

UNITED STATES NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001 June 1, 1998

Mr. Robert G. Byram Senior Vice President-Generation and Chief Nuclear Officer Pennsylvania Power and Light Company 2 North Ninth Street Allentown, PA 18101

SUBJECT: REEVALUATION OF PENNSYLVANIA POWER AND LIGHT COMPANY'S (PP&L) INSPECTION RELIEF REQUEST OF INTERGRANULAR STRESS-CORROSION CRACKING (IGSCC) CATEGORY C WELDS; SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2 (TAC NOS. M98736 AND M98737)

Dear Mr. Byram:

By letter dated November 13, 1995, PP&L (the licensee) submitted an inspection relief request (Relief Request RR-12) for NRC approval. PP&L's relief request (RR-12) proposed to inspect the IGSCC Category C welds in accordance with the scope and frequency of IGSCC Category B welds. The NRC denied PP&L's relief request RR-12 in a letter dated June 24, 1996. By letter dated March 21, 1997, PP&L provided a response to NRC's denial and requested NRC to reevaluate its relief request RR-12.

In accordance with Generic Letter (GL) 88-01, IGSCC Category C welds are welds made of nonresistant stainless steel materials and were stress improved after 2 years of operation. All IGSCC Category C welds are required to be ultrasonically inspected (UT) within the next two fuel cycles after the stress improvement application followed by 100% inspection every 10 years. IGSCC Category B welds are welds made of non-resistant stainless steel material and were stress-improved within 2 years of operation. For IGSCC Category B welds, UT is required for 50% of the welds every 10 years. The main reason for inspecting Category C welds more frequently than Category B welds is that cracks could be initiated in the susceptible welds after 2 years of plant operation.

There are 32 IGSCC Category C welds on Unit 1 and 31 such welds on Unit 2. The licensee stated that these welds were treated by a mechanical stress improvement process (MSIP) during the last two refueling outages (7th and 8th refueling outages on Unit 1 and 6th and 7th refueling outages on Unit 2). Therefore, both Units 1 and 2 have been operated on an average of more than 10 years when the MSIP was applied. To qualify for IGSCC Category B inspection schedule, the welds must be stressed-improved within 2 years of plant operation.

The bases of the staff's denial of the licensee's relief request were discussed in the staff's safety evaluation dated June 24, 1996. The bases were summarized below:

- (1) The IGSCC is a time-dependent process. It is not prudent to decrease the inspection scope or increase the interval between inspections as plants age.
- (2) In view of the recent finding of deep axial cracks at several stress-improved welds, the staff has concerns regarding the ability in detecting the axial cracks by Ultrasonic testing (UT) and the effectiveness of the subject mitigation technique in arresting the axial cracks.

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(3) The staff has concerns regarding the lack of test data such as the residual stress measurements and the stress corrosion testing to verify the effectiveness of the process
MSIP control parameters and regarding the potential of a relaxation of compressive residual stresses as a result of operating loads as well as the anticipated and unanticipated transient loads.

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- (4) Since the MSIP process was accepted by NRC in 1988 as an effective process to mitigate IGSCC, the service experience of those MSIP treated welds is limited. It is not conservative to reduce the inspection frequency based on a limited service experience.
- (5) The staff suggested that the licensee could achieve a significant saving of the total personnel radiation exposure in performing the subject UT inspection by implementing measures such as chemical decontamination, removal of hot spots, hydrogen water chemistry, installation of effective shielding, integrated service inspection program and performing automatic UT inspection.

The staff has reviewed the licensee's response and finds that it does not provide any new significant information. The staff has determined that the licensee has not provided adequate justification to support its inspection relief request. Therefore, the licensee's relief request RR-12 for Susquehanna, Units 1 and 2, is denied. If the industry desires a generic inspection relief from GL 88-01, it would be more desirable to have the Boiling Water Reactor Owners Group initiate such a proposal.

Since	rely,	;	
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Robert A. Capra, Director

Project Directorate I-2

Division of Reactor Projects - I/II

Office of Nuclear Reactor Regulation

Docket Nos. 50-387 and 50-388

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- (3) The staff has concerns regarding the lack of test data such as the residual stress measurements and the stress corrosion testing to verify the effectiveness of the process MSIP control parameters and regarding the potential of a relaxation of compressive residual stresses as a result of operating loads as well as the anticipated and unanticipated transient loads.
- (4) Since the MSIP process was accepted by NRC in 1988 as an effective process to mitigate IGSCC, the service experience of those MSIP treated welds is limited. It is not conservative to reduce the inspection frequency based on a limited service experience.
- (5) The staff suggested that the licensee could achieve a significant saving of the total personnel radiation exposure in performing the subject UT inspection by implementing measures such as chemical decontamination, removal of hot spots, hydrogen water chemistry, installation of effective shielding, integrated service inspection program and performing automatic UT inspection.

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Sincerely,

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Robert A. Capra, Director Project Directorate I-2 Division of Reactor Projects - I/II Office of Nuclear Reactor Regulation

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