

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

March 3, 1997
IPN-97-027

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

Subject: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
**Supplemental Response to NRC Generic Letter 96-06: Assurance of
Equipment Operability and Containment Integrity During
Design-Basis Accident Conditions**

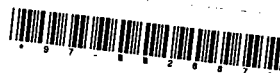
- Reference:
1. NYPA Letter IPN-97-012 to US NRC, "Response to NRC Generic Letter 96-06: Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions," January 28, 1997.
 2. NRC Generic Letter 96-06, T. T. Martin, NRC to Operating Licensees, "Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions," dated September 30, 1996.

Dear Sir:

Reference 1 provided a report on the results of preliminary analyses of a potential waterhammer condition resulting from a loss of coolant accident (LOCA) with a concurrent loss of offsite power (LOOP), as defined in NRC Generic Letter 96-06. Attachment 1 to this letter supplements the report, to identify the use of a more detailed waterhammer analysis and methodology which envelopes the single failure concern that NYPA committed to report on in Reference 1. Attachment I summarizes the type of evaluation performed, conclusions that were reached and the bases for continued operability of affected systems and components. The evaluation allowed withdrawal of previous temporary operating restrictions, which were imposed pending completion of a detailed engineering evaluation, placed on service water temperature at the outlet of the Containment Fan Coolers and Containment temperature to not exceed 60°F and 85°F, respectively. Based on the evaluations it is concluded that the IP3 containment fan cooler and service water system continues to remain operable. The report in Reference 1 will be supplemented within 30 days of startup from the next refueling outage (scheduled to start May 17, 1997) to provide additional details on our methodology, results and corrective actions.

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The commitments made by the Authority in this letter are contained in Attachment II. If you have any questions, please contact Mr. K. Peters at (914) 736-8029.

Very truly yours,



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

Attachments I, & II

cc: Mr. Hubert J. Miller
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U.S. Nuclear Regulatory Commission
Resident Inspectors' Office
Indian Point 3 Nuclear Power Plant

**Supplement 1 To Summary Report - Generic Letter 96-06 Evaluation
Potential SW Flashing in FCU Coils During LOCA with Coincident LOOP**

NYPA has obtained the services of an outside consultant to perform a more detailed evaluation of the susceptibility of the IP3 containment fan cooler units and service water system to waterhammer loading. This evaluation bounds previous evaluations as well as the single failure scenario that NYPA committed to evaluate in IPN-97-012 because it assumes continuous operation of all fans throughout the duration of the event.

Two kinds of waterhammer may occur. The first is column closure waterhammer, which is assumed to occur during the LOOP event. The second type of waterhammer is caused by the trapping and condensing of steam in the supply and return piping that was generated in the FCUs during the draining phase. Analysis has demonstrated that this type of waterhammer is less severe than the column closure waterhammer for the most limiting LOOP event.

The new evaluation considers pressure pulsations that can be caused in systems where voids can form due to elevation differences between the equipment or piping and their suction or discharge reservoirs. This is the case with the fan cooling units where a void will form due to column separation in the supply and return piping any time that all service water pumps are shut down. The velocity of the closing column will determine the magnitude of the pressure pulse. A representative bounding supply and return line were selected and structurally analyzed for the calculated pressure pulse loading.

The evaluation concluded that, because of the differences in design stress criteria (i.e., upset are much less than faulted stress limits), the waterhammer loads postulated to occur during a design basis loss of coolant accident (LOCA) with loss of offsite power (LOOP) event are enveloped for design by the LOOP without a LOCA event. The piping stresses of representative lines 11C and 12C were evaluated to be within the UFSAR Upset Conditions limits. Although some supports require structural upgrade to meet the UFSAR limits, all pipe supports meet the operability limits of ASME III, Appendix F.

A simulated LOOP without a LOCA is assumed to occur as part of the IP3 testing program performed prior to restart from refueling outages. Past operating and test history indicates no failures associated with these lines. Further, a review of previous Inservice Inspections, snubber inspections, and of a recent walkdown of accessible areas of the system showed that no pipe supports have suffered structural damage.

During the walkdown it was noted that four supports were missing. A seismic and a waterhammer analysis was performed for the affected system(s) with the missing supports, which concluded that the piping and remaining supports have been operable. The identified missing supports have now been installed.

**Supplement 1 To Summary Report - Generic Letter 96-06 Evaluation
Potential SW Flashing in FCU Coils During LOCA with Coincident LOOP**

NYPA's initial response, based on preliminary evaluations, concluded that no significant waterhammer would occur, while there were temporary operating restrictions on containment temperature and FCU service water outlet temperatures to not exceed 85°F and 60°F, respectively. The additional analysis performed has determined that a column closure type waterhammer resulting from a LOOP only, would be bounding. Therefore, the operating restrictions on containment temperature and FCU service water outlet temperature have been removed.

It is concluded, based on completed evaluations and analyses, the service water system and containment fan cooler units will remain operable and perform their design accident functions following either a LOCA with a coincident LOOP, or a LOOP alone.

COMMITMENT LIST

Number	Commitment	Due
IPN-97-027-01	The report in IPN-97-012 will be supplemented within 30 days of startup from the next refueling outage (scheduled to start May 17, 1997) to provide additional details on our methodology, results and corrective actions.	Within 30 days of startup from RO9