

DECOMMISSIONING POWER REACTOR INSPECTION PROGRAM

Effective Date: 01/01/2021

2561-01 PURPOSE

To establish the policy and guidance for the inspection of decommissioning nuclear power reactors.

2561-02 OBJECTIVES

02.01 To obtain information through direct observation and verification of licensee activities to determine whether the power reactor is being decommissioned safely, that spent fuel is safely and securely stored onsite or transferred to another licensed location, and that site operations and license termination activities are in conformance with applicable regulatory requirements, the facility licensing basis, licensee commitments, and management controls.

02.02 To verify that (1) the licensee's procedures, processes, and programs for post-operational transition, decommissioning, and license termination are adequate, (2) necessary programs continue from the period of operation into decommissioning in accordance with the applicable regulatory requirements, and (3) the safety culture established during reactor operations is maintained. These decommissioning programs are assessed by inspection of **the following** areas: plant status; modifications, maintenance, and surveillances; problem identification and resolution; **fire protection**; and radiation protection.

02.03 To identify declining trends in performance and perform inspections to verify that the licensee has resolved the issue(s) before performance declines below an acceptable level.

02.04 To provide for effective allocation of resources for the inspection of nuclear power reactors following permanent cessation of operations.

2561-03 APPLICABILITY

This program is to be implemented **on or shortly after** the certification date for permanent removal of fuel from the reactor vessel **in accordance with Title 10 of the Code of Federal Regulations** (10 CFR) 50.82(a)(1)(ii) **or prior shutdowns**, and is to continue until license termination.

2561-04 DEFINITIONS

Decommissioning. 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.

DECON. The equipment, structures, and portions of the facility and site that contain radioactive contaminants are removed or decontaminated to a level that permits termination of the license after cessation of operations.

Independent Spent Fuel Storage Installation (ISFSI). A complex designed and constructed for the interim storage of spent nuclear fuel and other radioactive materials associated with spent fuel storage. An ISFSI may either have a general license or a specific license under 10 CFR Part 72, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater Than Class C Waste," and may or may not be located near an operating or formerly operating nuclear reactor.

License Termination Plan. A plan required by 10 CFR 50.82(a)(9) that includes (1) a site characterization; (2) identification of remaining dismantlement activities; (3) plans for site remediation; (4) detailed plans for the final radiation survey; (5) a description of the end use of the site, if restricted; (6) an updated site-specific estimate of remaining decommissioning costs; (7) a supplement to the environmental report describing any new information or significant environmental change associated with site decommissioning; and (8) identification of parts, if any, of the site that were released for use before approval of the license termination plan.

Major Decommissioning Activity. For a nuclear power facility, any activity that results in permanent removal of major radioactive components, permanently modifies the structure of the containment (for pressurized water reactors (PWRs), primary containment; for boiling water reactors (BWRs), the primary and secondary containments), or results in the dismantling of components or systems for shipment containing "greater than Class C" waste (see 10 CFR 61.55, "Waste classification"). The licensee is precluded by regulation from conducting major decommissioning activities until 90 days after the U.S. Nuclear Regulatory Commission (NRC) has received the Post-Shutdown Decommissioning Activities Report (PSDAR) submittal and the 10 CFR 50.82(a)(1) certifications have been submitted by the licensee.

Major Radioactive Component. For a nuclear power plant, this includes the reactor vessel and internals, steam generators, pressurizer, large bore reactor coolant system piping, and other large components that are radioactive to a comparable degree.

Permanent Cessation of Operations. The permanent cessation of power operations means, for a nuclear power reactor facility, a certification by a licensee to the NRC that it has permanently ceased or will permanently cease reactor operation(s), or a final legally effective order to permanently cease operation(s) has come into effect. Following this certification, the licensee may possess the power reactor structures, systems, and components, reactor site, and related radioactive material, but is prohibited by regulation from operating the reactor.

Permanent Fuel Removal. Permanent fuel removal from the reactor vessel is a licensee determination certified to the NRC in writing in accordance with 10 CFR 50.82(a)(1)(ii). Following the receipt of this certification, the licensee has permanently ceased operations and entered decommissioning.

Open Item. A generic term that can encompass any previous violations that have not been closed, any incidents or events reported since the last inspection requiring review, or any other issues requiring additional review.

Possession-Only License. Possession-only licenses (POLs) were issued by the Office of Nuclear Reactor Regulation (NRR) to decommissioning licensees prior to the decommissioning regulation changes in 1996. POLs are amended to reflect the permanently shutdown condition of the facility and the licensee's continued possession of spent nuclear fuel. POLs are no longer issued to any facility that entered decommissioning after the 1996 decommissioning rule change.

Post Operation Transition Phase. The interval between final reactor shutdown and the establishment of a safe and stable permanently shutdown and defueled condition, which is based on the completion of regulatory and safety milestones. NRR Office Instruction COM-101 and the Office of Nuclear Material Safety and Safeguards (NMSS) Policy and Procedure 5-1 provide direction for NRC activities and funding requirements during the operation-to-decommissioning transition. During this phase, the licensee establishes safe shutdown conditions and places the facility in a configuration acceptable for decommissioning, consistent with the decommissioning strategy chosen by the licensee. In addition, during this transition phase the licensee will be implementing policies, programs, and procedures to reflect the permanently shutdown and defueled condition of the facility. These changes may include making physical modifications to the plant, such as alterations to the spent fuel pool that could modify the facility security plan.

Post-Shutdown Decommissioning Activities Report. A report required by 10 CFR 50.82(a)(4) that provides a description of the licensee's planned decommissioning activities, a schedule for their accomplishment, an estimate of the associated decommissioning costs, and a discussion that provides the reasons for concluding that the environmental impacts associated with site-specific decommissioning will be bounded by appropriate, previously issued environmental impact statements or other environmental assessments.

Power Reactor. A nuclear facility having a reactor licensed under 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," for power generation which may or may not have generated electrical power. For the purposes of this manual chapter, the power reactor is also considered to include the land area within the licensed boundaries of the site, as described in the NRC operating license.

Risk-Informed Approach. A philosophy in which risk insights are considered together with other factors to determine a course of action that focuses inspection activities commensurate with the licensee's authorized program. Risk can be determined by evaluating the combined answer to three questions (i.e., the risk triplet): (1) what can go wrong, (2) how likely it is, and (3) what its consequences might be.

