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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

December 27, 1996

Mr. William J. Cahill, Jr.
Chief Nuclear Officer
Power Authority of the State of New York
123 Main Street
White Plains, NY 10601

SUBJECT: EVALUATION OF REACTOR VESSEL HEAD FLAW INDICATION INSPECTION AND
EVALUATION SUBMITTAL FOR JAMES A. FITZPATRICK NUCLEAR POWER PLANT
(TAC NO. M97448)

Dear Mr. Cahill:

By letter dated December 5, 1996, you submitted an analysis report to the NRC staff detailing the reactor vessel head weld flaw inspection and evaluation results from ultrasonic testing (UT) performed during the 1996 refueling outage at the James A. FitzPatrick Nuclear Power Plant. This submittal was in accordance with the NRC staff's evaluation dated June 13, 1990, which requested that a reevaluation of the reactor vessel head weld flaw be performed during the subsequent three operating cycles to justify operation.

The flaw indications were originally discovered as a result of routine inspections conducted in accordance with the Inservice Inspection (ISI) Program in weld number VC-TH-1-2 during the 1990 inservice inspection. The report of this flaw was submitted to the NRC staff by letter dated May 25, 1990, and included an evaluation from the General Electric (GE) Company that concluded that both indications were the result of metallic inclusions (segregates), possibly manganese sulfides, during vessel fabrication. Indication #1 was reported to be 0.55 inches deep by 2.3 inches long, and indication #2, 0.5 inch deep by 5 inches long. The vessel head material is SA-533 Grade B with nominal thickness of 4 inches.

The Power Authority of the State of New York (PASNY) found that both UT indications were unacceptable under NRC Regulatory Guide 1.150 and IWB-3510 in Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code). ASME Section XI stipulates that flaw indications that exceed IWB-3510 are acceptable for service without removal, repair, or replacement if an analytical (fracture mechanics) evaluation meets the acceptance criteria of IWB-3600. Based on the flaw evaluation, PASNY predicted that the flaws would grow 0.096 inches in depth per 18-month period and that the final depth for the indications will be 0.646 inches at end of the 1992 fuel cycle. The allowable flaw size was predicted to be 1.667 inches deep at end of the 1992 fuel cycle. By letter dated June 13, 1990, the NRC staff concluded that PASNY's justification for operation was acceptable.

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A subsequent submittal, dated July 9, 1992, reported that both indications showed shorter length measurements and smaller through wall dimensions than the 1990 data. A teleconference with PASNY, conducted on July 21, 1992, revealed that the updated dimension of indication #1 was 0.05 inch deep by 1.0 inches long and that of indication #2 was 0.4 inch deep by 5.5 inches long.

PASNY attributed the inconsistencies between 1990 and 1992 inspection results to difference in evaluation of examination data. In 1990, PASNY used results of various examination angles and combined inspection data from automated examinations with manual examinations. PASNY judged that this method was too conservative. The inconsistencies also prompted PASNY to perform supplemental examinations in 1992 by its Level III personnel and to implement permanent references for future examinations.

PASNY reevaluated the examination results and reported that when data from the 1990 and 1992 inspections were compared after analysis, no measurable change in length or through wall dimension was discernable. Since the assumed initial flaw depth of .55 inch and the flaw growth rate of 0.096 inch per fuel cycle stayed the same, the NRC staff concluded by letter dated August 11, 1992, that both indications should be within the allowable depth of 1.667 inches at end of next fuel cycle, and that continued operation was justified.

PASNY then reinspected these flaws during your 1995 refueling outage. You reported that when the 1995 UT data was compared with the results of the 1990 and 1992 inspections, no measurable change in length or through wall dimension is discernable. Therefore, the same argument for the approval of the 1995 submittal applied and the flaw indications were acceptable without repair until the next cycle. The NRC staff agreed that continued operation with the existing reactor vessel head flaw indication was acceptable.

In the current submittal, you reported that when the 1996 UT data is compared with the results of the previous inspections, again no measurable change in length or through wall dimension is discernable. The staff again agrees with the conclusion of your submittal that, based on the same argument as in 1995, continued operation of the reactor with the existing head flaw indication is acceptable. In addition, your 1996 submittal also served to inform the NRC of your intent to revert to the original weld examination schedule as required by ASME Section XI. The staff agrees that PASNY has successfully met the re-examination request of our June 13, 1990, letter and that a return to the original ASME Section XI examination schedule is justified.

W. Cahill

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December 27, 1996

If you have any questions regarding this or any other subject, please contact me at 301-415-1438. This completes the NRC staff's work for TAC No. M97448.

Sincerely,

/S/

Karen R. Cotton, Acting Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-333

cc: See next page

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Sincerely,

Karen R. Cotton

Karen R. Cotton, Acting Project Manager
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Docket No. 50-333

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