

NRC INSPECTION MANUAL

RDB

INSPECTION PROCEDURE 60801

SPENT FUEL POOL MAINTENANCE, SURVEILLANCE, AND SAFETY AT PERMANENTLY SHUTDOWN REACTORS

Effective Date: 01/01/2021

PROGRAM APPLICABILITY: IMC 2561, Appendix A

60801-01 INSPECTION OBJECTIVES

01.01 To ensure the safe wet storage of spent fuel at permanently shutdown reactors until the fuel has been moved to dry storage in an Independent Spent Fuel Storage Installation (ISFSI) or otherwise permanently removed from storage in the Spent Fuel Pool (SFP).

01.02 To ensure that the program that implements the maintenance rule (10 CFR 50.65) relative to the safe storage of spent fuel is effectively executed.

60801-02 INSPECTION REQUIREMENTS

02.01 SFP Coolant Inventory Control, Instrumentation, Alarms, and Leakage Detection. Verify that the requirements detailed in the plant technical specifications (TS), post-shutdown decommissioning activities report (PSDAR), and the emergency preparedness (EP) plan are implemented to prevent a substantial reduction in SFP coolant inventory under normal and accident conditions by the following, as available: Selecting several (1-3) SFP instrumentation, alarm, and leakage detection and collection systems and evaluate through record review, walk downs, in-field observations, and interviews, whether the maintenance and surveillance of them are adequate to assure the safe wet storage of spent fuel.

02.02 SFP Water Chemistry and Cleanliness Control. Verify through review of select (1-3 as applicable) SFP samples, visual inspection, and interviews that the SFP chemistry and cleanliness control programs, including the licensee's foreign material exclusion program, maintain water purity standards to protect the integrity and cooling of the spent fuel and SFP.

02.03 SFP Criticality Safety and Controls. Verify that the fuel assemblies are stored and licensee's criticality controls, including boron concentrations as applicable, are consistent with the applicable nuclear criticality safety analyses and license procedures, and technical specification requirements through document review. For subsequent inspections, review any changes made since the last inspection.

02.04 SFP Operation and Power Supply. Verify the expected SFP operational strategy and line-up during decommissioning by conducting: (a) a review of licensee procedures, drawings, and PSDAR descriptions regarding SFP operation and power supplies, and (b) walk downs of the SFP cooling system and other applicable systems as appropriate. Observe a sample of fuel movements and other spent fuel pool activities as available.

02.05 Implementation of the Maintenance Rule (10 CFR 50.65).

- a. Verify that the licensee appropriately scopes in, conducts maintenance, and addresses structures, systems, and component (SSC) performance or condition problems within the scope of the Maintenance Rule (MR). Select (1-3) SSCs and verify the above and conduct walkdowns as appropriate.
- b. Select 1-3 maintenance activities (including but not limited to surveillances, post-maintenance testing, and corrective and preventative maintenance) and determine whether the licensee has assessed and managed the increase in risk that may result from the proposed maintenance activity in accordance with 50.65(a)(4).

02.06 Problem Identification and Resolution. Verify that the licensee is identifying problems related to SFP activities at an appropriate threshold and entering them into the corrective action program. If applicable, for a sample of problems documented in the corrective action program, verify that the licensee has identified and implemented appropriate corrective actions.

60801-03 INSPECTION GUIDANCE

General Guidance

The primary objective of this Inspection Procedure (IP) is to verify that each licensee maintaining spent fuel in wet storage implements appropriate controls and maintains adequate SSCs to prevent adverse radiological conditions during decommissioning and maintains the ability to mitigate any applicable credible accidents. This IP applies to all stages of decommissioning from the permanent cessation of reactor operations until the fuel is safely transferred from the SFP to an ISFSI or other licensed fuel storage system.

The inspector is not required to complete all of the inspection requirements listed in this IP, nor is the inspector limited to those inspection requirements listed if additional safety concerns are identified. However, the objectives of this IP shall be met. Due to the variance in decommissioning strategies and timelines, subsequent inspections may be less comprehensive, based on the licensee controls and adequacy of SSCs for maintaining spent fuel integrity and radiation shielding. These latter inspections should correspond to the number of licensee modifications made, the extent of any SFP problems (including leakage) identified, and any completed or planned fuel movements. In the case where a plant has been shutdown for a number of years, spent fuel cooling may no longer be a significant safety issue; therefore, the licensee's emergency response strategy could be focused primarily on minimizing radiation exposure, however, assumptions made in applicable accident analyses in the facility safety analysis report should be verified.