SAFSTOR. The facility is placed in a safe, stable, condition and maintained in that state until it is subsequently decontaminated and dismantled to levels that permit license termination.

Team Inspection. For the purpose of this Inspection Manual Chapter (IMC) only, team inspections are defined as those inspections conducted by more than two inspectors. Often, at least one of the inspectors is included on the team because of a specialty in a particular field and may come from a different region or office. Individuals that are observing the inspection for training purposes do not count toward the total number of inspectors.

Technical Specifications (TSs). An appendix to the facility license that contains safety requirements, bases, safety limits, limiting conditions for operation, and administrative requirements to provide assurance that decommissioning can be conducted safely and in accordance with regulatory requirements. Terminology such as “permanently defueled TSs” (PDTS) or “decommissioning TSs” (DTS) has been used to describe TSs that have been amended to reflect the permanently shutdown and defueled condition of the reactor.

2561-05 RESPONSIBILITIES AND AUTHORITIES

05.01 Director, Office of Nuclear Reactor Regulation. Provides overall direction for the transition of power reactors from operation to decommissioning and the transfer of the facility from NRR project management and the Reactor Oversight Program to NMSS project management and the Decommissioning Power Reactor Inspection Program. NRR Office Procedure COM-101 provides details on the project management transfer to NMSS, as well as the necessary resource transfer for both NMSS project management and appropriate regional inspection program responsibilities.

05.02 Chief, Inspection Program Branch (NRR). Provides overall agency leadership for the Reactor Oversight Program and concurs on changes to this manual chapter that impact or potentially affect the inspection of power reactors in the Post-Operation Transition Phase.

05.03 Director, Office of Nuclear **Material** Safety and Safeguards. Provides overall direction for the decommissioning power reactor project management and inspection programs, for power reactors in decommissioning status, until the license is terminated. NMSS Policy and Procedure 5.1 provides details on the project management transfer to NMSS, as well as the necessary resource transfer for both NMSS project management and appropriate regional inspection program responsibilities.

05.04 Chief, Reactor Decommissioning Branch (NMSS). Coordinates, develops, and implements the decommissioning power reactor project management program, and provides programmatic oversight of the regional inspection requirements and policies.

05.05 Regional Administrator and Regional Management. In concert with NRC Headquarters, the Regional Offices direct the implementation of the inspection program for decommissioning power reactors. Ensures that the regional office staff includes an adequate number of inspectors in various disciplines to carry out the inspection program as assigned and described in this manual chapter and within budget limitations. Determines the need for the temporary assignment of an inspector at a facility that has permanently shutdown and the duration and scope of this inspection coverage. Applies inspection resources, as necessary, to deal with issues that arise at specific facilities undergoing decommissioning. Headquarters and Regional Division Directors responsible for the implementation of the Reactor Oversight Program and the Decommissioning Power Reactor Inspection Program should determine the appropriate timing for transfer of the reactor inspection program from IMC 2515, “Light-Water Reactor Inspection Program - Operations Phase,” to IMC 2561, “Decommissioning Power Reactor Inspection Program.” The transfer should be documented in a letter between the appropriate Division Directors, including a statement of the formal transfer date, in order to ensure that the necessary resources, including travel funds, are allocated appropriately between the divisions to support performance of the required inspection activities.

05.06 Chief, Decommissioning Inspection Branch. Directs and implements the decommissioning power reactor inspection program in the Regions in accordance with this manual chapter and **coordinates** with the appropriate Resident Inspectors, and Headquarters, and Regional Managers **as applicable to implement this manual chapter**.

2561-06 REACTOR DECOMMISSIONING INSPECTION PROGRAM

06.01 Program Discussion

The decommissioning power reactor inspection program describes the inspection requirements for the decommissioning of 10 CFR Part 50 power reactor licensees. **If the Part 50 license is reduced to only what is necessary to support an ISFSI, then dry cask storage inspections shall be conducted under IMC 2690, "Inspection Program for Dry Storage of Spent Reactor Fuel at Independent Spent Fuel Storage Installations" until the ISFSI is decommissioned.**

As described in Regulatory Guide 1.184 "Decommissioning of Nuclear Power Reactors," regulations require a licensee to submit written certification to the NRC within 30 days of the determination to permanently shutdown. Before or within two years after permanent cessation of operations, the licensee is required to submit a Post-Shutdown Decommissioning Activities Report (PSDAR). No major decommissioning activities may be performed until 90 days after the NRC has received both the PSDAR and the certification that fuel has been permanently removed from the reactor.

In accordance with the NRC regulations, the decommissioning of power reactors may take up to 60 years. In addition, decommissioning activities at a specific facility may range from relative inactivity (e.g., deferred dismantlement under SAFSTOR) to activities that have a greater potential to challenge public health and safety and the environment (e.g., active dismantlement under DECON). Because of this wide range of decommissioning and safety considerations, this manual chapter promulgates inspection requirements and guidance necessary to provide reasonable assurance that (1) the NRC's regulatory oversight contributes to the protection of public health and safety, and (2) NRC staff oversight and inspection resources are effective, consistent, and appropriately focused. **The reactor decommissioning inspection program is to be implemented in a risk-informed manner with the inspections focused on the most safety significant activities that ensure protection of the workers and the environment.** Specifically, this inspection program focuses on ensuring that:

- Licensee documents, programs, and procedures are adequately implemented and maintained, and reflect the status of decommissioning at the facility.
- Licensee activities, organizational structure, and programmatic controls provide reasonable assurance that decommissioning and spent fuel storage can be conducted safely and in accordance with the regulatory requirements.
- Licensee staff readily identify emergent problems, evaluate them, and correct issues of concern in accordance with the NRC approved corrective action program and other quality assurance requirements.
- Licensee adequately protects workers, the public, and the environment from the hazards associated with ionizing radiation.

The inspection program is completed by performing multiple IPs that assess licensee performance, identify performance trends, identify weaknesses, and foster corrective actions to contribute to public health and safety and the protection of the environment during the decommissioning process. The inspection program also provides appropriate latitude for NRC management to administer, plan, and implement site-specific inspection plans commensurate, in part, with licensee performance, site activities, and safety.

