

## **Reactor and Materials Decommissioning Licensing and Inspection Activities – 2022 Presentation**

### **Key Messages:**

- Provide the Commission with an overview of the significant challenges in staffing for the decommissioning licensing and oversight program.
- Staff are using Be riskSMART principles to proactively update decommissioning Inspection Manual Chapters (IMCs) and procedures to be more risk-informed, performance-based, decrease duplication of efforts, and incorporate experience gained since last revision, including from the Coronavirus Disease 2019 (COVID-19).
- Staff are developing a systematic approach to planning to help address resource needs for an accelerated and growing program.

### **IMC 2561**

A recent revision of IMC 2561, “Decommissioning Power Reactor Inspection Program,” and its nine core Inspection Procedures (IPs), were complete and became effective on January 1, 2021. These procedures were revised to further risk-inform inspection activities, incorporate lessons learned and new guidance, and to eliminate IP duplication.

- IMC 2561, “Decommissioning Power Reactor Inspection Program” Agencywide Documents Access and Management System (ADAMS) Accession No. [ML20358A131](#)
- IP 37801, “Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors” ADAMS Accession No. [ML20205L624](#)
- IP 40801, “Problem Identification and Resolution at Permanently Shutdown Reactors” ADAMS Accession No. [ML20258A075](#)
- IP 60801, “Spent Fuel Pool Maintenance, Surveillance, and Safety at Permanently Shutdown Reactors” ADAMS Accession No. [ML20205L544](#)
- IP 64704, “Fire Protection Program at Permanently Shutdown Reactors” ADAMS Accession No. [ML20294A347](#)
- IP 71801, “Decommissioning Performance and Status Reviews at Permanently Shutdown Reactors” ADAMS Accession No. [ML20240A293](#)
- IP 83750, “Occupational Radiation Exposure at Permanently Shutdown Reactors” ADAMS Accession No. [ML20289A772](#)
- IP 83801, “Inspection of Remedial and Final Surveys at Permanently Shutdown Reactors” ADAMS Accession No. [ML20352A103](#)

- IP 84750, “Radioactive Waste Treatment, and Effluent and Environmental Monitoring” ADAMS Accession No. [ML20290A843](#)
- IP 86750, “Solid Radioactive Waste Management and Transportation of Radioactive Materials” ADAMS Accession No. [ML20274A024](#)

Some of the changes to the reactor decommissioning inspection program are:

- IP 64704, “Fire Protection Program at Permanently Shutdown Reactors (PSRs),” was elevated and revised from a discretionary procedure to a Core IP based on recent increases in non-reportable fire incidents and inspection experience with fire hazards at active decommissioning sites. This procedure will now be required to be performed annually.

Additionally, the revision of IP 64704 incorporates information from the newly revised Regulatory Guide 1.191, “Fire Protection Program for Nuclear Power Plants During Decommissioning and Permanent Shutdown,” and fire protection requirements previously discussed in IP 71801, “Decommissioning Performance and Status Reviews at PSRs.”

- The inspection financial reviews previously in IP 36801, “Organization, Management and Cost Controls at PSRs,” were incorporated into IP 71801. The revision of IP 71801 also incorporated the recommendations identified by the Reactor Decommissioning Financial Assurance Working Group (ADAMS Accession No. [ML20121A188](#)). For example, the inspection requirements were revised to enhance communication between the inspectors and the Financial Assurance Branch, Office of Nuclear Material Safety and Security, which reviews the annual decommissioning trust fund reports, to correlate the decommissioning activities to the licensee funds and ensure that adequate resources remain available until license termination.
- In IP 60801, “Spent Fuel Pool Safety at PSRs,” the requirements for spent fuel pool walkdowns and fuel movements were moved from the guidance section to the requirements section, as appropriate, based on the risk significance of these activities.
- In all IPs, actionable requirements and a range of quantitative number of activities for review were added, as appropriate. For example, temporary ventilation units can be used extensively during dismantling activities, and inspectors are now to walk down 1-3 temporary ventilation systems, as available, to verify that they are correctly configured to mitigate the potential for airborne radioactivity.
- A number of inspection procedure duplications were eliminated, and guidance was condensed into a more streamlined format. For example, IP 62801, “Maintenance and Surveillance at PSRs” was previously divided into two portions: regular maintenance and maintenance rule. Since the only activity applicable to the maintenance rule was related to those systems, structures, and components required for safe storage of spent fuel, this information was incorporated into IP 60801. Information related to maintenance of other components (i.e., those for fire and radiological effluents) was already covered in their respective component procedure, and IP 62801 was deleted.