Inspectors should select inspection items using a performance based, risk-informed approach, while also considering variety. Inspectors should review a sampling of past inspection reports to inform their selection of inspection items.

Specific Guidance

03.01 SFP Coolant Inventory Control, Instrumentation, Alarms, and Leakage Detection

The SFP coolant inventory assures adequate cooling of the stored fuel, provides shielding, mitigates the consequences of the design-basis fuel handling accident, and maintains some of the initial conditions assumed in the criticality safety analysis. A substantial reduction in SFP coolant inventory is prevented by: (1) design features that limit potential drainage and prevent siphoning; (2) reliable operation of the SFP cooling system designed to limit evaporation of coolant; and (3) capabilities to add make-up water to recover or maintain SFP coolant inventory using permanently installed or portable equipment. Protection against substantial loss of coolant inventory is described in the applicable facility safety analysis report. Design features that protect against drainage are typically included in the TS as well as the minimum acceptable level of SFP water above the top of the irradiated fuel assemblies seated in the storage racks. Other potential causes of significant coolant inventory loss include liner leakage, leakage by seals to adjacent volumes that are drained, and excessive evaporation following loss of forced cooling.

The licensee should be knowledgeable of any potential siphon or drain paths and have plans or procedures that can identify, resolve, and minimize the probability of occurrence of an inadvertent or undetected drain or siphon. Procedures should include provisions for addition of make-up water to recover from any potential loss of coolant inventory events, including radiation protection and soluble boron management in cases where the inventory loss is significant. Bulletin 94-01 "Potential Fuel Pool Draindown Caused by Inadequate Maintenance Practices at Dresden Unit 1," Information Notice (IN) 88-65, "Inadvertent Drainages of Spent Fuel Pools," and IN 87-13, "Potential for High Radiation Fields Following Loss of Water from Fuel Pool," discuss some mechanisms for loss of SFP inventory and the potential consequences of these events.

On March 12, 2012, the NRC issued Order EA-12-051, "Order to Modify Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation," which requires all operating reactors to have a reliable indication of the SFP water level capable of supporting identification of the following pool water level conditions: (1) level that is adequate to support operation of the normal fuel pool cooling system, (2) level that is adequate to provide substantial radiation shielding for a person standing on the spent fuel pool operating deck, and (3) level where fuel remains covered and actions to implement make-up water addition should no longer be deferred. While most decommissioning facilities will not be subject to this Order, or will have requested that the requirements of the Order be rescinded to reflect the permanently shutdown status of the plant, the inspector should be aware of any portions of the Order, or any associated commitments, may still be in place at facilities that shutdown after March 2012. This information, especially with respect to on-going licensee commitments, should be used when reviewing and verifying the requirements for SFP instrumentation discussed below.

Review and evaluate whether the SFP instrumentation, alarms, and leakage detection systems used during decommissioning are adequate to assure the safe wet storage of spent fuel. This review should include SFP water level and temperature instrumentation, instrumentation calibration requirements, alarm set points, and alarm response procedures. SFP leakage collection systems, associated alarms, level and/or flow instrumentation, and collection and trending of data should also be evaluated. Wide-range level instrumentation installed pursuant to Order EA-12-051 should be verified for compliance with the requirements specified in the Order. Review design, operational, and administrative measures in place to prevent a substantial reduction in SFP coolant inventory under normal and accident conditions, including TS surveillance requirements for the acceptable minimum water level above the top of the irradiated fuel assemblies in the SFP.

The inspector should walk down and inspect the SFP system (including all accessible points and liner penetrations) for material conditions and integrity; review any repairs conducted on the SFP liner; evaluate system configuration control for permanent and temporary systems connected to the SFP based on field conditions and licensing basis documentation; and if there have been major modifications made to the SFP and the associated systems since the last inspection, ascertain the seismic qualification of the SFP systems. Particular focus should be on the evaluation of any modifications, temporary or otherwise by evaluation of system low points, active and passive drain pathways, primary and secondary makeup water supplies, and SFP boundary integrity control.

