

50-309



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

March 26, 1999

Mr. Raymond Shadis
Friends of the Coast
P.O. Box 98
Edgecomb, ME 04556

Dear Mr. Shadis:

I am responding to your letter of June 5, 1998, that you sent to Leonard J. Callan of the U.S. Nuclear Regulatory Commission (NRC) regarding emergency preparedness and financial protection exemption requests made by Maine Yankee Atomic Power Company (MYAPC) for the Maine Yankee Atomic Power Station (MYAPS). In your letter, you requested that (1) a meeting scheduled at NRC Headquarters be rescheduled and held in the vicinity of MYAPS, (2) NRC clarify its safety concerns regarding the MYAPS spent fuel pool, and (3) NRC not act on MYAPC's exemption applications until certain design features and accident scenarios were analyzed with respect to current and proposed spent fuel pool operating conditions. The NRC has already discussed these issues at meetings and phone conversations between you and Mike Webb, the MYAPS Project Manager. This letter serves to document the results of all the NRC interactions with you on these issues.

The NRC determined that the meeting between members of NRC and the MYAPC staff should be held on June 9, 1998, at NRC Headquarters as scheduled. Although the NRC is sympathetic to your concern that interested citizens cannot always arrange their work schedules and obtain reasonably priced airfares on short notice to observe such meetings at NRC Headquarters, we believe that appropriate notice had been provided to the public in accordance with the NRC Final Policy Statement on Staff Meetings Open to the Public. In addition, we noted that it would be prohibitively difficult (and expensive) to rearrange the schedules and arrange for travel for the large number of NRC staff (14) who attended the meeting. In the future, the NRC will try to hold meetings, when possible, in the vicinity of the plant. The NRC staff did, in fact, meet on November 9, 1998, at the site with MYAPC and its decommissioning operations contractor, Stone & Webster Engineering Corporation, in a meeting open to the public and observed by several members of the local community, to discuss future site activities and the schedule for decommissioning.

With respect to your questions regarding NRC's safety concerns about the spent fuel pool, the NRC staff has determined that a scenario that should be addressed for a permanently shutdown reactor involves the loss of all or nearly all of the water from the spent fuel pool and subsequent heatup of the fuel. If the decay heat is high enough, oxidation of the zirconium fuel clad could become self-sustaining, resulting in a zirconium clad fire. Although the zirconium clad fire may not be included in the design basis of the facility (as MYAPC has noted), the NRC staff considers it among those events that are "reasonably conceivable" and that should be considered in determining that there is no undue risk to the public from a permanently shutdown reactor facility. While the consequences of this scenario are not considered by the NRC to be worse than previously estimated, the staff

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evaluates this scenario more closely because it is no longer bounded by events that could occur at an operating plant. The evaluation is based on the length of time after shutdown, which is unique for each plant, when the decay heat is insufficient to cause a fire and the scenario is no longer possible. In the interest of the most effective use of the NRC and MYAPC resources, the staff postulated a bounding theoretical case (an adiabatic heatup of the fuel in which all heat generated in the fuel is retained in the system with no heat loss to the surroundings). For this bounding scenario, the time available to reach the self-sustaining oxidation temperature (approximately 10 hours on August 1, 1998), provided sufficient time for onsite actions, and, if necessary, offsite protective measures to be initiated before a postulated release of radioactivity resulting from spent fuel overheating. Based on plant information and analysis, the NRC determined for MYAPS that in the event of the unlikely case of a loss of all spent fuel pool water, sufficient time had elapsed since final shutdown to warrant granting the emergency preparedness exemption in early September 1998.

You also requested that the NRC not take action on the MYAPS emergency plan and financial protection exemption requests until certain design features and accident scenarios are analyzed. To evaluate the level of offsite emergency preparedness needed at a permanently shutdown facility, the NRC staff evaluates those accidents or scenarios that would result in offsite consequences. For permanently shutdown plants, the staff has determined that the worst radiological consequences would result from a loss of all or nearly all of the water from the spent fuel pool. The staff believes that although it is unlikely to occur, for some period after permanently ceasing operations, the loss of water from the spent fuel pool is the worst credible scenario for the decommissioned plant. In your letter, you asked several questions regarding the plant design and different scenarios that we have determined are included in or bounded by the identified worst case scenario. Since your issues fell within these bounds, and therefore would have lesser consequences than the worst case scenario, we have not addressed each of your questions individually. Although we have not addressed each question individually, we have tried to address your concerns collectively.

You expressed concern about the construction of the spent fuel pool and the pool cooling system. The staff reviewed the design information of the MYAPS spent fuel pool, and specifically your concern that the upper portion of one spent fuel pool wall is next to the primary auxiliary building. In its review, the staff noted that all the walls (including the wall shared with the primary auxiliary building) of the spent fuel pool are 6 feet thick and constructed of reinforced concrete. The pool is seismically qualified; that is, it will remain functional after the hypothetical earthquake determined for that plant area. The hypothetical earthquake is larger than any earthquake actually experienced in that area. The MYAPS spent fuel pool is also founded on bedrock. In fact, it is also embedded 12.5 feet in the ground. The normal spent fuel pool cooling system is not required to be seismically qualified; therefore, NRC does not require the backup generators for the spent fuel pool cooling system to be seismically qualified either. Additionally, the structure over the spent fuel pool is designed to withstand a hypothetical earthquake and tornado winds.

