SAFETY EVALUATION BY THE OFFICE OF
NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
RELATED TO AMENDMENT NO. 172 TO FACILITY OPERATING LICENSE NO. DPR-36
MAINE YANKEE ATOMIC POWER COMPANY
MAINE YANKEE NUCLEAR PLANT
DOCKET NO. 50-309

1.0 INTRODUCTION

On March 15, 2004, as supplemented by letters on September 2, 2004, and May 16, 2005, (ADAMS Accession Nos. ML040990045, ML0042600417, and ML051440411, respectively) Maine Yankee Atomic Power Company (Maine Yankee) submitted a request to amend its license to release the remaining land under License No. DPR-36 with the exception of the land where the Independent Spent Fuel Storage Installation (ISFSI) is located and a 3.17 acre parcel of land adjacent to the ISFSI. Notification of the amendment request and opportunity for hearing was published in the Federal Register on May 25, 2004 (69 FR 29769).

2.0 BACKGROUND

The plant was permanently shut down on August 7, 1997. By October 20, 1997, Maine Yankee had moved the fuel from the reactor vessel to the spent fuel pool. Maine Yankee submitted its original License Termination Plan (LTP) on January 13, 2000. Revision 3 of the LTP was approved by license amendment on February 28, 2003. The licensee completed construction of an on-site ISFSI under a general license pursuant to 10 CFR Part 72, Subpart K. Transfer of the spent nuclear fuel from the spent fuel pool to the ISFSI was completed in February 2004.

The licensee conducted decommissioning activities in accordance with the approved LTP from February 2003 to June 2005. In accordance with the approved LTP, the licensee conducted final site surveys (FSSs) to demonstrate that the area of the site to be released meets the 25 millirem per year (mrem/yr) criteria for unrestricted release in 10 CFR 20.1402, and is less than the enhanced State of Maine clean-up standards of 10 mrem/yr from all pathways and 4 mrem/yr from groundwater sources of drinking water. Details of the FSS results were submitted to the U.S. Nuclear Regulatory Commission (NRC) in 12 FSS Report (FSSR) Supplements. Additional information regarding each of these Supplements is provided in Section 2.2 of this Safety Evaluation Report (SER).

Pursuant to 10 CFR 50.90 and in accordance with its approved LTP, the licensee submitted an application to amend its facility operating license to release the remaining land under License No. DPR-36, with the exception of the land where the ISFSI is located and a 3.17 acre parcel of land adjacent to the ISFSI, from its license (ADAMS No. ML040990045). This SER documents the NRC's approval of Maine Yankee's license amendment request.

3.0 EVALUATION

Maine Yankee requested that most of the land under the jurisdiction of its Part 50 license be released for unrestricted use. Since the land will be permanently released from Maine Yankee's license, the staff evaluated Maine Yankee submittals against the license termination requirements of 10 CFR 50.82(a)(11). In accordance with 10 CFR 50.82(a)(11) the Commission shall determine that; (i) The dismantlement has been performed in accordance with the approved LTP, and (ii) The final radiation survey and associated documentation, including an assessment of dose contributions associated with parts released for use before approval of the LTP, demonstrate that the facility and site have met the criteria for decommissioning in 10 CFR part 20, subpart E. The following is the staff's evaluation of this information.

3.1 License Changes

Currently License Condition 2.B.(9), "Lands Released from the Jurisdiction of Facility Operating License No. DPR-36" reads:

> The lands described in the following correspondence have been released from the jurisdiction of Facility Operating License No. DPR-36. The NRC may require additional surveys and/or decontamination only if, based upon new information, it determines that the criteria of 10 CFR Part 20, Subpart E were not met and residual activity remaining at the site could result in a significant threat to public health and safety.
>
> (a) MYAPC Letter to USNRC dated August 16, 2001 "Early Release of Backlands, Proposed Change No. 211 as supplemented and as approved in Amendment No. 167.

In its license amendment request, Maine Yankee requests to remove all land from Facility Operating License No. DPR-36, with the exception of the ISFSI and a 3.17 acre parcel of land adjacent to the ISFSI. Maine Yankee proposes to add the following condition (b) which identifies the land to be released from the license:

> (b) MYAPC Letter to USNRC dated March 15, 2004, "Release of Non-ISFSI Site Land" as supplemented by letters dated September 2, 2004, and May 16, 2005.

