductions in emergency response organization staff, the PM may need to consult with the Radiation Protection and Consequence

Branch (NRR/DRA/ARCB) early in the process, in addition to the Reactor Licensing Branch in NSIR (NSIR/DPR/RLB), to determine if safety evaluation input or concurrence is required, if the request involves changes to dose consequences.

Discussion

The regulation in 10 CFR 50.59(c)(1) establishes requirements that may permit a licensee to make changes in the facility and procedures as described in the UFSAR and conduct tests or experiments not described in the UFSAR without obtaining a license amendment. However, 10 CFR 50.59(c)(4) states that “[t]he provisions in this section do not apply to changes to the facility or procedures when applicable regulations establish more specific criteria for accomplishing such changes.” These specific criteria for the licensee’s evaluation of changes to its emergency plan are provided in 10 CFR 50.54(q), which states that “[t]he licensee may make changes to its emergency plan without NRC approval only if the licensee performs and retains an analysis demonstrating that the changes do not reduce the effectiveness of the plan and the plan, as changed, continues to meet the requirements in appendix E to this part and, for nuclear power reactor licensees, the planning standards of § 50.47(b).” Otherwise, the licensee is required to obtain prior staff approval under 10 CFR 50.54(q)(4).

The assessment of the reduction in effectiveness is based on the delta between: (1) the last emergency plan approved by the NRC (i.e., in an SE) and (2) the emergency plan as modified. Accordingly, plant configuration changes implemented under 10 CFR 50.59 cannot currently be considered under the 10 CFR 50.54(q)(3) evaluation.

In the examples below, the 10 CFR 50.59 process was used inappropriately by licensees in implementing or considering changes to their emergency plans.

Lessons Learned

Licensees for decommissioning nuclear power reactors either (1) have improperly used the 10 CFR 50.59 process to implement changes in their emergency plans under 10 CFR 50.54(q) (e.g., changes to ERO staffing) or (2) were considering removing plant equipment or instrumentation no longer required for plant operation under 10 CFR 50.59 but required to implement emergency plan/emergency action levels (EALs) under 10 CFR 50.47(b). An apparent cause is the inappropriate use of the 10 CFR 50.59 process in determining whether a reduction in effectiveness in the emergency plan was involved.

Example #1: A violation was identified by the NRC for the failure of a licensee to obtain prior NRC approval for certain changes made to the station’s (onsite) emergency plan following the cessation of operations. The licensee-implemented changes to its onsite emergency plan, made via the 10 CFR 50.54(q)(3) process, consisted of changing several ERO positions from 30- to 60-minute responders and eliminating an ERO position.

Although the licensee performed the analyses required by 10 CFR 50.54(q)(3), the licensee largely based many of its analyses on changes made to the plant design and operations that had been implemented under the authority granted by the 10 CFR 50.59 change process. The licensee’s 10 CFR 50.54(q)(3) analyses erred in assuming that the 10 CFR 50.59 change process modified the approved emergency plan’s licensing basis. This inappropriate conclusion apparently led the licensee to implement changes that reduced the effectiveness of the

emergency plan without obtaining the requisite prior NRC staff approval, which was a violation of 10 CFR 50.54(q)(4). The licensee's actions deprived the staff of its oversight ability. If the analyses had been based on the last NRC-approved emergency plan, the licensee would have likely recognized that the changes were reductions in effectiveness and, therefore, required prior NRC staff approval. In summary, the licensee's 10 CFR 50.54(q)(3) analyses erred in assuming that the 10 CFR 50.59 change process modified the approved emergency plan's licensing basis.

Example #2: A licensee identified the retirement of plant equipment no longer required to support plant operation as a potential EP decommissioning issue. Specifically, the licensee wanted to use its equipment abandonment procedures and processes to permanently remove from service the EP equipment that was not required to support permanently defueled accident scenarios, but was required to support event classification using the current EAL scheme that is based on an operating plant. Licensees should not take the approach of removing EP equipment or instrumentation via 10 CFR 50.59 when their analyses indicate various DBAs are no longer applicable. Licensees should treat removal of EP equipment or instrumentation required for event classification in decommissioning using the stations configuration control process (e.g., equipment out-of-service programs, equipment checklist, etc.) as they would during a maintenance shutdown for a refueling outage. Licensees cannot use the equipment or instrumentation changes made under 10 CFR 50.59 to make emergency plan changes that reduce the effectiveness of their emergency plans.

An option available to a licensee is to submit an LAR for proposed changes to the site's EP on-shift and ERO staffing commensurate with a reduced spectrum of credible accidents based on a permanently shutdown and defueled power reactor facility. See Reference 1. The reduced spectrum of credible accidents could also provide the basis for abandonment of plant equipment, once approved for elimination of various fission product barrier-based and system malfunction-based EALs, as described in Revision 6 to NEI 99-01, "Development of Emergency Action Levels for Non-Passive Reactors".

Recommendations

Based on experience during the recent reactors that were transitioning to a decommissioning state, the NRC staff determined that the need to clarify the NRC staff's position on whether a change would constitute a reduction in effectiveness for decommissioning nuclear power reactors (i.e., delta between the last NRC-approved plan and the plan as modified) should be included as part of the revision of RG 1.219, "Guidance on Making Changes to Emergency Plans for Nuclear Power Reactors." Revision 1 of this regulatory guide was issued on July 27, 2016 (ADAMS Accession No. ML16061A104) and addressed the use of the EP change process and related reduction in effectiveness considerations for decommissioning reactors.

As part of the planned integrated decommissioning rulemaking, the NRC staff is considering changes to 10 CFR 50.54(q) that would address the evaluation of the reduction in effectiveness performed by licensees that have permanently ceased operations. RG 1.219 may require a further revision to reflect the final rulemaking.

Reference

1. Kim, James, U.S. Nuclear Regulatory Commission, letter to Vice President, Operations, Entergy Nuclear Operations, Inc., Vermont Yankee Nuclear Power Station—Issuance of Amendment to Renewed Facility Operating License Re: Changes to the Emergency Plan (TAC NO. MF3668), February 4, 2015, ADAMS Accession No. ML14346A065.

1.5.2. Exemptions from Emergency Preparedness Requirements

Requirements

The NRC's EP regulations for nuclear power plant licensees are found in 10 CFR 50.47, "Emergency Plans," and Part 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities." Under 10 CFR 50.47(a), before the NRC can issue a Part 50 operating license to an applicant, the agency must make a finding that "there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency." Section 50.47(b) specifies the planning standards for the onsite (licensee) and offsite (State and local) emergency response plans for nuclear power reactors.

Section IV of Appendix E to 10 CFR Part 50 specifies that an onsite (licensee's) emergency plan shall contain, but not necessarily be limited to, information needed to demonstrate compliance with key elements addressing the organization for coping with radiological emergencies, assessment actions, activation of emergency organization, notification procedures, emergency facilities and equipment, training, maintaining emergency preparedness, recovery, and onsite protective actions during hostile action.

The SRM to SECY-08-0024 requires Commission approval for any reduction in the effectiveness of a licensee's emergency plan that requires an exemption from the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50.

The regulation in 10 CFR 50.12(a)(2)(ii) states that the NRC may, on application by a licensee or on its own initiative, grant exemptions from the requirements of the 10 CFR Part 50 regulations based on, in part, circumstances in which application of the regulation would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule.

Type of Action

- an exemption request for the reduction of EP requirements based on the permanently shutdown and defueled condition of a power reactor
- license amendment request implementing changes to the onsite (licensee's) emergency plan, hereafter referred to as the PDEP, which is submitted for NRC approval under 10 CFR 50.90, "Application for Amendment of License, Construction Permit, or Early Site Permit," and is based on the NRC's granting of proposed exemption request
- license amendment request implementing changes to the onsite (licensee's) EAL event classification scheme, based on the NRC's granting of the proposed exemption request

For the review of EP exemption requests, in addition to the Reactor Licensing Branch in NSIR (NSIR/DPR), the PM should consult with the following branches (and others as necessary, based on the requested changes) early in the process to determine if safety evaluation input or concurrence is required:

- Balance of Plant Systems Branch (NRR/DSS/SBPB)
- Radiation Protection and Consequence Branch (NRR/DRA/ARCB)

Discussion

The purposes of the EP requirements in 10 CFR 50.47 and Appendix E to 10 CFR Part 50 are to ensure that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency, establish plume exposure and ingestion pathway emergency planning zones (EPZs) for nuclear power plants, and ensure that licensees maintain effective offsite and onsite emergency plans, with the cooperation and assistance of State and local authorities. These requirements continue to apply to a nuclear power reactor licensee after permanent cessation of operations and permanent removal of fuel from the reactor vessel. There are no explicit regulatory provisions distinguishing EP requirements for a permanently shutdown and defueled power reactor from those for an operating power reactor.

The risk of an offsite radiological release is significantly lower, and the types of possible accidents are significantly fewer, at a nuclear power reactor that has permanently ceased operations and removed fuel from the reactor vessel than at an operating power reactor. The NRC has previously granted exemptions from certain EP requirements to licensees for permanently shutdown and defueled power reactors. For the Trojan Nuclear Plant, Connecticut Yankee Atomic Power Station, Maine Yankee Atomic Power Station, Big Rock Point Nuclear Plant, and Zion Nuclear Plant, the technical basis for the approvals of the exemptions was based on demonstrating that: (1) the radiological consequences of remaining applicable DBAs would not exceed the limits of the EPA PAGs at the EAB and (2) based on site-specific analysis, the fuel stored in the SFP would not reach the zirconium ignition temperature in less than 10 hours from the time at which the licensee assumed a loss of both water- and air-cooling of the spent fuel. The NRC staff concluded that, if a minimum of 10 hours is available to initiate mitigative actions or, if needed, for offsite authorities to implement protective actions using a comprehensive emergency management plan (CEMP) approach, formal offsite radiological emergency plans, required under 10 CFR Part 50, are not necessary for permanently shutdown and defueled nuclear power reactor licensees. Recently, requests for exemptions from specific EP requirements have been granted for KPS, CR-3, SONGS Units 2 and 3, and VY. In addition to the analyses described above, the technical basis for approving these requests also included demonstrations that adequate security remains to protect the spent fuel and that adequate mitigation strategies can be promptly performed by the onsite staff.

Interface with FEMA

In accordance with 10 CFR 50.54(s)(3), the Federal Emergency Management Agency (FEMA) is responsible for determining whether offsite (State and local) emergency plans are adequate and capable of being implemented. The NRC will base its findings on a review of the FEMA findings and determinations. Exemption by the Commission from the planning standards of 10 CFR 50.47(b) for offsite emergency response plans removes the requirement for FEMA-approved offsite emergency response plans for nuclear power reactors.

As part of the review of recent EP exemption requests, the NRC staff met with the FEMA Radiological Emergency Preparedness (REP) staff and provided them the opportunity for questions and clarifications on the draft Commission papers seeking approval of the staff's recommended EP exemptions. In response, FEMA provided the following comments, which are documented in the respective Commission papers for KPS, CR-3, SONGS, and VY (References 13 through 16):

FEMA is not taking a position on the technical arguments presented by the licensee or the NRC's assessments. FEMA recognizes the NRC's role to analyze the possibility of incidents that could result in offsite dose impacts. FEMA acknowledges that individual states and local governments have the primary authority and responsibility to protect their citizens and respond to disasters and emergencies. The exemption, if issued, could create a transitional environment for off-site emergency planners in how they consider radiological hazards. FEMA will continue to support offsite organizations as they adjust their plans, capabilities, and resources to the changing radiological threat. Among the resources available to support FEMA stakeholders during the transition process include, but are not limited to, the National Preparedness System guidance materials, the Federal Radiological Preparedness Coordinating Committee, and assistance from FEMA Headquarters and Regional Staff.

The decommissioning facility, at the time the exemption is granted, would pose significantly less of a radiological risk to public health and safety than an operating power reactor, which allows for the elimination of formal offsite REP plans. However, aspects of existing offsite REP plans may remain in place, at the State's discretion, prior to completion of any adjustments to State and local CEMPs that are appropriate for the reduced radiological risk and can be adopted to minimize burden on the State and local governments. The recent exemptions approved by the Commission would not affect the authority that FEMA has under its regulations in 44 CFR Chapter I, "Federal Emergency Management Agency," for overall emergency management and assistance to State and local response organizations, nor would it affect the responsibilities of State and local governments to establish and maintain CEMPs. The NRC would base its finding of reasonable assurance on its review of licensee onsite emergency preparedness and would not require a finding from FEMA on the adequacy of State and local CEMPs.

On December 7, 2015, a revision to the Memorandum of Understanding between the Department of Homeland Security/FEMA and the NRC regarding Radiological Response, Planning, and Preparedness (Reference 17) was published. While the revised memorandum of understanding (MOU) does not alter any existing agency roles, responsibilities, or commitment of resources, it provides clarity concerning FEMA's responsibility to coordinate the discontinuation of FEMA REP Program services when the NRC determines that offsite radiological emergency planning and preparedness are no longer required at a particular utilization facility.

Lessons Learned

In the SRM to SECY-14-0066, "Request by Dominion Energy Kewaunee, Inc. for Exemptions from Certain Emergency Planning Requirements" (Reference 1), the Commission directed the

NRC staff to report to the Commission in January 2015 and provide its views on the need for an integrated rulemaking for decommissioning based on lessons learned from the most recent operating plant closures and, as appropriate, provide the potential schedule and resources required for completion. Subsequently, in the SRM to SECY-14-0118, "Request by Duke Energy Florida, Inc., for Exemptions from Certain Emergency Planning Requirements" (Reference 2), the Commission directed the staff to continue to review other exemption requests, already in process, and provide timely recommendations to the Commission, but also to proceed with rulemaking on decommissioning.

To support the interim use of the exemption process until the publication of the integrated decommissioning final rule, on May 11, 2015, the NRC staff issued an interim staff guidance (ISG) document—NSIR/DPR-ISG-02, "Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants" (Reference 3). This ISG provides guidance to NRC staff for conducting the technical review of requests for exemptions from the EP requirements for nuclear power reactors that have been permanently shut down and defueled or are planning to transition to a decommissioning state. The ISG also provides guidance for the staff's review of associated changes to the licensee's proposed PDEP reflecting the EP exemptions, as granted, and based on the reactor's permanently shutdown and defueled condition (References 4 through 12).

- Table 1, "Exemptions for Consideration," of this ISG should be considered by the staff as one acceptable means for reviewing the adequacy of the licensee's request for exemptions from planning standards in 10 CFR 50.47 and the requirements of Appendix E to 10 CFR Part 50, which are submitted for NRC approval under 10 CFR 50.12.
- Attachment 1, "Staff Guidance for Evaluation of Permanently Defueled Emergency Plans," of this ISG should be used by the staff as an acceptable means for reviewing the adequacy of the licensee's PDEP submitted for NRC approval under 10 CFR 50.90.
- Changes to a licensee's EALs to reflect the permanently shutdown and defueled condition of the reactor, should be considered a scheme change per Section IV.B.2 of Appendix E to 10 CFR Part 50.

NRC staff should review Section 1.4.8 of this Appendix with respect to the need to consider whether to perform an Environmental Assessment associated with the exemption request.

Recommendations

- As part of the planned integrated decommissioning rulemaking, the NRC staff is considering revisions to EP requirements for decommissioning power reactors informed by the guidance in NSIR/DPR-ISG-02.

References

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1.5.3. Emergency Response Data System (ERDS) Requirement for a Permanently Shutdown Power Reactor

Requirements

The regulation in Section VI.2 of Appendix E to 10 CFR Part 50, “Emergency Response Data System,” specifies, in part, that “[e]xcept for Big Rock Point and all nuclear power facilities that are shut down permanently or indefinitely, onsite hardware shall be provided at each unit by the licensee to interface with the NRC receiving system....”

The regulation in 10 CFR 50.54(q)(3) specifies that “[t]he licensee may make changes to its emergency plan without NRC approval only if the licensee performs and retains an analysis demonstrating that the changes do not reduce the effectiveness of the plan and the plan, as changed, continues to meet the requirements in [A]ppendix E to this part and, for nuclear power reactor licensees, the planning standards of § 50.47(b).”

The regulation in 10 CFR 50.82(a)(1)(i) specifies, in part, that for power reactor licensees, “[w]hen a licensee has determined to permanently cease operations the licensee shall, within 30 days, submit a written certification to the NRC, consistent with the requirements of § 50.4(b)(8).”

The regulation in 10 CFR 50.82(a)(1)(ii) specifies, in part, that for power reactor licensees, “[o]nce fuel has been permanently removed from the reactor vessel, the licensee shall submit a written certification to the NRC that meets the requirements of § 50.4(b)(9).”

