

REQUEST FOR ADDITIONAL INFORMATION
Worcester Polytechnic Institute (WPI)
DOCKET No. 50-134

1. **Comment:** The Worcester Polytechnic Institute (WPI) Decommissioning Plan (DP) indicates in Section 1.2.2 that a historical site assessment and radiological surveys have been completed. There is no discussion of past radiological spills and/or events and their contribution to the radiological status of the facility.

Basis: The licensee should provide sufficient information on the reactor operating history that forms a basis for the determination of the radioactive materials inventory (i.e., radiation survey and calculations) as specified in NUREG-1537 (Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors), part II, Appendix 17.1, Sections 2.2.1 and 2.2.2.

Path Forward: Provide information regarding facility operating history including any radioactive spills, fuel failures, and component failures that led to a release of radioactive contamination or contaminated components. Ensure that the operating history is used in the development of the radiological facility status.

2. **Comment:** References are made to NUREG-1727 (Office of Nuclear Material Safety and Standards (NMSS) Decommissioning Standard Review Plan) in the WPI DP (under Section 1.2.7.3 "Sample and Analysis Quality Control" and Section 2.7 "Facility Release Criteria").

Basis: As specified in the Federal Register (68 FR 54503) on September 17, 2003, the three volumes of NUREG-1757 (Consolidated NMSS Decommissioning Guidance) supersede NUREG-1727 (NMSS Decommissioning Standard Review Plan) and NUREG/BR-0241 (NMSS Handbook for Decommissioning Fuel Cycle and Materials Licensees) in their entirety and should be used as guidance for decommissioning.

Path Forward: Ensure that the most recent decommissioning guidance is referenced and utilized.

3. **Comment:** The WPI DP specifies in Section 2.3.1.2 "Phase Three: Decontamination and Dismantling Activities" that pipes will be checked for contamination and that if contamination is detected, or if the pipe contamination cannot be adequately quantified, they will be assumed to be contaminated above release criteria. It is not clear what release criteria will be used for the piping.

Basis: Per guidance in NUREG-1537 Section 2.2.3, licensees are expected to clearly state release criteria applied to decommissioning projects. Guidance that may help in pipe removal scenarios may be found in NUREG-1640 (Radiological Assessment for Clearance of Materials from Nuclear Facilities) and in the NUREG-5512 series.

Enclosure

Path Forward: Provide the specific details of the release criteria for use with embedded and non-embedded pipes.

4. **Comment:** The WPI decommissioning training program is outlined in Section 2.5 of the WPI DP as “General Site Training”, “Radiation Worker Training”, and “Respiratory Protection Training.” The training program, as outlined, does not appear to have any Decontamination and Decommissioning (D&D) specific components.

Basis: NUREG-1537 specifies that “the licensee should present a complete outline of training appropriate to the staff and contractor functions and positions, consistent with 10 CFR 19.” It is also expected that training should emphasize D&D activities in addition to general radiation safety training.

Path Forward: Provide a complete outline on the methods for training, evaluating, and certifying staff and contractors, with an emphasis on D&D activities.

5. **Comment:** It is specified in Section 2.7 “Facility Release Criteria” of the WPI DP that “if small amounts of concrete with volumetric residual radioactivity need to be released, the volumetric soil release criteria may be used for that purpose.” It is not clear what volumetric criteria are being used for release, and it is also unclear to the U.S. Nuclear Regulatory Commission (NRC) staff whether this discussion refers to criteria for the release of material offsite for unrestricted use (clearance) or to criteria for leaving concrete onsite at license termination.

Basis: Guidance provided in NUREG-1537 Section 3.2.3 “Radioactive Waste Disposal” states that “the only criterion acceptable to NRC at present is that no measureable radioactivity above background levels should be disposed of in unrestricted locations.” It should also be noted that the screening values in NUREG-1757, Volume 1, Rev. 2 Appendix B and Volume 2, Rev. 1 Appendix H are not intended to be release criteria for the offsite removal of radioactively contaminated materials. Additional guidance on the clearance of materials from facilities can be found in NUREG-1640.

