123 Main Street
White Plains, New York 10601
914 681.6240

New York Power Authority

February 6, 1990
IPN-90-004

John C. Brons
Executive Vice President
Nuclear Generation

U. S. Nuclear Regulatory Commission
Mail Station P1 - 137
Washington, D. C. 20555

ATTN: Document Control Desk

Subject: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
Response to NRC Generic Letter 89-13
Service Water System Problems Affecting
Safety-Related Equipment

References: 1. NRC Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment," dated July 18, 1989.

Dear Sir:

Generic Letter 89-13 (Reference 1) requested licensees to supply information about their respective service water systems (SWSs).

Attachment 1 to this letter is the Authority's response to Generic Letter 89-13 for the Indian Point 3 plant. The Attachment includes a summary of the review performed and plans and schedules to enhance and ensure continued SWS reliability.

Should you or your staff have any questions regarding this matter, please contact Mr. P. Kokolakis of my staff.

Very truly yours,

John C Brons

John C. Brons
Executive Vice President
Nuclear Generation

STATE OF NEW YORK
COUNTY OF WESTCHESTER

Subscribed and sworn to before me
this 6th day of February 1990.

Mina Holden

Notary Public

MINA HOLDEN
NOTARY PUBLIC, State of New York
Westchester County
No. 4829150
My Commission Expires Aug. 31, 1991

cc: See next page.

A065
1/1

cc: 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, New York 10511

Mr. J. D. Neighbors, Sr. Project Manager
Project Directorate I-1
Division of Reactor Projects-I/II
U.S. Nuclear Regulatory Commission
Mail Stop 14-B2
Washington, D.C. 20555

ATTACHMENT 1 TO IPN-90-004

RESPONSE TO NRC GENERIC LETTER 89-13 SERVICE WATER SYSTEM PROBLEMS AFFECTING SAFETY-RELATED EQUIPMENT

INTRODUCTION

Generic Letter 89-13 requests licensees to ensure that their service water systems (SWSs) comply with 10 CFR 50 Appendix A, General Design Criteria 44, 45 and 46 and 10 CFR 50 Appendix B, Section XI.

In response to this generic letter, the Authority evaluated the Indian Point 3 service water system (SWS). The evaluation included a preliminary review of design bases, operation, maintenance, testing and training.

The following structures, systems and components are affected by Generic Letter 89-13:

STRUCTURE

Intake Structure

SYSTEM

Service Water System

COMPONENTS

1. Component cooling water heat exchangers
2. Control room air conditioning units
3. Containment recirculation fan cooling coils
4. Containment recirculation fan motor cooling coils
5. Diesel generator lube oil coolers
6. Diesel generator jacket water coolers
7. Service water pumps
8. Pump discharge strainers (main)
9. Associated piping and valves for above components

Notes:
1. Those safety-related heat exchangers that are serviced by the component cooling water system which are operated and maintained under controlled water chemistry conditions are not included in this evaluation.
2. The need to include the non-safety-related backup service water pumps will be evaluated.

IMPLEMENTATION PLAN

Item I: Surveillance and Control Techniques to reduce the incidence of flow blockage as a result of biofouling.

During the 1987 and 1989 IP-3 refueling outages, the service water intake bay was dewatered, inspected and cleaned to facilitate installation of the new service water pumps. Based on the findings of these outages, the Authority proposes to inspect the service water intake bay during the 1990 refueling outage and every refueling outage thereafter. If the inspection reveals evidence of biofouling which could hinder flow during the subsequent cycle, the area will be cleaned and accumulations discharged in accordance with New York State Environmental Regulations.

At this time, there is no evidence of Corbicula Fluminea (Asiatic clams) in the Hudson River and there is no indication of introduction in the near future. However, the Authority has concerns over the possible introduction of Dreissena Polymorpha (zebra mussels) into the Hudson River, and therefore, a task force has been formed. The group is addressing technical issues involved in controlling this species and establishing a monitoring program to determine the presence of zebra mussels in the lower Hudson River.