License Condition 2.B.(9)(b) adequately references the correspondence describing the land to be released from Operating License No. DPR-36. The description of the land provided in these documents is consistent with FSS information presented in FSSR Supplements 1 - 10A. Therefore, the staff finds the proposed License Condition 2.B.(9)(b) to be acceptable.

3.2 Remaining Dismantlement Activities

In accordance with the requirement of 10 CFR 50.82(a)(9)(ii)(B), Section 3.2 of the LTP provided a discussion of the remaining dismantlement activities necessary for the NRC to make a finding pursuant to the requirements of 10 CFR 50.82(a)(11)(i). This section describes the major decommissioning activities, and the decommissioning schedule. This section also

provides a description of the final state of the site, including the final disposition of the major structures and systems.

In the LTP, the licensee stated it planned to remediate the site for unrestricted use. To meet the radiological criteria for unrestricted use, the licensee demolished all above grade structures to three feet below grade, and backfilled and graded the land. The resulting concrete debris was disposed of offsite at either a low-level waste facility or an appropriate disposal facility. The LTP indicates that the former low-level waste storage building (now the ISFSI Security Operation Building (SOB)) will remain in place until the spent fuel is transferred to the U.S. Department of Energy (DOE). The licensee plans to demolish the ISFSI SOB to three feet below grade after DOE takes possession of the spent fuel.

The licensee removed the majority of the embedded piping when the concrete was removed to three feet below grade. The remaining embedded or buried pipe was surveyed in-place and capped or grouted and then released for unrestricted use.

The staff has reviewed the licensee's FSSR and determined that the licensee has remediated the remaining structures, systems, and components in accordance with Section 3.2 of the LTP. Therefore, the staff concludes that the dismantlement and decontamination activities have been completed in accordance with the approved LTP.

3.3 Final Site Survey

The FSSs are the radiation surveys performed after an area has been fully characterized, remediation has been completed, and the licensee believes that the area is ready to be released for unrestricted use. The purpose of the FSS is to demonstrate that the area meets the radiological criteria for license termination.

Details of the FSS results were submitted to the NRC in 12 separate FSSR Supplements, and supplemental information submitted in response to NRC requests for additional information. The following list identifies the documents submitted by Maine Yankee, and reviewed by the staff, to demonstrate that the site meets the release criteria presented in the approved LTP.

- Supplement 1 (ML042360036, ML043500338, ML050970076, ML051100318, ML051370587)
- Supplement 2 (ML04271047, ML050030059, ML050970076, ML051100318, ML051370587)
- Supplement 3 (ML041350397, ML042940029, ML043500338)
- Supplement 4 (ML043290278, ML050390365)
- Supplement 5 (ML043500228, ML051090433)
- Supplement 6 (ML043640169, ML051450306, ML051730285)
- Supplement 7 (ML050330265, ML051440545)

- Supplement 8 (ML050590037)
- Supplement 9 (ML051050065)
- Supplement 9A (ML051370366, ML051890095)
- Supplement 10 (ML051520400, ML052020165)
- Supplement 10A (ML051750697, ML052020165)

In addition to reviewing Maine Yankee's FSSR Supplements, the staff conclusions are based on the results from a number of performance-based, in-process inspections of the licensee's FSS program conducted during the decommissioning process. The purpose of the inspections was to verify that the FSS's were being conducted in accordance with the commitments made by Maine Yankee in the LTP, and to evaluate the quality of the FSSs by reviewing the FSS procedures, methodology, equipment, surveyor training and qualifications, document quality control, and survey data supporting the FSSRs. In addition, the NRC conducted a number of independent, in-process/confirmatory surveys to verify the FSS results obtained and reported by the Maine Yankee. Confirmatory surveys consisted of surface scans for beta and gamma radiation, direct measurements for total beta activity, collection of smear samples for determining removable radioactivity levels, and soil and surface water samples to determine specific activity levels.

The staff's review and acceptance of the above referenced FSSRs is documented in correspondence with the licensee, and summarized below.