Path Forward: Provide details of the volumetric screening criteria to be used for the release of concrete, and clarify if WPI’s discussion of concrete release refers to criteria for the release of material offsite for unrestricted use (clearance) or to criteria for leaving concrete onsite at license termination.

6. **Comment:** In Section 2.7 of the WPI DP it is stated that “if additional screening values are required for nuclides not included in Table 2.2 or Table 2.3, they will be calculated using NRC’s COMPASS computer code for planning and assessing Multi Agency Radiation Survey and Site Investigation Manual (MARSSIM) site surveys, with default values. COMPASS is not the appropriate software for the development of screening values.

Basis: COMPASS will give the number of samples needed in a survey unit for the specified type I and II errors as well as the associated data variability (relative shift) and the probability of passing the survey. Guidance on codes to derive Derived Concentration Guideline Levels (DCGLs) is provided in NUREG-1757, Volume 2, Rev. 1, Appendix H and Appendix I, and in NUREG/CR-6755 (Technical Basis for Calculating Radiation Doses for the Building Occupancy Scenario Using the Probabilistic RESRAD-BUILD 3.0 Code).

Path Forward: Provide appropriate software or calculation methods for the determination of screening values.

7. **Comment:** Table 2.3 of the WPI DP lists the surface soil screening value for unrestricted release of cesium-137 as 2.8E+4 pCi/g as opposed to the value given in NUREG-1757, Volumes 1 and 2 as 1.1E+01 pCi/g.

Basis: See NUREG-1757, Volume 1, Rev. 2 (Appendix B) and Volume 2, Rev. 1 Appendix H.

Path Forward: Correct the screening value for cesium-137 in Table 2.3.

8. **Comment:** In Section 3.1.2 under the “Criteria for Selecting Survey and Monitoring Equipment” it is stated that the project Health Physicist staff will select instrumentation that is sensitive to the minimum detection limits for the particular task being performed.” It is not clear how minimum detection limits for each task will be derived or how Minimum Detectable Concentrations (MDCs) will be determined.

Basis: NUREG-1575, Rev. 1, MARSSIM specifies in Chapter 6 that “Scanning and direct measurement techniques should be capable of measuring levels below the established DCGLs – detection limits of 10-50% of the DCGL should be the target.” MARSSIM guidance also cautions that the sensitivities of detection limits given by service providers and instrument manufacturers are usually based on “ideal or optimistic situations and may not be achievable under site-specific measurement conditions.”

Path Forward: Describe how measurement MDCs and scan MDCs will be determined per MARSSIM. Selection of instrumentation should be based on contaminants present, their associated radiations, media surveyed, and MDCs (sensitivity).

9. **Comment:** The WPI DP states in Section 3.1.2 under “Personnel Monitoring - Internal and External” that “monitoring will be required if the prospective dose evaluation shows that an individual’s dose is likely to exceed 10% of the applicable limits, and for individuals entering a high or very high radiation area.” It is further noted under Section 3.1.4 “Dose Estimates” that the total projected occupational exposure to complete the reactor decommissioning is less than 0.5 person-rem and that “detailed exposure estimates and exposure controls shall be developed during detailed planning of the decommissioning activities.” Sufficient explanation on dose estimation for the decommissioning project is not provided.

Basis: Per guidance in NUREG-1537, part II, Appendix 17.1, Section 3.1.3 “Dose Estimates” the licensee should estimate the total cumulative and individual maximum dose equivalents to both radiation workers and the public “for each major task in which radiation is a factor.” It is additionally noted that “these estimates should take into account both external and internal exposures” and that “methods to ensure compliance with 10 CFR Part 20 and the ALARA program should be explained.”

Path Forward: Provide dose estimates for each major task in which radiation is a factor along with details on the method used to arrive at those estimates.