Type of Action

- removal of a licensee’s Emergency Response Data System (ERDS) data link from service under 10 CFR 50.54(q) following certification by licensee in accordance with 10 CFR 50.82(a)(1) that the power reactor has permanently ceased operation and removed fuel from the reactor vessel

Discussion

The ERDS is a direct electronic data link between computer data systems used by licensees and the NRC Operations Center. The ERDS supplements the voice transmission over the currently installed emergency notification system (ENS). The ERDS provides the NRC Operations Center with timely and accurate values of a limited set of parameters that describe selected plant conditions. The parameter values are taken directly from data systems existing on a licensee’s onsite computer.

To fulfill this emergency response role, the NRC requires reliable realtime (i.e., actual time in which a process takes place) data on four types of selected plant conditions:

- (1) core and coolant system conditions—needed to assess the extent or likelihood of core damage
- (2) conditions inside the containment building—needed to assess the likelihood and consequence of its failure
- (3) radioactivity release rates—needed to assess the immediacy and degree of public danger
- (4) data from the plant’s meteorological tower—needed to assess the likely patterns of potential or actual impact on the public due to local meteorological conditions

ERDS supplements communications between the licensee and the NRC conducted over dedicated communications circuits (e.g., ENS, Health Physics Network), and its removal does

not preclude incident response communications between the licensee and the NRC Operations Center. In addition, ERDS is not intended to provide an emergency function (Reference 1).

Although the ERDS Final Rule (Reference 2) neither required nor solicited State participation in the ERDS, the NRC permitted States to establish an “ERDS interface” with the NRC through an MOU to facilitate protective action decisionmaking by States with operating power reactors within their plume exposure pathway (10-mile) EPZ. Licensees have not been required to describe in the site’s emergency plan the transmission of ERDS data from the NRC to States per the respective MOU, since this does not constitute a commitment by the licensee, unless the licensee has voluntarily committed to provide plant data as documented in the onsite emergency plan or via an MOU directly with the State(s).

Lessons Learned

While Section VI.2 of Appendix E to 10 CFR Part 50 is interpreted by the NRC staff to mean the ERDS link to the NRC Operations Center is no longer required after a power reactor is shut down permanently or indefinitely, neither the rule itself nor the SOC for the ERDS Final Rule defined the terms “permanently shutdown” or “indefinitely shutdown.” Guidance was provided to NRC Regions in a publicly available, internal NRC memorandum from Robert Lewis, Director, Division of Preparedness and Response, Office of Nuclear Security and Incident Response (NSIR), dated June 2, 2014 (Reference 3), on the licensee’s ability to evaluate the removal of ERDS from service under 10 CFR 50.54(q) following permanent cessation of operations. The memorandum states, in part, that:

The requirements in Section VI of Appendix E do not apply to nuclear power reactor licensees who have submitted a certificate of permanent cessation of operation (see Appendix E, Section VI.2). If the licensee’s emergency plan does not describe ERDS or its use during an emergency, permanently shut-down facilities have the authority to retire ERDS without prior NRC approval. A licensee is not required to seek an exemption from Section VI of Appendix E.

If the licensee’s emergency plan did describe ERDS or its use during an emergency, the licensee would need to process a change to the plan as required by Paragraph 50.54(q)(3) to delete the ERDS information. Under this change process, the licensee can make the change without prior NRC approval if the licensee performs and retains an analysis demonstrating that the following two conditions are met: (1) the plan, as changed, continues to meet the requirements in Appendix E and the planning standards of Paragraph 50.47(b); and (2) the changes do not reduce the effectiveness of the plan.

In addition, no formal mechanism was established by the NRC outlining the process for:

- Acknowledging notification by the licensee that ERDS data link is no longer required due to the permanent or indefinite shutdown condition of the power reactor, and addressing the return of NRC-supplied equipment. The staff has provided acknowledgements of termination of ERDS to the recently permanently shutdown reactors (References 4, 5, and 6).

- Notifying a State(s) that has entered into an MOU with the NRC that an ERDS data link is being terminated based on the permanent or indefinite shutdown of the power reactor and, as applicable, that advance notice of termination of the MOU is provided. The NSIR staff recently made appropriate State notifications for the recently permanently shutdown reactors (References 7, 8, 9, and 10).

As a result, an NSIR Office procedure/protocol has been developed for administratively coordinating removal of ERDS for a permanently shutdown reactor and notification of licensee and, as applicable, State(s) per established MOU.

Recommendations

- As part of the planned integrated decommissioning rulemaking, the NRC staff is considering clarification of removal of ERDS from service by licensee under 10 CFR 50.54(q) following permanent cessation of operations. Based on comments received to the ANPR, the staff will consider the retention of certain ERDS data points associated with the spent fuel pool to permit the NRC and respective States the ability to monitor spent fuel pool parameters needed to assess a potential radiological release.

References

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1.6 Security

Generally, the power-reactor physical security (PS) requirements in 10 CFR 73.55 and the NRC security orders that apply to licensees of operating nuclear power reactors also apply to decommissioning power reactor licensees. This is because the license under 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," is retained after permanent cessation of operations and removal of fuel from the reactor vessel and because the DBT of radiological sabotage continues to be applicable to the licensee.

To be consistent with 10 CFR 73.55(a), each nuclear power reactor licensed under 10 CFR Part 50 shall meet the requirements for a Commission-approved physical security plan, training and qualification plan, safeguards contingency plan, and CSP. The general performance objective and requirements described in 10 CFR 73.55(b) require licensees to establish and maintain a physical protection program that protects against the DBT of radiological sabotage as stated in 10 CFR 73.1, "Purpose and Scope."

The general characteristics of the DBT of radiological sabotage are set forth in 10 CFR 73.1(a)(1). The specific characteristics of the DBT of radiological sabotage for nuclear power reactors are described in the NRC Order ICM EA-03-086, "Order Requiring Compliance with Revised Design Basis Threat for Radiological Sabotage for Operating Reactors," issued April 2003, and portions of this order remain in effect. Further specific detail regarding the DBT of radiological sabotage is provided in RG 5.69, "Guidance for the Application of Radiological Sabotage Design-Basis Threat in the Design, Development and Implementation of a Physical Security Program that Meets 10 CFR 73.55 Requirements." Regulatory Guide 5.69 and the order referenced above are Safeguards Information (SGI).

Regulations in 10 CFR 73.55(b)(3) require the physical protection program to be designed to prevent significant core damage and spent fuel sabotage. It further requires the licensee's

physical protection program to ensure that the capabilities to detect, assess, interdict, and neutralize threats (up to and including the DBT of radiological sabotage, as stated in 10 CFR 73.1(a)(1)) are maintained at all times. Regulations in 10 CFR 73.55(b)(3) also require that the licensee's physical protection program provide defense in depth through the integration of systems, technologies, programs, equipment, supporting processes, and implementing procedures to ensure the program's continued effectiveness.

For an operating nuclear power reactor, the possible adversary scenarios associated with the DBT of radiological sabotage cover a wide range of targets in several locations, requiring a complex security program. This contrasts with a permanently shutdown and defueled reactor that has irradiated fuel in the SFP or an ISFSI or both, where adversary scenarios are generally less complex and cover fewer target locations. At a decommissioning power plant, the area to be protected is typically reduced in size from the area required to be protected when the plant is operating. Therefore, fewer security assets may be required to maintain an equivalent level of protection. Despite the reduced target sets and complexity of decommissioning reactor facilities' security programs, any changes to the site's security posture, as the licensee transitions from operating to decommissioning, must be carefully considered.

During the initial transition from operation to decommissioning, the reactor is permanently shut down, and the spent fuel is permanently moved from the reactor to an SFP. Although the potential adversary targets are fewer, in fewer locations, the licensee is responsible for identifying and analyzing the "new" site-specific conditions to account for possible adversary approaches consistent with changes in facility configuration to include those that may not directly involve the SFP initially. Therefore, for the NRC staff to reach a decision on any licensing action associated with a revised or modified security posture, the licensee must clearly describe site-specific configurations, decommissioning operations, the proposed implementation of physical protection measures at the site, and the proposed site protective strategy to enable NRC staff to evaluate the effectiveness of a licensee's security program in defending against the applicable DBT for spent fuel sabotage.

Licensees with reactors in the decommissioning transition process have submitted to the NRC various requests for both exemptions from the NRC security requirements under 10 CFR 73.5, "Specific Exemptions," and requests for license amendments under 10 CFR 50.90. However, licensees have submitted most security plan changes under 10 CFR 50.54(p).

For NRC staff to conduct a timely review of a licensee's submittal (i.e., request for exemption, license amendment, alternative measure, or security plan change), it is critical that the licensee supply the staff with supporting documentation detailing the site-specific analysis done to support the request or change. It is important that supporting documentation address the details of the security program and the details of security implementation for the particular facility throughout the stages of the decommissioning process, including (1) the period during which spent fuel is stored in the SFP and (2) the period during which the spent fuel has been transferred from the SFP into dry cask storage at an ISFSI.

It is important that NRC staff have, at a minimum, knowledge of the following: (1) any remaining target set(s), including any credited operator actions, (2) all PS measures and equipment employed to support the implementation of the protective strategy, (3) the detailed information that outlines the implementation of the protective strategy (e.g., response timelines, response

locations, field-of-fire diagrams, responder equipment), and (4) any equipment (e.g., barriers, delay features) and personnel necessary to address multiple applicable DBT scenarios.

The following items reflect general experience from processing the security-related licensing action reviews at the recent reactors that have transitioned to decommissioning:

- All four reactor sites were visited by NRC staff performing security licensing action reviews. Due to the unique physical characteristics found at each site, the staff was unable to understand the overall security approaches used by the licensees as documented in the 10 CFR 50.54(p) submittals. The staff found that an onsite observation of the decommissioning security plan implementation was an essential part of the licensing review process.
- The exemption criteria in the regulation in 10 CFR 73.5 are different from the more commonly used 10 CFR 50.12 criteria. The NRC staff found it useful to consider the special circumstances discussed in 10 CFR 50.12 (such as considering the underlying purpose of the regulation) when assessing the acceptability of a security exemption request—even though this is not in 10 CFR 73.5.
- The NRC staff's review of security-related licensing actions needs to be as transparent as possible to the public. Due to the complexity and site-specific nature of the changes made by licensees, most NSIR staff security reviews involved Safeguards or Official Use Only security-related information. This resulted in an additional effort by NRR project management staff to prepare a non-sensitive version for release to the public. The NSIR staff should include a non-sensitive public version of its staff security reviews that provides a sufficient understanding of the action and the staff's evaluation. This issue was resolved with the creation of a non-sensitive memorandum by the NSIR staff that summarized the physical security review.

Most security-related requests for regulatory exemptions have been site-specific. For example, certain licensees requested security exemptions for licensee-led force-on-force (FOF) exercises, central and secondary alarm station locations and configurations, and reduced numbers of armed responders (based on the reduced area being protected). These requests were subsequently withdrawn or in one case denied based on insufficient justification.

To support these potentially complex security licensing actions, the NRC staff issued ISG NSIR/DSP-ISG-3, "Review of Security Exemptions/Licensing Amendment Requests for Decommissioning Nuclear Power Plants," on September 28, 2015 (ADAMS Accession No. ML15106A737).

One generic security exemption that NRC staff is likely to process during the transition to decommissioning is the regulatory change to add the CFH position to those authorized to deviate from the security plan during emergencies or severe weather conditions. This is because a decommissioning licensee may be unable to implement suspensions of security measures during emergencies or severe weather (10 CFR 73.55(p)), since a licensed senior operator is not required at a permanently shutdown and defueled reactor. Decommissioning reactor licensees may request an exemption from the PS regulations in 10 CFR 73.55(p) from the requirement that the suspension of security measures during certain emergency conditions or during severe weather "must be approved as a minimum by a licensed senior operator."

For permanently shutdown and defueled reactors, licensed operators are no longer required, and licensees typically eliminate these positions shortly after shutdown. Decommissioning licensees create a new CFH position (consistent with the definition in 10 CFR 50.2) as the senior nonlicensed operator at the plant. These positions cannot be compared directly, so licensees typically are unable to demonstrate that the CFH position meets the “as a minimum” criteria in 10 CFR 73.55(p). Because the regulation does not include a provision, similar to 10 CFR 50.54(y), which authorizes a CFH to approve the suspension of security measures for permanently shutdown and defueled reactors, an exemption is needed.

1.6.1. Application of 10 CFR 50.54(p) for Security Plan Changes at Permanently Shutdown Reactor Transitioning to Decommissioning

Requirement

The regulations in 10 CFR 50.54(p) state, in part:

- (p)(1) The licensee shall prepare and maintain safeguards contingency plan procedures in accordance with appendix C of part 73 of this chapter for affecting the actions and decisions contained in the Responsibility Matrix of the safeguards contingency plan. The licensee may not make a change which would decrease the effectiveness of a physical security plan, or guard training and qualification plan, or cyber security plan prepared under § 50.34(c) or § 52.79(a), or part 73 of this chapter, or of the first four categories of information (Background, Generic Planning Base, Licensee Planning Base, Responsibility Matrix) contained in a licensee safeguards contingency plan prepared under § 50.34(d) or § 52.79(a), or part 73 of this chapter, as applicable, without prior approval of the Commission. A licensee desiring to make such a change shall submit an application for amendment to the licensee’s license under § 50.90.
- (p)(2) The licensee may make changes to the plans referenced in paragraph (p)(1) of this section, without prior Commission approval if the changes do not decrease the safeguards effectiveness of the plan. The licensee shall maintain records of changes to the plans made without prior Commission approval for a period of 3 years from the date of the change, and shall submit, as specified in § 50.4 or § 52.3 of this chapter, a report containing a description of each change within 2 months after the change is made. Prior to the safeguards contingency plan being put into effect, the licensee shall have:
 - (i) All safeguards capabilities specified in the safeguards contingency plan available and functional;
 - (ii) Detailed procedures developed according to appendix C to part 73 of this chapter available at the licensee’s site; and

- (iii) All appropriate personnel trained to respond to safeguards incidents as outlined in the plan and specified in the detailed procedures.

Type of Action

All four of the reactor licensees that recently entered into decommissioning made changes to their security plans after determining, as provided for in 10 CFR 50.54(p)(2), that in the opinion of the licensee the changes did not result in a decrease in safeguards effectiveness of the licensee's PS plans. This resulted in extensive NRC staff reviews and inspections due to the scope of the security plan changes associated with reactor decommissioning transition. The reviews were further prolonged due to the insufficiency of the information provided by the licensees in the § 50.54(p) change documentation.

Discussion

The regulation in 10 CFR 50.54(p)(2) states that licensees may make changes to their PS plans without prior NRC approval if the changes do not decrease the effectiveness of the plans, including security guard training and qualification plan, or safeguards contingency plan (collectively referred to as the licensees' security plans for this topic). All four of the recently permanently shutdown reactor licensees concluded that the changes to their security plans did not reduce the effectiveness of the plans and, therefore, the changes were submitted to the NRC. The NRC staff reviewed (but did not approve) the submittal under the 10 CFR 50.54(p) change process.

The NRC staff reviewed the description of changes in the licensee's PS plans against the regulations in 10 CFR Part 73, "Physical Protection of Plants and Materials." During the review, the NRC staff found that, for the most part, the initial submittals provided by the decommissioning licensees did not provide adequate detailed information to understand the decommissioning-related changes. Consequently, many RAIs were necessary to complete the staff's reviews. In addition, the staff conducted site visits that were beneficial in resolving the RAIs and reaching a common understanding of the changes being made to the security plans.

Based on site visits by NRC headquarters personnel and discussion on the associated RAIs, the licensee submitted supplements to its PS plan changes documentation. Upon completing the review of the submittal, supplements, and information gained during the site visits, the NRC staff was able to conclude that the changes to the security plans did not decrease the effectiveness of the security program, and therefore, no further regulatory actions were necessary (References 1, 2, 3, and 4).

Lesson Learned

The major reconfigurations of licensee security at decommissioning plants were submitted under the 10 CFR 50.54(p) change process. The decommissioning power reactor licensees stated that the changes made to their PS plans are consistent with the NRC-endorsed process outlined in NEI 11-08, "Guidance on Submitting Security Plan Changes," Revision 0, August 2012 (Reference 5). In most cases, the security plan changes that decommissioning licensees provided, pursuant to the 10 CFR 50.54(p) change process, did not contain adequate detailed information for the staff to understand the revised security strategy and resulted in

inadequate information for the NRC staff to reach conclusions concerning the physical security plan changes. The details of the plan change goals and the rationale supporting the licensee's conclusions were inconsistent and necessitated numerous RAs and site visits from the NRC staff. The extent and complexity of the security plan changes made during the transition from an operating reactor phase to a decommissioning phase suggests the need to revise NEI 11-08 to address decommissioning-specific lessons learned.

