

October 30, 2007

The Honorable Lisa Baker  
Pennsylvania Senate  
Senate Box 203020  
Harrisburg, PA 17120

The Honorable Robert M. Tomlinson  
Pennsylvania Senate  
Senate Box 203006  
Harrisburg, PA 17120

Dear Ms. Baker and Mr. Tomlinson:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I would like to thank you for the opportunity to participate in the October 16, 2007, joint hearing of the Consumer Protection and Professional Licensure, and Veterans Affairs and Emergency Preparedness Pennsylvania Senate Standing Committees. I appreciated being invited to answer your questions regarding the NRC's augmented inspection of the recent concerns with security officer inattentiveness at the Peach Bottom Atomic Power Station (Peach Bottom). I would also like to take this opportunity to list and address the open items from the hearing.

1. Senator Lisa Boscola asked how much high level radioactive waste is generated annually at the Pennsylvania nuclear power plants, and how this compares to the waste generated in other states. She also asked about the security requirements of spent fuel storage facilities.

There are currently 104 operating nuclear power reactors in the United States, 9 of which are located at the 5 reactor sites in Pennsylvania (Beaver Valley Units 1 and 2, Limerick Units 1 and 2, Peach Bottom Units 2 and 3, Susquehanna Units 1 and 2, and Three Mile Island Unit 1). Thirty-one States have commercial nuclear power plants, and Pennsylvania ranks second, behind Illinois, in the number of plants. Across the country, about 7800 used nuclear fuel assemblies are taken out of reactors each year and placed in storage onsite. The Pennsylvania reactors would average approximately 8.6% of this amount, or about 670 used assemblies.

When spent fuel is first removed from a reactor, it is placed in a spent fuel pool of highly purified water contained in a steel-lined concrete basin. The water cools the spent fuel and protects workers and the public from radiation. After it has cooled considerably, some commercial power plants move the fuel to dry-storage casks. The casks are either placed upright on concrete pads, or stored horizontally in concrete bunkers. These facilities are called Independent Spent Fuel Storage Installations (ISFSIs), and may be located on the reactor site or on a separate, secure property.

According to a 2004 report from the Energy Information Administration (within the U.S. Department of Energy), as of the end of 2002, about 165,000 spent fuel assemblies, containing 47,000 metric tons of spent fuel from nuclear power plants, were in storage in the United States. Of these, over 161,000 assemblies were stored at nuclear power plants. The vast majority of the assemblies are stored in spent fuel pools. In Pennsylvania, the Susquehanna and Peach Bottom sites currently utilize dry cask storage, and Limerick is preparing to do so. The Energy Information Association report is provided as Enclosure 1. Please note that a revised report is expected in December 2007.

The NRC responded to the September 11, 2001, terrorist attacks by promptly developing and requiring security enhancements for both spent nuclear fuel pools and dry casks. Key features of these physical protection programs include: intrusion detection; assessment to distinguish between false or nuisance alarms and actual intrusions; response to intrusions; and offsite assistance, as necessary, from local, State, and Federal agencies.

Spent fuel pools are strong structures constructed of very thick steel-reinforced concrete walls with stainless steel liners, and are located inside the plants' protected areas. Many fuel pools are located below ground level, many are shielded by other structures, and many have intervening walls that would obstruct an aircraft's or other object's impact. The dry casks are robust, massive concrete and/or steel structures. The NRC has required the ISFSIs to have security systems to protect against unauthorized access to the spent fuel. In addition, the NRC conducted classified studies evaluating the robustness of dry casks to ground assault explosives and large aircraft impact. Those evaluations indicate that it is highly unlikely that a significant release of radioactivity would occur from either scenario. Over the last 20 years, there have been no radiation releases which have affected the public, and no known, or suspected attempts to sabotage spent fuel casks or storage facilities. Additional NRC information on spent nuclear fuel storage is provided as Enclosures 2 and 3.

2. Senator Robert Robbins asked about the duties of Peach Bottom security officers assigned to the plant's "ready room". He also asked about security officer response time testing.

The NRC inspection verified that the security officers, while on duty in the ready room, served a response-only function that did not involve surveillance or detection duties. The responders involved were part of the layered defense-in-depth strategy and were not credited as initial engagement responders. The officers assigned to the ready room, worked a significant portion of their 12-hour shifts at this post. The security officers also performed occasional patrols and rounds outside of the ready room, but a significant portion of the shift could be spent sitting in the room with low physical activity.

The NRC routinely tests the security at nuclear facilities with realistic, force-on-force exercises. As stated by Senator Robbins, these are not pass/fail inspections. Rather, they are the primary means to evaluate and improve the effectiveness of a plant security force's ability to prevent radiological sabotage. The NRC oversees every aspect of these exercises and evaluates them using rigorous standards.

A full force-on-force exercise spans two weeks, and includes both table-top drills and simulated combat between a mock commando-type adversary force and the nuclear plant security force. During the attack, the adversary force attempts to reach and simulate damage to key safety systems and components that protect the reactor's core or the spent nuclear fuel pool. The nuclear power plant's security force, in turn, seeks to stop the adversaries from reaching the plant's equipment. These exercises include a wide array of federal, state, and local law enforcement and emergency planning officials in addition to plant operators and NRC personnel. Any significant security problems are promptly identified, reviewed, and fixed prior to NRC's inspection team leaving the facility. The NRC tests every plant with a force-on-force exercise a minimum of every three years. The plants also must conduct their own yearly exercises.

Security officer response times (i.e. the estimated times to reach defensive positions) is one component tested in these exercises. The NRC inspection at Peach Bottom determined that the response times of the security officers in the ready room were conservative when compared to the time-lines associated with postulated threats.

Additional NRC information on nuclear plant security and force-on-force exercises is provided as Enclosures 4 and 5.

If you have additional questions on these topics or any other issue, please do not hesitate to contact me. Our Regional State Liaison Officers, Nancy McNamara (610-337-5337) and Marjorie McLaughlin (610-337-5240), are available to you as resources, and they can arrange any further discussions you require. Again, thank you for meeting with us, and I look forward to future discussions.

Sincerely,

*/RA/*

Marsha K. Gamberoni, Director  
Division of Reactor Safety

Enclosures:

1. U.S. Department of Energy, Energy Information Administration data on Spent Nuclear Fuel
2. Background information on storage of spent nuclear fuel
3. Background information on dry cask storage of spent nuclear fuel
4. Background information on safety and security improvements at nuclear plants
5. Background information on force-on-force security exercises

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