Indian Point 3
Nuclear Power Plant
P.O. Box 215
Buchanan, New York 10511
914 736.8001

NewYorkPower Authority

Robert J. Barrett
Site Executive Officer

November 19, 1998
IPN-98-123

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

SUBJECT: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
License No. DPR-64
Response to Generic Letter 98-02

Dear Sir:

In response to Generic Letter 98-02, the Authority performed an assessment of the configuration of the Indian Point 3 (IP3) safety injection (SI) and residual heat removal (RHR) systems. The purpose of this assessment was to determine whether these systems included certain design features which could render them susceptible to common-cause failure as a result of events similar to the Wolf Creek reactor coolant system (RCS) drain-down event of September 17, 1994. Based on a review of the Wolf Creek event and the configuration of the IP3 systems, the Authority has concluded that the IP3 emergency core cooling (ECC) systems are potentially susceptible to an event similar to the Wolf Creek event. The results of this assessment are included in Attachment I.

The Authority has reviewed its operations procedures, outage risk assessment process, surveillance test procedures, maintenance activities, and training to determine if additional procedural guidance and licensed operator training are appropriate to prevent an incident similar to Wolf Creek from happening at Indian Point 3. The Authority has concluded that additional precautions should be added to certain risk assessment and operations procedures to prevent an incident similar to the Wolf Creek event from happening at Indian Point 3. Also, licensed operators will be provided training on lessons learned from the Wolf Creek event.

The Authority intends to complete these efforts prior to the next refueling outage. However, the Authority is not making any commitments in this submittal.

1/1
A001

010018
9812010087 981119
PDR ADOCK 05000286
P PDR

If you have any questions regarding this matter, please contact Mr. K. Peters at (914) 736-8029.

Very truly yours,

Robert J. Barrett
Site Executive Officer
Indian Point 3 Nuclear Power Plant

STATE OF NEW YORK
COUNTY OF WESTCHESTER
Subscribed and sworn to before me

this 19th day of November 1998

Notary Public

CHRISTINA LEITMANN
Notary Public, State of New York
No. 01LE5070946
Qualified in Putnam County
Commission Expires January 6, 1999

Attachment: as stated

cc: Regional Administrator
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Resident Inspector's Office
Indian Point 3
U. S. Nuclear Regulatory Commission
P. O. Box 337
Buchanan, NY 10511

Mr. George Wunder, Project Manager
Project Directorate I-1
Division of Reactor Projects I/II
U. S. Nuclear Regulatory Commission
Mail Stop 14B2
Washington, DC 20555

ATTACHMENT I

ASSESSMENT OF SUSCEPTIBILITY FOR IP3

RHR AND SI SYSTEMS TO WOLF CREEK EVENT (GL 98-02)

NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET No. 50-286
DPR-64

Background

The Nuclear Regulatory Commission issued Generic Letter 98-02, "Loss of Reactor Coolant Inventory and Associated Potential for Loss of Emergency Mitigation Functions While in a Shutdown Condition." Prior to GL 98-02, the NRC had issued Information Notice (IN) 95-03, "Loss of Reactor Coolant Inventory and Potential Loss of Emergency Mitigation Functions While in a Shutdown Condition." Both the GL and the IN addressed the incident at the Wolf Creek plant involving the loss of reactor coolant inventory while the reactor was in a hot shutdown condition. The GL requested licensees to perform an assessment to determine whether their emergency core cooling (ECC) systems included certain design features which could render the systems susceptible to common-cause failure as a result of events similar to the Wolf Creek reactor coolant system (RCS) drain-down event. If the assessment reveals that the susceptibility exists, the result of the assessment is required to be submitted to the NRC. Also, the GL requested licensees to prepare, with consideration of plant-specific design attributes, a description of the features of their Appendix B quality assurance program that provided assurance that the safety-related functions of the residual heat removal system (RHR) and ECC systems would not be adversely affected by activities conducted at hot shutdown. This information is not required to be submitted to the NRC but shall be kept in a retrievable system for verification.

Assessment of Susceptibility for IP3 RHR and Safety Injection Systems

The Authority has reviewed the Wolf Creek system configuration and has determined that the RHR and safety injection (SI) system configuration for IP3, as shown on Drawings 9321-F-27353 and 9321-F-27503, is not identical to Wolf Creek. Wolf Creek's RHR system has two suction lines, each associated with a train of RHR system. These suction lines are cross connected and provide a flow path back to the refueling water storage tank (RWST). Unlike Wolf Creek, IP3 has only one suction line from the RCS for both RHR pumps. However, IP3 could be susceptible to an inadvertent drain-down and flashing in the common suction line from the RWST to the suction of the SI and RHR pumps. Motor operated RHR suction valves AC-MOV-730 and 731 are installed in series in the line from the RCS to both RHR pumps. During normal power operation, injection and recirculation phases of a large break LOCA, both valves are de-energized closed. These valves are opened to allow RHR system operation to cool the RCS when the RCS is not being cooled by the steam generators. These valves are energized and opened in accordance with plant procedures when the plant is in hot shutdown with the RCS pressure less than 400 psig and temperature between 250 and 350 degrees F.