Recommendations

- As part of NRC-planned interactions with industry representatives and NEI, the NRC staff should discuss the need to revise NEI 11-08 for NRC review and endorsement to specifically address the significant changes expected at power reactors transitioning to decommissioning to ensure that there is adequate detail in submissions for the NRC to make regulatory decisions.
- As part of the update to NRR OI COM-101, specifically related to communications and planning, the NRC staff should proceduralize early planning meetings with the licensee that includes, among other things, encouraging licensees to submit a decommissioning physical security plan amendment under 10 CFR 50.90, when required, approximately 1 year in advance of permanent cessation of operations.

References

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1.6.2. Applicability of 10 CFR 73.54 Cyber Security Regulations to Decommissioning Power Reactors

Requirement

The regulations in 10 CFR 73.54, "Protection of Digital Computer and Communication Systems and Networks," state, in part, that each licensee currently licensed to operate a nuclear power plant under 10 CFR Part 50 shall submit, as specified in 10 CFR 50.4 and 10 CFR 50.90, a CSP that satisfies the requirements of 10 CFR 73.54 for Commission review and approval. Each submittal must include a proposed implementation schedule. Implementation of the licensee's cyber security program must be consistent with the approved schedule.

Type of Action

The regulations in 10 CFR 73.54 require a power reactor that was operating in 2009 to have a CSP. To comply with this regulation, each of the recently permanently shutdown reactors has a license condition for cyber security that remains in effect. Decommissioning power reactor licensees may reduce the scope of the CSP utilizing 10 CFR 50.54(p) if appropriate, and/or request exemption from the cyber security regulatory requirements.

Discussion

In 2013, two licensees submitted LARs, which proposed to remove the CSPs based on the permanent shutdown and defueled status of the facility (References 1 and 2). Approval of these LARs would have removed the CSP as a condition of the license. After discussions with the NRC staff, the licensees subsequently withdrew the requested action (References 3 and 4). As noted in the staff's request for additional information, the staff position at the time was that since these plants were operating in 2009, they were required to have a CSP; 10 CFR 73.54 does not contain language and specify a specific point where the CSP is no longer required (Reference 5).

Cyber security programs at operating reactors are required to protect safety, security, and emergency preparedness (SSEP) functions from cyber attacks.

The cyber security program implemented by a licensee in accordance with its NRC-approved CSP is flexible. Digital assets that have been identified as critical digital assets (CDAs) while the reactor is operating may not be required for SSEP functions after the reactor is certified to be permanently shut down and defueled, and therefore, the CDA designation may be removed from such digital assets after the 10 CFR 50.82 certifications have been submitted.

Lesson Learned

The staff's current position regarding the applicability of the cyber rule to decommissioning plants is under review, however, licensees may utilize the 10 CFR 50.54(p) process to reduce the scope of the CSP, as appropriate, as they move fuel from the reactor to the SFP.

Recommendation

As part of the planned integrated decommissioning rulemaking, the NRC staff is considering revisions to 10 CFR 73.54 for technical issues and potential language for a scheme to step down cyber security requirements as the risk profile is reduced during decommissioning.

References

1. Grecheck, Eugene S., Dominion Energy Kewaunee, Inc., letter to U.S. Nuclear Regulatory Commission, Kewaunee Power Station, License Amendment Request 256, Permanently Defueled License and Technical Specifications, May 29, 2013, ADAMS Accession No. ML13156A037.
2. Elnitsky, John, Duke Energy, letter to U.S. Nuclear Regulatory Commission, Crystal River Unit 3—License Amendment Request #316, Revision 0, Revise and Remove License Conditions and Revision to Improved Technical Specifications to Establish Permanently Defueled Technical Specifications, October 29, 2013, ADAMS Accession No. ML13316C083.
3. Sartain, Mark D., Dominion Energy Kewaunee, Inc., letter to U.S. Nuclear Regulatory Commission, Kewaunee Power Station, Supplement 2: License Amendment Request 256, Permanently Defueled License and Technical Specifications, January 7, 2014, ADAMS Accession No. ML14009A393.
4. Elnitsky, John, Duke Energy, letter to U.S. Nuclear Regulatory Commission, Crystal River Unit 3—Response to Requests for Additional Information and Supplement 1 to License Amendment Request #316, Revision 0, withdrawing its proposed deletion of cyber security conditions from its license, May 7, 2014, ADAMS Accession No. ML14139A006.
5. Gratton, Christopher, U.S. Nuclear Regulatory Commission, e-mail to Daniel Westcott, Duke Energy Florida, Inc., MF3089 Defueled TS Request for Additional Information, April 10, 2014, ADAMS Accession No. ML14114A279.

1.6.3. NRC-Led Force-on-Force Inspections at Decommissioning Power Reactors

Requirement

Section 170D of the Atomic Energy Act of 1954, “Security Evaluations,” as amended states, in part, that “not less often than once every 3 years, the Commission shall conduct security evaluations at each licensed facility that is part of a class of licensed facilities, as the Commission considers to be appropriate, to assess the ability of a private security force of a licensed facility to defend against any applicable design basis threat.” A contingency response FOF performance-based inspection assesses a licensee’s physical protection program to ensure that it has been appropriately developed and implemented to provide high assurance of adequate protection for target set equipment and can prevent significant core damage and spent fuel sabotage from the DBT of radiological sabotage. The current DBT characteristics were defined in Order EA-03-086, issued to operating power reactors, dated April 29, 2003 (not publicly available; SGI), and the DBT was codified in 10 CFR 73.1 in 2007.

Type of Action

The Commission has determined that NRC-conducted FOF inspections are not necessary at permanently shutdown reactor sites because the current security inspection program provides adequate oversight and verification of the security posture given a reduction in both risk and the number of target sets at decommissioning power reactors.

Discussion

Each decommissioning power reactor has unique characteristics such as the age of the fuel, amount of fuel in the pool, pool construction or location, and spent fuel load pattern. Under the current safety analysis, the event sequences important to risk at decommissioning power reactors are limited to large earthquakes and cask drop events. This is an important difference relative to operating power reactors where, typically, a large number of different initiating events make significant contributions to risk. For security, risk insights can be used to determine what targets are important to protect against sabotage. Based on the safety analysis, consequence declines as fuel ages and thereby decreases the underlying concern that a sabotage attack could cause offsite radiological consequences. With reduced radiological risk for a power reactor undergoing decommissioning, an NRC-led contingency response FOF inspection is not warranted. However, a level of security commensurate with the consequence is required and is evaluated on a site-specific basis.

Moreover, in 2004, the NRC staff proposed a change to the definition of spent fuel sabotage that would allow for additional considerations. The Commission's position regarding the proposed change to the spent fuel sabotage definition stated that it would not be revised unless more "definitive realistically conservative studies (including mitigative measures)" demonstrated the need for such a revision. In response to Commission direction, the staff continues to examine SFP sabotage. If the current understanding of SFP vulnerabilities changes, the defined classes of licensed facilities deemed appropriate for the conduct of security evaluations may need to be re-evaluated.

On April 23, 2014, the NRC staff submitted to the Commission COMSECY-14-0015, "Security Inspections at U.S. Nuclear Regulatory Commission Decommissioning Power Reactors" (Reference 1). The staff recommended that NRC-led FOF inspection at decommissioning power reactor sites be discontinued because the current security inspection program provides adequate oversight and verification of the security posture given a reduction in both risk and the number of target sets at decommissioning power reactors.

On May 28, 2014, the Commission issued SRM-COMSECY-14-0015 (Reference 2), stating that the "... Commission agrees with the staff's conclusion that NRC-conducted force-on-force inspections during decommissioning are not warranted...at decommissioning power reactors. The Commission has approved the staff's recommendation to continue the current practice of security inspections for decommissioning power reactors which do not include NRC-conducted force-on-force inspections."

Lesson Learned

Licensees maintain a level of security at permanently shutdown power reactors commensurate with the consequence, which is reviewed and evaluated by the NRC on a site-specific basis. As a result, NRC staff believes that adequate oversight of security for decommissioning power reactors is achieved through the current inspection program without the need to conduct an NRC-evaluated contingency response FOF inspection. As documented in SRM-COMSECY-14-0015, the Commission has affirmed the staff position on this inspection activity.

Recommendation

As part of the update to NRR OI COM-101, specifically related to communications and planning, the NRC staff should proceduralize the action to notify licensees that the NRC-evaluated contingency response FOF inspection is not required for decommissioning power reactors.

References

1. U.S. Nuclear Regulatory Commission, "Security Inspections at U.S. Nuclear Regulatory Commission Decommissioning Power Reactors," COMSECY-14-0015, April 23, 2014, ADAMS Accession No. ML13347B178.
2. U.S. Nuclear Regulatory Commission, staff requirements memorandum, "COMSECY-14-0015—Security Inspections at U.S. Nuclear Regulatory Commission Decommissioning Power Reactors," May 28, 2014, ADAMS Accession No. ML14148A010.

1.6.4. Licensee-Conducted Force-on-Force Exercises

Requirement

The regulatory requirements for annual licensee-conducted FOF exercises are specified in Section VI.C.3(b), (c), (d), (e), (g), (h), (i), (k), (l), and (m) of Appendix B, "General Criteria for Security Personnel," to 10 CFR Part 73.

Type of Action

- In 2014, certain licensees transitioning to decommissioning requested exemptions to regulatory requirements for conducting annual FOF exercises, in accordance with the provisions of 10 CFR 73.5 (References 1 and 2)

Discussion

The Materials and Waste Security Branch in the Division of Security Policy, NSIR, reviewed both licensee exemption requests for conducting the annual FOF exercises. The NRC staff determined that the information provided by the licensees did not provide the technical detail sufficient for the staff to evaluate and make a determination to either grant or deny the licensees' requests. As a result, the staff requested additional information from one of the

licensees in order to obtain the information necessary to evaluate the licensee's exemption request (Reference 3).

The licensee determined that it was more cost effective to continue its annual FOF exercises until the fuel was transferred from the SFP to dry cask storage, at which time the need for an annual licensee FOF exercise would be eliminated. Therefore, the licensee withdrew its specific exemption request (Reference 4). The other licensee also withdrew its related exemption request (Reference 5). As a result, the NRC staff did not receive the technical information necessary to make a regulatory decision to either grant or deny the requested exemption.

Lesson Learned

The NRC staff developed a draft SE (Reference 6) that documents the NRC staff review activities related to the request for exemptions from certain requirements in Appendix B to 10 CFR 73. The draft SE could inform technical reviewers assigned to possible future complex licensing actions that request the Commission to grant exemptions to annual FOF requirements for decommissioning power reactors.

Recommendation

As part of the update to NRR OI COM-101, specifically related to communications and planning, the NRC staff should proceduralize an action to arrange for an early planning meeting with the licensee that should include, among other things, that the previously requested exemptions from annual FOF exercises required extensive NRC staff review and licensee interaction. If the licensee is considering such a request, it is recommended that a presubmittal meeting be conducted to discuss the review complexity and schedule, and ensure that the licensee is aware of previous challenges related to this topic.

References

1. Blasioli, Paul A., Dominion Energy Kewaunee, Inc., letter to U.S. Nuclear Regulatory Commission, Kewaunee Power Station (KPS), Request for Exemptions from 10 CFR 73 Appendix B, General Criteria for Security Personnel, June 25, 2013, ADAMS Accession No. ML13178A206 and Electronic Safe Document No. NS112969.
2. Elnitsky, John, Duke Energy, letter to U.S. Nuclear Regulatory Commission, Crystal River Unit 3—Request for Exemptions from 10 CFR 73, Appendix B, General Criteria for Security Personnel, January 15, 2014, ADAMS Accession No. ML14023A662.
3. Huffman, William, U.S. Nuclear Regulatory Commission, e-mail to Craig Sly, Jack Gadzala, and Margaret Earle, Dominion Energy Kewaunee, Draft Request for Additional Information Concerning DEK's Request for Exemption from Conducting Annual Force-on-Force Exercises at Kewaunee Power Station (TAC MF2371), June 2, 2014, ADAMS Accession No. ML14164A074.
4. Heacock, D.A., Dominion Energy Kewaunee, Inc., letter to U.S. Nuclear Regulatory Commission, Kewaunee Power Station, Withdrawal of Exemptions from 10 CFR 73 Appendix B, General Criteria for Security Personnel, June 26, 2014, ADAMS Accession No. ML14177A747.

5. Hobbs, Terry D., Duke Energy, letter to U.S. Nuclear Regulatory Commission, Crystal River Unit 3—Withdrawal of Request for Exemptions from Certain 10 CFR 73 Physical Security Requirements, June 30, 2014, ADAMS Accession No. ML14184A019.
6. Lee, P.S., U.S. Nuclear Regulatory Commission, memorandum to file, Closure Documentation for TAC No. MF2371 (Draft Safety Evaluation with Open Items, Request for Additional Information, and Dominion Energy Kewaunee, Inc. Withdraw of Exemption) and Knowledge Management, September 18, 2014, ADAMS Package Accession No. ML14261A060 (not publicly available; security-related information).

1.6.5. Applicability of Fitness-for-Duty Requirements to Decommissioning Power Reactors

Requirement

10 CFR Part 26, “Fitness for Duty Programs,” in whole or in part, applies to nuclear power reactors authorized to operate, Category I fuel cycle facilities, nuclear power reactors under construction, and certain contractor/vendors. Section 26.3, “Scope,” lists those licensees and other entities that are required to implement designated subparts of Part 26. The scope does not include Part 50 licensees that are no longer authorized to operate as described in § 50.57, “Issuance of operating license,” because they have provided both certifications under § 50.82, “Termination of license,” or have been so ordered by the Commission. Therefore, Part 26 does not directly and explicitly apply to decommissioning power reactors.

On August 18, 2004, the NRC issued Order EA-03-099 “Issuance of Order for Implementation of Additional Security Measures Associated with Access Authorization, Fitness for Duty and Behavior Observation,” requiring sites to develop, implement or enhance, and maintain an access authorization, fitness for duty (FFD), and behavioral observation program for all decommissioning power reactors with spent fuel in the spent fuel pool (SFP). Specifically, to satisfy FFD program requirements, sites had to develop, implement or enhance procedures for initial, random, and for-cause drug and alcohol testing of persons with unescorted access to the site’s protected area.

To help ensure the continuing effectiveness of the security program, the staff initially considered reissuing these orders to the current decommissioning facilities with spent fuel in the SFP. However, because the threat environment has changed since the issuance of the Order on August 18, 2004, the staff could not justify an immediate threat that would constitute a risk to the health and safety of the public or the common defense and security.

In 2009, the NRC issued a comprehensive change to Part 73 to, in part, codify the 9/11-related security orders, address lessons learned and operating experience, and to require the implementation of site-specific insider mitigation programs (IMPs). The IMP provisions, located at 10 CFR 73.55(b)(9), require that each nuclear power reactor licensee shall establish, implement, and maintain an IMP within its Commission-approved security plan as long as spent fuel remains in the reactor core or SFP and until the licensee is subject to the security requirements in 10 CFR Part 72 for interim spent fuel storage installations. Furthermore, the IMP regulations require licensees to, in part, establish, implement, and maintain elements of an FFD program as described in Part 26.

Type of Action

Section 73.55(b)(9) requires a power reactor licensee to, in part, implement FFD program elements. RG 5.77, "Insider Mitigation Program," was issued by the NRC to provide one acceptable method for licensees to meet this requirement. This RG was committed to by all power reactor licensees licensed to operate through a commitment contained in their NRC-approved security plans. Since the issuance of RG 5.77, the NRC staff has determined that the guidance is not sufficiently detailed to enable a decommissioning licensee to consistently and effectively implement FFD program requirements in a manner that effectively contributes to the IMP. This observation is based on the recent decommissioning of VY and SONGS, where licensee representatives were questioning what provisions of Part 26 needed to be implemented, such as post-event testing (§ 26.31), auditing of laboratories (§ 26.41), and annual reporting requirements (§ 26.719). Additionally, the NRC has determined through its attendance at annual industry conferences that many licensees do not fully understand the regulatory nexus between the drug and alcohol testing provisions of Part 26 and the insider mitigation requirements of § 73.55(b)(9). Anecdotal evidence suggests that decommissioning licensees may not fully implement those Part 26 FFD elements necessary for an effective IMP in accordance with § 73.55(b)(9). For example, one decommissioning licensee has ceased to provide annual performance data as described by § 26.717, thereby preventing NRC assessment of FFD program performance and licensee access authorization programs (i.e., trustworthiness and reliability determinations). Another licensee was questioning how licensee auditing of the laboratories contributes to the programmatic effectiveness of the IMP.