The decommissioning inspection program is further divided into two program elements:

- The Core IPs, listed in Appendix A, Section I, are to be performed annually, as applicable, at all decommissioning power reactors. Deviations from the core inspection program should be handled as discussed in Section 06.02, "Inspection Procedures," of this manual chapter and should be approved by Regional Branch Chiefs.
- The Periodic and Discretionary IPs, listed in Appendix B, are IPs and IMCs that may be performed as needed at a decommissioning power reactor (as determined by NRC management), or used as supplemental guidance during the conduct of the core inspection program. Periodic and discretionary inspections should be used to augment the core inspection program and assess particular areas, safety concerns, or aspects of licensee performance, and may be used to supplement or inform inspections conducted under a core IP.

The direct inspection effort associated with the implementation of the core IPs should, in part, be dependent on the decommissioning activities being planned or performed at the facility. For planning purposes, the range of decommissioning activities are grouped into eight possible categories. These categories are defined as follows:

1. Post-Operation Transition Phase
2. Actively Decommissioning (DECON), Fuel in the Spent Fuel Pool
3. Actively Decommissioning (DECON), No Fuel in the Spent Fuel Pool
4. SAFSTOR, Fuel in the Spent Fuel Pool
5. SAFSTOR, No Fuel in the Spent Fuel Pool
6. SAFSTOR, Co-Located with Operational Unit, Fuel in the Spent Fuel Pool
7. SAFSTOR, Co-Located with Operational Unit, No Fuel in the Spent Fuel Pool
8. Final Status Surveys Underway, No Fuel in the Spent Fuel Pool

It is expected that the category, and thus the appropriate direct inspection effort and associated resources for a decommissioning power reactor, will change over time, based on the progress of decommissioning at the facility (i.e., an actively decommissioning facility would be expected to go from Category 1 to 2 and eventually to Category 8 as decommissioning progresses). Categories 4 and 5 are intended for decommissioning single or multi-unit sites in SAFSTOR where all units have permanently shutdown. Categories 6 and 7 are intended for decommissioning units at multi-unit sites where at least one unit is still in operation. These operational units are expected to maintain resident inspectors and remain in the Reactor Oversight Process to provide oversight of the site wide programmatic inspections, such as radiological safety, corrective action, and quality assurance. Appendix A, Section II provides a table with the recommended average annual inspection hour ranges for each of these decommissioning categories.

In summary, the decommissioning power reactor inspection program emphasizes **risk-informed** balanced oversight and review of a cross-section of licensee activities important to the conduct of safe decommissioning and spent fuel safety. Licensee decommissioning programs and procedures should be assessed to ensure that they afford a comparable level of quality, rigor, and effectiveness as those in existence during power reactor operations, while taking into consideration the decreased risk to public health and safety and the environment that is present at a decommissioning facility. The decommissioning power reactor inspection program also provides NRC management with flexibility in the allocation of inspection resources to address emergent activities and potential issues at specific decommissioning power reactors.

Transitions between the eight categories should be documented in an inspection report (e.g., provide a description of the current site status), however it is expected that a facility may have ongoing activities that overlap categories and the inspection effort should be modified as appropriate.

06.02 Modifications or Changes to the Facility

Before undertaking any major decommissioning activities (as defined by 10 CFR 50.2), the licensee must have: (1) certified the permanent removal of all reactor fuel from the vessel and the permanent cessation of operations; (2) submitted a PSDAR to the NRC; and (3) waited 90 days from the date the PSDAR was submitted to allow the NRC time to review the document and solicit stakeholder feedback via a public meeting and other interactions. Prior to these PSDAR activities being complete, a licensee may undertake any minor decommissioning activity that does not result in the permanent removal of major radioactive components (e.g., the steam generators, reactor vessel and internals, pressurizer, large bore reactor coolant system piping, and other large components that are radioactive), permanently modify the structure of the containment, or result in dismantling components for shipment that contain greater than Class C waste in accordance with 10 CFR 61.55, "Waste classification."

Examples of activities that are not considered major decommissioning activities include: (1) those that could be performed under normal maintenance and repair procedures; (2) the removal of certain, relatively small radioactive components, such as control rod drive mechanisms, control rods, pumps, and valves; (3) removal of components similar to that for maintenance and repair; (4) removal of non-radioactive components and structures not required for safety; and (5) activities related to radiological and contamination characterization.

An important inspection activity during facility decommissioning is the assessment of facility design changes and modifications that were not submitted to the NRC for review and approval before implementation. Such changes to the facility or licensing basis must be performed in accordance with 10 CFR 50.59, license conditions, and applicable licensee procedures. In addition, 10 CFR 50.82(a)(6) states that decommissioning activities must not: (1) foreclose release of the site for possible unrestricted use; (2) significantly increase decommissioning costs; (3) cause any significant environmental impact not previously reviewed; or (4) violate the terms of the existing facility license. Headquarters staff has the lead for assessing the appropriateness of a licensee's decommissioning fund allocation.

06.03 Inspection Procedures

Inspection effort should be based on site activities and licensee performance. Although all of the specific requirements in each **IP** need not be completed during every decommissioning inspection, the objectives of the **IP** should be met. **Discretionary IPs or Temporary Instructions**

(TIs) may also be used to meet a core IP requirement as long as the scopes are equivalent. This allows the overall decommissioning inspection program the flexibility to adjust resources to address the level of activity and other considerations at a particular decommissioning facility. IP completion is determined by regional management consulting with the appropriate inspector and evaluating that the procedure objectives have been met. The results will be documented in the inspection report. The scope of a particular IP and its respective requirements may be adjusted by regional management, as appropriate, to satisfy the objectives of this manual chapter as it applies to the specific facility being inspected. A TI may be required during decommissioning in order to cover areas not explicitly addressed by existing IPs for site-specific situations and will be determined on a case-by-case basis. If no activity is believed to have occurred since the last annual inspection, an inspector should verify that no activities occurred onsite using the applicable IPs. If a core IP is not applicable to the current facility conditions (e.g., the spent fuel pool is no longer in service and therefore the associated IP is unnecessary), then the procedure is not required to be performed to complete the inspection requirements at the site. It should be noted that all IPs listed in Appendices A and B are applicable to both sites shutdown under 10 CFR 50.82(a)(1) and sites shut down prior to those regulations being in place.

