September 28, 2000

The Honorable Maurice D. Hinchey
United States House of Representatives
Washington, D.C. 20515-3226

Dear Congressman Hinchey:

I am writing in response to your letter of July 19, 2000, in which you expressed a number of concerns about the operation of the Indian Point Nuclear Generating Unit No. 2 (IP2). You expressed concern about the safety of operating the plant with its old steam generators; about radiation measurements during and after the February 15, 2000, event as described in our April 28, 2000, Augmented Inspection Team (AIT) report; about the adequacy of emergency preparedness; about safety issues that might be revealed as a result of the investigation by the Office of the Inspector General (OIG); and about the effects on safety of a possible sale of IP2.

In regard to your concerns about the safety of operating IP2 with its old steam generators, on August 9, 2000, the Consolidated Edison Company of New York, Inc. (ConEd), announced that the steam generators at IP2 will be replaced before the plant is restarted. The replacement will be conducted in accordance with U.S. Nuclear Regulatory Commission (NRC) standards and will be subject to NRC inspection.

In your letter, you asked a number of questions about our assessment of the radioactive releases as well as the availability and adequacy of monitoring data during the February 15, 2000, steam generator tube failure event. You expressed particular concern about what you thought might be conflicting radiation measurements on a steam generator dump valve. The existence on February 16, 2000, of some residual noble gas activity from the #24 steam generator dump valve is entirely consistent with the NRC's overall assessment that the event caused a minor release of radioactivity, too small to cause offsite consequences or to be distinguishable from normal background levels offsite. We are confident that we obtained enough information to make a valid radiological assessment. Regarding your concerns about the pressurized ion chamber (PIC) radiation detectors, data from 6 of the 16 PICs were received via remote transmission, and data from 4 others were subsequently gathered before being overwritten by newer data per the system design. The data obtained from those 10 monitors are considered accurate. However, the monitors themselves are not explicitly required by the NRC, and our radiological assessment relies on other information as well. We understand that ConEd is addressing the problems encountered with PIC data retrieval. More detailed answers to your specific questions regarding the AIT report are enclosed.

Your concerns about emergency preparedness at IP2 centered on public participation in full-participation exercises, the size of the emergency planning zones (EPZs) at IP2, and NRC review of the Federal Emergency Management Agency (FEMA) reports included with my June 13, 2000, letter to you. In regard to public participation in emergency preparedness exercises, our regulations state that full-participation exercises should test as much of the licensee, State, and local emergency plans as is reasonably achievable without mandatory public participation.

Large-scale public participation in emergency exercises is not considered necessary to evaluate response capabilities because the focus of emergency preparedness exercises is on ensuring that utility, State, and local emergency response personnel understand and can perform their duties following a radiological emergency. In regard to your concern about the size of EPZs for commercial nuclear power plants, I can merely note that the size of these zones is specified in emergency planning regulations. These regulations represent a judgment based on the consideration of the probabilities and consequences of a spectrum of accidents and on the extent of detailed planning required to ensure an adequate response to a radiological emergency. In regard to your request for our review of the FEMA reports that were enclosed in my June 13 letter to you, I must explain that, although the NRC assesses onsite emergency planning, it reviews the results of FEMA's assessment of offsite plans and preparedness solely for the purpose of making findings on the overall state of emergency preparedness. After initial approval of emergency preparedness for a site, our review of the FEMA reports is generally for confirmation and is not formally documented. More detailed answers to your specific questions regarding emergency preparedness are also enclosed.

In regard to your concern about the safety of operation of IP2 following a potential sale of the unit, neither ConEd nor any other entity has applied to transfer the license for IP2. Any such license transfer must be reviewed and approved by the NRC staff. And, before approving the transfer of an operating license for a nuclear power plant, the NRC must have assurance that the organization to which the license is being transferred has both the technical capability and the financial means to operate the facility safely. Please also be assured that NRC regulations apply to any U.S. commercial nuclear power plant, no matter who owns and operates it.

With regard to the OIG investigation, I am sure you are aware that OIG has issued its final report. I have directed that the report be analyzed by the NRC's Executive Director for Operations and that the analysis be provided to the Commission for consideration by November 1.

The CD-ROM containing the IP2 Final Safety Analysis Report that was promised to you in my June 13 letter has been sent to you separately. I trust that this letter answers your concerns.

Sincerely,

/RA/

Richard A. Meserve

Enclosure: As stated

cc w/o encl: See next page

Concern 1:

The Augmented Inspection Team (AIT) Report of April 28, 2000, concluded that the February 15, 2000, accident did not cause a measurable release of radioactivity to the environment. Conflicting radiation measurements on February 16, 2000, indicate that there was some residual activity measured at a steam dump valve in the steam line of the failed steam generator.