3.3.1 Supplement 1 - Review and Acceptance

Maine Yankee submitted Supplement 1 to the NRC on August 12, 2004, with supplemental information resulting from NRC's Request for Additional Information(RAI)s submitted on October 14, 2004, December 7, 2004, February 16, 2004, April 13, 2005, and May 10, 2005. In addition to the information referenced above, NRC and Maine Yankee reached agreement on several technical issues during meetings at NRC headquarters on September 9, 2004, and April 19, 2005, as documented in the meeting reports dated October 14, 2004, and May 3, 2005, respectively (ML042870482 and ML051280006). The staff completed its review of all submittals and accepted the FSSR on June 21, 2005 (ML051720115).

FSS Supplement 1 includes the following 10 survey units (SUs):

Survey Area FA-1700 (Spray Building), SUs 1-9; and
Survey Area FC-0300 (Spray Pipe), SU 1.

Acceptance of Supplement 1 is supported by NRC staff reviews of FSS data packages and FSS release records for all 10 survey units during inspections in September 2003, and October 2004. NRC staff evaluated instrument calibration records, and technician training and qualification records. The inspectors determined that all FSS survey instruments used by Maine Yankee were appropriately maintained and calibrated, and records for FSS technician training and qualification were up to date and appropriately maintained. Further, FSS data packages for Containment Spray Building SUs 6, 7, and 8 were complete and had been

reviewed and approved by Maine Yankee management. Documentation of the review results is presented in NRC Inspection Reports 050000309/2003003 and 050000309/2004003 (ML040430024 and ML050870429).

Staff conclusions regarding Supplement 1 are also supported by the results of independent in-process surveys conducted by the Oak Ridge Institute for Science and Education (ORISE) of embedded piping (Survey Area FC-0300, SU 1) and the Containment Spray Building interior (Survey Area FA-1700, SU 6, SU 7, and SU 8). In May 2003, ORISE staff performed internal surface scans of selected portions of the 16-inch Containment Spray Building embedded piping (Survey Area FC-0300) for total beta radiation using gas-flow proportional detectors. Scans were performed on 100% of a horizontal section of spray building piping, accessible from cubicles P-12A and P-12B. Direct measurements on embedded piping were made at two to five locations in each pipe run, including locations of maximum radiation detected during surface scans. Measurement locations, in general, corresponded to licensee locations for direct data comparison and/or the location(s) of maximum activity detected during scans. All ORISE surface scan and direct measurements made inside Containment Spray Building pipes CS-M-91 and CS-M-92 were less than the $DCGL_W$ as specified in Section 6.7.2 of Maine Yankee's LTP. Documentation of the survey results is presented in NRC Inspection Report 05000309/2003002 (ML0328990079).

During the week of September 15, 2003, ORISE staff performed surface scans, direct measurements, gamma scans, and removable surface activity evaluations in Containment Spray Building (Survey Area FA-1700) SUs 6, 7, and 8. Surfaces were scanned for total beta activity using gas-flow proportional detectors and scanned for gamma radiation using scintillation detectors. Total beta and gamma radiation scans were performed on approximately 90% of concrete floors and lower walls up to the 17-foot elevation. Particular attention was given to cracks and joints in concrete surfaces, scabbled surface areas, and other locations where radioactive material may have accumulated. Smears were performed on surfaces to evaluate the presence of removable contamination. Samples were analyzed for gross alpha and gross beta activity using a low background gas-flow proportional counter. Smear data and direct measurements were converted to units of dpm/100 cm^2.

ORISE beta surface scans of the floors and walls of Survey Area FA-1700, SUs 6, 7, and 8, identified some areas of elevated radiation. The majority of the areas were identified in SU 8. All elevated areas were small in size, generally less than 300 cm^2. Gamma scans did not identify any indications of volumetric or subsurface contamination (i.e., gamma radiation levels were consistently within background ranges). Five measurements exceeded the $DCGL_W$ and no measurements exceeded the $DCGL_{EMC}$ of 90,000 dpm/100 cm^2. A comparison of ORISE and Maine Yankee data also showed close agreement for measurements performed in the same area. No significant removable beta-gamma or alpha surface activity was identified. Documentation of the survey results is presented in NRC Inspection Report 05000309/2003003 (ML0040430024).

3.3.2 Supplement 2 - Review and Acceptance

Maine Yankee submitted Supplement 2 to the NRC on September 15, 2004, with supplemental information resulting from NRC RAIs submitted on December 23, 2004, February 16, 2004,

April 13, 2005, and May 10, 2005. In addition to the information referenced above, NRC and Maine Yankee reached agreement on several technical issues during a meeting at NRC headquarters on April 19, 2005, as documented in the meeting report dated May 3, 2005, (ML051280006). The staff accepted the FSSR on June 21, 2005 (ML051720115).