06.04 Direct Inspection Effort

The estimate of direct inspection hour resources in Appendix A of this manual chapter refers to the estimated range of time needed to complete the IP objectives at a given facility. The resource estimate is provided for planning purposes only, and deviations from the estimate should be made based on licensee performance, multi-unit site considerations, resident inspection activities, the type and schedule of decommissioning activities being conducted by the licensee, and the radiological source term present at the site.

The direct inspection hour estimates are based on current experience regarding the time needed on site to complete the IP requirements, and will be reviewed periodically. It is expected that actual direct inspection hours will vary from site to site, as well as from the estimate given in a particular IP, depending on the status of decommissioning and the activities underway at the site, as well as NRC management discretion and the availability of inspection resources.

06.05 Inspection Planning

At the discretion of Regional Management, the regional staff may choose to develop annual site-specific inspection plans for a power reactor facility undergoing decommissioning, consistent with the guidance in this manual chapter, and using the IPs listed in Appendix A and Appendix B, or an applicable TI. Regional and headquarters staff should review the licensee's planned decommissioning activities for the upcoming year based on the schedule details in the PSDAR and discussions with licensee management. The inspector should remain aware of the requirements for the licensee to notify the NRC before performing an activity inconsistent with or on a schedule significantly different from what was described in the PSDAR (i.e., 10 CFR 50.82(a)(7)). If used, the site-specific inspection plan should list the IP planned throughout the inspection period. Inspection plans should, at a minimum, be reviewed as a licensee transitions between decommissioning categories (e.g., transition from SAFSTOR to DECON) and updated accordingly. Discretionary procedures may be used to augment the site-specific inspection plan or used as guidance (and not listed in the master inspection plan).

The following factors should be considered in developing and implementing a site-specific inspection plan:

- a. Design. Some power reactors have unique designs, configurations, and environmental considerations that could bias an inspection effort to specific areas of potential concern. For example, unique or challenging hydrological conditions at a site (such as diversion of the radiological effluent stream, excavation of contaminated soils from below a water table, or dredging of soils from outfalls or intakes) or shared systems between reactor units, may warrant an increased inspection effort.
- b. Plant Status. Plant status will vary between reactor units and depend, in part, on the status of decommissioning. For example, even if a power reactor is in long-term storage, the licensee could elect to change system(s) operation, configuration, or design to enhance performance, efficiency, or reduce costs. These plant status changes may subsequently change the NRC inspection effort listed in Appendix A, Section II. **Inspection** plans should also take into account the licensee's spent fuel storage location and transfer plans, criticality and decay heat removal considerations in the spent fuel pool, and planned facility and environmental changes.
- c. Licensee Performance, Management, and Decommissioning Scheduling. The scope and frequency of inspections specified in the site-specific inspection plan should also be based on licensee performance, staffing plans, effectiveness of management oversight and contractor control, and the timing and scheduling of significant decommissioning activities. Other elements, such as the loss of licensee technical expertise and nuclear experience, should factor into the development of a site-specific inspection plan. For example, a lack of detail or missing licensee radiological release records (see 10 CFR 50.75, "Reporting and recordkeeping for decommissioning planning"), a marked reduction in staff experience, technical expertise, or significant changes in the level of quality assurance oversight, or significant problems that originated during power operations may require additional NRC inspections. Similarly, the use of technologically advanced contamination removal methods, dismantlement techniques, or transportation packaging may require enhanced NRC oversight.
- d. Multi-Unit Sites. The site-specific inspection plan should take into account whether the decommissioning facility shares programs and structures, systems, and components (SSCs) with other operating or decommissioning units on site. These SSCs could include service water, fire protection, electrical systems, and radiological effluent streams. Additionally, programs such as the Corrective Action, Radiation Protection, Emergency Preparedness, and Fire Protection Programs could be shared among units. The amount of direct inspection effort at the decommissioning unit(s) should be tailored to avoid duplicating reviews of the plans, programs, and procedures shared among the units where the resident and regional inspectors provide various levels of oversight, and the inspectors should evaluate those shared areas to provide assurance that potential vulnerabilities between units are understood and mitigated.

Inspections conducted early in the decommissioning process should use the procedures listed in Appendix A, and should: (1) provide sufficient evidence to confirm that the licensee can or will safely transition into decommissioning; (2) verify that procedures, programs, and facility operations implement license requirements and reflect the current licensing bases as described in the Final Safety Analysis Report (or Updated Final Safety Analysis Report), PSDAR, or other applicable licensing basis documentation; (3) confirm that management oversight and control, as well as safety culture, are adequate; and (4) take appropriate credit for NRC inspections conducted while the unit was operating.

For power reactors in a SAFSTOR condition, it is not expected that the licensee will undertake activities that have the potential to significantly impact public health and safety, security, or the environment. Therefore, the direct inspection effort for units in SAFSTOR is likely to be at the lower end of the range for decommissioning inspections, while still maintaining an acceptable periodic NRC presence at the site. Based on the NRC staff's assessment of licensee performance and the conduct of facility activities, appropriate changes to the inspection plan, IP periodicity, or level of inspection effort could be implemented. Similarly, although a power reactor unit may be in SAFSTOR, the licensee may elect to incrementally dismantle certain SSCs over the course of years using the 10 CFR 50.59 process. To account for the incremental dismantlement of a facility while in SAFSTOR, the decommissioning inspection program conservatively assumes that licensee procedures, controls, staff knowledge and cognizance of the 10 CFR Part 50 requirements could diminish over time, and anticipates that the direct inspection effort for sites in SAFSTOR would increase toward the upper end of the range for decommissioning inspections. **Inspectors shall conduct a walkdown of the accessible facilities annually.**

For a licensee planning or preparing to actively dismantle, decontaminate, or decommission its facility after a long period of relative inactivity, the NRC staff expects that the inspection effort will also increase commensurate with the planned licensee activities, and may approach the same level of effort as at actively decommissioning facilities. If, as a part of overall facility decommissioning, the operating license is transferred to another entity, or a general decommissioning contractor is used to perform reactor decommissioning or maintain the unit in SAFSTOR, attention should be given to ensure the safety culture of the new management is appropriate and consistent with license requirements and expectations.

