

February 28, 2000

Mr. Robert G. Byram
Senior Vice President
and Chief Nuclear Officer
PP&L, Inc.
2 North Ninth Street
Allentown, PA 18101

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2 - DEFERRAL
OF INSPECTIONS REQUIRED BY SECTION 4.3 OF NUREG-0619 (TAC NOS.
MA8047 AND MA8048)

Dear Mr. Byram:

In a letter dated January 13, 2000, you requested relief from the requirements of Section 4.3 of NUREG-0619, "BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking," for the Susquehanna Steam Electric Station, Units 1 and 2 (SSES Units 1 and 2). Specifically, you requested that the deferral of the liquid penetrant (PT) examination requirements for the feedwater nozzle bore and inner radius as identified in NUREG-0619 be extended another operating cycle for Units 1 and 2.

For the feedwater nozzle thermal sleeve configuration, Section 4.3 of NUREG-0619 specifies a PT examination of the nozzle bore and inner radius areas every nine refueling cycles (or 135 startup/shutdown cycles). The ninth refueling cycle outage for SSES Unit 1 occurred in the fall of 1996 and in the spring of 1997 for Unit 2. In a letter dated June 5, 1996, the staff approved a request to defer the PT examination one operating cycle pending completion of staff review of the Boiling Water Reactor Owners Group's (BWROG) generic submittal on the feedwater nozzle cracking issue. In a letter dated April 15, 1998, the staff approved a request to defer the PT examination for an additional cycle to allow additional time for the Nuclear Regulatory Commission (NRC) to address the generic issue. The staff documented its review of the generic issue in a letter dated June 5, 1998, and is currently completing the generic review process with the BWROG.

NUREG-0619 indicates that although state-of-the-art ultrasonic (UT) techniques at the time of issuance in 1980 were not acceptable (in terms of resolution and sensitivity), future developments and demonstrations of the ability of UT methods to detect small thermal fatigue cracks with acceptable reliability and consistency would allow modification of the stated inspection criteria. Significant advances in automated and computer-controlled UT techniques for flaw detection and sizing have occurred since issuance of NUREG-0619. During every other refueling outage, PP&L, Inc. (PP&L), uses the GERIS 2000 UT system (GE Reactor Inspection System 2000) with specialized techniques designed specifically for feedwater nozzles to examine the SSES Units 1 and 2 feedwater nozzles. The GERIS 2000 system has the ability to detect cracking that may have gone undetected by previously used UT techniques. A switch from a PT to a UT examination would significantly reduce the radiation exposure to personnel during inspection of these nozzles. In addition, the UT method allows indications to be sized for depth while the PT method gives no depth indication.

The SSES Units 1 and 2 feedwater nozzles are not clad and incorporate the triple sleeve, double piston ring thermal sleeve design. The augmented inservice inspection requirements for the SSES Units 1 and 2 feedwater nozzles, based on Section 4.3 of NUREG-0619 and the SSES Units 1 and 2 specific nozzle/thermal sleeve configuration, are as illustrated below:

PARTS EXAMINED	TYPE OF EXAMINATION	EXTENT OF EXAMINATION	FREQUENCY
Nozzle Safe End	UT	100% of the nozzle safe ends	every 2 refueling cycles
Nozzle Bore	UT	100% of the nozzle bores	every 2 refueling cycles
	PT	100% of the nozzle bores (one sparger removed)	every 9 refueling cycles OR 135 startup/shutdown cycles
Nozzle inner Radius	UT	100% of the nozzle inner radii	every 2 refueling cycles
	PT	100% of the nozzle inner radii (one sparger removed)	every 9 refueling cycles OR 135 startup/shutdown cycles
Sparger	Visual (VT-3)	100% of the spargers	every 4 refueling cycles

PP&L is requesting this further deferral only of the requirements for the PT examination of the nozzle bore and inner radius. PP&L will continue to perform ultrasonic examinations of the nozzle bore and inner radius every 2 refueling cycles. The nozzle safe end and sparger are not affected by this request for deferral.

NRC Generic Letter (GL) 88-11 provided amplifying information related to NUREG-0619. That GL included a limiting criterion for crack growth in reactor vessel feedwater nozzles due to combined stresses, i.e., an assumed crack will not grow to more than 1 inch in 40 years. In PP&L's January 13, 2000, letter, the licensee stated that SSES Units 1 and 2 inspection history has provided no indication of cracking to date. In addition, an SSES plant-specific fracture mechanics analysis, based on utilization of the existing low flow controller and routing of the reactor water cleanup system to all feedwater lines, shows that stresses present in the feedwater nozzles will not result in the growth of an initial 0.25-inch crack to greater than 1 inch during the 40-year life of the plant.

The staff finds that the PP&L request for further deferral of PT examination of the feedwater nozzle bore and inner radius for another operating cycle satisfies the criteria in the staff's safety evaluation to the BWROG dated June 5, 1998. Therefore, PP&L's request to defer PT examinations of Units 1 and 2 feedwater nozzle bore and inner radii for an additional operating

R. Byram

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cycle is acceptable. Furthermore, future PT examinations of the feedwater nozzle bore and inner radii may be eliminated if PP&L continues to follow the BWROG's topical report and the criteria in the staff's safety evaluation dated June 5, 1998.

Sincerely,

/RA/

Robert G. Schaaf, Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-387 and 50-388

cc: See next page

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Sincerely,

/RA/

Robert G. Schaaf, Project Manager, Section 1
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Division of Licensing Project Management
Office of Nuclear Reactor Regulation

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