The SFP water level instrumentation and alarms must ensure that any significant loss of inventory will be promptly detected by operations personnel. Response to alarm procedures should require a leakage assessment and contingency actions including makeup, cooling, and radiological considerations, as appropriate. Response to alarm procedures should also include an assessment of forced cooling systems as well as contingency actions to recover SFP cooling in the event of a sustained loss of forced cooling. The instrumentation and alarms should be periodically calibrated in accordance with facility procedures. If applicable, the licensee should have procedures in place to provide for reliable forced cooling of the SFP and to respond to a scenario involving a loss of forced cooling. IN 93-83, "Potential Loss of Spent Fuel Pool Cooling Following a Loss of Cooling Accident (LOCA)," discusses a scenario where recovery of forced SFP cooling may be challenging.

Leakage detection systems must be verified to be functional and routinely monitored. Assess the design and maintenance of the leakage detection system to verify that the system will provide indication of leakage and includes provisions for isolation in the event leakage could exceed makeup system capacity. Operator rounds and control room logs should provide a data set sufficient to identify SFP leakage problems. If installed, a SFP leakage collection system will usually be described in the licensing basis documentation. If this system is alarmed, an instrument check and functionality check of the instrumentation and alarms should be performed periodically. If the licensee uses operator rounds to survey the leakage collection volume, the inspector is advised to review the logged data, assess the data trend, and consider accompanying an operator on rounds. The inspector should review any modifications made to this system to determine if the system is still able to adequately perform its function.

The inspector should review credible accidents in the facility safety analysis report and verify assumptions made there as well as assumptions made in the emergency plan. The inspector should also assess the licensee's training procedures or program to respond to and mitigate a potential loss of SFP inventory as well as a zirconium fire resulting from a hypothetical draindown of the SFP. Response actions should be commensurate with safety and maintaining radiation exposure As Low As Reasonably Achievable (ALARA). In its response to Bulletin 94-01, "Potential Fuel Pool Draindown Caused by Inadequate Maintenance Practices at Dresden Unit 1" the licensee should have documented its SFP inventory management and emergency response strategies; addressed radiation protection and spent fuel cooling during abnormal situations; provided information on SFP leakage; and detailed its siphon and draindown evaluations.

Note that operating experience discussed in IN 2004-05, "Spent Fuel Leakage to On-site Groundwater," describes the obstruction of leakage detection lines at a pressurized water reactor due to the accumulation of boric acid, mineral salts, and other contaminants. Further inspection of any leakage and possible groundwater contamination issues

should be conducted under IP 84750. The inspector should communicate with program office (NMSS) staff regarding findings involving ground water transport of radiological effluents from the SFP.

03.02 SFP Water Chemistry and Cleanliness Control

Proper maintenance and operation of SFP systems is necessary to maintain water quality and radionuclide concentrations at acceptable levels. Maintenance of water quality is necessary to prevent degradation of the spent fuel and other materials stored in the SFP (e.g., control rod blades, neutron-absorbing materials, and core instrument strings). Proper SFP water treatment programs also prevent the build-up of excessive concentrations of radionuclides. The primary focus of the SFP water chemistry program should be to protect against inadvertent criticality and prevent an accelerated degradation of spent fuel and SFP liner integrity. SFP water purity and radionuclide concentration requirements will typically be stated in TS or site procedures. Water purity limits for pH, conductivity, chlorides, fluorides, and sulfates are generally stated in the facility licensing basis, NRC requirements, or American National Standards Institute (ANSI) standards. SFP boron concentration, as applicable, is covered under section 03.03 of this procedure.

The inspector should review the licensee's controls and practices regarding SFP water chemistry and cleanliness and review the results of the licensee's recent chemical analyses. The inspector should verify that the licensee has evaluated the data and identified any trends. The inspector should consider conducting a tour of the licensee's chemistry facilities to observe sample collection as available.

The inspector should also ascertain licensee's foreign materials exclusion control program or other housekeeping measures to provide assurance that the inadvertent introduction of foreign materials into the SFP is not adverse to the safe wet storage of spent fuel. These materials could either be chemical or mechanical in nature. Program considerations could include, in part, housekeeping, cleanliness boundaries, and administrative accountability of loose materials.

