



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

September 19, 2013

Ms. Joan Holt
P.O. Box 1087
Truro, MA 02666

Dear Ms. Holt:

I am responding to your email dated July 5, 2013. In your email, you asked two questions as a result of the Nuclear Regulatory Commission (NRC) staff's response to Ms. Dorice A. Madronero's letter regarding the United Water New York's (UWNY) proposed desalination plant on the Hudson River.

With respect to your first question, as part of the NRC's requirements for operating a nuclear power plant, licensees must comply with radiation dose limits for the public, as specified in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 20. In part, 10 CFR Part 20 states that the annual total effective dose equivalent (TEDE) to members of the public is 100 mrem and the annual TEDE for occupational adults is 5 rem. As required by 10 CFR Part 100, the whole body limit, for an individual located at any point on the boundary of the exclusion area for any 2-hour period, following a fission product release, is 25 rem. These radiation dose limits have never been exceeded at the Indian Point Nuclear Generating or Pilgrim Nuclear Power Station.

With respect to your second question, the Federal regulations in 10 CFR Part 20 define background radiation as "radiation from cosmic sources; naturally occurring radioactive material, including radon (except as a decay product of source or special nuclear material); and global fallout as it exists in the environment from the testing of nuclear explosive devices or from past nuclear accidents such as Chernobyl that contribute to background radiation and are not under the control of the licensee. Background radiation does not include radiation from source, byproduct, or special nuclear materials regulated by the Commission."

The base levels of radioactivity in the environment were measured prior to the operation of the Indian Point nuclear plant. The following pre-operational environmental reports are available through the NRC's Agencywide Documents Access and Management System (ADAMS) at <http://www.nrc.gov/reading-rm/adams.html>:

- ML090510302, "Pre-Operational Environmental Survey of Radioactivity In The Vicinity of Indian Point Power Plant," 1958, Consolidated Edison Company Of New York, Inc.
- ML090510301, "Pre-Operational Environmental Survey of Radioactivity In The Vicinity of Indian Point Power Plant 1959," Consolidated Edison Company Of New York, Inc.
- ML090820352, "Pre-operational Environmental Survey In the Vicinity of the Consolidated Edison Company's Indian Point Nuclear Electric Generating Plant," 1959, New York State Department of Health

- ML100221810, "Pre-Operational Environmental Survey In The Vicinity Of The Consolidated Edison Thorium Reactor," New York State Department Of Health, 1962"

A full discussion of background radiation is also available in many textbooks, and in reports prepared by the National Council on Radiation Protection and Measurements Report (NCRP). In NCRP Report No. 160, "Ionizing Radiation Exposure of the Population of the United States," the NCRP states that "there are clearly two major contributors to the exposure of the US population from ionizing radiation: exposure to ubiquitous background radiation and medical exposure of patients." The NCRP report states that the average dose to the US population (from non-nuclear power plants) is approximately 620 mrem per year. Of this, approximately 50 percent of the radiation arises from background radiation (311 mrem per person per year), 48 percent from medical radiation exposure (the dose per person cannot be calculated because not everyone receives a computed tomography (CT) scan each year), and 2 percent from consumer products and activities (12 mrem per person per year). The major sources of exposure are radon and thoron (37 percent, 229 mrem per person per year), CT scans (24 percent), and nuclear medicine (12 percent). Other background radiation sources (cosmic and terrestrial) are 13 percent (61 mrem per person per year) and other medical sources are 12 percent.

For comparison, the Indian Point Energy Center, for Unit Nos. 1, 2, and 3 combined, contributed less than 1 mrem per year to a member of the public in 2011 and 2012 (see Indian Point Energy Center effluent reports in ADAMS Accession Nos. ML12132A122 and ML13157A132, respectively). Pilgrim also contributed less than 1 mrem per year to a member of the public in 2011 and 2012 (see Pilgrim effluent reports in ADAMS Accession Nos. ML12136A554 and ML13141A480, respectively).

Each commercial nuclear power plant is required to submit an annual report on the radioactive effluents discharged from the site and a report of the effects (if any) on the environment. The reports are publicly available on the NRC web site at: <http://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-info.html>. The Indian Point 2012 Annual Radiological Environmental Operating Report can be located at ADAMS Accession No. ML13144A133. The Pilgrim 2012 Annual Radiological Environmental Operating Report can be located at ADAMS Accession No. ML13141A579.

Given the relatively minor amounts of radiation dose (less than 1 mrem per year) from Indian Point and Pilgrim to the general public, as compared to natural background radiation (approximately 311 mrem per year), it may be concluded that the initial levels of radiation near these nuclear facilities has not increased substantially since the nuclear plants began operation.

The NRC requires licensees to conduct environmental monitoring programs, and provides licensees regulatory guidance on performing environmental monitoring programs. Regulatory Guide 4.1, "Radiological Environmental Monitoring for Nuclear Power Plants" provides applicable guidance. This regulatory guide is posted on the NRC web site at: <http://www.nrc.gov/reading-rm/doc-collections/reg-guides/environmental-siting/rg/division-4/division-4-1.html>.

Further detailed guidance on how environmental monitoring programs are conducted is provided in NUREG-1301, "Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Pressurized Water Reactors" (ADAMS Accession No. ML091050061) and NUREG-1302, "Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Boiling Water Reactors" (ADAMS Accession No. ML12171A680).

The NRC also provides the public with additional information on nuclear plants and radiation related issues as part of its public information program in the form of "Fact sheets" and "Backgrounders". These can be found on the NRC web page at the following URL:

<http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/>

Specifically, the fact sheet on environmental monitoring can be found at:

<http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/env-monitoring.html>

I hope that I have been responsive to your questions.

Sincerely

A handwritten signature in black ink, appearing to read "R. H. Beall". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Robert H. Beall, Acting Chief
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

J. Holt

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/ra/

Robert H. Beall, Acting Chief
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

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