Response:

As stated in the AIT report, the event resulted in a radiological release to the environment that was well below regulatory limits. No radioactivity was measured offsite above normal background levels, and public health and safety were not affected. The AIT report notes that on February 16, 2000, a survey conducted by the licensee indicated some residual entrained noble gas activity associated with the #24 steam generator atmospheric dump valve. This finding acted to confirm, not conflict with, the NRC's determination that there was a minor radiological release. As a result of this finding, the licensee conducted a comprehensive evaluation of all known and possible release pathways. Upon review and evaluation of the licensee's analysis, and upon independent measurement and assessment, the NRC determined that the dose to the public and environment from this radiological release was not distinguishable from that due to naturally occurring background radiation.

Concern 2:

The availability and reliability of some radiation detectors seems to be questionable, as indicated by Attachment 4 to the AIT Report, which indicates that only 6 of 16 pressurized ion chambers (PICs) responded to computer query during one 15-minute interval. Contrarily, page 22 of the report indicates that 10 of 16 PICs responded with data during the event. It cannot be determined from the report how many PICs provided data every 15 minutes and in which sectors the non-responding PICs were located.

Response:

All 16 of the PICs were designed to record data (detect radiation) every 15 minutes and store the information on a data buffer for a period of about 3 days before the information is overwritten by the most recent data input. Additionally, all were designed to interface with, and download stored information to, the licensee's computer when queried. However, when queried on February 15, only 6 of the 16 PICs responded to download data to the licensee's computer, due to an apparent data transfer problem. Subsequently, the licensee initiated action to attempt to retrieve the information from the data buffers of the remaining PIC units physically before the February 15 data record was overwritten with new data. Snowstorms in the area hindered physical access to all of the PIC locations; however, data from the buffers of four additional PIC units located in areas that were believed to be in the most likely plume pathways were retrieved and considered in the radiological assessment. As stated in the AIT report, the data reported by these 10 PICs showed only background radiation for the duration of the steam generator tube failure event. Data from PICs located in Sectors 4, 6, 8, 12, 13, and 14 were not retrieved before they were overwritten because the weather hindered access and because they were not considered to be in the likely plume pathways.

Concern 3:

The high failure rate of the PICs raises questions about radiation measurement accuracy. From the report, it is not obvious that meaningful radiation data were obtained. Were all radiation measuring devices operable and properly calibrated? What type of radiation was measured compared with the type of radiation that is known to have been released? What are the NRC requirements for these radiation devices?

Response:

The failures of the PICs were related to their ability to download information rather than their ability to detect radiation. To the staff's knowledge, all 16 PICs were operable and functioning to detect radiation throughout the event. The AIT report described difficulty in remotely downloading the data to the licensee's computer for some of the units, and in acquiring timely physical access to data storage buffers for those that did not respond to remote query. None of these difficulties affected the accuracy of the radiation measurements that were obtained.

The NRC's radiological assessment of public health and safety did not rely solely on PIC data. Information acquired from the PIC units supplemented and corroborated other radiation measurements and survey results used to assess radiological consequence. Other radiation measurements were provided by the radiological field surveys performed by licensee and Westchester County personnel during the event, offsite surveys and soil samples collected by NRC and New York State representatives following the event, air samples from nine continuously operating fixed environmental stations surrounding the plant, and the dose measurements from about 80 thermoluminescent dosimetry fixed radiation monitoring stations located on and off the site. All of these measurements and activities indicated that no radioactivity distinguishable from background radiation was detected during, or as a result of, this occurrence; these measurements also confirmed that any radiological release was minor.

Although not required by the NRC, the Consolidated Edison Company of New York, Inc., installed the 16 PIC units to supplement and enhance the collection and evaluation of radiation exposure information from offsite locations. The licensee routinely calibrates and maintains this radiation detection equipment in accordance with formal procedures. The PICs are capable of detecting low levels of gamma radiation, which is the primary radiation type that characterizes gaseous radiological effluent releases, including the noble gases (e.g., krypton, argon, and xenon) associated with the steam generator tube leak.

Concern 4:

What is the highest possible release of radiation that could have escaped during the event that would be consistent with the readings recorded by the radiation detectors in and around the plant? How does the NRC independently know that public health and safety are being protected from adverse radiation effects when NRC has no radiation detectors of its own and has no independent way to measure radioactive emissions from the plant?