When the RHR system is being used to remove decay heat, it is possible that with

improper valve alignment, the RCS could potentially be inadvertently drained to the containment sump through the 14 inch line that is used as a suction line to the RHR pumps during the recirculation phase of a LOCA. This line does not contain a check valve. This containment sump suction line is equipped with two motor operated isolation valves in series, SI-MOV-885A and 885B. To prevent inadvertent drain-down to the sump, AC-MOV-730 is interlocked with SI-MOV-885A such that if AC-MOV-730 has left its closed limit seat, SI-MOV-885A can not be opened. For added drain-down protection, valve AC-MOV-731 is interlocked with SI-MOV-885B such that if AC-MOV-731 has left its closed limit seat, SI-MOV-885B can not be opened. This interlock protection is not effective if AC-MOV-730 or 731 is deenergized or in the unlikely event that both SI-MOV-885A and SI-MOV-885B are opened manually using the handwheel. If such an incident did occur, no steam binding of the RWST suction header would be expected because there is a check valve and a normally closed isolation valve in the RWST header. If operator action were not taken to mitigate this incident, it could result in hot leg uncovery, cavitation, and potential loss of an operating RHR pump similar to the Wolf Creek experience. However, RCS inventory would have the ability to be restored because the RWST could be injected using an SI pump.

During decay heat removal in hot shutdown, it is possible that with improper valve alignment, the RCS could potentially be inadvertently drained to the RWST through an 8 inch line that is used as a suction line to the SI pumps during the recirculation phase of a LOCA. This line is equipped with two motor operated isolation valves SI-MOV-888A and 888B, in parallel. To prevent inadvertent drain-down to the RWST, AC-MOV-730 is interlocked with SI-MOV-888A such that if AC-MOV-730 has left its closed limit seat, SI-MOV-888A can not be opened. Also, valve AC-MOV-731 is interlocked with SI-MOV-888B such that if AC-MOV-731 has left its closed limit seat, SI-MOV-888B can not be opened. This interlock position is not effective if AC-MOV-730 or 731 is deenergized or in the unlikely event that either SI-MOV-888A or 888B is opened manually using the handwheel. If operator action were not taken to mitigate this incident, it could result in hot leg uncovery, cavitation, and loss of an operating RHR pump. With this scenario in the hot shutdown condition, there is a potential for steam binding in the SI pump suction header similar to the Wolf Creek experience.

Additionally, during decay heat removal in hot shutdown, with improper valve alignment, the RCS could be inadvertently drained to the RWST through an 8 inch return line to the RWST supply line. This 8 inch line is used as an alternate low to high head supply line to one of the SI pumps or as a means to drain the RCS to the RWST following refueling activities. This line is equipped with a motor operated isolation valve SI-MOV-883. To prevent inadvertent RCS drain-down to the RWST, valves AC-MOV-730 and 731 are interlocked with SI-MOV-883 such that if AC-MOV-730 or 731 has left its closed limit seat, SI-MOV-883 can not be opened. Also, SI-MOV-883 will auto close, if either AC-MOV-730 or 731 leaves its closed seat and SI-MOV-883 is open. The interlock protection is not effective if AC-MOV-730 and 731 are deenergized or in the unlikely event that SI-MOV-883 is opened manually using the handwheel. If operator action does not occur to mitigate this incident, it could result in

hot leg uncovery, cavitation, and loss of the operating RHR pump. With this scenario in the hot shutdown condition, there is a potential of steam binding in the RWST header and challenge to the ECCS pumps in a manner similar to that experienced at Wolf Creek.

Finally, if, while the RHR system is in service in hot shutdown condition, check valve SI-881 fails open or leaks excessively and SI-MOV-882 is open, the potential of steam binding the RWST suction line could exist.

Conclusion

The Authority has reviewed its operations procedures, outage risk assessment process, surveillance test procedures, maintenance activities, and training to determine if additional procedural guidance and licensed operator training are appropriate to prevent an incident similar to Wolf Creek from happening at Indian Point 3. The Authority has concluded that additional precautions should be added to certain risk assessment and operations procedures to prevent an incident similar to Wolf Creek from happening at Indian Point 3. Also, licensed operators will be provided training on lessons learned from the Wolf Creek event. The Authority intends to make these improvements prior to the next refueling outage.