A tour of the SFP should be performed to ascertain the quality of housekeeping in and about the SFP. Particular attention should be focused on the identification of materials that do not add value to the safe wet storage of spent fuel or create a potential siphon pathway. These materials could include, but are not limited to:

- heavy materials supported in the SFP from the SFP curb or rail without structural or seismic analysis;
- excessive combustible loading beyond that described in the Fire Hazards Analysis or Fire Protection Plan, as applicable;
- general loose debris within the SFP area that could inadvertently make its way into the SFP, such as clear plastic bags within the pool that could go undetected and reduce spent fuel channel cooling;
- uncontrolled material in or about the SFP that could chemically or mechanically degrade the fuel, SFP liner, or support systems; and

- Uncontrolled hoses or temporary modifications that could create an unintended siphon pathway

Further guidance regarding the storage of components on the inner sides of the SFP or hanging from the SFP curb or handrail can be found in IN 87-13. "Potential for High Radiation Fields Following Loss of Water from Fuel Pool."

03.03 SFP Criticality Safety and Controls

SFP sub-criticality must be maintained in accordance with Title 10 of the Code of Federal Regulations (10 CFR) 50.68, "Criticality Accident Requirements," and 10 CFR Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants," General Design Criteria (GDC) 62, "Prevention of Criticality in Fuel Storage and Handling," in or equivalent regulatory criteria, as applicable. Engineered design features that maintain acceptable geometry to ensure sub-criticality will generally involve fuel assembly rack spacing, Bora-flex or other permanent neutron absorbers, and physical design features. Administrative considerations may include procedural precautions, instructions, water temperature control, and dual verifications for fuel loading and transfers. Seismic considerations and heavy load handling limitations (including bridge and crane interlocks) will generally be required to preclude a fuel handling event that has the potential for crushing fuel assemblies into a critical geometry.

A variety of TS requirements and docketed commitments provide the basis for the licensee to conclude that spent fuel storage will preclude criticality. These requirements and commitments could be described in the TS, FSAR, PSDAR, or other licensee documents. Nuclear criticality safety (NCS) analyses are usually documented in the FSARs for power reactors and are the basis for demonstrating compliance with plant TS, compliance with NRC regulations, and an adequate margin to criticality during both normal operating conditions and design-basis events.

In many SFP NCS analyses, neutron-absorbing materials, through the inputs of dimensions and boron-10 (^{10}B) areal density, are credited for maintaining margin to criticality in the SFP. Hence, these materials must be able to perform their safety function during both normal operating conditions and design-basis events. Unidentified or unmitigated degradation or deformation of the credited neutron-absorbing materials may reduce the safety margin, especially when subjected to additional challenges during and following design-basis events. Many licensees use integrated defense-in-depth design features to account for degradation of the neutron-absorbing material. For example, some pressurized water reactor licensees rely on the soluble boron concentration in the SFP water to maintain a margin to criticality in accordance with the requirements of 10 CFR 50.68.

The inspector should verify that the licensee's criticality controls are consistent with the applicable nuclear criticality safety analyses, including those that were provided in response to Generic Letter 2016-01, "Monitoring of Neutron-Absorbing Materials in Spent Fuel Pools" that can be found in ML18332A316. Inspectors should review the analyses to see if there are any changes or updates. The inspector should also verify that appropriate surveillance programs are in place to monitor potential degradation for the neutron absorbers in the SFP. The inspector should verify that the licensee has implemented the appropriate geometric arrangement of fuel based on restrictions on fuel placement included in the TS, neutron-absorbing materials, fuel assembly characteristics (e.g., fuel design, initial enrichment, burn-up, and burnable neutron poison loading), soluble boron concentration, and accident conditions that may affect one or more of the preceding characteristics. For soluble boron

concentrations, inspectors should review several surveillance records to verify compliance with TS requirements as applicable. This review should include a review of frequency of sampling and trending. Also, verify that the licensee has identified each assembly placed in the SFP, recorded the parameters and characteristics of each assembly, and maintained a record of each fuel assembly as a controlled document. Observe the material condition of the visible portion of the SFP walls where boron is in use to ensure there is no exposed boric acid related corrosion. If applicable, verify by review of selected records that the SFP boron concentration satisfies the TS requirements.

