

Division of Environmental Safety and Health  
Radiation Protection and Release Prevention Element  
PO Box 415  
Trenton, NJ 08625-0415  
Phone: (609) 984-5636  
Fax: (609) 984-7513

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Mr. Hubert Miller  
Regional Administrator  
U.S. Nuclear Regulatory Commission  
475 Allendale Rd.  
King of Prussia, PA 19406-1415

Subject: Effects of Aircraft Impact on Spent Fuel Pools in New Jersey

Dear Mr. Miller:

Since the September 11, 2001 tragedy, nuclear power generation facilities have been the subject of numerous evaluations related to the prevention of and emergency response to possible terrorist actions, including the use of aircraft as a destructive device. The State of New Jersey through our Radiation Protection and Release Prevention Element – Bureau of Nuclear Engineering (BNE) has been studying developments in this area.

Recently, two technical studies related to the effects of aircraft impact on Spent Fuel Pools have been performed by private parties and were reviewed by the NRC. These two studies were the Nuclear Energy Institute (NEI)/Electric Power Research Institute (EPRI) Study: “Deterring Terrorism: Aircraft Crash Impact Analyses Demonstrate Nuclear Power Plant’s Structural Strength,” issued March 2003 (hereafter referred to as the NEI Study) and the paper, “Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States,” April 21, 2003, Robert Alvarez, et al., published in Science and Global Security, Spring 2003 (hereafter referred to as the Alvarez Paper).

NEI considers the details of their study, submitted to the NRC for review, to be security sensitive. Accordingly, New Jersey did not have access to the complete report and could not conduct a detailed independent review as to the study’s validity for nuclear facilities located in the state. However, NEI has made public sufficient information to conclude that the study was limited to the evaluation of the impact of a Boeing 767-400 airplane into containment buildings, used fuel storage pools, used fuel “Dry” storage facilities and used fuel transportation containers. The NEI Study does not appear to have taken into account the thermal and structural consequences and collateral damage of the explosion and resulting fire that would also occur from the impact of a commercial aircraft. In

addition, it appears that the structural models used to evaluate impact damage were based on “representative” (not site-specific), structures, which were considered by NEI to be typical to those that exist across the nuclear power industry.

The Alvarez Paper was available to New Jersey as was the NRC staff’s review and comments. This paper focused on the potential generic vulnerabilities of spent fuel pools to terrorist attack. The paper also details the possible public safety and environmental consequences should such attacks successfully occur. Included in this paper were conservative estimates of the radiological release should a spent fuel zircaloy cladding fire occur due to a significant breach of a spent fuel pool. The paper states, “The long-term land-contamination consequences of such an event could be significantly worse than those from Chernobyl”. The paper further states (in reference to Chernobyl), “The total area of this radiation-control zone is huge: 10,000 km<sup>2</sup>, equal to half the area of the State of New Jersey. During the following decade, the population of this area declined by almost half because of migration to areas of lower contamination”.

As you are aware, New Jersey is the home to four operating nuclear power reactors located at two separate generating sites. Three power reactors, “Hope Creek”, “Salem Unit 1” and “Salem 2”, are located on the Delaware River at the PSE&G Artificial Island Site and the fourth reactor, “Oyster Creek”, is located near Barnegat Bay and the Atlantic coastline at the AmerGen Oyster Creek Site.

New Jersey is especially concerned about the vulnerability of the Oyster Creek spent fuel pool (OCSFP) to a terrorist attack using a commercial aircraft. This concern is based, in part, on the structural design of the superstructure of the building which encloses the OCSFP (metal siding, concrete roof panels, high collapse potential for this scenario), the location of the pool in the building (high elevation, near an outside wall, pool surface open to superstructure), the relatively unimpeded flight path to the fuel pool location (located on an open coastal plane with minimal surrounding obstructions to fuel pool wall), and, most importantly, the lack of a comprehensive site-specific evaluation for this terrorist aircraft impact scenario which addresses the collective consequences of impact and resulting explosion, fire (including thermal gradients through fuel pool concrete), and probable structural collapse on the OCSFP and fuel assemblies.

Additionally, the site-specific radiological release (including a timeline for the expected release) resulting from this terrorist aircraft impact scenario needs to be quantified by the NRC and provided to New Jersey for emergency planning preparation to insure that the safety of the residents of New Jersey and first responders can be maintained. New Jersey requests this information be provided expediently.

Since New Jersey is not aware of any site-specific evaluation of the OCSFP that addresses these issues, it is requesting that the USNRC provide detailed technical assurance documenting the basis that the above mentioned concerns have been rigorously addressed and that the safety of residents of New Jersey and the environment can be maintained should a 9-11 style terrorist attack occur at Oyster Creek.

New Jersey is also requesting that some provision be made so that authorized representatives of the State of New Jersey, Bureau of Nuclear Engineering, can be granted access to review any and all documentation which is used by the NRC as the basis for concluding that terrorist threats to nuclear power facilities do not represent a risk to New Jersey residents.

If you need additional information, please contact Mr. Kent Tosch, Manager of the Bureau of Nuclear Engineering, at (609) 984-7701.

Sincerely,

Jill Lipoti, Ph.D., Assistant Director  
Radiation Protection Program and Release  
Prevention