The staff believes that additional regulatory guidance needs to be developed to describe what FFD program elements licensees should implement during decommissioning and, generally, to provide assurance that an effective FFD program will be maintained by licensees. NRC staff is also considering to amend Part 26 to specifically detail which Part 26 provisions are elements necessary for an IMP. These provisions could include those requirements provided in, for example, Subparts A, B, C, D, E, G, H, N, and O. This rulemaking effort would also help provide long-term assurance that decommissioning licensees understand the nexus between Parts 73 and 26. The staff notes that programmatic inconsistency challenges the NRC staff its assessment of FFD programs that provide reasonable assurance that individuals, who have unescorted access authorization to the SFP, are trustworthy and reliable and can safely and competently perform their assigned duties and responsibilities.

A) FFD—Drug and Alcohol Testing Considerations

Description

Utilization facilities licensed under 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," and Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," must implement the physical protection requirements described in § 73.55, "Requirements for physical protection of licensed activities in nuclear power reactors against radiological sabotage," during decommissioning. Under § 73.55, each nuclear power reactor licensee shall maintain and implement its Commission-approved security plan as long as spent fuel remains in the reactor core or SFP, and until the licensee comes under security requirements established for spent fuel storage in Part 72. Furthermore, the IMP requirements in § 73.55(b)(9) require licensees to establish, maintain, and implement elements of the access

authorization program described in § 73.56, the FFD program described in 10 CFR Part 26, the cyber security program described in § 73.54, and the physical protection program described in § 73.55. In 2009, the NRC staff issued RG 5.77 to provide guidance for IMP implementation.

NEI 03-12, Revision 7, "Template for the Security Plan, Training and Qualification Plan, Safeguards Contingency Plan," is utilized by all power reactor licensees that are authorized to operate, as the framework for developing their security plans (licensing documents) to meet the requirements of § 73.55. NEI 03-12 states that the IMP requirement is satisfied when the licensee "implements the elements of the IMP, utilizing the guidance provided in RG 5.77, 'Insider Mitigation Program.'" Specifically:

(U) The Pre-access, Random, For cause, Post-event, and Follow-up drug and alcohol testing element of an IMP may be implemented by applying the guidance for meeting the requirements of 10 CFR Part 26, "Fitness for Duty Programs," and the latest NRC staff endorsed guidance described in NEI 03-01, "Nuclear Power Plant Access Authorization Program."

Discussion

Currently, all power reactor licensees have committed to RG 5.77, Revision 0 (March 2009) by their commitment to NEI 03-12, Revision 7, in their Commission-approved security plans.

The March 2009 version of RG 5.77 only describes the types of drug and alcohol testing necessary for the IMP (i.e., pre-access, random, for cause, and post event); however, the RG does not address program elements that are necessary to provide assurance that the contribution of Part 26 to the IMP will be effective and not infringe upon donor protections. These elements include, but are not limited to: the random testing rate, required drugs to be tested, specimen validity testing, drug and metabolite cutoffs, alcohol cutoffs, medical review officer requirements, employee protections (e.g., appeals), reporting and recordkeeping requirements, quality assurance, use of U.S. Department of Health and Human Services-certified laboratories, employee assistance programs, etc. Furthermore, the regulatory guidance does not address how these elements contribute to an effective IMP – namely, how the Part 26 elements help identify individuals who do not demonstrate characteristics of being trustworthy or reliable to be afforded unescorted access authorization to the protected area of an NRC-licensed commercial power reactor facility. The staff-proposed revision to RG 5.77 is intended to, in part, clarify those FFD elements that are needed for an acceptable IMP for both operating and decommissioning sites. The NRC staff also proposed other revisions to this RG to clarify/enhance the guidance associated with the access authorization, physical protection, and cyber security programs.

Based on operating experience feedback from decommissioning licensees, all decommissioning licensees are implementing Part 26 requirements. Therefore, the clarifications provided in the proposed regulatory guide would be of low burden because these licensees have already implemented applicable policies, procedures, training, and programs (e.g., a behavior observation program and an employee assistance program).

Lesson Learned

Current regulatory guidance insufficiently describes which elements of an FFD program are necessary for an IMP especially as it relates to licensees transitioning to decommissioning. Insufficient regulatory guidance has led to inconsistent program implementation.

Recommendations

- Review and update RG 5.77 to better clarify FFD program elements and the limited application of Part 26 to decommissioning licensees.
- Work with industry to consider if licensees should revise their security plans to include a commitment to an updated RG 5.77 that includes guidance for decommissioning activities.
- The NRC staff is considering changes to the FFD drug and alcohol testing requirements as part of the planned integrated decommissioning rulemaking to clarify the applicability of Part 26 to decommissioning licensees, via § 73.55(b)(9).

B) FFD—Fatigue Management

Description

On March 31, 2008 (73 FR 16966), the NRC published a final rule in the *Federal Register* adding, in part, Subpart I, “Managing Fatigue,” to 10 CFR Part 26. Compliance with Subpart I provides reasonable assurance that the effects of fatigue and degraded alertness on an individual’s ability to safely and competently perform his or her duties are managed commensurate with maintaining public health and safety. The fatigue management provisions also reduce the potential for worker fatigue in security officers, maintenance personnel, control room operators, and fire and emergency response personnel that could otherwise adversely affect the common defense and security. The 2008 final rule established clear and enforceable requirements for operating nuclear power plant licensees and other entities for the management of worker fatigue. Power reactor licensees that had permanently shut down and defueled were not considered within the scope of that rulemaking effort.

Discussion

The NRC staff has concluded that there is sufficient basis to establish fatigue management for security personnel at decommissioning plants similar to the fatigue management provisions for security personnel at operating plants described in 10 CFR Part 26, Subpart I. The security requirements set forth in 10 CFR 73.55 and the DBT described in 10 CFR 73.1 are the same for a decommissioning power plant as they are for an operating plant. Therefore, in order to ensure that security personnel are able to meet their responsibilities for maintaining the common defense and security, it is necessary to ensure that they are not subject to fatigue, which could reduce their alertness and ability to perform the critical job duties of identifying and promptly responding to plant security threats.

Compared to an operating reactor, the risk of an accident leading to a release beyond the site boundary is significantly reduced at a decommissioning plant. Even with the lower risk profile of

the decommissioning plant, nonsecurity workers may still perform activities that a risk-informed evaluation has shown to be significant to public health and safety. As part of the decommissioning rulemaking, the NRC staff will review the nonsecurity activities performed at decommissioning facilities to assess what workers and what activities could fall within the scope of fatigue management requirements.

On November 30, 2015, NEI submitted NEI 15-08 “Managing Personnel Fatigue at Decommissioning Reactors” (Reference 1) for the NRC staff’s consideration.

Lesson Learned

Develop requirements for decommissioning power reactor licensees to implement an FFD fatigue management program commensurate with the safety and security significance of activities being performed.

Recommendations

- Work with industry to consider if licensees should revise their security plans to address certain aspects of fatigue management related to decommissioning activities.
- As part of the planned integrated decommissioning rulemaking, the NRC staff is considering changes to the FFD fatigue management requirements to ensure individuals at decommissioning plants are subject to adequate fatigue management programs.
- The NRC staff plans to review the comments received on the ANPR and determine whether it can consider endorsement of NEI 15-08, Revision 0, in parallel with the rulemaking without predisposition of the rulemaking efforts.

References

1. Richter, Mark A., Nuclear Energy Institute, letter to Ms. Meena Khanna, U.S. Nuclear Regulatory Commission, Submittal of NEI 15-04, “Guidelines for a Certified Fuel Handler Training and Retraining Program” and NEI 15-08, “Managing Personnel Fatigue at Decommissioning Reactors,” November 30, 2015, ADAMS Package Accession No. ML15350A129.

1.7 Quality Assurance Plans

Requirements

The regulation in 10 CFR 50.54(a)(1) specifies that each nuclear power plant shall, as a condition of its license, implement a quality assurance (QA) program described or referenced in the safety analysis report.

The regulation in 10 CFR 50.54(a)(3) specifies that each licensee described in 10 CFR 50.54(a)(1) may make a change to a previously accepted QA program description without prior NRC approval, provided the change does not reduce the commitments in the program description as accepted by the NRC.

The regulation in 10 CFR 50.54(a)(4) specifies that changes to the QA program that do reduce the commitments must be submitted to the NRC and receive approval prior to implementation.

Type of Action

- requests for NRC approval of a decommissioning QA plan that decreases commitments in the previously accepted QA program description

Discussion

A licensee can make changes to a QA program description previously accepted by the NRC in accordance with 10 CFR 50.54, "Conditions of Licenses." There are two types of changes: those that do not reduce commitments in the program description as accepted by the NRC and those that do reduce commitments.

- (1) Changes to the QA program that do not reduce commitments must be submitted to the NRC but do not require prior approval. Such changes include administrative improvements and clarifications, spelling corrections, punctuation or editorial corrections, the use of a QA standard approved by the NRC that is more recent than the QA standard in the licensee's current QA program, the use of a quality assurance alternative or exception approved by an NRC safety evaluation, and others. All such changes are described in 10 CFR 50.54(a)(3).
- (2) Changes that do reduce the commitments must be submitted to the NRC and receive approval prior to implementation, in accordance with 10 CFR 50.54(a)(4). Changes to the QA program description included are considered accepted by the Commission upon receipt of a letter to this effect from the appropriate reviewing office of the Commission or 60 days after submittal to the Commission, whichever occurs first.

In the response to comments received associated with the decommissioning final rule published in the *Federal Register* on July 29, 1996 (61 FR 39278), the NRC explicitly states that Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," is applicable to decommissioning plants (61 FR 39283). As noted above, the licensee is allowed to make changes to the QA program without prior NRC approval provided the changes do not reduce previous commitments in the program that were previously approved by the NRC. Changes that fit this description shall be documented in periodic final safety analysis report revision in accordance with 10 CFR 50.71(e). Any changes that reduce previously approved commitments must be submitted for prior NRC approval in accordance with the notification requirements of 10 CFR 50.4, "Written Communications."

Reactor licensees transitioning to decommissioning may elect to simplify and revise their current QA plans, which are based on operating reactors, to plans commensurate with defueled and shutdown reactors. Licensees may decide to reduce some requirements, where appropriate, to simplify the QA plan, given the fewer number of SSCs for a decommissioning facility and the fewer number of quality standards that would apply. Submittal of licensee requests for QA program changes are not common during the reactor decommissioning transition period. Only one licensee made such a request for the recently permanently shutdown reactors. The licensee request and staff approval are provided in References 1 and 2 below.

Lesson Learned

It is unclear which SSCs at decommissioning plants are subject to the QA program.

Recommendation

The NRC staff should consider clarifying, through a generic communication, the scope of SSCs at a decommissioning plant that are subject to the QA program.

References

1. Palmisano Thomas J., Southern California Edison, letter to U.S. Nuclear Regulatory Commission, Docket No. 50-206, 50-361, 50-362, and 72-041, Request for Approval of Decommissioning Quality Assurance Program for San Onofre Nuclear Generating Station Units 1, 2 and 3 and Independent Spent Fuel Storage Facility, November 13, 2014, ADAMS Accession No. ML14322A157.
2. Khanna, Meena K., U.S. Nuclear Regulatory Commission, letter to Mr. Thomas J. Palmisano, Southern California Edison Company, San Onofre Nuclear Generating Station, Units 1, 2 and 3 and the Independent Spent Fuel Storage Installation—Review of Changes to the Decommissioning Quality Assurance Program (TAC Nos. MF5215, MF5216, and MF5217), August 10, 2015, ADAMS Accession No. ML15191A461.

1.8 Transfer of Licensing and Oversight Responsibility from NRR to NMSS

Requirement

There are no regulatory requirements regarding the transfer of project management responsibilities from the Office of Nuclear Reactor Regulation (NRR) to the Office of Nuclear Material Safety and Safeguards (NMSS).

NRR OI COM-101 (Reference 1) contains a high-level overview of the process for the transition of project management responsibilities from NRR to NMSS for reactors transitioning to decommissioning.

Type of Action

To document the transfer of project management responsibilities from NRR to NMSS, an internal memo is sent from the Director of NRR/DORL to the Director of NMSS/Division of Decommissioning, Uranium Recovery, and Waste Programs (DUWP), providing the details of the transfer and other relevant information and issues, as described in OI COM-101.

Discussion

NRR/DORL has the project management responsibilities for all operating power reactors. When a licensee decides to permanently shut down the reactor, letters are sent to the NRC, pursuant

to 10 CFR 50.82(a)(i) and (a)(ii), certifying the permanent cessation of power operations and permanent defueling of the reactor vessel. Following the receipt of these certification letters, NRR/DORL will maintain project management responsibility, oversight, and inspection support responsibilities (except as noted in OI COM-101 Section 4.1.2) until the Regulatory and Safety Milestones identified in OI COM-101 Appendix B, Table 1, are completed. Upon completion of the transition milestones, NRR/DORL will prepare a memo to NMSS/DUWP transferring formal project management to NMSS (References 2, 3, 4, and 5).

Based on the recent licensing activities for the recently shutdown reactors, the following are the significant licensing action reviews that are typically completed prior to the transition to NMSS:

- Amendment for PDTs (required per OI COM-101)
- Exemption concerning Licensed Operators (required per OI COM-101)
- Exemption from certain Emergency Preparedness Requirements (required per OI COM-101)
- Amendment for PDEP and Revised EAL Scheme implementing EP exemption, as granted (required per OI COM-101)
- PSDAR closeout letter
- Approval of CFH training and retraining program
- Exemption to Allow Access to DTF
- Exemption concerning Reduced Offsite Primary Liability Insurance and Withdrawal from the Secondary Rating Pool
- Exemption concerning Reduced Onsite Accident Insurance
- Relaxation or Rescission of Fukushima Orders

The order of the completion of the licensing actions is not important; however, the issuance of the PDTs is often the last major licensing action completed before the transition to NMSS. Note that it has been NRC staff's practice to complete the transition even if a hearing has been requested and a proceeding is pending on a particular licensing action.

Lessons Learned

Involvement of the cognizant NMSS PM, as early in the process as practical, was effective in making NMSS aware of the progress of the licensing actions and facilitating a good understanding of the licensing issues, which promoted a smooth transition.

Similarly, early communication among NRR, NMSS, and the Regions was also very important to a smooth transition. The NRC Region that the transitioning plant is assigned to might not be the same as when it was operating (e.g., operating Crystal River was inspected by Region II, but

during transitioning it was inspected by Region I). The practice of frequent periodic licensing status calls involving NRR, NMSS, the Region, and the licensee promoted effective communication and coordination.

Some NRR-initiated correspondence with licensees is sent out through an electronic mailing list that distributes the correspondence to those external project stakeholders who have voluntarily requested to be on the mailing list. NMSS does not have an electronic system to distribute correspondences to its stakeholders. When it became known, NRR offered to distribute NMSS correspondences on its electronic system until NMSS staff can be trained on its use. Once trained, the system will be used by both NRR and NMSS. Before each reactor transitions, NRR staff should confirm that NMSS administrative staff are trained and able to use the electronic system for distributing correspondences.

NRR/DORL and NMSS/DUWP worked together to determine which licensing actions would remain within DORL's scope of review, both during and after the transfer. For those actions for which the workload/reviews had already been substantially completed, the management from DORL and DUWP determined that it was more efficient to have NRR complete the review, rather than NMSS.

NMSS is the lead for public communications and outreach, including leading and integrating the offices and regions for public outreach meetings, interfacing with congressional, State, and local governments, and responding to media requests.

Recommendations

As part of the update to NRR OI COM-101, the NRC staff should proceduralize the following actions:

- For internal business process, as early as possible, PMs should make NRR/PMDA (or OCFO, depending on what organization currently maintains responsibility) aware of the date of the transfer from NRR to NMSS. This allows the budget structure and charges to be moved to the proper organization concurrently with the transfer. The NRR PM should schedule an initial transfer planning meeting with affected branches in NRR, NMSS, and OCFO, 2 to 4 weeks prior to transfer date, to facilitate awareness and reinforce roles and responsibilities to ensure a smooth transition.
- For planning and communications, initiate preliminary planning meetings with the licensee. Specific topics, not exhaustive, have been identified throughout the specific sections of the Appendix to this report.
- Start internal communications with the future NMSS/DUWP counterpart PM and BC and the regions to provide the status and progress of the licensing activities.
- Conduct periodic licensing status calls with the licensee and cognizant staff from NRR, NMSS, and the region starting early in the decommissioning transition process. The frequency of the calls can be determined based on the level of ongoing licensing actions and activity. Send out a communications e-mail to inform all internal stakeholders when the transition to NMSS is complete.