Evaluate licensee methodologies and surveillance programs to monitor and assess the degradation and deformation of the neutron-absorbing materials in the SFP. If possible, verify by direct observation or review of selected records that the fixed neutron poisons maintained in the SFP storage racks satisfy the parameters credited in the applicable nuclear criticality safety analysis. For reactors that have recently permanently shut down and entered decommissioning, the inspector should determine if the licensee used a dispersed pattern to store the recently discharged (i.e., hot) fuel assemblies in accordance with IN 2014-14, "Potential Safety Enhancements to Spent Fuel Pool Storage." Although not an NRC requirement, the storing of spent fuel in more favorable loading configurations by placing fuel in dispersed patterns immediately after core offload and taking action to improve mitigation strategies when the SFP heat load is high may reduce the risk associated with the SFP. If the licensee is using a dispersed pattern, the inspector should ascertain whether the configuration is appropriate given the decay heat load present in the SFP and the associated mitigating strategies available.

03.04 SFP Operation and Power Supply

Ascertain whether SFP operation is adequate. The inspector should review the spent fuel pool cooling line up and walk down the system. The focus of the walkdown should be on system line up as well as material condition and housekeeping. During the walk down, the inspector should verify the SSCs do not exhibit defects, such as corrosion, cracks, leakage, missing fasteners, and degraded insulation that would impact function. Also, verify that valves are correctly positioned and the system is otherwise in a lineup expected for the current state of the SFP. Review any outstanding maintenance work requests on the system and any deficiencies that could affect the system's ability to perform its function(s). The inspector should verify that electrical power is available as required, including any backup systems. Further guidance for system alignments can be found in IP 71111.04, "Equipment Alignment."

Evaluate any modifications made to spent fuel pool operations, including temporary modifications. This could include changes made to electrical system operation, spent fuel pool cooling, etc. Evaluate any modifications and determine if the licensee appropriately assessed any differences in operation via the 10 CFR 50.59 process. The inspector should evaluate these changes to system operation and ascertain whether the changes were appropriate. Identify situations where differing operational strategies, system line-ups, etc., which may be outside the original system design and operating parameters, could be detrimental to long-term system operability or safe fuel storage. Time spent reviewing 50.59 screenings and evaluations and engineering modification packages should be charged to IP 37801, "Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors."

During fuel movement or other spent fuel pool activities, the inspection effort should assess whether the activities are conducted safely and in accordance with the facility licensing basis and/or the PSDAR, as applicable. This includes licensee control of heavy loads in the vicinity of

the SFP. The inspector should review the licensee's plans and analysis for lifting and rigging of heavy loads to verify that the safe load path analysis for any component removal and/or reinstallation is technically sound and consistent with the facility's licensing basis. Appropriate instructions, precautions, and prerequisites should be established to assure that TS requirements are met and the worst-case fuel damage and dose generation would not exceed the associated safety and criticality analyses.

Review the spent fuel related credible accidents in the facility safety analysis report and verify that the assumptions made are still valid considering the current plant configuration.

03.05 Implementation of the Maintenance Rule (10 CFR 50.65).

- a. Except where the licensee proposes an acceptable alternative method for complying with specific portions of the Maintenance Rule (10 CFR 50.65), the methods described in Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," should be used to evaluate the effectiveness of the licensee in implementing the requirements as stated in 50.65. This regulatory guide endorses NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," and provides methods acceptable to the NRC for complying with the requirements of the rule. Inspection Procedure 71111.12, "Maintenance Effectiveness," can be used, specifically section 03.01 and Appendices B and C as reference material and Appendix A for issue disposition. Inspectors should consider soliciting regional subject matter experts as necessary, including for review of any proposed violations.

For licensee's who have submitted the 10 CFR 50.82(a)(1) certifications or equivalent, the Maintenance Rule applies to those SSC's associated with the storage, control and maintenance of spent fuel. For example, a licensee could establish SFP leakage monitoring; measure and trend concrete crack or spalling propagation; SFP heat exchanger performance; SFP pump capacity, vibration, or differential pressure testing; ventilation capacity and differential pressure testing; and radiation monitoring surveillance testing.