To reduce biofouling of the SWS, high level chlorination of the service water pump bay is performed periodically. Additionally, heat exchangers are regularly inspected and cleaned under the IP-3 Preventative Maintenance Program and specifically in accordance with Maintenance Procedure HTX-001-GEN, Rev. 1, "Inspection and Cleaning of Heat Exchangers." Based on the results of the findings, chlorination of the service water pump bay is adjusted accordingly.

Biocides are not used to mitigate microbiologically influenced corrosion (MIC) because it presently cannot be targeted. Instead, periodic chlorination of the SWS and frequent regular maintenance inspection and cleaning of the heat exchangers by means of Maintenance Procedure HTX-001-GEN, Rev. 1, will be used to control MIC. Additionally, IP-3's SWS piping that is not cement-lined (cement-lined piping is not susceptible to MIC) will be incorporated into the IP3 Erosion/Corrosion Program.

A review of the safety-related service water system indicates that the Emergency Diesel Generator (EDG) Cooling system would fall under the infrequently used or redundant loops category. An operability test is performed on the EDG Cooling system weekly, and a surveillance test is conducted monthly. The former test ensures that sufficient flow is provided to the diesel generators and the latter test ensures that the diesel generators will operate as required. In addition, diesel generator heat exchangers are inspected and cleaned semiannually. This testing and inspection is deemed sufficient to control fouling and clogging.

The Authority is developing an equipment layup program to be implemented by July, 1990. Included in this program are the component cooling water heat exchangers, control room air conditioning units, and fan cooler units. The program specifies flushing requirements which may require the addition of vents and drains. Such modifications, if required, would be completed during the scheduled 1992 Refueling Outage. Additionally, while one component cooling water heat exchanger is required for operation, the other is placed in standby but can be cut in at any time the first heat exchanger condition deteriorates. Periodic inspections of these heat exchangers under the IP-3 Preventative Maintenance Program has confirmed that this practice has not contributed to degradation of the heat exchangers by means of biofouling.

Item II: A test program to verify heat transfer capability of all safety-related heat exchangers cooled by service water.

The Authority is evaluating the need to develop an extensive heat exchanger testing program. The results of this evaluation, including a cost/benefit analysis, will determine which heat exchangers, if any, will be included in such program.

In lieu of a test program the Authority has substituted and implemented an inspection program for all heat exchangers listed in the introduction. This inspection program is based on the IP-3 Preventative Maintenance Program which provides the flexibility to increase or decrease inspections consistent with the results of the program. For instance, the Authority will inspect at least one fan cooler unit heat exchanger at the next refueling outage. The results of this inspection will be evaluated and the schedule for further inspections will be appropriately determined.

Item III: Inspection and maintenance program for service water piping and components.

The Authority maintains and inspects the service water pumps and the service water pump discharge strainers under the IP-3 Preventive Maintenance Program. For the fouling and corrosion of piping, metallurgical analyses are conducted on those portions of the SWS piping which are replaced as a result of erosion/corrosion. Based on the results of the analyses, the Authority has upgraded portions of the service water system piping required to ensure SWS reliability. Additionally, when performing heat exchanger inspections, the associated piping is also examined for excessive accumulations of organic and inorganic material, erosion/corrosion and MIC. Furthermore, since the amount of piping is considerable, it would be prudent to determine those areas most likely to contain corrosion and silting. It is expected that the service water piping will be incorporated in the IP-3 Erosion/Corrosion Program in 1991. In addition, nondestructive test methods for determining fouling are being developed by EPRI. The results of the EPRI Program will be reviewed and evaluated for incorporation in the IP-3 Erosion/Corrosion Program. Although the Authority has always inspected, repaired or replaced valves, as necessary, in accordance with the IST Program, Technical Specification Surveillance requirements, and in response to specific identified deficiencies, a Valve Inspection Program is being developed for implementation by December, 1991. The purpose of this program is to identify potential problematic valves and to inspect and maintain them prior to any degradation in operation. While this program will include the Service Water System valves, the program will be reviewed to ensure that the concerns of G. L. 89-13 are incorporated into the program.

