UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 28, 2013

Ms. Lara Margolis
30 Mayflower Dr.
Tenafly, NJ 07670

Dear Ms. Margolis:

I am responding to your letter of February 6, 2013, to Commissioner Svinicki regarding your concerns about the safe operation of the Indian Point Nuclear Generating Unit Nos. 2 and 3. Specifically, you voiced concerns about 1) seismic design and the risk of a earthquake that exceeds the licensing design basis, 2) age-related degradation of equipment and the prospect of license renewal, and 3) the threat of terrorism and the consequences of a severe reactor accident resulting in a large radiological release over the New York City area.

Before I address your concerns, I would like to congratulate you for taking an interest in nuclear power. I hope you found your research project rewarding and I encourage you to continue your interest in science throughout high school and college. You may already know that the Nuclear Regulatory Commission (NRC) maintains a public web page at www.nrc.gov where a wealth of information is maintained and periodically updated. The concerns you have identified, plus many more, are discussed in-depth on our web page and hopefully you will take the opportunity to explore it. I will now attempt to summarize how the NRC has addressed the concerns you have identified.

Seismic Design

Your letter states that Indian Point is only able to withstand an earthquake of 6.1 on the Richter scale and you cite the risk of the site's proximity to the Ramapo fault line. The NRC requires U.S. reactors to withstand a predicted level of ground motion, or acceleration, specific to a given site. Ground acceleration is measured in relation to "g," the acceleration caused by Earth's gravity. Thus, all U.S. reactors, including Indian Point, are designed to "g" forces and not the Richter scale. An earthquake's magnitude, often described on the Richter scale, is an expression of how much energy the quake released. There is no direct correlation to transform a given magnitude alone to ground acceleration at a site.

Several important factors affect the relationship between an earthquake's magnitude and associated ground acceleration, including the distance from the earthquake, the depth of the quake and the site's local geology (i.e., hard rock or soil). A small earthquake close to a site could therefore generate the same peak ground acceleration as a large earthquake farther away. The NRC's requirements call for a nuclear power plant's design to account for ground acceleration that is appropriate for its location, given the possible earthquake sources that may affect the site and the makeup of nearby faults, etc. Existing U.S. plants were designed on a "deterministic" or "scenario earthquake" basis. In other words, examination of an area's seismological history provides an understanding of the largest earthquake and associated ground acceleration that can be reasonably expected at a specific plant site.

Your letter identified a series of faults passing through the Indian Point area that are collectively known as the Ramapo Fault System. Concerns about building a nuclear power plant in the Indian Point area have been the subject of extensive geological studies. Subsequent to the construction of the Indian Point plants in the early 1970s, an NRC Atomic Safety and Licensing Board (ASLB) spent several months examining public concerns, similar to yours, about seismic activity in the Indian Point area. The geological studies and the findings of the ASLB concluded that the faults in the Indian Point area are inactive and that they have not moved in the last 2 million years. Although we do not expect any significant seismic activity in the Indian Point area, both operating Indian Point plants are designed for what we call a "safe-shutdown earthquake." A safe-shutdown earthquake is an earthquake based on an evaluation of the maximum potential earthquake expected in the geological region. The plants are designed so that during a safe-shutdown earthquake the reactor coolant pressure boundary will remain intact and the equipment needed to bring the reactor to a safe-shutdown condition will remain operable.

Considering that the Ramapo fault system is inactive, the plants are built on solid bedrock, and the plants are designed for a safe-shutdown earthquake, we believe that the risk to public health and safety from the plant due to a probable earthquake in the area is extremely small.

Plant Aging and License Renewal

Your letter discussed aging and reliability of plant equipment. As you know, all U.S. reactors were originally licensed for 40 years. The original 40 year licenses for Indian Point Unit Nos. 2 and 3 will expire at midnight on September 28, 2013, and December 12, 2015, respectively. By letter dated April 23, 2007, the owner of the Indian Point facility requested NRC approval to extend the operating licenses for an additional 20 years, a process we call license renewal. The NRC has not taken action on this application and its review is continuing.

Aging effects such as erosion, corrosion, wear, thermal and radiation embrittlement, microbiologically induced aging effects, creep, and shrinkage may gradually occur as a plant ages. Licensees are able to detect aging-related degradations through performance and condition monitoring programs, technical specification surveillances, and other licensee maintenance activities. Moreover, licensees are required to develop and implement programs that ensure that conditions adverse to quality are promptly identified and corrected.

NRC regulations require that each license renewal application, including Indian Point, include an integrated plant assessment identifying structures and components subject to aging management review, an evaluation of time-limited aging analyses, and a final safety analysis report supplement describing the plant's aging management programs. Only passive, long-lived structures and components are subject to an aging management review for license renewal. The aging management review covers passive structures and components which perform their intended function without moving parts or without a change in configuration or properties.

Prior to renewing a license, the NRC staff must find that there is reasonable assurance that the activities authorized by the renewed license will continue to be conducted in accordance with the plant-specific licensing basis. The burden will be placed on the licensee to demonstrate that the effects of aging will be managed such that the intended functions of passive and long-lived structures and components will be maintained consistent with the plant-specific licensing basis for the period of extended operation.

The NRC staff's safety evaluation describing its technical and environmental review for the Indian Point license renewal application can be found in NUREG-1930, "Safety Evaluation Report Related to the License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3."

Plant Physical Security

Finally, your letter addressed the possibility of a terrorist attack and the consequences of a core meltdown in the metropolitan New York City area. Since the terrorist attacks of September 11, 2001, the NRC has required significant upgrades of plant security at the cost of millions of dollars at every nuclear power plant in the country.

Physical security consists of a variety of measures to protect nuclear facilities and material against sabotage, theft, diversion, and other malicious acts. The NRC and its licensees use a graded approach for physical protection, consistent with the significance of the facilities or material to be protected. In so doing, the NRC establishes the regulatory requirements and assesses compliance, and licensees are responsible for providing the protection.

Physical security programs for nuclear facilities, such as Indian Point, include the following key features:

- Threat assessment determines how much physical protection is sufficient
- Physical protection areas provides defense-in-depth with barriers and controls for the Exclusion Area, Protected Area, Vital Area, and Material Access Area
- Intrusion detection notifies the site's security force of a potential intruder
- Intrusion alarm assessment distinguishes between false or nuisance alarms and actual intrusions and to initiate response
- Armed response protects public health and safety and the common defense and security, by defending nuclear material or a nuclear facility against an intrusion or attack
- Regulatory initiatives ensure that the NRC's domestic safeguards regulations, guidance and communication continue to adequately protect the nation's nuclear facilities and material in a changing threat environment

Furthermore, the NRC staff continually assesses intelligence issues that include terrorism (foreign and domestic) involving nuclear facilities and materials, insider malevolence against nuclear facilities, nuclear smuggling, illicit sales, and scams. The NRC maintains liaison with the local law enforcement and intelligence communities, the Federal Bureau of Investigation, the Department of Homeland Security, the Department of Energy, national laboratories, and other Federal agencies.

I hope that I have addressed your concerns.

Sincerely,

Sean C. Meighan, Acting Chief
Plant Licensing Branch I-1
Division of Operating Reactors Licensing
Office of Nuclear Reactor Regulation

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/RA/
Sean C. Meighan, Acting Chief
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