Response:

The detectors located around the site are intended to measure the impact of a radiological release on the environment. Variables such as atmospheric conditions; the radiological characteristics of the gaseous mixture; radiological dose factors; and the elevation, concentration, rate and duration of the release will have an impact on the amount of activity measured by any given detector around the plant. Because of these variables, attempts to take the measurements of individual detectors and use them to calculate the total amount of activity released would be very difficult. However, using the measured radioactivity per unit volume released, conservative estimates of rate of the release, and the duration of the release, the NRC staff was able to confirm ConEd's estimate that, in the worst case, 1.7 curies of activity were released as a result of the February 15 event. A release of 1.7 curies is consistent with the indications of the detectors around the site.

While the agency does not operate any independent system of radiation detectors or effluent measurement devices, the NRC has confidence, based on performance and experience, that the NRC's independent inspection program in this area provides sufficient oversight of licensee performance to ensure that public health and safety and protection of the environment is maintained. We periodically inspect the licensee's programs, practices and methods so as to verify and validate their conformance with radiological effluent technical specifications. The NRC also reviews and inspects the licensee's Radiological Environmental Monitoring Program to determine whether the licensee is effectively monitoring the radiological impact of plant operations on the environment, and to confirm that radiological effluents are properly managed, processed, monitored, and controlled; furthermore, following the February 15 event NRC personnel analyzed soil samples in the vicinity of IP2.

Concern 5:

How can a drill which uses hypothetical children and vehicular traffic on a very small scale be deemed satisfactory considering the population density in the area? It would be prudent to schedule an exercise that would permit full public participation.

Response:

NRC regulations specifically state that full-participation exercises that test as much of the licensee, State and local emergency plans as is reasonably achievable are to be conducted without mandatory public participation. The actual movement of any large number of people during an exercise is not generally necessary or desirable for the following reasons:

1. Provided that public officials take the actions indicated in their emergency preparedness plans, persons who have access to an automobile should have no unusual tasks to perform. People without access to cars receive special attention and special plans must be in place to provide buses, ambulances, or other appropriate vehicles for them. These plans and the availability of necessary resources are tested during full-participation exercises.

2. Computer models are used to address the movement of people in cars and other vehicles and to develop estimates of the time required to evacuate the plume EPZ.

> Because there is always some risk of death or injury whenever someone is transported in a vehicle, movement of a large group of people in an exercise may represent an undue risk, and is not considered a safe or prudent method for evaluating the effectiveness of emergency plans. The use of computer models that take into account such factors as population distribution, road network, time of day, and effects of adverse weather, provides an acceptable method for estimating evacuation times and does not jeopardize the health and safety of the public.

Throughout the country, State and local governments exercise their emergency plans for a variety of hypothetical natural and man-made hazards without large-scale public participation. We believe that this methodology is acceptable for a hypothetical radiological accident, as well. Exercises are conducted at nuclear power plant sites to ensure that utility, State, and local emergency decision-makers and personnel understand and can perform their duties in response to a radiological emergency.

Concern 6:

When does the NRC plan to complete a review of the Federal Emergency Management Agency (FEMA) reports included in its letter of June 13, 2000? What standards are used in the review?

Response:

The NRC and FEMA are the two Federal agencies tasked to evaluate emergency preparedness at and around nuclear power plants as described in NRC and FEMA regulations and in a Memorandum of Understanding (MOU) between FEMA and the NRC (58 FR 47996). FEMA has the lead responsibility for assessing offsite radiological emergency response plans and preparedness. The NRC assesses onsite emergency planning and reviews FEMA's assessment of offsite preparedness for the purpose of making findings on the overall state of emergency preparedness. As stated in the NRC/FEMA MOU, FEMA exercise evaluations identify one of the following conditions: (1) there is reasonable assurance that the plans are adequate and can be implemented as demonstrated in the exercise; (2) there are deficiencies that must be corrected; or (3) FEMA is undecided and will provide a schedule of actions leading to a decision.

After the initial approval of emergency preparedness for a site, our review of the FEMA exercise reports is confirmatory in nature to assure that offsite emergency preparedness is being adequately maintained and that any deficiencies identified by FEMA have been, or are being, corrected in accordance with the NRC/FEMA MOU. These reviews are generally not formally documented. For the FEMA reports dated February 19, 1999, and February 28, 2000, FEMA determined that, based on the results of the respective exercises, the offsite radiological emergency response plans for the State of New York and the affected local jurisdictions, specific to the IP2 site, could be implemented and were adequate to provide reasonable assurance that appropriate measures could be taken offsite to protect the health and safety of the public in the event of a radiological emergency at the site. Based on that determination by FEMA, no further action by the NRC was necessary.