- Regarding templates, the transition memorandum template should be updated to follow the most recent transitions. In the interim to the revision, latest precedents should be used in lieu of the template.

References

1. U.S. Nuclear Regulatory Commission, "NRR Interfaces with NMSS," NRR Office Instruction COM-101, November 2002, ADAMS Accession No. ML022110316 (not publicly available).
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3. Boland, A., U.S. Nuclear Regulatory Commission (NRR), memorandum to Larry W. Camper, U.S. Nuclear Regulatory Commission (NMSS), San Onofre Nuclear Generating Station, Units 2 and 3—Transfer of Project Management Responsibilities to the Office of Nuclear Material Safety and Safeguards, August 27, 2015, ADAMS Accession No. ML15216A620 (not publicly available).
4. Boland, A.T., U.S. Nuclear Regulatory Commission (NRR), memorandum to Larry W. Camper, U.S. Nuclear Regulatory Commission (NMSS), Crystal River, Unit 3 Nuclear Generating Plant—Transfer of Project Management Responsibilities to Office of Nuclear Material Safety and Safeguards, September 10, 2015, ADAMS Accession No. ML15247A438 (not publicly available).
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2. OVERSIGHT TOPICS

2.1 Inspection and Oversight

Requirement

The regulations in Title 10 of the *Code of Federal Regulations* (10 CFR) 50.70, “Inspections,” identify the inspection-related requirements. Specifically, under 10 CFR 50.70(a), licensees shall permit inspection by representatives of the Commission as may be necessary to effectuate the purposes of the Atomic Energy Act of 1954, as amended. The regulation in 10 CFR 50.70(b) requires the licensee to make provisions for the resident inspector office and provide NRC inspectors with unfettered access to the facility.

Type of Action

The NRC implements its inspection and oversight activities using the following inspection procedures.

Inspection Manual Chapter (IMC) 2515, “Light-Water Reactor Inspection Program—Operations Phase” (Reference 1), lays out the policy for the operating reactor inspection program and continues to be implemented in accordance with IMC 0305, “Operating Reactor Assessment Program” (Reference 2) until the reactor permanently ceases operation and defuels.

The NRC transitions from the reactor oversight process to IMC 2561, “Decommissioning Power Reactor Inspection Program” (Reference 3) following the certification by the licensee that all nuclear fuel has been permanently removed from the reactor vessel in accordance with 10 CFR 50.82(a)(1)(ii).

Security inspections and oversight guidance at permanently shutdown plants are provided in IMC 2202, “Security Inspection Program for Decommissioning Nuclear Power Reactors” (Reference 4).

The oversight program for operating and decommissioning sites that have an Independent Spent Fuel Storage Installation (ISFSI) or plan to construct one are contained in IMC 2690, “Inspection Program for Dry Storage of Spent Reactor Fuel at Independent Spent Fuel Storage Installations and for 10 CFR Part 71 Transportation Packaging” (Reference 5).

Discussion

The Reactor Oversight Process (ROP) ends and the Reactor Decommissioning Oversight Program begins upon licensee certification that the reactor has been permanently shut down and all nuclear fuel has been permanently removed from the reactor vessel, in accordance with 10 CFR 50.82(a)(1). When this occurs, the licensee is no longer authorized to operate or place fuel into the reactor vessel and oversight responsibility within the regional offices transfer from the Regional Division of Reactor Projects (DRP) to the Division of Nuclear Material Safety (DNMS). The NRC Regional materials program was consolidated from Region II into Region I

on October 1, 2003 (Reference 6), and responsibility for all Region II decommissioning reactors was transferred to Region I. Consequently, when a plant in Region II permanently shuts down, the decommissioning oversight is transferred to Region I (as was the case for Crystal River Unit 3 Nuclear Generating Plant (CR-3)).

The decommissioning oversight program comprises two major program elements: core inspections and discretionary (i.e., reactive and initiative) inspection activities. The core inspection activities can be found in Appendix A of IMC 2561 and should be completed on an annual basis. The non-core inspection activities are listed in Appendix B of IMC 2561 and are implemented as needed, based on licensee performance or activities being performed.

Decommissioning core inspections include, but are not limited to: organization and management controls; quality assurance; spent fuel wet storage and handling; maintenance and surveillance; radiation protection; security; and safety evaluations. Other core procedures include those applicable to transportation of irradiated materials and license termination activities.

The guidance in IMC 2561 also addresses how long the resident inspector's office should remain staffed after shutdown. The guidance recommends that one inspector should stay up to 6 months for a site entering SAFSTOR or 12 months for a site entering active decommissioning or as performance dictates. During the time that the resident inspector is at the site following permanent shutdown, the resident will assist regional decommissioning inspectors in the oversight of the plant. Once the resident inspector departs the site, inspection activities are provided solely by regional inspectors. The timing of the resident inspector reassignment is intended to be flexible, meeting the needs of the agency, region, and the individual.

In recent implementation of the ROP at sites that are transitioning to decommissioning, the ROP was adjusted to account for preparation of decommissioning activities. Once the recent sites were transitioned to the Reactor Decommissioning Oversight Program, NRC started to consider whether the ROP could be modified to better align with the planned permanent cessation of operations without compromising the effectiveness of the core ROP inspections. Following this evaluation, the NRC staff issued Appendix G, "Baseline Inspection Guidance for Power Reactors Preparing for Transition to the Decommissioning Phase," to IMC 2515, dated February 1, 2016, to address the year prior to permanent shutdown.

Some of the findings in NRC regional inspection reports for the power reactors that recently entered into decommissioning are summarized below:

Kewaunee Power Station

- One Severity Level III Violation was issued along with a \$17,500 civil penalty for licensee-made changes to the physical security plan and guard training and qualification plan that decreased the safeguards effectiveness of the plans and for which the licensee did not seek prior approval of the Commission (See Reference 7).
- One Severity Level IV (SLIV) Violation was issued for failure to ensure Incipient Fire Brigade Services Agreement in Effect (See Reference 8).

- Two SLIV Non-cited violations (NCVs) were issued related to changes made to the site's emergency plan: (1) Failure to Obtain Prior NRC Approval for Emergency Plan Changes and (2) Failure to Maintain an Acceptable On-Shift Staffing Analysis (See Reference 9).

Crystal River Unit 3 Nuclear Generating Plant

- One licensee-identified SLIV NCV of CR-3 Technical Specifications (TSs) 5.6.2.17, "Technical Specifications Bases Control Program," was identified. Duke Energy did not submit any TS Bases updates to the NRC from April 30, 2009, to May 27, 2015 (See Reference 10).

San Onofre Nuclear Generating Station, Units 2 and 3

- One NCV involving the licensee's failure to obtain prior NRC approval before implementing changes to SFP makeup system, changes which reduced the seismic qualification of the system (See Reference 11).
- A SLIV non-cited violation was identified for the licensee's failure to obtain prior approval from the NRC before implementing changes to the licensee's Emergency Plan, as required by 10 CFR 50.54(q)(3). Specifically, the licensee did not obtain NRC approval before implementing Emergency Plan Revisions 34 and 35, which, together, eliminated thirty-nine emergency response organization positions (See Reference 16).

Vermont Yankee Nuclear Power Station

- Based on the results of the inspection, a SLIV NCV violation of 10 CFR 50.82(a)(8)(ii) was identified. 10 CFR 50.82(a)(8)(ii) states, in part, that initially, three percent (3%) of the generic amount of decommissioning funds as specified in § 50.75 may be used for decommissioning planning. Contrary to the requirement, Entergy withdrew decommissioning funds for an activity that was not directly related to decommissioning planning. Specifically, on February 4, 2015, Entergy withdrew decommissioning funds for operational spent fuel management planning activities prior to receiving an exemption from the applicable regulations (Reference 12).

Lessons Learned

- Decommissioning oversight responsibility for CR-3 was transferred from Region II to Region I (See Reference 13). There was no guidance in IMC 2561 on how this should be accomplished. Region I coordinated a highly successful and seamless transfer of oversight responsibility, including allegations, enforcement, and emergency response from Region II.
- The ROP lacked guidance on what areas should be reviewed as a plant approaches permanent cessation of operations. The regional offices made adjustments in their oversight of plants in their final year of operations. This included focusing inspection activities on programs and equipment important to maintain reactor safety and support

shutdown operations, as well as conducted quarterly assessment reviews in some cases.

- The ROP lacked guidance on how the transition from IMC 2515 to IMC 2561 should be communicated and documented to the licensee and public (See References 14 and 15 for examples).
- Inspection hours tracking in the time and labor reporting system (HRMS) for inspection planning and decommission function in the Reactor Program System (RPS) needs to be improved.
- IMC 2561 and the associated Appendix A and B inspection procedure had not been maintained up-to-date with the various regulatory and oversight changes that had occurred over the years since the last set of plants underwent decommissioning. Inspection procedures such as adverse weather, spent fuel pool safety, and fire protection were either not available or lacked adequate guidance for inspectors.
- Regional staff are not trained to review or identify potential decommissioning trust fund issues. The inspection guidance in this area is limited and questions should be referred to NRR.
- Security and emergency preparedness inspection procedures for a permanently shutdown reactor were initially unavailable. As a result, NSIR created a series of physical security and EP inspection procedures. Inspection Manual Chapter 2202, "Security Inspection Program for Decommissioning Power Reactors," was issued August 2014. Emergency Preparedness inspection procedures were issued in September 2014. Regional security inspectors found the newly created Security Inspection Program for shutdown plants mimicked the operating procedures too closely and did not adequately factor in the difference between an operating and decommissioning site. This issue was remedied through the comment resolution process required by NRC IMC-0040, "Preparing, Revising and Issuing Documents for the NRC Inspection Manual," where feedback from the inspectors was considered and reflected throughout the inspection program.
- Additional guidance could be developed in the following areas for decommissioning plants:
 - Transition of health physics inspections between Regional Division of Reactor Safety (DRS) and Division of Nuclear Materials Safety (DNMS) would be recommended during the ROP/decommissioning process.
 - Guidance for unresolved inspection items after transitioning from operation to decommissioning.
 - Guidance on handling open greater than green findings during decommissioning. For example, Kewaunee had two open white findings in the

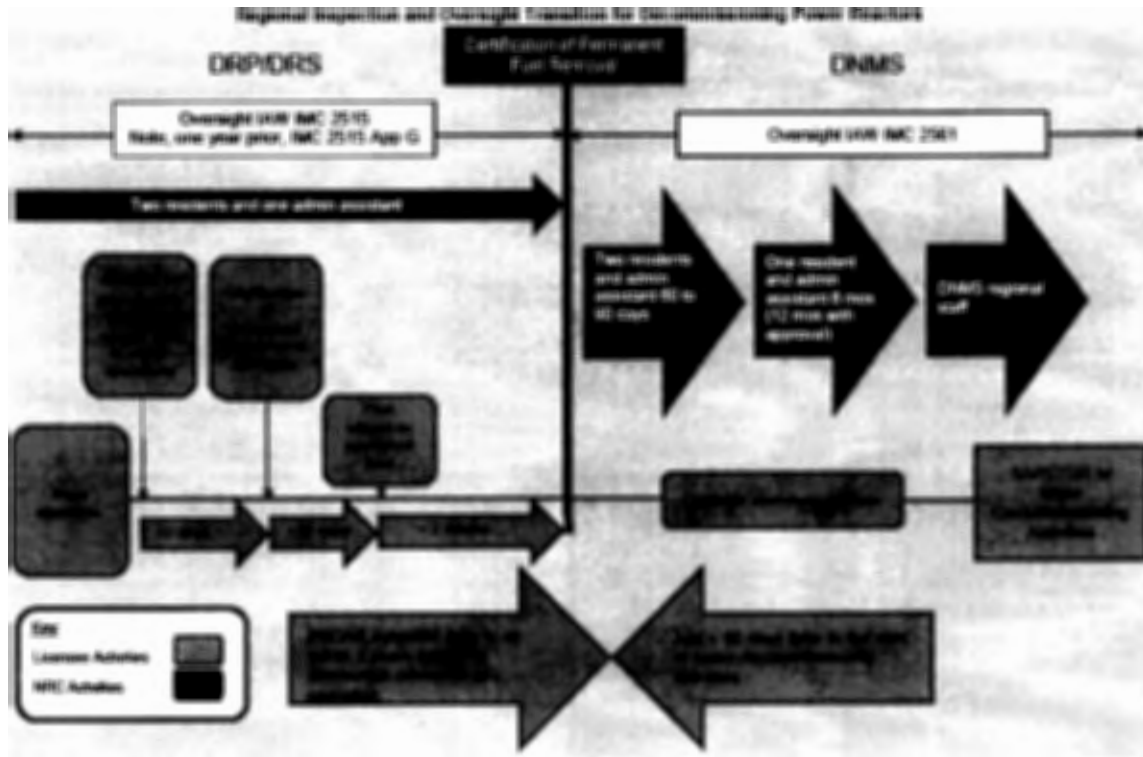
area of emergency preparedness and fire protection when they transitioned to decommissioning.

- Several waivers were needed to allow for resident inspectors to remain at the site longer than what is contained in the IMC 2561 for plants that were entering SAFSTOR.
- The regulations in 10 CFR 50.70 require the licensee to provide the resident inspector with office space. When the NRC no longer maintains a resident inspector and inspection oversight is conducted by regional inspectors, some sites have historically requested an exemption to providing the office space described in 10 CFR 50.70. More recently, the NRC has determined this to be unnecessary since the requirement for providing office space is “upon request.” If the region no longer has a need for office space, then the region can close the office and the licensee would not have to maintain the office space.
- The licensee may release a large number of existing plant staff during the early phases of decommissioning, especially if there hasn’t been an adequate time to plan for the decommissioning phase. Included in the exodus from the plant are likely to be individuals that have performed the safety reviews (10 CFR 50.59, 50.54 and 72.48). The staff may not be aware that, depending on the plant’s licensing basis, the fuel in the spent fuel pools along with systems to cool the pool and provide make-up water may be required to be protected from accident conditions and meet existing commitments for high seismic or code requirements. This may include both the piping systems and back-up power. Additionally, program changes to the Licensee’s Emergency Plan may be implemented under 10 CFR 50.54(q) without the necessary NRC review and approval prior to implementation. Inexperienced staff may not understand these regulatory requirements and commitments and thus may prepare and execute modification and program changes that require NRC review before implementation.
- Frequency of spent fuel inspection while the fuel is being maintained in the spent fuel pool. Operating reactors are required to have a Special Nuclear Material (SNM) review, which would include spent fuel, on a triannual basis and has a well-developed inspection procedure. However, the decommissioning instructions for this type of inspection do not include instructions that are as well developed or a corresponding frequency of inspection.

Recommendations

- Revise IMC 0305 to include guidance on how to document ending the ROP, final performance assessment, and transition to decommissioning oversight program.
- Consideration should be given to revising IMC 2561 to allow for the retention of a resident inspector for up to 1 year after the permanent shutdown of an operating reactor in order to avoid the need for waivers from the guidance/policy established in IMC 2561 (regardless of whether a licensee begins active decommissioning immediately or elects for SAFSTOR). The DRP resident inspection staff were very helpful in assisting DNMS with inspections during the transition from IMC 2515 to IMC 2561 oversight.

- The resident inspectors' office assistants should be retained until both resident inspectors have been reassigned and leave the site. Experience showed that the office assistants played an important role in supporting the remaining onsite resident and completing the official closure of the resident inspector office.
- IMC 2561 and inspection procedures references in Appendix A and B should be reviewed and updated as needed to capture changes in regulatory and oversight framework over the years and lessons learned from inspections completed at Kewaunee, Crystal River Unit 3 San Onofre Units 2 and 3, and Vermont Yankee. There may be opportunities to utilize ROP procedures in some areas, vice the ones currently referenced as inspection procedures (IPs) to be implemented at shutdown sites, which could reduce the level of effort needed to revise some of the procedures referenced in Appendix A and B. Note that NMSS/DUWP/RDB has programmatic ownership of IMC 2561 and a revision schedule for updating the inspection guidance is provided in Appendix 4.3 of this report.
- The DTWG recommended that additional guidance be developed for IMC 2515 to ensure appropriate oversight is maintained at sites that have announced their intention and prepare to transition to a permanently shut down condition. A revision to IMC 2515 was issued in February 2016 which captured best-practices utilized by the regional offices to ensure the safe operation of a plant as it transitioned from an operating status to a permanently shutdown status. Of note, staff issued Appendix G to IMC 2515, "Baseline Inspection Guidance for Power Reactors Preparing for Transition to Decommissioning Phase." Appendix G provides recommendations on potential adjustments to the inspection activities that can be used to perform a more detailed assessment of performance in areas potentially impacted by the impending shutdown.
- Perform a focused inspection of licensee's 10 CFR 50.59, "Changes, Tests and Experiments," reviews prior to the licensee's beginning major modifications after the plant has been shut down. Inspectors found numerous issues at one facility due to changes to definition of "safety-related SSC's" by the licensee.