For a licensee planning or conducting **ISFSI** activities, direct inspection efforts should be accomplished in accordance with IMC 2690. IMC 2690 inspection requirements should complement the inspection effort required by this manual chapter.

Depending on a number of factors, there will be changes to site programs based on the results of licensee-performed heat up analysis that calculates the time to a zirconium cladding fire (zirconium fire window) following a postulated complete and instantaneous loss of cooling to spent fuel. These include significant changes to emergency preparedness and fire protection programs. The appropriate discretionary IPs should be performed to review these, and subsequent major changes. For these inspections, the use of regional or other NRC subject matter experts should be considered.

06.06 Periodic Management Review

The regional staff should periodically review and adjust the planned inspection efforts to reflect any identified inspection issues or changes in plant status and decommissioning activities, **including any described in any site-specific inspection plans. During periodic inspection reviews, regional management should assess licensee performance and use these insights as one of the many possible justifications to change the site-specific master inspection plan (i.e., increased or decreased inspection effort, schedule changes, or IP deletions).** This review of licensee performance should focus on the **following** assessments of the decommissioning power reactor inspection program: plant status; modifications, maintenance, and surveillance; problem identification and resolution; **fire protection**; and radiation protection.

In addition, regional management should periodically assess completion of the required periodic core decommissioning inspections at each facility. This assessment should include a review of whether **inspections were** executed as outlined by the staff, and where deviations from the inspection plan exist, they should be justified and accounted for in a manner acceptable to regional management. Per the performance plan requirements, a minimum of 80 percent of the required periodic core decommissioning inspections are to be completed at each decommissioning facility across all Regions (**Regions should strive to accomplish all core procedures annually per site**).

06.07 Management Communication with Licensee Representatives and Public Outreach

In addition to the 10 CFR 50.82 requirements to hold public meetings related to certain decommissioning activities in the vicinity of the decommissioning power reactor, NRC headquarters and regional management should plan periodic visits to decommissioning facilities in order to more fully understand the licensee's plans to decommission the facility. NRC management should consider visiting the site prior to the development of a site-specific master inspection plan or a significant change in decommissioning status. As decommissioning progresses, additional site visits may be held periodically or prior to major changes in the status of decommissioning to gain licensee management insights and perspectives. The NRC management focus should be to understand licensee plans, schedules, and controls implemented to ensure quality and safety.

The NRC is an independent safety regulator and maintains an "open door" policy with regard to access by members of the public or State and local officials to the NRC staff, as well as to publicly available documentation concerning a licensee's current and past performance. Some licensees or States will sponsor periodic community engagement panels or citizens advisory boards to discuss various decommissioning topics that may be of interest to affected stakeholders near the plant; inspectors should consider attending these community meetings when appropriate. The degree of interaction that is considered necessary to maintain transparency regarding ongoing NRC oversight activities is expected to vary widely depending upon the situation at each decommissioning facility. In each case where inspectors are utilized in support of this purpose, regional management must carefully balance the use of inspection resources to complete inspections with the need to maintain and enhance public confidence.

06.08 Use of Resident Inspectors at Decommissioning Power Reactors

After a licensee permanently ceases power operations, the inspection program for decommissioning power reactor facilities considers the following: (1) there will likely be initial, short-term, resident inspector coverage; (2) licensee decommissioning programs and procedures should be comparable to the rigor, quality, and effectiveness of those used during power reactor operation; (3) few immediate changes would be expected in the technical ability and safety perspective of the licensee's staff and management; and (4) the primary safety significant activities would consist of maintaining safe reactor shutdown, conducting safe fuel handling and storage, and placing systems that are no longer necessary for safe facility operation into a storage or de-energized configuration.

During the period with a resident inspector still assigned at a permanently shutdown reactor unit **and until the unit is certified permanently defueled**, the site-specific inspection effort will be based on the operating reactor inspection program (IMC 2515). Section 2515-15, "Baseline Inspection Guidance for Power Reactors Preparing for Transition to Decommissioning Phase," gives additional guidance for inspectors to use during this transition phase. After the licensee

certifies permanent fuel removal from the reactor vessel, IMC 2561 is implemented for the remainder of the decommissioning process, and the licensee is removed from oversight under the operating power reactor inspection program. The licensee is informed of the transition in oversight programs as specified in IMC 0305, "Operating Reactor Assessment Program." **The regional branch with responsibility for decommissioning inspections should be the lead for this communication.** After implementation of the decommissioning power reactor inspection program, resident inspector (or region-based) direct inspection effort will be based on the "Transition" column of Appendix A, Section II, until the facility has fully transferred to a decommissioning status (i.e., the licensing basis reflects the decommissioning approach and project management responsibility has been transferred from NRR to NMSS). **This transition may take a couple of years.** Therefore, resident inspectors assigned at decommissioning facilities can be temporarily detailed to other sites or assignments, as necessary, to support the NRC's mission.

At a single unit power reactor facility that has just entered permanent shutdown, one of the two resident inspectors could be detailed away from the site shortly after the establishment of safe reactor shutdown. The remaining resident inspector should stay at the site for a pre-determined period as agreed upon by the applicable regional and headquarters Division Directors. Considerations for establishing this time period include if the licensee: (1) plans to enter active decontamination and dismantlement, or if licensee operational performance dictates, the remaining resident inspector could stay at the site for up to a year; (2) plans to enter SAFSTOR, the length of service of the remaining inspector would be based, in part, on the licensee's decommissioning schedule and the NRC's assessment of licensee performance, and should typically not exceed 6 months; or (3) had a significant operational event or accident prior to permanent shutdown, the assignment of NRC staff to the site would be based solely on NRC management discretion, not subject to the guidance in this section. For scenarios (1) and (2) above, and for the multi-unit discussion below, the assignment of a resident inspector in excess of the 6-month and 12-month periods described should be justified and documented in a memo to file, created by the Division of Reactor Projects and agreed upon by the applicable regional and headquarters Division Directors.