- Language was added to each IP to ensure inspection activities are planned and performed based on an evaluation of the risk of these activities by answering three questions: (1) what can go wrong, (2) how likely it is, and (3) what its consequences might be.

The reactor decommissioning inspection program inspection resources vary depending on plant status and the activities planned at the site. For example, a multi-unit site with operating reactors requires only inspections of specific areas of the shuttered plant since many site safety programs are inspected under the Reactor Oversight Program. The staff conducted this risk-informing review of the inspection program without a pre-conceived target for the level of effort for the program. COVID-19 was ongoing during this revision and staff incorporated initial lessons learned as able. This included adding language to the IMC that while remote document reviews could supplement on-site inspections when warranted, on-site inspection is the preferred method of inspection and clarifying the level of management approval required to conduct partial and full remote inspections. Staff are continuously evaluating the net impact of the changes.

### **IMC 2602**

A major revision to IMC 2602, “Decommissioning Oversight and Inspection Program for Fuel Cycle Facilities and Materials Licensees,” and associated IPs is ongoing with an expected completion in Spring 2022. The current version of IMC 2602 can be found at ADAMS Accession No. [ML081690257](#). The new IMC and IPs are being revised using the Be riskSMART process, including adding risk modules to focus inspector attention on the most important aspects of an inspection. The proposed risk modules include observation of decommissioning activities; waste generation storage, and transportation; occupational radiation protection; security and control of licensed material; public dose, effluent releases, and environmental monitoring; management organization and controls; and final status/confirmatory surveys. Other proposed changes include adding baseline inspection frequencies to the IMC, adding minimum inspection requirements to meet the objectives of the core IPs, and changing the IMC title to “Decommissioning Fuel Cycle, Uranium Recovery, and Materials Inspection Program,” for consistency with other IMC titles. Agreement State input will be considered, and stakeholder outreach is being conducted.

### **IMC 1248**

A major revision to IMC 1248 Appendix F, “Training Requirements and Qualification Journal for Decommissioning Inspectors,” is ongoing with an expected completion in Winter 2022. The current version can be found at ADAMS Accession No. [ML15266A113](#). This revision was conducted because the previous version of IMC 1248 Appendix F did not include sufficient decommissioning focused and technical material. The effort focused on risk-informing the training to ensure activities were commensurate with safety significance and to incorporate guidance from new decommissioning procedures, lessons learned, and input from the ongoing IMC 2602 working group.

Major changes proposed include dividing the qualification journal into two sections: Basic and Technical commensurate with other inspector qualifications. Much of the existing requirements were updated and incorporated into the Basic Level qualification and designed so, once completed, the trainee can perform limited scope inspection activities under an appropriate degree of detailed supervision, including charging to IPs as deemed appropriate. The Technical Level was divided into two qualification tracks: Reactor and Materials. This divide allows for an

inspector to become fully qualified in one or both tracks based on the branch and regional needs identified by their supervisor. Seventeen new technical training activities were created, and several incumbent activities were significantly updated, including clearer completion requirements. Some examples of the new training topics include NUREGs 1757 and 1500 (Material track specific), Fire Protection Program and Spent Fuel Pool Maintenance, Surveillance and Safety (Reactor track specific), and Planning for Inspections and Financial Assurance (Both tracks). Training activities are largely based on the IPs, both the background reading on relevant topics and how to implement the procedure as well as supporting topics such as reactor licensing basis.

As with other NRC qualifications, an individual undergoing qualification discusses the requirements with their supervisor to identify the appropriate qualification timeline and any qualification requirements that may be waived with sufficient justification, including equivalent experience and/or training. An example of justified equivalency is the experience of a fully qualified inspector in another topic area. They are likely to have completed the equivalency of much of the Basic Level Qualification and could likely become basic qualified quickly while beginning the Technical Level proficiency for cross-qualification. The trainee progresses through the qualification journal and is evaluated by an oral qualification board, as applicable, at the end. The expected timeline for qualification will vary based on the inspector's previous experience, the percentage of time devoted to training, and the availability of formal training classes and inspections.

### **Systematic Approach to Reactor Decommissioning**

Staff are updating the current resource planning tools to account for accelerated decommissioning activities associated with the business transfer model, to allow better forecasting of resource needs for the program.