FSS Supplement 2 includes 14 survey units from the Primary Auxiliary Building:

FA-0600 Primary Aux Building, SUs 1 -14.

Acceptance of Supplement 2 is supported by the staff review of FSS release records for all 14 survey units during an inspection on November 5, 2004. These onsite reviews were conducted to resolve questions developed during the review of the FSS packages. Documentation of the review results is presented in NRC Inspection Report 050000309/2004003 (ML050870429).

Staff conclusions also are supported by in-process surveys conducted by ORISE in Primary Auxiliary Building (PAB) Survey Area FA-0600 (SUs 7, 8, and 9) in May 2003. NRC selected these survey units for in-process surveys because these three rooms formerly contained significant radioactively contaminated plant equipment (e.g., water purification pumps, auxiliary charging pumps, and aerated drain tank and pumps) and these rooms historically contained elevated levels of loose radioactive contamination (e.g., often > 500,000 dpm beta-gamma/100 cm^2).

ORISE staff performed surface scans, direct measurements, gamma scans, and removable surface activity evaluations. Surfaces were scanned for total beta radiation using gas-flow proportional detectors and scanned for gamma radiation using NaI scintillation detectors. Total beta and gamma radiation scans were performed on approximately 100% of concrete floors and lower walls up to the 17-foot line. Particular attention was given to cracks and joints in concrete surfaces, scabbled surface areas, and other locations where material may have accumulated.

ORISE surface scan measurements performed in PAB SUs 7, 8, and 9 were less than the $DCGL_W$. ORISE gamma scan measurements were consistently within background ranges and did not identify any indications of volumetric or subsurface contamination. Total surface activity for the PAB ranged from 290 to 13,000 dpm/100 cm^2 for total beta activity. Removable surface activity for the PAB was less than the detection limits of 8 dpm/100 cm^2 for gross alpha activity and 15 dpm/100 cm^2 for gross beta activity.

Documentation of the survey results is presented in NRC Inspection Report 05000309/2003002 (ML0328990079).

3.3.3 Supplement 3 - Review and Acceptance

Supplement 3 was originally submitted to the NRC on May 6, 2004, as Supplement 1A. In response to an RAI dated September 23, 2004, Supplement 1A was resubmitted as Supplement 3. Supplemental information resulting from NRC RAIs was submitted on October 13, 2004, and December 7, 2004. The staff accepted the FSSR on January 7, 2005 (ML050040005).

FSS Supplement 3 includes 15 survey units:

FB-1200 Administrative Building Footprint (SU 1);
FB-1300 WART Building Footprint (SU 1);
FB-1400 Information Center Footprint (SU 1);
FB-1900 Bailey House Footprint (SU 1);
FB-2500 Relay House (SUs 1, 2, and 3);
FR-0210 Land Between Circ. Water Pump House and Turbine Bldg. (SUs 1, 2, and 3);
FR-0810 Collection Site Foundation Footprint (SU 1);
FR-1800 Bailey Land (SUs 1, 2, and 3); and
FR-1810 Bailey Land Miscellaneous Structures (SU 1).

Acceptance of Supplement 3 is supported by the staff review of FSS release records for all 15 survey units during a October 25, 2004, inspection. These onsite reviews were conducted to resolve questions developed during the review of the FSS packages. Documentation of the review results is presented in NRC Inspection Report 050000309/2004003 (ML050870429).

3.3.4 Supplement 4 - Review and Acceptance

Maine Yankee submitted Supplement 4 to the NRC on November 17, 2004, with supplemental information resulting from NRC RAIs submitted on January 27, 2005. The staff accepted the FSSR on March 2, 2005 (ML0506101170).

FSS Supplement 4 includes 16 survey units:

FA-1400 Personnel Hatch (SU 1);
FA-1900 HV 7 and 9 Area (SU 1);
FB-0200 Control and Computer Rooms/Service Area (SU 1);
FB-0500 Turbine Building (SUs 1, 2, 3 and 4);
FB-1100 Circulating Water Pump House (SU 1);
FB-2000 Bailey Barn (SU 1);
FB-2600 Warehouse 5 (SU 1);
FB-3000 Sewage Water Treatment Plant (SU 1);
FC-2000 Containment Foundation Drains (embedded pipe) (SU 1);
FD-0500 Circulating Water Piping (SUs 1, and 2);
FR-0910 Firepond and Fire Pumphouse (SUs 1, and 2).