References

1. U.S. Nuclear Regulatory Commission Inspection Manual Chapter 2515, "Light-Water Reactor Inspection Program – Operations Phase," issued February 2016, ADAMS Package Accession No. ML16029A036.
2. U.S. Nuclear Regulatory Commission Inspection Manual Chapter 0305, "Operating Reactor Assessment Program" issued December 23, 2015, ADAMS Accession No. ML15317A147.
3. U.S. Nuclear Regulatory Commission Inspection Manual Chapter 2561, "Decommissioning Power Reactor Inspection Program," issued April 2003, ADAMS Accession No. ML031270502.
4. U.S. Nuclear Regulatory Commission Inspection Manual Chapter 2202, "Security Inspection Program for Decommissioning Nuclear Power Reactors," ADAMS Accession No. ML13234A269 (security related; not publicly available).

5. U.S. Nuclear Regulatory Commission Inspection Manual Chapter 2690, "Inspection Program for Dry Storage of Spent Reactor Fuel at Independent Spent Fuel Storage Installations and for 10 CFR Part 71 Transportation Packaging" issued March 9, 2012, ADAMS Accession No. ML120390415.
6. U.S. Nuclear Regulatory Commission Regulatory Issue Summary 2003-15: Consolidation of the Region I and Region II Materials Program, ADAMS Accession No. ML032480409.
7. NRC Inspection Report No. 05000305/2014401 issued on January 15, 2015 (ADAMS Accession No. ML15020A594 - publicly available and related ADAMS Accession No. ML15016A387 - not publicly available; security-related information), and the subsequent Notice of Violation and proposed imposition of civil penalty issued on March 31, 2015, ADAMS Accession No. ML15091A787 (publicly available) (ADAMS Accession No. ML15091A828; not publicly available; security-related information).
8. NRC Inspection Report Nos. 05000305/2014003 and 07200064/2014001 issued on November 13, 2014, ADAMS Accession No. ML14317A656.
9. NRC Inspection Report No. 05000305/2013011 issued March 10, 2014, ADAMS Accession No. ML14069A225.
10. NRC Inspection Report No. 05000302/2015008 issued on July 28, 2015, ADAMS Accession No. ML15209A632.
11. NRC Inspection Report Nos. 05000361/2015009 and 05000362/2015009 issued on October 8, 2015, ADAMS Accession Nos. ML15274A558 and ML15279A454 (not publicly available).
12. NRC Inspection Report No. 05000271/2016001 issued on May 4, 2016, ADAMS Accession No. ML16125A036.
13. Ferdas, Marc S., U.S. Nuclear Regulatory Commission, letter to Mr. Terry D. Hobbs, Crystal River Nuclear Plant, Transfer of Oversight for Crystal River 3 from NRC Region II to NRC Region I and Inspection Schedule for 2013 dated August 1, 2013, ADAMS Accession No. ML13217A088.
14. Casto, Charles A., U.S. Nuclear Regulatory Commission, letter to Mr. David A. Heacock, Dominion Energy Kewaunee, Termination of Reactor Oversight Process for Kewaunee Power Station and Commencement of Decommissioning Inspection Program, dated May 31, 2013, ADAMS Accession Nos. ML13151A375 and ML13151A439 (not publicly available).
15. Ferdas, Marc S., U.S. Nuclear Regulatory Commission, letter to Mr. Christopher Wamser, Entergy Nuclear Operations for Vermont Yankee, Termination of Reactor Oversight Process for Vermont Yankee Power Station and Commencement of

Decommissioning Inspection Program, dated January 20, 2015, ADAMS Accession No. ML15020A482.

16. NRC Inspection Report: San Onofre Nuclear Generating Station – NRC Baseline Inspection Report (05000361/2013501) and (05000362/2013501), dated March 26, 2014, ADAMS Accession No. ML14085A502.

2.2 Licensing and Oversight Budget Planning for Power Reactors Transitioning to Decommissioning

Requirement

The Office of Nuclear Reactor Regulation (NRR) continues to fund the processing of licensing actions, as well as inspection activities, under the Operating Reactor Business Line for decommissioning power reactors during the transition period of decommissioning. In accordance with NRR OI COM-101 (Reference 1) and NMSS P&P 5-1 (Reference 2), "Reactor Decommissioning Program Procedures for Interfacing with NRR," NRR continues to fund all inspection activities through the fiscal year (FY) when plant oversight and project management responsibilities are transferred to NMSS. NRR budgeted resources assigned to the Operating Reactor Business Line continue to be used as the basis for organizational staffing plans and to make decisions regarding the level of inspection activities conducted at the decommissioning reactors during this transition period.

Oversight and inspection activities for operating power reactors fall under the ROP, and inspections are conducted under NRC IMC 2515 (Reference 3) as the reactor transitions to decommissioning. When a power reactor licensee has submitted certification of permanent cessation of operation and permanent removal of fuel from the reactor vessel in accordance with 10 CFR 50.82(a)(1)(i) and (1)(ii), the facility operating license no longer authorizes operation of the reactor or emplacement or retention of fuel in the reactor vessel. At this point, the plant oversight exits from the ROP, and inspections conducted under IMC 2515 transition to oversight inspections under NRC IMC 2561 (Reference 4). However, NRR continues to fund regional inspections through the end of the fiscal year that project management responsibilities are transferred to NMSS. At this point, the Decommissioning Business Line funds licensing and regional inspection activities.

Type of Action

During the recent unplanned decommissioning of the five reactors, the NRC staff identified a need for a defined process to appropriately realign budget lines and inspection funding resources as operating reactors move from inspection activities under the ROP to IMC 2561 during the decommissioning transition phase.

Discussion

The formal reactor decommissioning inspection process begins when the reactor has been permanently shut down and defueled and the responsible NRC Region has transferred the licensee from the ROP inspection program to IMC 2515 and its associated inspection

procedures. IMC 2561 describes a number of decommissioning scenarios available to licensees. Each site has specific considerations and resource needs that must be evaluated on a case-by-case basis depending on the decommissioning strategy chosen and the facility details.

Typically, for the first 2 years after a plant permanently ceases operation, the amount of licensing work may increase significantly (particularly if the decommissioning is unplanned) to process the license amendments and exemptions needed to reflect the decommissioning status of the facility. By the third year following permanent shutdown, the licensing workload decreases to the equivalent of approximately 0.5 full-time equivalent (FTE) and varies thereafter, depending on the decommissioning strategy and timeline chosen by the licensee (i.e., higher FTE levels are expected for plants in active dismantlement and decontamination (i.e., DECON) than for those entering SAFSTOR).

For inspection activities, the level of effort reduces from approximately 4.5 FTEs per operating plant to approximately 2 FTEs during the first year of decommissioning. In addition, a resident inspector is typically maintained at the site for 6 months to a year following permanent shutdown to monitor open ROP inspection items, allegations, and modifications made to the plant while preparing it for future decommissioning activities. Resources are estimated to reduce to 1 FTE in year 2, and 0.7 FTE by year 3. After this, inspection activities remain steady at approximately 0.5 FTE for a plant in active DECON and 0.3 FTE for a plant entering into SAFSTOR status. Once the transition to SAFSTOR is completed, the inspection effort decreases to 0.1 FTE. NMSS typically budgets 1.0 FTE (0.3 FTE for licensing and 0.7 FTE for inspections) for the first year after the plant is fully transferred.

NRR will continue to fund all inspection activities through the FY when plant oversight and project management responsibilities are transferred to NMSS. The conditions necessary to complete project management transfer to NMSS are identified in NRR OI COM-101. After the conditions for transfer are met, project management responsibility is transferred to NMSS. Subsequently, NMSS is responsible for funding all inspection activities beginning the next FY.

Lessons Learned

Currently, the reactor inspection program is formally transferred from the ROP to IMC 2561 when it is agreed by the affected regional Division Directors that the plant has achieved the appropriate status to be considered a permanently shutdown reactor and defueled. Based on recent experience, it is recommended that this regional inspection transfer process requires that the regional DNMS Division Directors determine the appropriate FTE needs, based on the plant status, site-specific details, and overall decommissioning strategy. The regional DNMS Directors would also obtain agreement with the regional DRP Division Director counterparts prior to formal transfer from the ROP to IMC 2561. Considerations for the timing of this transfer and the level of effort required include the availability of the resident inspector to remain on site, allegation history, public involvement, outstanding ROP issues, and modifications the licensee plans to perform.

To support this transfer for the recent power reactors that entered into decommissioning, managers from NRR and NMSS met to review the FTE associated with decommissioning inspections for FY 2015 and future years. For FY 2015, since four plants were new to

decommissioning, 4 FTEs would be funded by NRR for NMSS to use toward inspection activities. NMSS divided the FTEs between the appropriate regional offices as needed. Thus, although the four reactor sites were expected to be transferred to NMSS in FY 2015, NRR funded inspections for the entire fiscal year as outlined above, with NMSS taking over full funding responsibility in FY 2016 (for all the reactor sites except Vermont Yankee Nuclear Power Station, which did not transfer until FY 2016).

Subsequent to the budgeting realignment between NRR and NMSS for the recent power reactors that entered into decommissioning, it was noted that the travel expenditures for regional inspection staff was not captured. NRR and NMSS will need to work with the Office of the Chief Financial Officer (OCFO) to ensure that adequate travel funds are allotted for regional inspection staff travel to the decommissioning sites for future budget formulations.

It was also noted that several decommissioning licensing actions cost activity codes (CACs) were opened under Decommissioning Planned Accomplishment codes. These codes are associated with the NMSS Decommissioning Business Line. Reactor decommissioning work CACs should be opened under the Operating Reactor Business Line codes until project management for decommissioning reactors has transferred from NRR to NMSS.

Alternate Funding Consideration for Decommissioning Reactors

Because NRR cannot currently provide direct funding to the NMSS Decommissioning Business Line, impacted NRR and NMSS managers have proposed that the budget lines be realigned to allow funding for decommissioning activities to come from a “co-owned” decommissioning reactor business line. This will allow for greater efficiency in the use of decommissioning oversight funds for future reactor licensees that choose to permanently shut down. Under this new model, in the FY following permanent cessation of operations, inspection and licensing funding for that reactor could be transferred to the co-owned decommissioning reactor business line, still funded by NRR. After the appropriate milestones for transfer to NMSS have been met, NMSS will assume funding for the co-owned decommissioning reactor business line during the next FY.

In order to accomplish this change, after a licensee announces its intention to permanently shut down, an appropriate line item (or line items), with oversight and licensing resources allocated by the regional and headquarters offices, will be created by OCFO under the co-owned decommissioning reactor business line with NRR as the owner. These can include licensing and oversight line items. When the reactor subsequently transfers to NMSS, the resources and line item(s) will transition to NMSS in the next FY.

In addition, when possible, NRR will attempt to incorporate appropriate resource shifts from the Operating Reactor Business Line to the co-owned decommissioning reactor business line as part of the normal budget formulation process. The ability to accomplish this will depend primarily on the amount of notice given to the NRC by the licensee as a result of receipt of the letter of intent to permanently cease operations. When the NRC receives the formal certification of cessation of operations and permanent removal of fuel from the reactor vessel, NRR will notify OCFO to implement the appropriate resource shifts to the co-owned decommissioning reactor business line. However, if decommissioning occurs with little advance notice, the oversight resources will be unchanged until the next FY.

Recommendations

- As part of the update to IMC 2515, the NRC staff should clarify the overall inspection program budget needs for the transfer of decommissioning sites from the ROP to IMC 2561 activities.
- As part of the update to IMC 2561, the NRC staff should clarify the regional DNMS Director's role in the budget process and the transfer of regional budget resources within division business lines.
- The budgeting formulation process should ensure that travel funds for regional inspectors to decommissioning sites is adequately accounted for.
- As part of the update to NRR OI COM-101 and NMSS P&P 5.1, the NRC staff should include NRC inspection funding background information.
- As part of the budget formulation process, the NRC staff should consider realigning the NRR and NMSS budget lines to allow funding for decommissioning activities to come from a "co-owned" decommissioning business line.

References

1. U.S. Nuclear Regulatory Commission, "NRR Interfaces with NMSS," NRR Office Instruction COM-101, November 2002, ADAMS Accession No. ML022110316 (not publicly available)
2. U.S. Nuclear Regulatory Commission, "Reactor Decommissioning Program Procedures for Interfacing with the Office of Nuclear Reactor Regulation," Office of Nuclear Material Safety and Safeguards Policy and Procedure 5-1, Revision 3, March 31, 2016, ADAMS Package Accession No. ML16081A172 (not publicly available).
3. U.S. Nuclear Regulatory Commission, NRC Inspection Manual Chapter 2515, "Light-Water Reactor Inspection Program – Operations Phase," issued February 2016, ADAMS Package Accession No. ML16029A036.
4. U.S. Nuclear Regulatory Commission, NRC Inspection Manual Chapter 2561, "Decommissioning Power Reactor Inspection Program," April 2003, ADAMS Accession No. ML031270502.

3. COMMUNICATIONS

With the recent increase in the number of power reactors beginning the decommissioning process, there is an increased public interest in the decommissioning process. Consistent with the U.S. Nuclear Regulatory Commission's (NRC's) policy on transparency and communication, the NRC frequently interacts with interested stakeholders, including both nongovernmental organizations (NGOs) and local and State government officials, in order to discuss any decommissioning topics that may be of interest to the public, interested stakeholders, and the community surrounding the decommissioning reactor.

These interactions include participation at existing community forums; government to government (G2G) meetings; end of cycle, post-shutdown decommissioning activities report (PSDAR), license termination plan (LTP) meetings; congressional staffer briefings; meetings with State and local officials; attendance at media boards and press briefings; and correspondence related to nuclear plant decommissioning.

Requirements

The regulation at Title 10 of the *Code of Federal Regulations* (10 CFR) 50.82(a)(4)(ii) requires the NRC to notice receipt of the licensee's PSDAR and make the PSDAR available for public comment. Additionally, the NRC shall schedule a meeting in the vicinity of the licensee's facility upon receipt of the PSDAR and publish a notice announcing the meeting in the *Federal Register* (FR) and another readily accessible forum to individuals in the vicinity of the site.

Licensees are prohibited from performing any major decommissioning activities until 90 days after the NRC has received the licensee's PSDAR submittal and until certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel, as required under 10 CFR 50.82(a)(1), have been submitted. For licensees that submit their PSDAR after the certifications have been submitted, the public meeting is typically held within 60 days of receipt of the PSDAR.

The regulation at 10 CFR 50.82(a)(9)(iii) similarly requires the NRC to notice receipt of the licensee's LTP, make the LTP available for public comment, schedule a meeting in the vicinity of the location of the licensed facility to discuss the LTP, and publish a notice of the meeting in the *Federal Register* and another forum readily accessible to individuals in the vicinity of the site.

Type of Action

Engaging the external stakeholders is an NRC cornerstone of strong, fair regulation of the nuclear industry. The NRC recognizes the public's interest in the proper regulation of nuclear activities and provides various opportunities for citizens to make their opinions known. The NRC seeks to elicit public involvement early in any regulatory process, including decommissioning, so that safety concerns that may affect a community can be resolved in a timely and practical manner. This process is considered vital to assuring the public that the NRC is making sound, balanced decisions about nuclear safety.

Discussion

The NRC staff recognizes the desire for, and value of, community involvement in the decommissioning of a nuclear power plant. Power plant decommissioning is typically treated as a complex project, and the NRC believes that the impacts of decommissioning and termination of a nuclear power reactor license need to be communicated with the local community. However, the NRC was created by the Congress to be an independent regulator charged with ensuring public health and safety and protecting the environment. As an independent regulator, the NRC ensures that all external stakeholders are given a fair and equal opportunity to comment on a licensee's PSDAR and LTP, commensurate with the risks involved. Therefore, the NRC does not officially recognize or endorse any specific special interest group, public or private organizations, community groups, coalitions, or individuals. This approach assures that one or more organizations do not dominate the public forum and allows members of the public to provide alternative and differing viewpoints and comments to the NRC.