For multi-unit reactor sites that have one or more units permanently shutdown, the guidelines in the preceding paragraph would be applicable. However, the guidelines should be further defined by the following: (1) if multiple units are decommissioning and more than one resident inspector is assigned to the particular facility, a Senior Resident Inspector (SRI), or equivalent, should be assigned to supervise the NRC site activities; and (2) if one or more units remain operational and if there are full- or part-time inspector(s) assigned to the decommissioning unit(s), the decommissioning resident inspectors should have a primary reporting responsibility to the applicable regional division management and a secondary reporting responsibility to the operational unit SRI when decommissioning activities have the potential of impacting operating unit safety. This command structure establishes one "senior" NRC representative at the site to represent the NRC when the need arises, and minimizes any potential adverse impact on the operating unit that may be caused by activities at the decommissioning unit(s).

For multi-unit reactor sites at which there is a mix of operating and decommissioning units, but with no resident inspector coverage at the decommissioning unit(s), headquarters or regional management may allocate decommissioning inspection hours to the operating reactor resident inspector staff in order to conduct periodic assessments of the decommissioning unit(s). The direct inspection activities conducted by the resident inspector(s) in this scenario should be charged to the applicable docket and decommissioning IP, and not to the operating reactor docket. These inspection activities may include assessments that focus on observing licensee

management meetings, or discussions with the cognizant decommissioning management staff, to ascertain the status of the decommissioning unit(s) or identify any problems encountered while implementing the site decommissioning strategy. Other areas that resident inspectors may support include reviewing the Corrective Action Program or modifications if agreed-upon by the Division of Reactor Projects and the applicable regional Decommissioning Branch Chief. Resident inspector activities at the decommissioning unit(s) shall contribute to the NRC's overall mission to ensure adequate protection of public health and safety and the environment in the use of nuclear materials, and not detract from effective inspection oversight of the operating unit(s). Any follow-up to these routine decommissioning inspection activities should be charged to the appropriate IMC 2515 or IMC 2561 IP after discussion with the appropriate regional and headquarters management. For decommissioning event response, resident inspectors should be utilized in the same manner to assess and report the situation.

06.09 Basic Inspection Process

The NRC inspection program can only cover a sampling of licensee activities in any particular area, with an emphasis on those activities with relatively high radiological risk. Inspection activities begin with the planning of core and discretionary inspections, using the periodicity described in Appendix A, Section II. Implementation of the inspection plan also includes the coordination of NRC site visits and inspections to promote regulatory efficiency and effectiveness and to reduce regulatory burden on the licensee. Subsequently, the core and discretionary inspections are conducted, inspection reports are written, licensee performance is assessed, and feedback on the decommissioning inspection program should occur. This process will repeat until the site is decommissioned. Inspection activities should focus on in-person observations, interviews, and walkdowns in addition to document review. Where appropriate, supplementing on-site with remote inspection techniques may be used when warranted, e.g., document reviews, interviews. Direct observation shall be regarded as the preferred method of inspection. Remote inspection of activities that are normally directly observed should be considered only in rare or unusual circumstances and headquarters or regional management approval must be received, as applicable. Partial remote inspections may be approved by branch chiefs, but full remote inspections shall be approved by division management.

A basic inspection should involve the following steps, as applicable:

Prepare for the inspection by reviewing appropriate background material as described in the respective IP being performed.

- a. As needed, prepare an inspection plan describing the scope and major areas of emphasis that will be reviewed, evaluated, or assessed during the inspection.
- b. If needed for the specific inspection, the inspector should use appropriate, calibrated radiation detection instrumentation or any other equipment necessary to evaluate and verify licensee activities. The collection of in situ measurements by the NRC can be beneficial as part of future determinations regarding the scope of confirmatory surveys required for the facility. The use of an outside contractor may also be considered to perform confirmatory in situ measurements or laboratory analyses. IP 83801, "Inspection of Remedial and Final Surveys at Permanently Shutdown Reactors," provides guidance on collection of in situ measurements and use of contractor.

- c. Conduct an entrance meeting with the licensee. Inspectors should discuss the inspection scope with licensee management and articulate whether any open items will be reviewed. The lead inspector should state that the inspection may involve the observation of facility operations, interviews with staff, document reviews, and/or radiation surveys to obtain independent and confirmatory data. Appropriate emphasis should be placed on observing staff training, equipment operation, and implementation of the licensed programs during the inspection. Any change or potential change to the onsite inspection plan should be communicated to the appropriate NRC management.

Although unique plant conditions may exist following the permanent cessation of operations, NRC inspectors should not face situations in which license conditions, regulatory requirements, or licensee commitments no longer apply **unless amended or exempted with approval from the NRC**. In cases where unique situations or unclear configurations may be identified and considered potentially adverse to the conduct of safe decommissioning or public health and safety, the inspector(s) should evaluate whether the licensee is aware of the situation and taking appropriate action, if necessary, to correct **the condition**. Such cases or potential issues involving NRC requirements or licensee commitments should be raised to the responsible NRC **project manager as discussed in each IP**. Of equal importance, the lead inspector should determine if the situation is beyond the expertise of the inspectors participating in the inspection. If the issue is beyond their expertise, the lead inspector should promptly inform his or her supervision and make recommendations regarding the skillset necessary to appropriately address the decommissioning issue, so that the responsible NRC **project** managers can determine the urgency of the request for assistance, what type of expertise is required, and what extent of effort is required to resolve the issue.

- d. Conduct an exit meeting with licensee management at the conclusion of the inspection. The inspection scope should be reiterated, specific inspection activities discussed, including any facility walkdowns or personnel interviews that yielded information pertinent to the inspection, and any potential violations or other inspection results should be presented, emphasizing their impact on safety. If potential violations are to be presented as part of the inspection results, licensee management and the inspectors' supervisor should be briefed on the preliminary conclusions, as well as any licensee corrective actions identified, prior to the official exit meeting.
- e. Brief additional regional and headquarters personnel, as needed, either while the inspector is onsite or back in the regional or headquarters office. This briefing should include the inspection results, a discussion of any potential violations, and inspector conclusions in order to ascertain whether additional inspection activities should occur.
- f. Document inspection results, open items, follow-up items, and overall inspection conclusions in accordance with IMC 0610, "Nuclear Material Safety and Safeguards Inspection Reports," and other relevant regional or headquarters guidance documents. Any allegations reviewed during inspections will be documented and dispositioned in accordance with NRC Management Directive 8.8, "Management of Allegations."