Acceptance of Supplement 4 is supported by the staff's review of FSS release records for all 16 survey units during a December 8, 2004, inspection. Documentation of the results of the release record review is presented in NRC Inspection Report 05000309/2005001 (ML052690213).

In addition, ORISE performed confirmatory surveys of the Turbine Building in June 2001. Confirmatory surveys were conducted at three elevations in the Turbine Building (61 ft., 35 ft., and 21 ft.) Approximately 10 percent of the selected areas were scanned for gamma and alpha plus beta radiation using NaI scintillation and gas proportional detectors. Direct measurements for total alpha plus beta radiation were performed on the selected structural surfaces or equipment at 82 random locations using gas proportional detectors coupled to portable ratemeter-scalers. Smear samples, for detecting removable activity levels, were collected from

each direct measurement location. Surface scans did not identify any elevated areas of residual contamination. Total alpha plus beta activity levels ranged from -900 to 8700 dpm/100 cm^2. Removable activity ranged from 0 to 3 dpm/100 cm^2 for alpha and -5 to 6 dpm/100 cm^2 for beta. These results are consistent with the results reported by Maine Yankee. Documentation of the results of these confirmatory surveys is presented in ORISE Report 01-1122 (ML052370158). Although these surveys were conducted on material which was removed from the site, and therefore not part of the as-left conditions, the survey results indicate that prior to demolition, the Turbine Building met the criteria for unrestricted release.

3.3.5 Supplement 5 - Review and Acceptance

Maine Yankee submitted Supplement 5 to the NRC on December 7, 2004, with supplemental information resulting from NRC RAIs submitted on April 7, 2005. The staff performed detailed reviews of six of the 15 survey unit records during an April 2005, inspection. The staff reviewed the submittals and accepted the FSSR on May 23, 2005 (ML051430123).

FSS Supplement 5 includes 15 survey units:

FA-0100 Containment Building (SUs 1, 2, 3, 4, and 5);
FB-0800 Fuel Oil Storage Building (SU 1);
FR-0110 PAB Alleyway (SUs 1, 2, 3, 4, and 5);
FR-0230 X1A and X1B Transformer Pad (SU 1);
FR-0500 Bailey Point (SUs 1 and 2); and
FR-1000 Foxbird Island (SU 1).

Staff conclusions also are supported by in-process surveys conducted by ORISE in the Containment Building, Survey Area FA-0100 (SUs 1, 2, 3, and 4) in May 2004. Survey activities consisted of beta and gamma surface scans, total beta surface activity measurements, and smear sampling for removable alpha and beta contamination.

Surfaces were scanned for total beta activity using gas-flow proportional detectors and scanned for gamma radiation using scintillation detectors. Beta and gamma radiation surface scans were performed on approximately 10 - 50% of the upper and lower containment walls, approximately 80% of the containment floor, and 90% of the ICI sump. Beta radiation surface scans also were performed on the three steam generator pedestals.

The surveys identified 23 locations with residual contamination exceeding the $DCGL_W$. Measured values ranged from 23,000 to 210,000 dpm/100 cm^2. Of the 23 locations, 21 were small in size, approximately 100 cm^2. All in-process inspection total surface activity measurements satisfied the appropriate DCGL for the specific area. No significant removable beta or alpha surface activity was identified. Documentation of the results from the in-process surveys is presented in NRC Inspection Report 050000309/2004002 (ML050320122).

3.3.6 Supplement 6 - Review and Acceptance

Maine Yankee submitted Supplement 6 to the NRC on December 22, 2004, with supplemental information resulting from NRC RAIs submitted on May 5, 2005, and June 16, 2005. The staff performed detailed reviews of four of the 16 survey unit records during an April 2005,

inspection. The staff reviewed the submittals and accepted the FSSR on June 22, 2005 (ML051730064).

FSS Supplement 6 includes 18 survey units:

FA-2600 LSA Building Slab Footprint (SU 1);
FB-1700 Staff Building Footprint (SU 1);
FB-2400 Staff Building Tunnel (SU 1);
FR-0400 Forebay (SUs 1, 2, 3, 4, 5, 6, 7, 8 and 9);
FR-0111 Soil Remediation Areas (SUs 1, 2, 3, 4, and 5); and
FR-2000 Diffuser (SU 1).