The standards for emergency preparedness are contained in NRC and FEMA regulations, and criteria for the evaluation of emergency preparedness are provided in the joint NRC/FEMA

document NUREG-0654/FEMA-REP 1, Rev. 1, “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,” dated November 1980. FEMA guidance for exercise evaluation, based on the emergency preparedness standards and evaluation criteria of NUREG-0654/FEMA-REP 1, Rev. 1, is provided in FEMA-REP-14, “Radiological Emergency Preparedness Exercise Manual,” dated September 1991, and FEMA-REP-15, “Radiological Emergency Preparedness Exercise Evaluation Methodology,” dated September 1991. FEMA updated its exercise reporting guidance in a document entitled “Standard Exercise Report Format,” dated October 1995. FEMA indicated that this document is to be used as a companion to FEMA-REP-14 and 15 for evaluating and documenting the performance of offsite response organizations participating in radiological preparedness exercises. The NRC participated in the development of the FEMA guidance and a member of the NRC staff serves on the FEMA Regional Assistance Committee, which assists FEMA in evaluating exercises. FEMA is currently in the process of revising its guidance for exercise evaluation again with NRC support.

Concern 7:

Why is there a 10-mile plume pathway and a 50-mile ingestion pathway Emergency Planning Zone? Shouldn’t the plume pathway evacuation go the full 50 miles?

Response:

The NRC uses a defense-in-depth approach to ensuring adequate protection of the public health and safety. This safety approach: (1) requires high quality in the design, construction, and operation of nuclear power plants to reduce the likelihood of malfunctions in the first instance; (2) recognizes that equipment can fail and operators can make mistakes, thus requiring safety systems to reduce the chances that malfunctions will lead to accidents that release fission products from the fuel; and (3) recognizes that, in spite of these precautions, serious fuel damage accidents can happen, therefore requiring containment structures and other safety features to prevent the release of fission products off site. Following the accident at Three Mile Island, emergency planning was strengthened as part of the defense-in-depth safety philosophy to provide that, even in the unlikely event of an offsite fission product release, there is reasonable assurance that adequate protective measures can be taken to protect the population around nuclear power plants. The Commission issued substantial revisions to its emergency planning regulations including requirements for emergency planning zones (EPZs).

The size of the EPZs for commercial nuclear power plants is specified in NRC regulations [10 CFR 50.33(g), 50.54(s)(1), and Appendix E to Part 50]. The EPZs are defined as the areas for which planning is needed to ensure that prompt and effective actions can be taken to protect the public in the event of an accident. The technical basis for the size of the EPZs is given in NUREG-0396, EPA 520/1-78-016, “Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants,” a joint NRC and Environmental Protection Agency (EPA) task force report issued in December 1978. The task force was established in response to a request from State radiation control program directors for guidance on the most severe accident basis for which radiological emergency response plans should be developed by offsite agencies. The major recommendation of the task force was that two EPZs should be established: an EPZ with about a 10-mile radius for planning to protect the public from airborne exposure (the plume exposure

pathway), and an EPZ with about a 50-mile radius for planning for actions to prevent radioactive material from entering the food chain (the ingestion pathway). The NRC/EPA task force indicated that it would be unlikely that any protective actions for the plume exposure pathway would be required beyond the 10-mile plume EPZ.

The choice of the size of the EPZs represents a judgment based on the consideration of the probabilities and consequences of a spectrum of accidents, and on the extent of detailed planning required to ensure an adequate response to a radiological emergency. Changes to the size of EPZs have been the subject of petitions to the NRC, contentions in licensing hearings, and requests from licensees and the nuclear industry. After careful consideration of these proposals, the NRC has consistently found that a 10-mile plume exposure pathway EPZ provides an acceptable planning basis for emergency response. One of the principal supports for the 10-mile EPZ is that detailed planning within 10 miles provides a substantial base for expansion of response efforts beyond 10 miles if necessary.

In the event of a severe reactor accident with offsite consequences, NRC guidance calls for the prompt evacuation of the population within a 2-mile radius of the plant and about 5 miles in the downwind direction based upon an assessment of plant conditions. The guidance also indicates that these protective actions would be expanded, as necessary, based upon further assessment of plant conditions, dose projections, and field monitoring information. At longer distances, shelter is usually the appropriate protective action followed by relocation, if necessary, of segments of the population based on the analysis of radiological measurements taken in the field. The major protective action planned for the 50-mile EPZ is protection of the public from the ingestion of contaminated food and water. It is considered extremely unlikely that evacuation would be required at a distance of 50 miles even for the most severe type of accident. The planning established for the 10-mile and 50-mile EPZs, the general decrease in consequences and the greater time available for taking protective actions as the distance from the plant increases, and the availability of monitoring data upon which to base protective actions provide assurance that appropriate protective actions can be taken for the population within 50 miles of the plant.

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