Because decommissioning involves the reduction of residual radioactivity to a level that permits subsequent release of the property and license termination, inspections at decommissioning facilities should: (1) evaluate and document the performance or effectiveness of licensee programs, processes, and equipment used to provide assurance that regulatory requirements are met and that decommissioning is conducted safely; and (2) act as a historical record of the

licensee's ability to effectively and accurately conduct radiological surveys and characterization, manage occupational dose, maintain the facility licensing and design basis, and control radiological effluents. This record should help focus future inspections in areas of licensee performance directly related to site release and license termination activities.

06.10 Decommissioning Inspectors

It is expected that all decommissioning inspectors be qualified in accordance with IMC 1248, "Formal Qualifications Program for Federal and State Material and Environmental Management Programs," Appendix F, "Training Requirements and Qualification Journal for Decommissioning Inspectors." The decommissioning inspector shall, in part, independently assess and verify licensee activities and performance, discuss any observations and results with the licensee, discuss inspection and general decommissioning issues with NRC management as needed, and periodically docket inspection observations, violations, and conclusions.

The regional division management responsible for inspections at decommissioning power reactors should be kept apprised of all inspection activities. All inspections should be coordinated with the licensee and in concert with the appropriate NRC Project Manager, who is responsible for headquarters oversight and coordination of the facility, well in advance of the inspection. (Note that depending on the status of the decommissioning transition effort, either NRR or NMSS project managers may need to be involved in the inspection coordination effort). Additional oversight or coordination with NMSS may be needed during the review and approval process for the license termination plan (10 CFR 50.82(a)(9)) in order to verify or validate implementation of the radiological remediation strategies described in the plan. As appropriate, an outside contractor may be used to provide independent verification of adequate site cleanup and remediation of residual radioactivity during the later **categories** of decommissioning.

If an inspector believes that they have operating experience insights that would be beneficial to other NRC staff or licensees of operating reactors, they should provide that information to the Operating Experience Resource Box at: NRR_DRO_IOEB.Resource@nrc.gov.

Any inspector that is not qualified under IMC 1248 should perform only the decommissioning IPs as agreed-upon with the Regional decommissioning Branch Chief.

END

Appendices

- A. Core Inspection Procedures for Decommissioning Power Reactors
- B. **Periodic and** Discretionary Inspection Procedures for Decommissioning Power Reactors

APPENDIX A

I. Core Inspection Procedures for Decommissioning Power Reactors

| | |
|----------|--|
| IP 37801 | Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors (PSRs) |
| IP 40801 | Problem Identification and Resolution at Permanently Shutdown Reactors |
| IP 60801 | Spent Fuel Pool Maintenance, Surveillance, and Safety at Permanently Shutdown Reactors |
| IP 64704 | Fire Protection Program at Permanently Shutdown Reactors |
| IP 71801 | Decommissioning Performance and Status Reviews at Permanently Shutdown Reactors |
| IP 83750 | Occupational Radiation Exposure |
| IP 83801 | Inspection of Remedial and Final Surveys at Permanently Shutdown Reactors |
| IP 84750 | Radioactive Waste Treatment, and Effluent and Environmental Monitoring |
| IP 86750 | Solid Radioactive Waste Management and Transportation of Radioactive Materials |

II. Recommended Average Annual Inspection Hours per Decommissioning Category

| IMC 2561 Estimated Inspection Resources | | | | | | | | | |
|---|--|---------------------------------|---|---|--------------------------------------|---|--|---|---|
| ESTIMATED (DIRECT AND INDIRECT) INSPECTION HOURS (CORE IPs) | | | | | | | | | |
| Core IP | Title | Cat 1 | Cat 2 | Cat 3 | Cat 4 | Cat 5 | Cat 6 | Cat 7 | Cat 8 |
| | | Post-Operation Transition Phase | Actively Decommissioning (DECON), Fuel in the Spent Fuel Pool | Decommissioning (DECON), No Fuel in the Spent Fuel Pool | SAFSTOR, Fuel in the Spent Fuel Pool | SAFSTOR, No Fuel in the Spent Fuel Pool | SAFSTOR, Co-Located with Operational Unit, Fuel in the Spent Fuel Pool | SAFSTOR, Co-Located with Operational Unit, No Fuel in the Spent Fuel Pool | Final Status Surveys Underway, No Fuel in the Spent Fuel Pool |
| 37801 | Safety Reviews, Design Changes, and Mods at PSRs | 58 - 72 | 26 - 40 | 8 - 16 | 5 - 7 | 2 - 11 | 1 - 2 | 1 - 2 | 4 - 14 |
| 40801 | Problem Identification and Resolution at PSRs | 52 - 77 | 52 - 77 | 52 - 77 | 17 - 25 | 17 - 25 | 3 - 5 | 3 - 5 | 6 - 10 |
| 60801 | Spent Fuel Pool Maintenance, Surveillance, and Safety at PSRs | 32 - 48 | 8 - 30 | 0 | 8 - 30 | 0 | 4 - 8 | 0 | 0 |
| 64704 | Fire Protection Program | 8 - 24 | 32 - 48 | 14 - 22 | 2 - 6 | 1 - 4 | 1 - 2 | 0 - 1 | 1 - 12 |
| 71801 | Decommissioning Performance and Status Reviews at PSRs | 84 - 150 | 74 - 136 | 66 - 124 | 10 - 14 | 6 - 8 | 6 - 10 | 6 - 10 | 11 - 67 |
| 83750 | Occupational Radiation Exposure | 48 - 72 | 48 - 72 | 48 - 72 | 22 - 34 | 19 - 29 | 3 - 5 | 3 - 5 | 24 - 36 |
| 83801 | Inspection of Remedial and Final Surveys at PSRs | Varies | Varies | Varies | Varies | Varies | Varies | Varies | 149 - 161 |
| 84750 | Radioactive Waste Treatment, and Effluent and Environmental Monitoring | 32 - 48 | 32 - 48 | 14 - 22 | 6 - 10 | 5 - 20 | 1 - 2 | 1 - 2 | 10 - 20 |
| 86750 | Solid Radioactive Waste Management and Transportation of Radioactive Materials | 58 - 86 | 58 - 86 | 20 - 70 | 8 - 12 | 1 - 2 | 1 - 2 | 1 - 2 | 12 - 20 |