Consistent with the NRC's principle of openness, the NRC frequently interacts with interested stakeholders, including both NGOs and local and State government officials, in order to discuss any decommissioning topics that may be of interest to the public, interested stakeholders, and the surrounding community. These interactions include participation at existing community forums, G2G meetings, end-of-cycle plant performance meetings, congressional staff briefings, meetings with State and local officials, attendance at media boards and press briefings, and replies to correspondence related to nuclear plant decommissioning. These meetings are scheduled and conducted in cooperation with the appropriate organizations (e.g., Office of Congressional Affairs (OCA) for congressional briefings and Office of Public Affairs (OPA) for media interest). A listing of many of the reactor decommissioning stakeholder outreach meetings is provided at the end of this Appendix section.

External Stakeholder Interface

Opportunities for the Public to Comment on Decommissioning Documents

The NRC regulations currently offer the public several opportunities to review and provide comments on licensee documents during the decommissioning process. Specifically, under the NRC regulations in 10 CFR 50.82, "Termination of License," the NRC is required to publish a notice of the receipt of the PSDAR and the LTP, make the PSDAR and LTP available for public comment, schedule separate meetings in the vicinity of the location of the licensed facility to discuss both the PSDAR and LTP within 60 days of receipt, and publish a notice of the meetings in the *Federal Register* and another forum readily accessible to individuals in the vicinity of the site. An example of this type of *Federal Register* notice for a PSDAR is the NRC's Notice of Public Meeting and Availability of Report published in the *Federal Register* on April 1, 2013 (78 FR 19540). These meetings typically discuss three areas: the decommissioning regulatory process, the licensee's proposed post-shutdown plans and schedule, and the NRC's continuing oversight throughout decommissioning.

The PSDAR serves as the main planning tool for the decommissioning process, including the estimated cost of the decommissioning activities. By regulation, a licensee has 2 years to submit the PSDAR from the time operations are permanently ceased at the nuclear power plant (i.e., the beginning of decommissioning process). The licensee must submit its LTP at least

2 years before the expected license termination request (i.e., the end of the decommissioning process). In addition, because the NRC approves the LTP by amending the license, a hearing opportunity occurs for the LTP and follows the normal amendment process.

In addition, all specific requests to amend the operating license during the transition to decommissioning follow the normal amendment process and contain opportunities for members of the public to provide comments and to request a hearing.

Community Outreach and Advisory Groups

For many years, the NRC has strongly encouraged licensees involved in decommissioning activities to form community committees to obtain views and concerns of the local citizenry regarding the decommissioning process and spent fuel storage issues. The NRC's experience has been that those licensees that actively engage their communities maintain better relations with the local citizens than those that don't actively engage their communities.

To date, the NRC has provided oversight for the decommissioning of 11 nuclear power plants. Experience gained and lessons learned from these decommissioning projects have been well-documented by both the NRC and the nuclear industry. In 2005, the Electric Power Research Institute (EPRI) published the "Maine Yankee Decommissioning—Experience Report—Detailed Experience 1997–2004" (EPRI 1011734). In this lessons learned report, industry recognized that engaging the local community and officially forming a Community Advisory Panel or Board (CAP/CAB) is a good practice. Specifically, the EPRI report states that "the Maine Yankee Community Advisory Panel was established in 1997 to enhance opportunities for public involvement in the decommissioning process of Maine Yankee. The CAP represents the local community. By thoroughly reviewing the decommissioning process, the CAP is in a position to advise Maine Yankee on key issues of concern to the local community."

In addition, the NRC held a decommissioning status Commission meeting in October 2005, during which members of the Maine Yankee CAP were invited to speak to the Commission regarding their experiences. At this meeting, the Vice Chairman of the Maine Yankee CAP concluded that CAPs "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." The complete information presented during that meeting can be found at <http://www.nrc.gov/reading-rm/doc-collections/commission/slides/2005/20051018/hudson-material-decommissioning.pdf>.

Since the decommissioning of Maine Yankee, licensees and, in some cases, States have employed a CAP or CAB at many other sites, including Connecticut Yankee, Yankee Rowe, Big Rock Point, Millstone, Humboldt Bay, and others. For all of the nuclear plants currently entering into the decommissioning process, the NRC has strongly encouraged the licensees to establish a CAP/CAB for the decommissioning effort in order to enhance communications with the local communities and stakeholders. In addition, as part of its role as an independent regulator, the NRC is available to attend CAP/CAB meetings to address questions or concerns from the community members, if requested.

Interface with Congress

Recent premature shutdowns have resulted in significant interest by members of Congress and requests for data and briefing by their offices. Typical topics include:

- NRC's decommissioning process and relevant regulations
- community involvement
- NRC's use of exemptions as a regulatory tool
- economic impacts to local communities
- emergency planning (EP) reductions and the loss of funding to local response organizations

These meetings are scheduled and conducted in cooperation with OCA.

State and Local Elected Officials

The shutdown of a power plant has a direct impact on the State and local communities. As the regulator, the NRC should engage State and local elected officials very early in the process to ensure they understand decommissioning and their role in the overall process. These outreach initiatives should include G2G meetings, routine State coordination meetings, teleconference calls, and email exchanges. Topics similar to those described above are recommended.

These initiatives are scheduled and conducted in cooperation with regional State liaison officers (RSLOs).

Public Affairs

The permanent shutdown of a nuclear power plant is a very newsworthy event, and there is generally regional, State, and local interest by the news media, the intensity of which can vary greatly by region. For example, the premature shutdowns of San Onofre Nuclear Generating Station and Vermont Yankee Nuclear Power Station drew significant interest by the news media, whereas the permanent cessation of operations at Kewaunee Power Station and Crystal River Unit 3 Nuclear Generating Plant resulted in only local print media coverage. Other media coverage includes television, radio, and print media requests for interviews. While many of the interviews are handled by OPA, some media outlets have requested interviews with technical staff. These are arranged and coordinated by the headquarters and regional public affairs officers.

In order to ensure media needs are met, various tools, such as the NRC Brochure on Decommissioning and the Decommissioning Background, have been developed. OPA continues to be integrated with the NRC management and technical staff to ensure accurate messaging and address public issues.

Communication Tools

The Decommissioning Transition Working Group noted that community interest in reactor decommissioning activities can vary depending on the location and historical relationship between the licensee and State and local governments, labor unions, members of the public, and other stakeholders. Furthermore, DTWG suggested that the NRC staff develop a strategy that could be employed, when circumstances warrant, for enhancing public awareness and understanding of the activities surrounding the transition to decommissioning for power reactors within the existing regulatory framework. To accomplish these objectives, the staff developed or updated the following communication tools:

Development of a Communication Strategy for Enhanced Public Awareness of Power Reactor Decommissioning

In order to create and implement a strategy to enhance public awareness and involvement throughout the decommissioning process, the NRC staff created a "Communication Strategy for the Enhancement of Public Awareness regarding Power Reactors Transitioning to Decommissioning," dated February 2015, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15013A068) (Reference 4). This document outlines the NRC strategy for communicating the key messages regarding the NRC process and practices for public and stakeholder engagement during the decommissioning of nuclear power plants. The document also provides a resource for addressing related frequently asked questions (FAQs).

This document is supplemented by other communication documents assembled by the Office of Nuclear Security and Incident Response (NSIR) related to the exemptions from certain EP requirements requested by the licensees that recently transitioned to decommissioning. The generic EP information from these documents was incorporated into the overall communication strategy where appropriate (<http://pbadupws.nrc.gov/docs/ML1410/ML14106A057.pdf>, <http://www.nrc.gov/about-nrc/emerg-preparedness/regs-guide-comm/ep-generic-comm.html>).

Document Key Public Issues and Responses as Frequently Asked Questions

In addition, the FAQs from the communication strategy document have been made publicly available online at <http://www.nrc.gov/waste/decommissioning.html> (Reference 5), and the NRC staff has made a commitment to maintain and update these FAQs throughout the decommissioning process in order to capture as many issues of public concern as possible and provide clear, consistent answers. These FAQs are also used to support the numerous interactions that the NRC staff has with stakeholders and members of the public during decommissioning, including G2G, State and local, congressional staff, end-of-cycle, PSDAR, and LTP meetings, as well as interactions with members of the press.

The communication strategy and the associated FAQs will be updated and maintained throughout the decommissioning transition process, at which time the FAQs will be incorporated into a formal revision of NUREG-1628, "Staff Responses to Frequently Asked Questions concerning Decommissioning of Nuclear Power Plants," dated June 2000 (Reference 1)

(ADAMS Accession No. ML003726190), which is publicly available for use by all stakeholders. The revision of NUREG-1628 is currently ongoing.

In addition, the NRC staff has begun to develop a subpage on the NRC public Web site, which will act as a clearinghouse for information about the decommissioning transition process. Proposed items include a graphics page to illustrate the process, status updates for decommissioning plants with high public interest, and links to completed decommissioning transition licensing actions.

Update the NRC Brochure on Decommissioning

The NRC brochure on decommissioning has been updated and is available to the public at <http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0521/> (Reference 2), as is the NRC backgrounder on decommissioning at <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/decommissioning.html> (Reference 3). Both of these information sources will be updated and maintained as appropriate to ensure that the decommissioning information available to the public is accurate and readily available.

Communication One-Pagers and Communication Plans Supporting Issuance of Regulatory Decision on Specific Regulatory Requests

The NRC staff recognized that strong internal communications and use of one-pagers are effective means of ensuring internal stakeholders are well informed regarding sometimes complex regulatory requirements and decommissioning activities. With the creation of a one-pager for each decommissioning licensing action issuance, staff evaluation issuance, or other regulatory actions regarding decommissioning, senior NRC staff (public affairs, state liaison officers, senior management) has easy access to crisp and concise information in order to effectively respond to external requests for information from external stakeholders. The format of these communications are as follows:

- type and title of specific regulatory request
- purpose and content of the document
- key messages
- public availability of documents
- links to documents

These communication one-pagers have been developed for internal stakeholders—especially OPA, SLOs, and senior management. These communications have been recognized as a best practice for regulatory decisions occurring in high interest nuclear power plants. The one-pages have been preserved as Official Agency Records (Reference 6; ADAMS Accession No. ML16082A165 – nonpublic) for use as references for future decommissioning transition activities.

Lessons Learned

As part of the NRC's decommissioning communication strategy, the NRC staff noted that the following public awareness and involvement topics and interactions should be considered during the decommissioning transition planning and post-shutdown period:

- the NRC policies on opportunities for public and G2G involvement during the decommissioning and associated licensing process
- as opportunities arise, discussions concerning transition and decommissioning issues with congressional staff, State and local officials, and the news media, should be considered.
- discussion of how many licensees have formed citizen advisory boards or panels to involve members of the public in the transition to decommissioning
- the public and G2G comment opportunities provided when licensing amendments and exemptions are being processed and reviewed by the NRC staff
- experiences from NRC-required public meetings (e.g., end of cycle, PSDAR, and LTP)
- experiences from NRC-sponsored forums and industry forums where potential interested State and local personnel may be informed and educated on the decommissioning process and the role of the NRC, State, and local governments
- use of communication one-pagers extremely helpful in allowing NRC personnel involved with communications with external stakeholders to more effectively perform their functions
- discussions with RSLOs and regional public affairs officers for understanding external stakeholders and outreach initiative opportunities

Additional References on Decommissioning Lessons Learned can be accessed on the NRC Web site. This is a preliminary collection of documents that the NRC, Fuel Cycle Facilities Forum, Nuclear Energy Institute (NEI), EPRI, and Organization of Agreement States have compiled to inform existing and future NRC licensees, NRC staff, States, and other interested stakeholders about potential lessons learned from past decommissioning actions. In addition, reports from the Decommissioning Lessons Learned Database can be accessed for the years 2002, 2004, 2005, 2006, and 2007. Much of the information relates to transition and planning for licensees and could be relevant for plants going directly into decommissioning.

The NRC believes that the processes and the associated guidance documents already in place establish best practices regarding public and stakeholder engagement in the decommissioning of nuclear power plants within the bounds of the NRC's role as an independent regulator. However, given the recent shutdown of several reactors and the potential of more, the NRC is updating many of these guidance documents to reflect the lessons learned during decommissioning and will continue to revise these documents on an ongoing basis as new

insights are gained. In addition, the existing practices within the agency promote community involvement in the decommissioning process to the extent practicable and attempt to capture lessons learned during each decommissioning activity to improve the overall regulatory process. Additional changes to improve or revise the decommissioning and decommissioning transition processes are being considered in the ongoing rulemaking effort. As such, the NRC does not currently plan to create a regulatory issue summary or other guidance document at this time to further discuss public participation in the decommissioning process, but will continue to implement the process and procedures already established for the decommissioning of nuclear power plants and to develop updated guidance as part of the rulemaking process.

Recommendations

As part of the update to Office of Nuclear Reactor Regulation (NRR) Office Instruction COM-101 and Office of Nuclear Material Safety and Safeguards (NMSS) Policy and Procedure 5.1, "Reactor Decommissioning Program Procedures for Interfacing with the Office of Nuclear Reactor Regulation," specifically related to communications and planning, the NRC staff should proceduralize:

- Early communication with the licensee and all interested stakeholders is vital to a successful decommissioning transition process. Leverage all of the communication tools and resources available to ensure that all parties feel as engaged as possible in the decommissioning process, and be responsive to their questions and concerns.
- Emphasize the continuity of public engagement mechanisms through existing NRC licensing processes.
- Engage RSLOs to understand the State and local political environment for establishing a communication outreach plan that would meet the needs and concerns of those external stakeholders. Utilize regional outreach initiatives for discussing NRC decommissioning activities.
- Develop communication plans with key messages, including emphasizing the NRC focus on safety and that NRC oversight continues at nuclear power plants after shutdown.
- Establish a schedule for periodic updates of communication documents related to decommissioning, such as the FAQs, brochure, backgrounder, the decommissioning transition public Web page, and nuclear power plant-specific public Web pages.
- Reach out early to applicable members of Congress as soon as practical after receiving notice of an impending shutdown from a licensee.
- Continue practice of communication one-pagers in support of issuance of regulatory decisions.
- Ensure consistency between related OIs and inspection procedures.

As part of communication strategy and implementation, the NRC staff should review and revise the NRC communication tools described above, including the NRC Web page, data sheets, and FAQs, to ensure they appropriately reflect the lessons learned that have been proceduralized.

As part of the planned integrated decommissioning rulemaking, the NRC staff is considering changes that would have implications related to communications, specifically, with respect to:

- Should the current role of States, members of the public, or other stakeholders in the decommissioning process be expanded or enhanced, and how so?
- Should NRC regulations be modified to mandate the formation of community advisory groups?

References

1. U.S. Nuclear Regulatory Commission, NUREG-1628, “Staff Responses to Frequently Asked Questions concerning Decommissioning of Nuclear Power Plants.”
2. U.S. Nuclear Regulatory Commission, “Decommissioning Nuclear Power Plants,” NUREG/BR-0521, August 2014, can be found at the NRC public Web site at <http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0521/>.
3. U.S. Nuclear Regulatory Commission, “Backgrounder on Decommissioning Nuclear Power Plants,” can be found at the NRC public Web site at <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/decommissioning.html>.
4. U.S. Nuclear Regulatory Commission, “Communication Strategy for the Enhancement of Public Awareness regarding Power Reactors Transitioning to Decommissioning,” February 2015, ADAMS Accession No. ML15013A068.
5. Updated Decommissioning Frequently Asked Questions (FAQS) can be found at the NRC public Web site at <http://www.nrc.gov/waste/decommissioning.html>.
6. Summary of Decommissioning Communications One-Pagers for Inclusion Into the Decommissioning Lessons Learned Report, March 2016 Memorandum to File, ADAMSPackage No. ML16082A165 (not publicly available).