Item IV: Service water system licensing basis review.

The Design Basis Documentation (DBD) for the Service Water System is scheduled for completion in December, 1990, under the Design Basis Consolidation Program. The IP-3 DBD Program is a focused effort on recovery, integration, limited reconstitution, and documentation of current as-modified design basis requirements. The baseline design requirements of the Service Water System will be compiled and documented. A comprehensive search and compilation of all pertinent documents such as calculations, specifications, reports and analysis will be made.

In accordance with the IP-3 Licensing basis and as stated in the IP-3 Final Safety Analysis Report (FSAR), the SWS was designed to provide a continuous flow of cooling water to those systems and components necessary for plant safety either during normal operation or under abnormal and accident conditions. During accident conditions, the SWS must provide the cooling water necessary to allow the engineered safety features to perform their intended function when subjected to:

a. The single failure of any active component used during the injection phase of a postulated Loss-of-Coolant Accident, or

b. The single failure of any active or passive component used during the long-term recirculation phase.

During the Cycle 5/6 Refueling Outage the NRC conducted a Safety System Outage Modification Inspection (SSOMI) which resulted in some concerns with regard to the licensing basis of the Service Water System. Since the original design basis of postulating guillotine and slot ruptures in the Service Water System piping for IP-3 was considered by the Authority to be overly conservative, the Authority proposed the revised methodology of Standard Review Plan (SRP) Sections 3.6.1 and 3.6.2 (moderate energy piping systems). The Authority submitted the revised methodology on September 7, 1988 for NRC approval. The NRC approved the use of SRP Sections 3.6.1 and 3.6.2 for the IP-3 Service Water System on June 12, 1989.

The revised Flow Network Model, reflecting the actual SWS configuration, was prepared to allow computerized verification of SWS flows for all normal and emergency operating modes, with active and passive failures. Passive failure criteria in accordance with the Standard Review Plan for moderate energy piping systems were applied in performing the analysis. The results of the evaluation show that the presently configured system can satisfy the flow requirements of essential components during abnormal and accident conditions.

In addition, as a result of the elevated river water temperatures experienced during the summer of 1988 and the

licensing actions that ensued, the Authority undertook an effort to permanently increase the design basis ultimate heat sink temperature from 85°F to 95°F. A proposed Technical Specification change was submitted to the NRC on July 24, 1989 (IPN-89-046), and is currently under review. This effort included an evaluation of certain plant equipment ultimately cooled by service water to perform all normal and safety functions at river temperatures up to 95°F. This evaluation is contained in WCAP-12313, "Safety Evaluation For An Ultimate Heat Sink Temperature increase to 95°F at Indian Point Unit 3," which was included in the July 24, 1989 submittal. The evaluation concludes that all equipment required for safe plant operations serviced by 95°F service water will operate acceptably and the current safety limits affected by the SWS temperature will be met.

During the Cycle 6/7 refueling outage a SWS flow balancing test (ENG-281, Rev. 2) was performed. The purpose of this test was to ensure that the new SW pumps were capable of providing the design basis flow to all necessary components under normal and accident conditions. The results of this test showed that the new SW pumps meet the design basis flow requirements.

It is therefore the Authority's belief that the above programs demonstrate that the Service Water System meets the licensing basis and single failure requirements and therefore a system walkdown is not required.

Item V: Maintenance practices, operating and emergency procedures and training.

The Authority will review documentation related to the SWS by the end of 1990 to ensure that safety-related equipment cooled by the Service Water System will function as intended and that operators of this equipment will perform effectively. This will include, but not be limited to, the review of operating and maintenance procedures; abnormal and emergency procedures; inspection procedures; surveillance and testing procedures; and training programs. Also, applicable concerns raised in NUREG-1275, Volume 3, "Operating Experience Feedback Report - Service Water System Failures and Degradations," dated November, 1988, will be reviewed.