NOTES:

- 1 - Multiply estimated hours by 1.5 for multi-unit decommissioning sites
- 2 - These are estimated hours only and may be changed to reflect actual inspection needs
- 3 - For decommissioning facilities co-located with an operating unit, radiation protection and other site programs will be reviewed by the resident inspector(s)

APPENDIX B

Periodic and Discretionary Inspection Documents for Decommissioning Power Reactors

Many of these inspection guidance documents are applicable to programs outside the reactor decommissioning inspection process. However, the information they contain may be used to supplement or enhance the inspection activities undertaken in accordance with the core decommissioning inspection procedures listed in Appendix A, Section I. **Periodic inspection procedures are denoted by the superscript ^P and their periodicity is described in the notes below.**

PLANT OPERATIONS AND OVERSIGHT

| | |
|----------|--|
| IP 42700 | Plant Procedures |
| IMC 0350 | Oversight of Reactor Facilities in a Shutdown Condition Due to Significant Performance and/or Operational Concerns |
| IMC 0375 | Implementation of the Reactor Oversight Process at Reactor Facilities in an Extended Shutdown Condition for Reasons Not Related to Performance |

RADIOLOGICAL CONTROLS

| | |
|-----------------|--|
| IP 69004 | Non-Power Reactor Effluent and Environmental Monitoring |
| IP 71124 | Radiation Safety—Public and Occupational |
| IP 83723 | Training and Qualifications: General Employee Training, Radiation Safety, Plant Chemistry, Radwaste, and Transportation Training |
| IP 83724 | External Occupational Exposure Control and Personal Dosimetry |
| IP 83725 | Internal Exposure Control and Assessment |
| IP 83726 | Control of Radioactive Materials and Contamination, Surveys and Monitoring |
| IP 84101 | Radioactive Waste Management |
| IP 84850 | Radioactive Waste Management Inspection, “Standards for Protection Against Radiation,” and 10 CFR Part 61, “Licensing Requirements for Land Disposal of Radioactive Waste” |
| IP 86740 | Inspection of Transportation Activities |
| IP 88035 | Radioactive Waste Processing, Handling, Storage, and Transportation |
| IP 88045 | Effluent Control and Environmental Protection |

MAINTENANCE, SURVEILLANCE, AND FIRE PROTECTION

IP 88025 Maintenance and Surveillance of Safety Controls

EMERGENCY PREPAREDNESS AND SECURITY

IP 81502 Fitness For Duty

IP 82401 Decommissioning Emergency Preparedness Scenario Review and Exercise
Evaluation^{P1}

IP 82501 Decommissioning Emergency Preparedness Program Evaluation^{P1}

IP 85103 Material Control and Accounting at Decommissioning Nuclear Power Reactors^{P2}

IP 87137 10 CFR Part 37 Materials Security Programs

IMC 2202 Security Inspection Program for Decommissioning Reactors

ENGINEERING AND TECHNICAL SUPPORT

IMC 2690 Inspection Program for Dry Storage of Spent Reactor Fuel at Independent Spent Fuel Storage Installations and for 10 CFR Part 71 Transportation Packagings

SAFETY ASSESSMENT AND QUALITY ASSURANCE

IP 71152 Problem Identification and Resolution

IP 88110 Quality Assurance: Problem Identification, Resolution and Corrective Action

IP 90712 Inoffice Review of Written Reports of -Routine Events At Power Reactor Facilities

IP 92700 Onsite Follow-up of Written Reports of Nonroutine Events At Power Reactor Facilities

IP 92701 Follow-up

IP 92702 Follow-up on Traditional Enforcement Actions Including Violations, Deviations, Confirmatory Action Letters, Confirmatory Orders, And Alternative Dispute Resolution Confirmatory Orders

IP 92720 Corrective Action

IMC 1230 Quality Assurance Program for Radiological Confirmatory Measurements

IMC 1232 Collection, Preparation, and Shipment of Independent Measurement Samples

ORGANIZATION, MEETINGS, AND DOCUMENTATION

IMC 0620 Inspection Documents and Records

IMC 1007 Interfacing Activities Between Regional Offices of NRC and OSHA

Notes

P1 – Procedure should be used on a biennial basis to evaluate EP exercises as appropriate. Consideration should be given to site conditions and any recent inspection efforts under IMC 2690.

P2 – Procedure should be used on a triennial basis as appropriate. Inspection effort will vary significantly based on site conditions and whether the site is co-located with an operating reactor. Inspectors should review the current site status and licensee performance to determine inspection effort and applicability, including not duplicating MC&A program review for co-located sites and scaling the inspection dependent on the amount of material onsite.

END

Revision History for IMC 2561

| Commitment Tracking Number | Accession Number Issue Date Change Notice | Description of Change | Description of Training Required and Completion Date | Comment Resolution and Closed Feedback Form Accession Number (Pre-Decisional, Non-Public Information) |
|----------------------------|---|---|--|---|
| | 03/26/92 | Initial issuance to establish the inspection policy and guidance for nuclear power reactor facilities during the interval between permanent shutdown and the NRC's approval of a licensee's decommissioning plan. | | |
| | 08/11/97 | Revised to enhance the NRC inspection of decommissioning power reactors. The IMC requires implementation of a core inspection program and provides inspection guidance for the staff. The IMC was also revised to address a recent amendment to the decommissioning regulations (10 CFR 50.82). This revision does not increase the die allocation and will be applicable during all phases of decommissioning. Note that SALP is not performed for decommissioning reactors. | | |
| | 04/23/03 | IMC 2561 (Decommissioning Power Reactor Inspection Program) has been revised to reflect recent changes in the program. | | |
| | ML17348A400 03/06/18 CN 18-007 | Revised the manual chapter to reflect updates in the overall decommissioning reactor inspection program and reflect the changes to the core and discretionary inspection procedures. | None | ML17362A141 |
| | ML20358A131 01/06/21 CN 21-002 | Revised to reflect updates in the overall decommissioning reactor inspection program and reflect the changes to the core and discretionary inspection procedures. This revision also addressed lessons learned from decommissioning inspectors. | | ML20358A132 |