Verify that the licensee has implemented SSC monitoring as required by 10 CFR 50.65(a)(1). This program is required to monitor the performance or conditions of SSC's monitored under (a)(1) against established goals, in a manner sufficient to provide reasonable assurance that such SSC's are capable of fulfilling their intended functions. These goals (i.e. performance objectives) are required to be commensurate with safety and, where practical, take into account industry-wide experience. For example, for fuel handling equipment, a licensee monitoring program could include visual and capacity testing, freedom of motion, or limit switch testing. A licensee should assess whether their fuel handling equipment, grapple, jib crane, polar crane, and spent fuel maintenance inspection stand are required to be monitored under (a)(1). For criticality control monitoring, a licensee could survey SFP boron concentration, SFP temperature, or spent fuel rack or Bora-flex integrity, as appropriate. For monitoring of the SFP liner integrity, a licensee could analytically assess the SFP evaporation rate, survey chemistry control limits, or perform ground water monitoring.

Also, a licensee undergoing decommissioning may utilize probabilistic risk assessment (PRA) information or Individual Plant Examination (IPE) insights in the determination of safety significance; however, the use of PRA information by decommissioning licensees for safety determinations is not required. Refer to NUMARC 93-01 and Regulatory

Guide 1.160 for additional details on the use of PRA information. The program shall require the implementation of appropriate corrective actions when the performance of an SSC does not meet established goals.

The monitoring of an SSC as specified in paragraph (a)(1) is not required if the licensee demonstrates that the performance or condition of the SSC is being effectively controlled through the performance of appropriate preventive maintenance so that the SSC can perform its intended function. Paragraph (a)(2) of the maintenance rule allows the licensee to demonstrate that the performance or condition of an SSC can be effectively controlled through the performance of appropriate preventative maintenance, such that the SSC remains capable of performing its intended function. Or, the SSC could be inherently reliable and of low safety significance, therefore, preventative maintenance may not be required. For those SSCs that are within the scope of the rule, but are not monitored under paragraph (a)(1), verify that appropriate preventative maintenance is demonstrated through implementation of paragraph (a)(2).

Verify that the licensee has established appropriate performance criteria and monitoring to demonstrate that the performance or condition of the SSC is effectively controlled through the performance of preventive maintenance. It is expected that most monitoring will be done at the plant, system, or train level rather than at the component level. In cases where a specific component has been identified as the cause of multiple system maintenance preventable failures, the licensee may elect to monitor at the component level. Parameters monitored at the system or train level could include temperature, pressure, flow velocity, voltage, current, or vibration, as well as, availability and/or reliability. Train level monitoring provides a method of addressing degraded performance of a single train even though the system function is still available. For low safety significant SSCs, monitoring at the availability/reliability level may be sufficient.

Evaluate whether the licensee has appropriately screened the selected SSCs associated with the storage, control, and maintenance of spent fuel and that the licensee has determined whether they are within scope of the Maintenance Rule. The inspector should independently review the licensee accident analysis as described in the FSAR, PSDAR, or licensee procedures to identify the SSCs that could be within scope.

Verify that the licensee is periodically evaluating and assessing the performance of their SSCs as required by 50.65(a)(3).

- b. Further guidance on reviewing risk assessments can be found in section 03.01 of IP 71111.13, "Maintenance Risk Assessments and Emergent Work Control."

03.06 Problem Identification and Resolution.

Additional guidance can be found in IP 71152, "Problem Identification and resolution" and IP 40801, "Problem Identification and Resolution at Permanently Shutdown Reactors."

60801-04 RESOURCE ESTIMATE

Note that for all decommissioning inspection activities, the frequency of performance, level of effort needed, and specific inspection requirements to be evaluated and verified vary based on the stage of decommissioning at the facility, the scope of licensee activities, and the overall

decommissioning strategy chosen for the plant (i.e., SAFSTOR or DECON). IMC 2561 contains a discussion of the expected inspection frequency and resource estimates during each phase of decommissioning and should be used when planning resources to conduct this inspection.

60801-05 COMPLETION STATUS

Inspection findings, open items, follow-up items, and conclusions shall be documented in accordance with Inspection Manual Chapter 0610 and other relevant regional or headquarters instructions. Inspections resulting from allegations will be documented and dispositioned in accordance with Management Directive 8.8.

60801-06 REFERENCES

10 CFR 50.65 "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants" (the Maintenance Rule)

10 CFR 50.68: Criticality Accident Requirements

Bulletin 94-01: Potential Fuel Pool Draindown Caused by Inadequate Maintenance Practices at Dresden Unit 1

Licensee Site-Specific Final Integrated Plan and NRC Safety Evaluation covering EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (ADAMS Accession No. ML12056A044).