Examples of Government and Public Stakeholder Interactions on Reactor Decommissioning

MEETING

BRIEF DESCRIPTION

July 31, 2013	Interjurisdictional Planning Committee Meeting (SONGS), Dana Point, CA
January 8, 2014	Region I Tri-State Meeting, with the Commonwealth of Massachusetts (MA) and States of New Hampshire (NH) and Vermont (VT)

January 22, 2014	Region I Regional Radiological Emergency Preparedness Conference
April 10, 2014	National Radiological Emergency Preparedness Conference, Salt Lake City, UT
May 6, 2014	Webinar on “Power Reactor Decommissioning” with State Liaison Officers
May 28, 2014	Meeting with NH, MA, and VT government officials on decommissioning aspects
October 9, 2014	Community Engagement Panel Meeting—presentation on “Reactor Decommissioning—Emergency Planning Aspects”
October 27, 2014	Supported closed G2G meeting (prior to PSDAR public meeting) with State, local, and county officials and congressional representatives (provided brief overview of SONGS EP exemption/basis)
January 21, 2015	Region I Regional Radiological Emergency Preparedness Conference
February 11, 2015	Region IV Training, Outreach, and Planning (TOP) Workshop, Buckeye, AZ
February 19, 2015	G2G meeting with representatives from NH, MA, and VT (held the afternoon of the VY PSDAR public meeting) to discuss aspects of proposed VY EP exemption
March 17, 2015	Webinar on “Power Reactor Decommissioning Process” with National Alliance for Radiation Readiness
April 27, 2015	California Energy Commission (CEC)—Joint Lead Commissioner Workshop on Nuclear Power Plant Issues
April 30, 2015	National Radiological Emergency Preparedness Conference, Sacramento, CA
June 4, 2015	Teleconference with representatives of the CEC to discuss comments on SONGS EP exemption request
October 2015	Presentation to FEMA on reactor decommissioning

November 10, 2015	Meeting with Region I Regional Administrator and Massachusetts State Legislature on reactor decommissioning
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February 9, 2016	Region IV TOP Workshop, Arlington, TX
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Congressional Hearings (including Reactor Decommissioning Topics)

August 13, 2013	The California State Senate Committee on Energy, Utilities & Communications held an “informational hearing” on the decommissioning of the San Onofre Nuclear Generating Station
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January 20, 2014	Senate Environmental and Public Works Oversight Hearing preparations and followup Questions for the Record (QFR)
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May 07, 2014	House Energy and Commerce Budget Hearing preparations and followup QFR
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May 14, 2014	Senate Environment and Public Works Committee held a hearing titled “Nuclear Reactor Decommissioning: Stakeholder Views” (Michael Weber testified) with followup QFR
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June 14, 2014	Senate Environmental and Public Works Oversight Hearing preparations and followup QFR
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March 2015	House Committee on Public Works Hearing preparations and followup QFR
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April 2015	Senate Environmental and Public Works Oversight Hearing preparations and followup QFR
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September 2015	House Energy and Commerce Budget Hearing preparations and followup QFR
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October 2015	Senate Environmental and Public Works Oversight Hearing preparations and followup QFR
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Congressional Staff Briefings

PHONE March 7, 2013	Congressional Research Service	Decommissioning Fund Process
PHONE March 7, 2013	Staff of Congresswoman Lowey (D-NY)	Decommissioning Fund
July 1, 2013	Staff of Rep. Darrell Issa (R-CA)	Decommissioning process: What to expect from start to finish
PHONE July 2, 2013	Staff of Senator Boxer; Rep. Juan Vargas (D-CA); Rep. Markey; Rep. Scott Peters (D-CA); Rep. Issa; Senator Feinstein; House Energy & Commerce (Rep. Waxman); Senator Sessions; Senate EPW (Vitter); and Senator Carper	Decommissioning oversight and SONGS's transition to decommissioning
September 26, 2013	Staff of Senator Dianne Feinstein (D-CA); Senator Barbara Boxer (D-CA); and Rep. Darrell Issa (R-CA)	G2G meeting in Carlsbad, Calif
November 19, 2013	Staff of Senator Markey (D-MA)/EPW; Senator Bernie Sanders (I-VT); and Senator Gillibrand (D-NY)	NRC decommissioning and financial assurance requirements
November 19, 2013	Staff of Senator Roger Wicker (R-MS); Senator Jeff Sessions (R-AL); and Senate EPW/Senator Vitter (R-LA)	NRC decommissioning and financial assurance requirements
April 24, 2014	Staff of Senate EPW and Senator Sanders	EP and security exemptions at decommissioning sites
PHONE April 24, 2014	Staff of Senator Feinstein	EP and security exemptions at decommissioning sites
PHONE April 29, 2014	Staff of Senate EPW Committee	NRC's decommissioning funding formula and actual decommissioning costs for specific plants (CR-3, KPS, SONGS, and VY)
NRC HQ July 2, 2014	Staff of Senator Feinstein	Tour of Headquarters Operations Center and briefings on high burnup fuel, small modular reactors, and decommissioning "101"
PHONE October 1, 2014	Staff of Senate EPW	SCE's March 31 Exemption requests from EP during decommissioning
PHONE June 17, 2015	Staff of Senator Leahy (D-VT); and Chris Company, Windham Regional Commission in Vermont	Local engagement in the decommissioning process and developing best practices
January 7, 2016	Staff of Senator Kirsten Gillibrand; Senator Elizabeth Warren; Senator Ed Markey; Rep. Bill Keating, D-MA; Senator Bernie Sanders; Rep. Peter Welch; Senator Patrick Leahy; Senator Bob Menendez; Senator Cory Booker; Rep. Adam Kinzinger; and Senate EPW	Decommissioning process overview and discussion of the decommissioning rulemaking

January 20, 2016	Staff of Energy and Commerce	Decommissioning Process and Decommissioning Rulemaking
January 21, 2016	Staff of Rep. Darrell Issa (R-CA)	SONGS Decommissioning: Status Updates
January 21, 2016	Staff of Senator Dianne Feinstein (D-CA)	SONGS Decommissioning: Status Updates

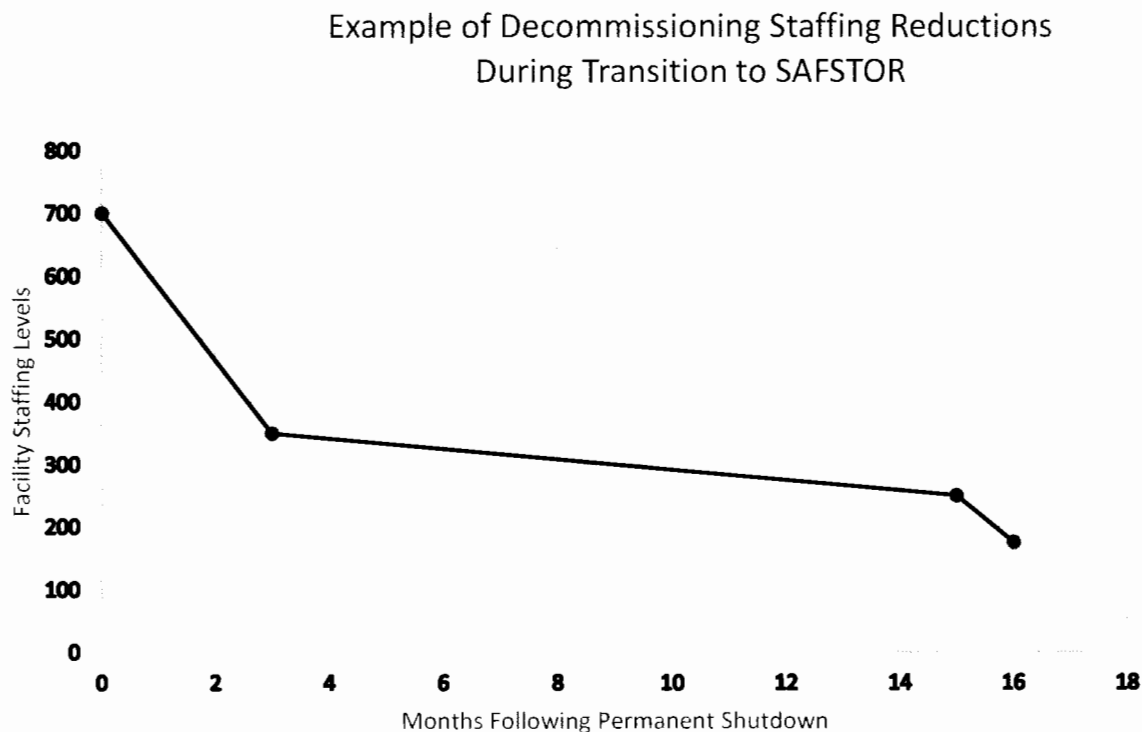
Externally Sponsored Meetings, Conferences, Symposiums

1. October 25, 2013—Nuclear Energy Agency steering committee presentation by Commissioner William Ostendorff on reactor decommissioning.
2. March 2014—Regulatory Information Conference (RIC) presentation on reactor decommissioning.
3. November 11, 2014—American Nuclear Society presentation on the evolving aspects of decommissioning commercial power reactors.
4. December 2014—Executive Director for Operations presented an overview of reactor decommissioning during his visit to Japan.
5. February 26, 2015—The Chairman presented an overview of U.S. reactor decommissioning during his visit to Japan.
6. March 2015—RIC presentation on reactor decommissioning.
7. November 20, 2015—Nuclear Energy Institute (NEI) Licensing Forum on licensing perspectives on decommissioning and used fuel.
8. January 10–12, 2016—Annual Decommissioning Trust Fund (DTF) Conference. Topics included controlling costs of premature shutdowns and a workshop on allowable expenditures from the DTF.
9. January 14, 2016—Energy Solutions 2016 Customer Conference with a focus on decommissioning rulemaking and DTF.
10. January 20, 2016—Northeast Regional Radiological Emergency Preparedness Conference. Pennsylvania Emergency Management Agency, Exelon Generation, NRC Region I and Federal Emergency Management Agency (FEMA) Region III were jointly hosting. Presentation made on the NRC's reactor decommissioning rulemaking.
11. February 15, 2016—Meeting on Decommissioning with Republic of Korea.
12. February 23, 2016—Decommissioning Plant Coalition meeting with NRC staff on reactor decommissioning rulemaking.
13. March 9, 2016—Meeting with Swiss Federal Nuclear Safety Inspectorate representative on obtaining reactor vessel data and other special inspections during reactor decommissioning.

14. March 2016—RIC presentation on reactor decommissioning.
15. May 2, 2016—NEI spent fuel conference that included a presentation on reactor decommissioning.
16. May 9–10, 2016—Chairman’s presentation at the 2016 International Nuclear Regulators Association meeting in Spain that included a presentation on reactor decommissioning.

4. MISCELLANEOUS INFORMATION RELATED TO REACTOR DECOMMISSIONING

4.1 Staffing during Decommissioning Transition



Many staff that support an operating reactor (operations, maintenance, administrative, licensing etc.) are no longer necessary when a reactor permanently shuts down. This results in a significant initial staffing reduction at decommissioning reactors. Additional reductions in initial staffing levels have been achieved through reductions in the physical security staffing and emergency planning (EP) staffing. All licensees used the 10 CFR 50.54(p) change process for reductions in physical security staffing. Several licensees also made changes to their EP staffing levels using the 10 CFR 50.54(q) change process. The EP program changes were based on changes made to the licensee's FSAR under 10 CFR 50.59, "Changes, Tests, and Experiments," and licensee evaluation that concluded that the changes did not decrease the effectiveness of emergency plans. The NRC did not agree with the § 50.54(q) process changes for the initial EP staffing reductions and cited several licensees (Dominion for KPS and Southern California Edison for San Onofre Nuclear Generating Station) with violations. The licensees were not required to undo the changes, based on their low safety significance due to the permanently shutdown and defueled condition of the facility. However, the licensee did have to

assess any potential vulnerabilities and compensate for any identified. Compensatory actions were taken at Kewaunee.

Future licensees that are planning to permanently shut down should request an NRC-approved license amendment change to reduce on-shift and augmented emergency response organization staffing, based on the licensee's re-evaluation of emergency plan basis events. Depending on the extent of the security staffing changes, the licensee may also need an amendment to the permanently shutdown security plan.

After approximately 15 months, spent fuel decay heat levels have reached a point where licensees can receive exemption from offsite EP regulations. This will result in another significant staffing reduction provided the exemption is granted by the NRC.

The final significant staff level reduction is expected to occur when all spent fuel is moved from the spent fuel pool into ISFSI dry cask storage. However, this staff reduction cannot occur until the NRC approves the independent spent fuel storage installation (ISFSI)-only emergency plan, ISFSI-only technical specification (TS), and ISFSI-only security plan. These staffing changes would be expected to take place well beyond the normal SAFSTOR transition period when NRC project management responsibility has been transferred to NMSS.

4.2 Snapshot of Current Power Reactor Decommissioning Status

The following 10 sites have completed decommissioning of the reactor facilities. At most of these sites, the spent fuel still remains on site on an ISFSI pad.

At those sites where the ISFSI is generally licensed, the 10 CFR Part 50 reactor license cannot be terminated until the fuel is removed off site from the ISFSI and the ISFSI structure is decommissioned.

- Pathfinder (No fuel on site—License Terminated)
- Fort Saint Vrain (No fuel on site—License Terminated)
- Saxton (No fuel on site—License Terminated)
- Shoreham (No fuel on site—License Terminated)
- Haddam Neck—Maintains a Part 50 License for General Licensed ISFSI
- Maine Yankee—Maintains a Part 50 License for General Licensed ISFSI
- Yankee-Rowe—Maintains a Part 50 License for General Licensed ISFSI
- Trojan—Part 50 License Terminated; Maintains a Part 72 License for a Specific Licensed ISFSI
- Big Rock Point—Maintains a Part 50 License for General Licensed ISFSI
- Rancho Seco—Maintains a Part 50 License for an onsite low-level waste facility; Maintains a Part 72 License for a Specific Licensed ISFSI

There are 20 Power Reactor units in Decommissioning Status:

Power Reactors in DECON (7): Humboldt Bay Unit 3; La Crosse; Zion, Units 1 and 2; and San Onofre, Units 2 and 3.

Power Reactors in SAFSTOR (13): Dresden, Unit 1; Fermi, Unit 1; Indian Point, Unit 1; Millstone, Unit 1; Peach Bottom, Unit 1; San Onofre, Unit 1; Three Mile Island, Unit 2; Crystal River, Unit 3; Kewaunee; Vermont Yankee; GE VBWR, (Vallecitos); GE EVESR; and the N.S. Savannah.

4.3 IMC 2561 Update and Review Effort

- IMC 2561 Contents
 - Appendix A
 - 12 core inspection procedures/8 decommissioning specific procedures
 - Appendix B
 - 37 discretionary inspection procedures/7 technical and specialized areas
- IMC 2561 Core Inspection Procedures
 - IP 36801: Organization, Management and Cost Controls at Permanently Shutdown Reactors (PSRs)
 - IP 37801: Safety Reviews, Design Changes, and Modifications at PSRs
 - IP 40801: Self-Assessment, Auditing, and Corrective Action
 - IP 71801: Decommissioning Performance and Status Review at PSRs
 - IP 62801: Maintenance and Surveillance at PSRs
 - IP 60801: Spent Fuel Pool Safety at PSRs – Revision 1 issued on January 11, 2016
 - IP 83750: Occupational Radiation Exposure
 - IP 83801: Inspection of Final Surveys at PSRs – Revision 2 issued on July 26, 2016
 - IP 84750: RadWaste Treatment, and Effluent and Environmental Monitoring
 - IP 86750: Solid RadWaste Management and Transportation of RadMat
 - IP 71714: Cold Weather Preparations – Replaced by 71111.01, "Adverse Weather Protection"
 - IP 82501: Decommissioning Emergency Preparedness Program Evaluation; this IP will be incorporated into the final revision of IMC 2561. Emergency Response Organization Staffing and Augmentation System Requirements have been incorporated into IP 82501
 - IP 82401: Decommissioning Emergency Preparedness Scenario and Exercise Evaluation – this IP will be incorporated into the final revision of IMC 2561
 - IP 81200.XX Physical Security Assessment at PSRs –IMC 2202 and the suite of security decommissioning inspection procedures identified in IP 81200.00, "Security," will be referenced and incorporated into the final revision of IMC 2561, as appropriate. NSIR has the lead on this IP.

- Review Plan
 - IMC 2561 – Review against applicable Regulatory Guides, similar ROP inspection procedures, and IPs from other business lines
 - Detailed review and update of all 12 core inspection procedures
 - Perform a high level review of the 37 discretionary procedures
 - Re-review / revise IMC 2561 upon completion
- Review Schedule
 - Core IP Revisions to be completed 4th quarter of 2016
 - Request regional comments and suggestions
 - Comments incorporated and IPs ready for issuance
 - Bin discretionary IPs and address potential revision needs – December 2016
 - Most discretionary IPs are not “owned” by the decommissioning branches
 - Requesting regional assistance to identify which discretionary IPs are useful and which are no longer needed – note that several are no longer in use
 - Disposition of each of the discretionary IPs will be shared with the regions
 - Complete revision and final update to IMC 2561 – December 2016
 - Initial revision to IMC 2561 was partially completed in 2015
 - Final version will ensure capture of all changes to the decommissioning IPs
 - Plan to provide expanded discussion of resource estimates for sites in various stages of decommissioning (i.e., SAFSTOR vs. DECON)
 - Provide additional section discussing transition activities / inspections