Staff acceptance of Supplement 6 is supported by the results from soil samples collected from Survey Area FR-0111, SU 3 in May 2004. The NRC requested that ORISE analyze four split soil samples collected by the State of Maine in Survey Area FR-0111, SU 3 following remediation. While on site, NRC staff and ORISE reviewed the State of Maine's survey methodology and results for the area. The staff determined that the State's survey was performed adequately and additional NRC sampling would not provide further benefit.

Soil samples were analyzed by solid-state gamma spectroscopy for the isotopes Cs-137 and Co-60. Spectra also were reviewed for any other identifiable total absorption peaks. The results from the four split soil samples indicate concentrations for Cs-137 ranged from 0.00 to 0.64 pCi/g and from 0.00 to 0.48 pCi/g for Co-60. All Cs-137 and Co-60 radionuclide concentrations satisfied the $DCGL_w$ values as well as the unity rule. Documentation of the results from the soil sample analyses is presented in the ORISE final letter report dated October 20, 2004 (ML050320176).

3.3.7 Supplement 7 - Review and Acceptance

Maine Yankee submitted Supplement 7 to the NRC on January 20, 2005, with supplemental information resulting from NRC RAIs submitted on May 16, 2005. The staff performed detailed reviews of three of the six survey unit records during an April 2005, inspection. The staff accepted the FSSR on June 22, 2005 (ML051730064).

FSS Supplement 7 includes 6 survey units:

FR-0111 Soil Remediation Areas (SUs 6, 7, 8, 9, 10 and 13).

Acceptance of Supplement 7 is supported by confirmatory surveys of Survey Area FR-0111, SUs 9 and 10, conducted by ORISE in November and December 2004. SU 9 includes remediated soil areas where radioactive material was used or stored. SU 10 encompasses portions of the Containment Building, Low Specific Activity Building, and the Refueling Water Storage Tank. Significant soil remediation was performed in these areas.

ORISE performed gamma surface scans over 100 percent of accessible portions of the survey units using NaI gamma scintillation detectors with audible-indicating ratemeters. Some areas were inaccessible due to standing water or access restricted due to safety concerns. Soil samples were taken from seven excavated areas in SU 9 and from six excavated areas in SU 10.

The gamma surface scans in SU 9 identified several locations of elevated gamma activity, but were determined to be the result of naturally-occurring radioactive material in granite formations. No elevated gamma activity areas were identified in SU 10. Soil samples analyzed by gamma spectrometry identified concentrations of cesium 137 that were all below the site-specific $DCGL_W$. No other gamma-emitting radionucide concentrations of significance were identified. Documentation of the survey results is presented in NRC Inspection Report 050000309/2004003 (ML050870429).

3.3.8 Supplement 8 - Review and Acceptance

Maine Yankee submitted Supplement 8 to the NRC on February 17, 2005. The staff performed detailed reviews of three of the 12 survey unit records during an April 2005, inspection. The staff reviewed the submitted information and accepted the FSSR on May 12, 2005 (ML051320237).

FSS Supplement 8 includes 12 survey units:

FB-1500 Warehouse 2/3 Footprints (SU 1);
FD-0700 Fire Protection System Buried Piping (SU 1);
FD-3500 Storm Drains (SU 3);
FR-0100 RCA Yard West Area (SUs 1, 2, and 3);
FR-0111 Soil Remediation Areas (SU 14);
FR-0200 Yard East (SU 1);
FR-0900 Balance of Plant Areas (SUs 1, 2, and 3);
FR-2900 Railroad Tracks & Roadways (SU 1).

Acceptance of Supplement 8 is supported by confirmatory surveys conducted in Survey Areas FR-0100, SU 3, and FR-0900, SUs 2, and 3. These surveys were performed to evaluate the adequacy and accuracy of Maine Yankee's procedures and FSS results.

ORISE performed gamma surface scans over 100 percent of accessible portions of the survey units using NaI gamma scintillation detectors with audible-indicating ratemeters. Surface soil samples were collected at three locations in Survey Areas FR-0100, SU 3, two locations in FR-0900, SU 2, and two locations in FR-0900, SU 3. Sample locations were chosen based on elevated direct gamma radiation identified by surface scans and from randomly selected locations. Soil samples were analyzed by gamma spectroscopy. Spectra were reviewed for identifiable total absorption peaks.