Technical Letter Report - Spent Fuel Pool Criticality Management Spreadsheet: A Compilation of the Means Used to Meet Sub criticality Requirements for all Operating Domestic Spent Fuel Pools, USNRC, Office of Nuclear Regulatory Research (ADAMS Accession No. ML113550241)

Spent Fuel Criticality Management Database, USNRC, Office of Nuclear Regulatory Research (ADAMS Accession No. ML13212A064)

Generic Letter 96-04: Bora flex Degradation in Spent Fuel Pool Storage

Generic Letter 80-113: Control of Heavy Loads

Generic Letter 16-01: Monitoring of Neutron-Absorbing Materials in Spent Fuel Pools

Generic Letter 78-11: Review and Acceptance of Spent Fuel Storage and Handling Applications

IE Bulletin 79-24: Frozen Lines

Information Notice 14-14: Potential Safety Enhancements to Spent Fuel Pool Storage

Information Notice 14-09: Spent Fuel Storage or Transportation System Misloading

Information Notice 12-13: Bora flex Degradation Surveillance Programs and Corrective Actions in the Spent Fuel Pool

Information Notice 09-26: Degradation of Neutron-Absorbing Materials in the Spent Fuel Pool

Information Notice 04-05: Spent Fuel Leakage to Onsite Groundwater

Information Notice 95-38: Degradation of Bora flex Neutron Absorber in Spent Fuel Pool Storage Racks

Information Notice 93-83: Potential Loss of Spent Fuel Pool Cooling Following a Loss of Cooling Accident (LOCA)

Information Notice 93-70: Degradation of Bora flex Neutron Absorber Coupons Information Notice 90-33: Sources of Unexpected Occupational Radiation Exposures at Spent Fuel Storage Pools

Information Notice 88-65: Inadvertent Drainages of Spent Fuel Pools

Information Notice 87-43: Gaps in Neutron-Absorbing Material in High-Density Spent Fuel Storage Racks

Information Notice 87-13: Potential for High Radiation Fields Following Loss of Water from Fuel Pool

Information Notice 83-29: Fuel Binding Caused by Fuel Rack Deformation

ANSI/N14.6-1993: For Radioactive Materials - Special Lifting Devices for Shipping Containers Weighing 10,000 Pounds (4500 kg) or More

IP 40801, "Self Assessment, Auditing, and Corrective Action at Permanently Shutdown Reactors"

IP 71111.04, "Equipment Alignment"

IP 71111.12, "Maintenance Effectiveness"

IP 71152, "Problem Identification and Resolution"

Nuclear Management and Resources and Research Council, NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 4A, August 2016

NUREG 1526, "Lessons Learned from Early Implementation of the Maintenance Rule at Nine Nuclear Power Plants," June 1995

NUREG-1801: Generic Aging Lessons Learned (GALL) Report, Revision 2 Inspection Procedure (IP) 71152: Problem Identification and Resolution

NRC Regulatory Guide (RG) 1.160, Rev. 4, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants" (ML18220B281)

Draft Guide – 1373, "Fresh and Spent Fuel Criticality Analyses"

U.S. Nuclear Regulatory Commission, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Federal Register, Vol. 83, No. 187, Wednesday September 26, 2018, Pages 48659 to 48660 10 CFR 50.65 "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants" (the Maintenance Rule)

END

ATTACHMENT 1
Revision History for IP 60801

| 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) |
|----------------------------|---|---|--|---|
| N/A | 08/11/1997 | Initial issuance. | N/A | N/A |
| N/A | ML15202A260 01/11/16 CN 16-001 | This procedure was updated to address content and format changes, content updates to reflect current SFP operation during decommissioning, as well as to address, in part, issues identified by the OIG in OIG-15-A-06, "Audit of NRC's Oversight of Spent Fuel Pools." Researched commitments for the last four years and found none. | None Required | ML15356A192 |
| N/A | ML20205L544 09/09/20 CN 20-041 | This procedure was updated to focus on the inspector's efforts on risk informing the inspection. This procedure now includes information from IP 62801, "Maintenance and Surveillance of Permanently Shutdown Reactors," which was deleted. | N/A | ML20205L542 |