UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 14, 1994

Docket No. 50-333

Mr. William A. Josiger, Acting
Executive Vice President, Nuclear
Generation
Power Authority of the State of
New York
123 Main Street
White Plains, New York 10601

Dear Mr. Josiger:

SUBJECT: EVALUATION OF CUMULATIVE EFFECTS OF WELD OVERLAYS ON THE RECIRCULATION PIPING SYSTEM - JAMES A. FITZPATRICK NUCLEAR POWER PLANT (TAC NO. M86250)

By letter dated November 13, 1991, the NRC staff requested that the Power Authority of the State of New York (PASNY) assess the cumulative shrinkage effects from weld overlay repairs and the effect of the associated increase in deadweight and stiffness on the piping systems and their supports and pipe whip restraints. Consistent with Generic Letter (GL) 88-01, Supplement 1, the purpose of the requested evaluation was to ensure that there are no adverse effects resulting from weld overlay repairs on the affected piping systems. By letter dated April 1, 1993, you provided the results of PASNY's evaluation of the cumulative effects of weld overlay repairs on the recirculation piping at the James A. FitzPatrick Nuclear Power Plant.

PASNY performed inspections and evaluations of the reactor recirculation piping system as 21 weld overlays are installed on the "A" and "B" loops of that system. Although two weld overlays exist on the "B" jet pump instrumentation assembly, the resulting shrinkage effect on other components is expected to be small because the outboard end of the assembly is not rigidly restrained. There are no weld overlays on the core spray piping system because all previously repaired piping has been replaced.

PASNY performed analyses of weld overlay shrinkage induced residual stresses on each loop of the recirculation piping system using the Algor Supersap finite element program. The maximum tensile residual stress of 15.6 ksi is located at nozzle weld N2D in Loop B. The residual stress is a steady-state secondary stress and has no limit in the American Society of Mechanical Engineers Boiler and Pressure Vessel Code. Although the residual stresses would affect crack growth, there are no unrepaired welds in the recirculation piping system.

The installation of weld overlays increases the dead weight and stiffness of the affected piping system. PASNY evaluated its effect on the recirculation piping system using a conservative bounding calculation. PASNY's evaluation

showed that the weight of weld overlays adds only 0.3 percent to the weight of the recirculation piping system. Your evaluation also showed that the increased weight and rigidity due to weld overlays would not significantly effect the dynamic responses of the recirculation piping system.

PASNY has performed inspections of the piping supports and whip restraints in the recirculation piping system. The piping supports consist of spring hangers and hydraulic snubbers. All hydraulic snubbers were inspected prior to startup from the 1992 refueling outage and were found to have acceptable fluid level, piston rod lengths, and other characteristics. All spring type hangers were inspected during the previous refueling outages starting in 1987. Seven pipe hanger supports were inspected for cold load settings during the 1992 refueling outage. All settings were found to be acceptable. Four pipe whip restraints at locations representing the worst-case shrinkage effects were selected for measurements of cold position settings. All settings were found to exceed the required minimum cold position setting. In addition, a walkdown inspection of all other pipe whip restraints was conducted and no adverse conditions were found. You indicated that hydraulic snubbers will be inspected in the future in accordance with the Technical Specifications, and the other pipe supports will be inspected as required by the inservice inspection program.

The NRC staff has reviewed your evaluation of the cumulative effects of weld overlay repairs on the reactor recirculation system at the FitzPatrick plant. Based on our review of your submittal, the staff concludes that your evaluation of the cumulative effects resulting from weld overlay repairs and the inspections of the pipe supports and whip restraints are acceptable and meet the intent of GL 88-01, Supplement 1. This completes the NRC staff actions associated with TAC No. M86250.

Sincerely,

Brian C. McCabe

Brian C. McCabe, Senior Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

cc: See next page

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James A. FitzPatrick Nuclear
Power Plant

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the recirculation piping system. Your evaluation also showed that the increased weight and rigidity due to weld overlays would not significantly effect the dynamic responses of the recirculation piping system.

PASNY has performed inspections of the piping supports and whip restraints in the recirculation piping system. The piping supports consist of spring hangers and hydraulic snubbers. All hydraulic snubbers were inspected prior to startup from the 1992 refueling outage and were found to have acceptable fluid level, piston rod lengths, and other characteristics. All spring type hangers were inspected during the previous refueling outages starting in 1987. Seven pipe hanger supports were inspected for cold load settings during the 1992 refueling outage. All settings were found to be acceptable. Four pipe whip restraints at locations representing the worst-case shrinkage effects were selected for measurements of cold position settings. All settings were found to exceed the required minimum cold position setting. In addition, a walkdown inspection of all other pipe whip restraints was conducted and no adverse conditions were found. You indicated that hydraulic snubbers will be inspected in the future in accordance with the Technical Specifications, and the other pipe supports will be inspected as required by the inservice inspection program.

The NRC staff has reviewed your evaluation of the cumulative effects of weld overlay repairs on the reactor recirculation system at the FitzPatrick plant. Based on our review of your submittal, the staff concludes that your evaluation of the cumulative effects resulting from weld overlay repairs and the inspections of the pipe supports and whip restraints are acceptable and meet the intent of GL 88-01, Supplement 1. This completes the NRC staff actions associated with TAC No. M86250.

Sincerely,

Original signed by:

Brian C. McCabe, Senior Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

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