

December 29, 1999

The Honorable Edward Markey  
United States House of Representatives  
Washington, D.C. 20515

Dear Congressman Markey:

I am responding to your letter of December 13, 1999, in which you expressed your concerns regarding a problem involving the control rod position deviation alarm at Indian Point Nuclear Generating Unit No. 2 (IP2) that was described in Licensee Event Report (LER) 1999-019-00. You also suggested that the U. S. Nuclear Regulatory Commission (NRC) take three additional actions.

IP2 has 53 control rods in four control banks and four shutdown banks that serve to control reactor power and automatically shut down the reactor when necessary. Control rod manipulations are made in accordance with plant procedures and are also governed by the plant Technical Specifications (TSs), which provide limits on the amount of misalignment between individual rod positions and the control rod bank demand position. During control rod manipulations, the control room operators verify rod alignment by observing that the individual indication of rod position is within the TS rod misalignment limits. As an added aid to the operator, the PROTEUS plant computer at IP2 gives an alarm through the RODLOW program when these limits are reached. (This program is unique to the PROTEUS system at IP2.) Although the TSs establish the misalignment limits, it should be noted that the alarm function is not required by the plant TSs.

The problem at IP2 involved the disabling of the alarm function for the reactor control rod position deviation from March to October 1999. The RODLOW program was erroneously disabled during the Year 2000 (Y2K) detailed assessment of PROTEUS and was not enabled when PROTEUS was upgraded and returned to service. During the time the alarm function was unavailable, plant operators were routinely logging the position of the control rods and verifying that they were acceptably aligned. Therefore, no violations of the plant TSs occurred and, as stated in the LER, the core power distribution and peaking factors were not adversely affected during the period that the RODLOW program was disabled. The root cause of the problem was inadequate tracking of software upgrades and improper software configuration control. The root cause is a plant-specific problem, and the licensee, Consolidated Edison Corporation of New York, Inc. (Con Ed), has addressed this tracking deficiency as part of its corrective action program. The NRC resident inspectors at IP2 have reviewed licensee implementation of the

corrective actions and found that all affected software issues have been properly addressed. Corrective actions, including additional Y2K testing of the RODLOW program in PROTEUS, have been completed.

It should be noted that the control rod control system, associated indication systems, and PROTEUS are non-safety systems. The ability to manipulate the control rods while controlling reactor power was not affected, nor was the ability of the control rods to insert fully to shut down the reactor, if so demanded by the safety-related reactor protection system. Therefore, no safety systems were affected by the control rod position deviation alarm problem and, as indicated in the NRC press release of July 7, 1999, all safety-related computer systems at IP2 have been Y2K ready since July 1999.

The NRC, its licensees, and the nuclear industry have recognized that in spite of every reasonable effort by licensees to identify and correct Y2K computer system problems at their facilities, some software, applications, equipment, and systems may remain susceptible to the Y2K problem and that software, data, and systems external to the facility could adversely affect the facility. Therefore, to help ensure continued safe operation, contingency plans have been formulated for systems and equipment involved in Y2K repairs. Preparation of Y2K contingency plans is an extension of normal industry practice to have procedures in place for responding to off-normal events or unexpected equipment failures. Con Ed has these procedures in place, as well as a contingency plan for the loss of the PROTEUS computer at IP2.

In your letter you suggested additional review of Y2K programs at all nuclear plants to ensure that computer systems and the rod position deviation alarm system are not inadvertently disabled. The root cause of the IP2 event was plant-specific, and the licensee has taken appropriate corrective actions to prevent its recurrence. Consistent with the provisions of Appendix B, to 10 CFR Part 50, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," licensees have established programs and processes to control plant modifications. On the basis of our ongoing inspections and oversight activities, we believe licensees are properly implementing Appendix B provisions and that the IP2 computer issue was an isolated problem.

