

Indian Point 3  
Nuclear Power Plant  
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**New York Power  
Authority**

**William A. Josiger**  
Resident Manager

March 21, 1989  
IP3-89-022

License No. DPR-64  
Docket No. 50-286

Mr. Charles E. Rossi, Director  
Division of Operational Events Assessment  
Office of Nuclear Reactor Regulation  
Attn: Document Control Desk  
Mail Station P1-137  
Washington, D.C. 20555

Subject: Indian Point 3 Nuclear Power Plant  
NRC Bulletin No. 88-11: "Pressurizer Surge Line  
Thermal Stratification"

Dear Sir:

NRC Bulletin 88-11 "Pressurizer Surge Line Thermal Stratification" requests that all addressees establish and implement a program to confirm pressurizer surge line integrity in view of the occurrence of thermal stratification. In addition, the bulletin requires that the NRC be informed of actions taken to resolve this issue. The bulletin also states that if the schedule identified cannot be met, the addressee is required to submit an alternate schedule with justification. The purpose of this letter is to inform the NRC of the results of a visual examination of the pressurizer surge line and to submit an alternate schedule for the remaining items.

A visual examination of the pressurizer surge line (Line 63) was completed in accordance with ASME Section XI 1983 Edition thru Summer 1983 Addenda VT-3 requirements as requested by NRC Bulletin 88-11, Paragraph 1.a. The visual examination (VT-3) included the pressurizer surge line piping (with insulation intact), four whip restraints (PWR-122, PWR-123, PWR-124, PWR-125), one spring hangar (PW-H-63-1) and two restraints (PWR-121, PWR-120). The results of the examinations were found acceptable. No gross discernible distress or structural damage was evident. There were no loose parts, debris, abnormal corrosion products, wear, erosion or loss of integrity at bolted or welded connections. In addition, a VT-4A visual examination was performed on the spring hangar (PW-H-63-1) and the examination results were acceptable.

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Although not required by the bulletin, the Authority included ultrasonic testing (UT) and liquid penetrant testing as part of the examination of two welds. The welds examined in this manner were the pressurizer surge line nozzle to safe end weld and the next weld downstream, the pressurizer surge line weld #2. The results of the UT liquid penetrant testing were satisfactory. No thermal stratification effects were evident.

Pursuant to satisfying the remaining requirements and schedules of Bulletin 88-11, the Authority is participating in a Westinghouse Owner's Group (WOG) program. The WOG program was approved at the October 1988 meeting and has the following objectives:

- o Develop a generic Justification for Continued Operation (JCO) to assure that plant safety is not compromised while the effects of thermal stratification are being determined.
- o Collect and summarize relevant design, operational, analytical and test data for as many WOG plants as possible. In addition, a representative sampling of approximately ten plants will be selected to perform a review of plant records and conduct interviews with operations personnel.
- o Evaluate data and identify and prioritize significant parameters contributing to this issue. Categorize (group) plants based on these parameters.
- o Recommend additional monitoring to supplement the existing transient database required to bound all WOG plants.
- o Estimate the effect of thermal stratification on fatigue life as a function of key parameters.
- o Recommend short term and long term actions.

The WOG program is designed to benefit from the experience gained in the performance of several plant specific analyses on Westinghouse PWR surge lines. These detailed analyses included definition of revised thermal transients (including stratification) and evaluations of pipe stress, fatigue usage factor, thermal striping, fatigue crack growth, leak before break, and support loads. The overall analytical approach used in all of these analyses has been consistent and has been reviewed, in detail, by the NRC staff. A significant amount of surge line thermal monitoring data has been obtained in support of these plant specific analyses. Additional surge line thermal monitoring and plant system data continues to be made available within the WOG, resulting in a steadily increasing database. A significant amount of progress has been accomplished toward meeting these objectives.

To date, the WOG has completed approximately 80% of the effort of assembling plant specific design information on all domestic Westinghouse PWRs (55 units total). This effort will establish the range of key design parameters and permit grouping of plants based on these parameters.

Based on the information assembled to date, and the experience gained in plant specific analyses and monitoring programs, the WOG evaluation has resulted in the following observations regarding plant similarity and thermal stratification:

1. Thermal stratification ( $>100^{\circ}\text{F}$ ) has been measured on all surge lines for which monitoring has been performed and which have been reviewed by the WOG to date (7 plants).
2. The amount of stratification measured and its variation with time (cycling) varies. This variation has been conservatively enveloped and applicability demonstrated for plant specific analyses. Additional monitoring data representing a wider range of surge line configurations may be needed in order to demonstrate the applicability of these thermal stratification transients to other Westinghouse units.
3. Significant factors which can influence the structural effects of stratification are:
  - a. Location and design of rigid supports and restraints
  - b. Pipe layout geometry and size
  - c. Type and location of piping components
4. Although the material and fabrication techniques for Westinghouse surge lines are reasonably consistent and of high quality, the design parameters listed in item 3 vary among Westinghouse PWRs. This variation in design is primarily a result of plant specific routing requirements. This variability is currently being examined in order to assess the feasibility of a bounding analysis approach.

These observations developed through the on-going WOG program, indicate that the development of thermal stratification loadings and the evaluation of fatigue, considering these loadings, is a complex process. Therefore, in order to precisely evaluate stratification, additional time is needed.

While more time is needed to evaluate the stratification issue in detail, the NDE inspection history at Indian Point 3 has not revealed any service induced degradation in the surge line piping that has been attributed to thermal stratification.

All the plant specific analyses performed to date, that have included the loadings due to stratification and striping, have validated the "leak before break" concept and have substantiated a 40-year plant life. Thus, a prudent approach for providing a detailed evaluation of the effects of surge line stratification would be to follow the WOG program grouping evaluation recommendations and monitor as determined to be appropriate.

The WOG has completed a grouping evaluation for the purpose of recommending the need for additional thermal monitoring. As a result, Indian Point 3 has been grouped with other plants that currently have sufficient thermal data such that no additional monitoring is required.

To assure that the plant safety is not compromised within the requested period of schedule extension, a Justification for Continued Operation (JCO) will be submitted to the staff. The JCO which is currently being developed will be submitted by the Authority to the NRC within (4) months of our receipt of the bulletin or no later than May 5, 1989. The JCO will utilize the information, experience, and monitor data obtained through the WOG program and will support the alternate schedule discussed herein.

A schedule of two years, from receipt of the bulletin, is considered sufficient time to obtain the necessary additional monitoring data, define thermal transients, perform all required analyses and update the stress and fatigue analyses to ensure compliance with applicable code and regulatory requirements. This schedule, though different from that requested in action 1.b of Bulletin 88-11, is consistent with the requirement to update the stress and fatigue analyses within two years as stated in action 1.d. of the bulletin.

The Authority's request for an alternate schedule applies only to item 1.b of NRC Bulletin 88-11. The Authority intends to comply with all other requirements of the bulletin.

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

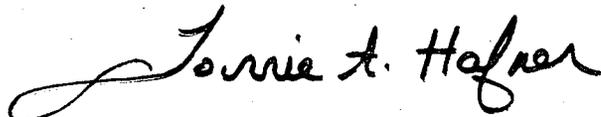
Very truly yours,

  
William A. Josiger  
Resident Manager  
Indian Point Unit 3  
Nuclear Power Plant

State of New York  
County of Westchester  
Subscribed and sworn to before me this

21<sup>st</sup> day of March 1989

LORRIE A. HAFNER  
Notary Public, State of New York  
No. 4928710, Dutchess County  
Term Expires May 2, 1990



cc: Mr. William T. Russell,  
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