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November 24, 1998

Re: Indian Point Unit No. 2  
Docket No. 50-247

Document Control Desk  
US Nuclear Regulatory Commission  
Mail Station P1-137  
Washington, DC 20555-0001

**SUBJECT:** 10 CFR 50.54 (f) Response to NRC Generic Letter 98-02: "Loss of Reactor Coolant Inventory and Associated Potential for Loss of Emergency Mitigation Functions While in a Shutdown Condition"

Pursuant to 10 CFR 50.54 (f), this letter and attachment constitute Consolidated Edison Company of New York, Inc.'s (Con Edison's) 180-day written response to the subject generic letter.

Generic Letter 98-02 requests addressees to (1) assess the susceptibility of their facility's residual heat removal (RHR) and emergency core cooling (ECCS) systems to common-cause failure as a result of inadvertent reactor coolant system (RCS) drain down while in a shutdown condition, and (2) pursuant to 10 CFR 50.54 (f), submit information concerning their findings regarding potential pathways for inadvertent RCS draindown and the suitability of surveillance, maintenance, modification and operating practices and procedures regarding configuration control during reactor shutdown cooling.

No new regulatory commitments are being made by Con Edison in this correspondence. Should you or your staff have any questions regarding this matter, please contact Mr. Charles W. Jackson, Manager, Nuclear Safety & Licensing.

Very truly yours,



Attachment

Subscribed and sworn to  
before me 24<sup>th</sup> day  
of November 1998.

Karen L. Lancaster  
Notary Public

KAREN L. LANCASTER  
Notary Public, State of New York  
No. 60-4643659  
Qualified In Westchester County  
Term Expires 12/31/00

ADD 1/1

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ATTACHMENT

Response to Generic Letter 98-02:

"Loss of Reactor Coolant Inventory and Associated Potential for Loss of Emergency Mitigation Functions While in a Shutdown Condition"

Consolidated Edison Company of New York, Inc.  
Indian Point Unit No. 2  
Docket No. 50-247  
November 1998

## Requested Information

- (1) addressees are required to perform the following: (1) an assessment of whether your emergency core cooling systems include certain design features, such as a common pump suction header, which can render the systems susceptible to common-cause failure as a result of events similar to the Wolf Creek RCS drain-down event of September 17, 1994;

### Response to item (1):

Con Edison has performed an assessment of the Indian Point Unit 2 (IP-2) emergency core cooling and residual heat removal systems and has determined that certain design features exist which could subject such systems to the susceptibility of a common cause failure similar to the Wolf Creek RCS drain down event. Specifically, we have determined that a flow path within the residual heat removal (RHR) system exists wherein an inadvertent RCS drain-down to the refueling water storage tank (RWST) could occur if valve 883 is mispositioned during hot shutdown mode. When the RHR system is providing its shutdown cooling function, a flow path exists for diverting RCS inventory to the RWST.

Valve 883 is a motor-operated valve which is normally closed, sealed and electrically-deenergized at its motor control center breaker with a caution tag. Redundant valve position indication is provided within the control room. This valve provides isolation capability for RHR return line (#190) between the discharge of the RHR pumps and the RWST. Line 190 is used during refueling operations to provide a drain down path from the refueling cavity to the RWST. The mispositioning valve 883 is considered to be highly unlikely as a result of the implementation of administrative and physical controls. Nevertheless, the inadvertent opening of valve 883 during RHR cooling would direct the RCS water inventory into the common supply line from the RWST to the emergency core cooling system pumps. This hot RCS water could potentially flash into steam within the line, thus creating a steam/water mixture which could lead to cavitation of the RHR pumps. In addition, water flashing to steam in the line and the RWST could cause serious mechanical damage to the piping and the RWST as a result of water hammer. During plant shutdown conditions, the RCS is normally cooled by the RHR system. RCS inventory is circulated from loop 22 hot leg through a RHR pump, through the RHR heat exchanger, back to the RCS.

The RHR system is also used for RCS purification purposes. Reactor coolant is taken from the loop 22 hot leg, passes through the RHR heat exchangers via valve 733A (or B) to the CVCS letdown. As noted above, if valve 883 is inadvertently opened while the RHR is supporting the RCS purification operation, the RCS inventory would also be diverted to the RWST.

Thus, a common suction line design feature at IP-2 serving both the safety injection and the residual heat removal pumps is susceptible to a common-cause failure which could result in a loss of residual heat removal capability similar to the Wolf Creek event.