You also noted previous suggestions regarding independent verification and validation (IV&V) of licensee's Y2K programs and suggested that NRC encourage IV&V of the Y2K procedures used at nuclear facilities. As discussed in the enclosure, IV&V activities have been conducted at all nuclear facilities, and NRC reviews have confirmed these activities. According to Con Ed, the Y2K program at IP2 underwent three industry audits. The NRC review was completed on May 14, 1999, and a follow-up review was completed on August 3, 1999. Consequently, we have reasonable assurance that Y2K programs and processes have been adequately implemented at IP2 as well as at other nuclear power plants.

As you have stated, the safe operation of nuclear plants is vital, and we at the NRC will do what is necessary in our oversight of nuclear power plant licensee Y2K readiness efforts in order to ensure safe operation of these facilities throughout 1999, the transition to Year 2000, and

Honorable E. Markey

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beyond. I trust we have been responsive to your concerns. Please contact me if you have any additional questions on this matter.

Sincerely,

***(/RA by R. A. Meserve)***

Richard A. Meserve

Enclosure: Independent Verification and  
Validation Activities at Nuclear Power Plants

Honorable E. Markey

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Sincerely,

*(/RA by R. A. Meserve)*

Richard A. Meserve

Enclosure: Independent Verification and Validation Activities at Nuclear Power Plants

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## Independent Verification and Validation Activities at Nuclear Power Plants

Year 2000 (Y2K) readiness activities have been completed at all nuclear power plants in accordance with plant-specific Y2K readiness programs, which are based on the guidelines of Nuclear Energy Institute/Nuclear Utilities Software Management Group (NEI/NUSMG) 97-07, "Nuclear Utility Year 2000 Readiness." NEI/NUSMG 97-07, which was found acceptable by the U. S. Nuclear Regulatory Commission (NRC), includes guidance regarding validation of system readiness and quality assurance (QA) measures. The staff's reviews confirmed that the licensees utilized NRC-inspected QA programs and processes required by NRC regulations, when completing Y2K activities.

Y2K QA measures are an outgrowth of nuclear QA programs and processes that are in place at all nuclear reactors and that provide an independent assurance of the quality of licensee activities. Internal QA activities, external reviews, third-party audits, and independent verification and validation (IV&V) all contribute to high confidence in the licensees' activities to achieve Y2K readiness.

Internal QA activities consist of those activities normally performed by the licensee during plant modifications or routine maintenance activities. The licensee management reviews plant modification and maintenance activities and ensures that these activities are conducted according to approved plant procedures and QA requirements. For safety-related systems and mission-critical systems, an independent check of the plant modification or maintenance activity is conducted by another technician or engineer, depending on the activity.

External reviews of plant modifications or maintenance activities are performed by an independent group, such as the licensee's QA group or a peer group from an external organization. The results and recommendations from these reviews are provided to licensee senior management as a means of improving the licensee's internal processes. For Y2K-readiness preparations, these peer group reviews were conducted by staff members from other licensees, industry experts, and NEI staff. Several of these peer group audits were reviewed by the NRC in the initial 12 audits it conducted between September 1998 and February 1999. Specifically, in March 1999, the nuclear industry reported to the North American Electric Reliability Council that 65 of 66 sites had undergone at least one industry audit. (The last facility audit was completed in April 1999.) Industry audits included 56 audits by QA departments, 36 cross-utility audits, and 46 third-party industry audits. Most facilities have conducted multiple audits, as reflected by the sum of 139 reported audits at the 66 reactor sites (which include all 103 operating nuclear power plants). In short, licensees for all reactor sites have received at least one independent industry audit of their Y2K program.

In addition, IV&V of software modification activities for systems and components was performed using the criteria for independence required by 10 CFR Part 50, Appendix B. IV&V is part of the licensee's normal software modification and maintenance safety-related and mission-critical applications. It entails a specific degree of technical, managerial, and financial independence from the development organization.

**ENCLOSURE**

NRC Y2K reviews conducted at each operating reactor site confirmed that licensees have implemented appropriate QA measures to provide a high level of confidence in their Y2K programs. The staff has concluded that sufficient independent validation has been conducted in connection with licensee Y2K programs.