You also raised concerns about the south wall of the spent fuel pool building. Through exhaustive review of MYAPS' Individual Plant Examination, we could not identify where they were asked to analyze the effects of the collapse of the south wall. However, as part of an open issue identified by the NRC staff concerning NRC Inspection and Enforcement Bulletin 80-11, "Masonry Wall Design," MYAPC provided a consequence analysis for failure of the spent fuel pool masonry wall. By letter dated December 10, 1987, the NRC staff informed MYAPC that it had determined that, in the event of a masonry wall failure, adequate spent fuel pool cooling capability is available and the structural integrity of the racks is adequate. The determination was based on an NRC staff Supplemental Safety Evaluation and a Technical Evaluation Report prepared by the Franklin Research Center under contract to the NRC. The staff does not intend to reanalyze this event.

You also were concerned about the freezing event that occurred in 1994 at the Dresden Nuclear Power Station, Unit 1 (Dresden 1). In that incident, several thousand gallons of service water (not spent fuel pool water as you stated) were deposited in the empty containment sphere when a valve in the service water system froze and ruptured. Although no spent fuel pool water was lost, because the spent fuel pool at Dresden 1 is connected to the containment through the fuel transfer tube, the NRC was concerned that the fuel transfer tube was also vulnerable to freezing and possible failure. To isolate the enclosure from the spent fuel pool water, a blind flange was welded to the fuel transfer tube. At Maine Yankee, draindown of the pool to the containment through the fuel transfer tube is prevented by two independent mechanical devices, an isolation valve located in the spent fuel pool and a blind flange seal at the refueling canal in the containment. The staff believes that these means of isolation coupled with the licensee's cold weather operations procedures provide adequate assurance that protracted low temperatures will not result in freeze damage that would have significant radiological consequence.

You also discussed the issue of aircraft accidents involving the SFP and asked what actions the NRC has undertaken to address concerns raised at the November 7, 1997, PSDAR meeting and if the NRC will require and verify analysis of potential aircraft accidents involving the Maine Yankee SFP. While the plant was still operating, an evaluation of the aircraft hazard at Maine Yankee was performed to determine if the facility met criteria specified in the NRC's Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants (NUREG-0800) (SRP). As per the SRP, Maine Yankee was considered adequately designed against aircraft hazards. The P-3 Orion aircraft that operate from Brunswick Naval Air Station are variants of the same aircraft that were flown at the time of the plant's initial licensing and, therefore, do not constitute a different hazard than previously assessed. Therefore, the staff does not intend to require Maine Yankee to submit an additional aircraft accident analysis regarding the SFP.

You expressed concern about a new trailer-mounted generator outside the spent fuel building being a potential tornado missile. Tornado missiles that are of concern in the decommissioned state are missiles that can damage the spent fuel pool structure such that its watertight integrity would be damaged or are missiles that would have a trajectory that will contact the fuel when fuel is in the spent fuel pool. MYAPC's analysis included a

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1,850-pound utility pole, which is 35 feet long and 14 inches in diameter, traveling at 150 mph, and a 1-ton automobile traveling at 150 mph. This licensing basis is still applicable in the decommissioned state. The wood blocks under the trailer that you discussed in your letter are similar to the telephone pole hazard and do not need further review. Regarding the generator and the trailer, the NRC staff asked the licensee for further information. On the basis of the information provided, we determined that the generator and the trailer weigh more than 15 times the missiles that were analyzed. Although not quantified, this large weight leads us to believe that there is a low likelihood that the trailer would be picked up by a tornado, moved in the direction of the spent fuel pool, and deposited therein. Because it is much larger than the objects that we believe should be postulated as tornado missiles and because of the low likelihood of the sequence of events that would have to occur in order for the generator and the trailer to damage the spent fuel, we do not believe that the generator and the trailer would become a tornado-generated missile that would damage the fuel.

You asked many questions regarding unanalyzed conditions and draindown rates, flow rates, and volumes of water drained from the spent fuel pool. There is a nearly unlimited number of different conditions, including drain down and flow rates, that could be postulated. However, as previously discussed, the NRC staff does not analyze every condition or scenario for a plant; rather, we evaluate scenarios or accidents that are believed to be bounding, that is, would have the most severe offsite consequences, to be analyzed and planned for through emergency planning. Thus, we do not require licensees to analyze how much water would drain out of the pool at different break locations; instead they analyze the pool to a completely or nearly completely drained level without regard as to whether the water actually has sufficient space to drain. Although this scenario may not be credible it certainly is bounding and conservative in evaluating offsite consequences. If it can be shown that the consequences of this scenario do not require sheltering or evacuation, and therefore, no offsite emergency plan, or that time is available to take mitigative actions to adequately protect public health and safety, the NRC will allow the licensee to eliminate the offsite portion of its emergency plan. In Maine Yankee's case, the staff performed its analyses and was able to determine that sufficient time had elapsed since final shutdown to warrant granting the emergency planning exemption in early September 1998.

We appreciate you sharing your concerns on the decommissioning process at MYAPS with us. If you have any further questions, please contact Mike Webb at 301-415-1347.

Sincerely,

ORIGINAL SIGNED BY:

Seymour H. Weiss, Director

Non-Power Reactors and Decommissioning

Project Directorate

Division of Regulatory Improvement Programs

Office of Nuclear Reactor Regulation

Docket No. 50-309

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Mr. Raymond Shadis

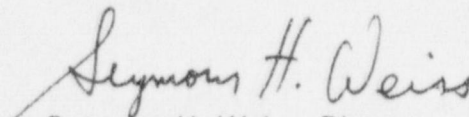
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