### Requested Information

- (2) and if this susceptibility is found, (2) prepare, with consideration of plant-specific design attributes, a description of the features of your Appendix B quality assurance program (for example, the methods used to verify valve position, the controls in place to assure compliance with plant surveillance, maintenance, modification and operating procedures, and the adequacy of operator training for such activities) that provide assurance that the safety-related functions of the RHR system and ECCS will not be adversely affected by activities conducted at hot shutdown (such as occurred at Wolf Creek)

### Response to item (2)

#### Quality Assurance Program

The quality assurance program and administrative controls which apply to the operation of IP-2 are described in the Quality Assurance Program Description (QAPD). This program conforms to the requirements of 10 CFR 50, Appendix B. Administrative controls and quality assurance requirements are described in documents such as corporate instructions, station administrative orders, and station procedures. The requirement that procedures be adhered to is both a plant administrative requirement and a plant Technical Specification requirement. Documentation of procedure compliance is required when specifically called for by the procedure in question. For example, a startup "Procedure Check-Off" is completed during plant warm-ups and power ascensions from shutdown conditions; a shutdown "Procedure Check-Off" is completed during planned plant shutdowns and cooldowns.

#### Equipment Control

Prior approval by Operations personnel is required for the release of equipment or systems for maintenance or repair, including when the unit is at hot shutdown. Normally, for interfacing station activities, Maintenance supervision, Instrument and Control supervision, and Operations supervision meet beforehand to plan the work. They verify that equipment or systems can be released, determine the time required to do the job, and the safety considerations to personnel and the public.

Shutdown, start-up and normal operating procedures guide the preparation of equipment or systems to support the applicable mode of plant operation for equipment or system maintenance. They include cognizance of such parameters as monitoring and control of reactivity, load reduction and cooldown rates, sequence of activating or deactivating, provisions for decay heat removal and emergency operating situations. Specific check-lists provide the assurance that pertinent factors are considered. Temporary alterations which include such items as bypass devices, lifted electrical contacts, varying of setpoint limits, jumping, and opening of trip links require prior approval from, and are controlled by Senior Watch Supervisors acting in accordance with approved directions. Upon completion of servicing work, operations personnel are responsible for verifying that the work is complete and that operating items are restored to prerequisite positions in accordance with applicable procedures.

## Residual Heat Removal

The RHR system is designed such that the RHR pumps may be used to return the water from the refueling cavity back to the RWST during refueling operations. Valve 883 isolates the RHR pump discharge return line to the RWST (Line #190) during normal plant operation. Operation of this valve is limited to the refueling mode when draindown of water from the refueling cavity to the RWST is necessary, and during valve testing. The valve is kept in a closed, sealed position, and electrically de-energized at its motor control center breaker with a caution tag hung during normal plant operation.

## Administrative Controls

In addition to the operational constraints mentioned above, Con Edison utilizes the following station administrative and system operating procedures to prevent inadvertently opening valve 883 during hot shutdown conditions. These procedures are applicable to the conduct of operations, outage planning, and work control.

SOP 4.2.1 "Residual Heat Removal System Operations," provides instructions for the operation of the RHR system and specifies valve positions per check-off lists when placing the RHR system in operation. COL 10, "Locked Safeguards Valves," requires that valve 883 be closed, and sealed; and its motor control center breaker (MCC26B-6HR) be off, and also sealed. A note within this SOP states that "Caution Tags should be placed on de-energized valves AND their associated MCCs while the RCS is depressurized to prevent re-positioning."

SAO-136 "Management of Outage," identifies the responsibilities and actions required to conduct planned outages. Included within the planning are the review requirements for inventory control and inadvertent transfer of RCS inventory.

SAO-202 "Conduct of Infrequently Performed Tests and Evolutions," defines infrequent tests or evolutions, the expectations of management for their conduct, and the administrative control requirements to perform these activities. This SAO requires that specific planning, training, increased management oversight, and supervisory controls be identified prior to conducting these activities.

OAD-38 "Outage Risk Assessment Management," identifies requirements for the assessment of risks associated with outage activities. This OAD provides direction for pre-outage planning to ensure that a system, structure, or component (SSC) is not placed in an undesirable high risk condition. This OAD requires that outage activities, such as maintenance, testing, and repair, be controlled such that these activities do not adversely affect the ability of the SSCs to perform their required safety functions during the outage.

OAD-19 "Tagout Program," identifies the guidelines and requirements for tagging out equipment. This OAD contains specific requirements that work permits be issued and coordinated through Operations.

## Summary

In response to NRC Information Notice 95-03 regarding the Wolf Creek event, Con Edison had performed a review of the adequacy of its existing procedures and training to preclude a similar event from occurring at IP-2. Based upon that review and our actions in response to this generic letter, Con Edison believes that the current procedural and administrative controls are sufficient to preclude the occurrence of an inadvertent draindown of RCS to the RWST during shutdown conditions, and that the concerns identified in the generic letter have been appropriately addressed.