Soil samples were analyzed by solid-state gamma spectroscopy for the isotopes Cs-137 and Co-60. Spectra were also reviewed for any other identifiable total absorption peaks. The results from the soil samples indicate concentrations for Cs-137 ranged from -0.03 to 1.66 pCi/g and from -0.03 to 0.44 pCi/g for Co-60. All Cs-137 and Co-60 radionuclide concentrations were less than the applicable $DCGL_w$ values as well the unity rule. Documentation of the survey results is presented in NRC Inspection Report 05000309/2005001 (ML052690213).

3.3.9 Supplement 9 - Review and Acceptance

Maine Yankee submitted Supplement 9 to the NRC on April 7, 2005. The staff performed

detailed reviews of five of the 10 survey unit records during an April 2005, inspection. The staff accepted the FSSR on May 12, 2005 (ML051320237).

FSS Supplement 9 includes 10 survey units:

FD-3500 Storm Drains (SUs 1, 2, and 4);
FR-0111 Soil Remediation Areas (SUs 11, 12, and 17);
FR-0200 Yard East (2 survey units - SUs 2 and 3);
FR-0220 Spare Transformer Excavation Pit (X1S) (SU 1); and
FR-0800 Administration and Parking Areas (SU 1).

Acceptance of Supplement 9 is supported by independent ORISE confirmatory surveys performed in Survey Areas FR0-111, SU 17, and FR-0200, SU 3. These surveys were performed to evaluate the adequacy and accuracy of Maine Yankee's procedures and FSS results.

ORISE performed gamma surface scans over 100 percent of accessible portions of the survey units using NaI gamma scintillation detectors with audible-indicating ratemeters. Surface soil samples were collected at two locations in Survey Areas FR-0111, SU 17, and two locations in FR-0200, SU 3. Sample locations were chosen based on elevated direct gamma radiation identified by surface scans and from randomly selected locations. Soil samples were analyzed by gamma spectroscopy. Spectra were reviewed for identifiable total absorption peaks.

Soil samples were analyzed by solid-state gamma spectroscopy for the isotopes Cs-137 and Co-60. Spectra were also reviewed for any other identifiable total absorption peaks. The results from the soil samples indicate concentrations for Cs-137 ranged from -0.03 to 1.66 pCi/g and from -0.03 to 0.44 pCi/g for Co-60. All Cs-137 and Co-60 radionuclide concentrations were less than the applicable $DCGL_w$ values as well the unity rule. Documentation of the results from the soil sample analyses is presented in NRC Inspection Report 05000309/2005001 (ML052690213).

3.3.10 Supplement 9A - Review and Acceptance

Maine Yankee submitted Supplement 9A to the NRC on May 5, 2005, with supplemental information resulting from NRC RAIs submitted on June 28, 2005. The staff reviewed the submittals and accepted the FSSR on August 15, 2005 (ML052210553).

FSS Supplement 9A includes 4 survey units:

FA-0400 Fuel Storage Building (SU 1);
FR-0111 Soil Remediation Areas (2 survey units - SU 15 and SU 16);and
FR-2600 Duct Banks (buried) (SU 1).

3.3.11 Supplement 10 - Review and Acceptance

Maine Yankee submitted Supplement 10 to the NRC on May 25, 2005, with supplemental information resulting from NRC RAIs submitted on July 6, 2005. The staff accepted the FSSR on August 15, 2005 (ML052210553).

FSS Supplement 10 includes 6 survey units:

FD-0600 Service Water Piping (SU 2);
FR-0111 Soil Remediation Areas (SUs SU 18, SU 19, and SU 20);
FR-0200 Yard East (SU 4); and
FR-2900 Railroad Tracks & Roadways (SU 2).

Acceptance of Supplement 10 is supported by independent ORISE in-process surveys performed in Survey Areas FR-0111, SU 19, and FR-0200, SU 4. These surveys were performed to evaluate the adequacy and accuracy of Maine Yankee's procedures and FSS results.

ORISE performed gamma surface scans over 100 percent of accessible portions of the survey units using NaI gamma scintillation detectors with audible-indicating ratemeters. Surface soil samples were collected at one location in Survey Areas FR-0111, SU 19, and four locations in FR-0200, SU 4. Sample locations were chosen based on elevated direct gamma radiation identified by surface scans and from randomly selected locations. Soil samples were analyzed by gamma spectroscopy. Spectra were reviewed for identifiable total absorption peaks. In addition, surface water was being pumped from FR-0111, SU 19. Water samples were analyzed for tritium by gamma spectroscopy.

Soil samples were analyzed by solid-state gamma spectroscopy for the isotopes Cs-137 and Co-60. Spectra were also reviewed for any other identifiable total absorption peaks. The results from the soil samples indicate concentrations for Cs-137 ranged from -0.03 to 1.66 pCi/g and from -0.03 to 0.44 pCi/g for Co-60. All Cs-137 and Co-60 radionuclide concentrations were less than the applicable $DCGL_w$ values as well the unity rule. Water samples from FR-0111 SU 19 were below the $DCGL_w$ for surface water. Documentation of the results from the soil sample analyses is presented in NRC Inspection Report 05000309/2005001 (ML052690213).

3.3.12 Supplement 10A - Review and Acceptance

Maine Yankee submitted Supplement 10A to the NRC on June 20, 2005, with supplemental information resulting from NRC RAIs submitted on July 6, 2005. The staff accepted the FSSR on August 15, 2005 (ML052210553).

FSS Supplement 10A includes 8 survey units:

FD-3500 Storm Drains (SU2);
FR-0200 Yard East (SUs 5, 6, 7, 8 and 9);
FR-0900 Balance of Plant Areas (SU4); and
FR-2900 Railroad Tracks & Roadways (SU3).

Acceptance of Supplement 10A is supported by an independent ORISE in-process survey performed in Survey Area FR-0200, SU 9. This survey was performed to evaluate the adequacy and accuracy of Maine Yankee's procedures and FSS results.

ORISE performed gamma surface scans over 100 percent of accessible portions of the survey units using NaI gamma scintillation detectors with audible-indicating ratemeters. Surface soil samples were collected at five locations in Survey Area FR-0200, SU 9. Sample locations were chosen based on elevated direct gamma radiation identified by surface scans and from randomly selected locations. Soil samples were analyzed by gamma spectroscopy. Spectra were reviewed for identifiable total absorption peaks.

Soil samples were analyzed by solid-state gamma spectroscopy for the isotopes Cs-137 and Co-60. Spectra were also reviewed for any other identifiable total absorption peaks. The results from the soil samples indicate concentrations for Cs-137 ranged from -0.03 to 1.66 pCi/g and from -0.03 to 0.44 pCi/g for Co-60. All Cs-137 and Co-60 radionuclide concentrations were less than the applicable $DCGL_w$ values as well the unity rule. Documentation of the results from the soil sample analyses is presented in NRC Inspection Report 05000309/2005001 (ML052690213).

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the State of Maine was notified of the proposed issuance of the amendment.

During the FSS process, NRC staff and the State of Maine, Nuclear Safety Inspectors, communicated frequently on technical issues associated with radiological measurements and results. Routinely, the State of Maine Inspectors accompanied NRC Inspectors and staff during field observations of the performance of Maine Yankee's FSSs, and NRC in-process and confirmatory surveys.

5.0 ENVIRONMENTAL CONSIDERATION

On February 12, 2003, NRC published the Environmental Assessment (EA) for approval of the Maine Yankee LTP (ML030340171). This EA evaluated the environmental effects from LTP approval and subsequent release of the site for unrestricted use. Included in the evaluation was a determination of the adequacy of the radiation release criteria and the adequacy of the FSS as presented in the LTP.

Maine Yankee has completed remediation in accordance with the approved LTP. Since the environmental effects of remediation were previously evaluated, no EA is required for this licensing action.

6.0 CONCLUSION

Maine Yankee's FSSR Supplements 1 -10A demonstrate that the land to be released from Facility Operating License No. DPR-36, meets the radiological criteria for unrestricted use, as defined by 10 CFR 20.1402, by meeting site release criteria of 10 millirem (Total Effective Dose Equivalent (TEDE) per year over background (all pathways) and 4 millirem (as distinguishable

from background) TEDE per year for groundwater sources of drinking water in accordance with the approved LTP.

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner; (2) such activities will be conducted in compliance with the Commission's regulations; and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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