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SUBJECT: Responds to Bulletin 88-008 re thermal stresses in piping connected to RCS.

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SEP 28 1988

Director of Nuclear Reactor Regulation
Attention: Dr. W. R. Butler, Project Director
Project Directorate I-2
Division of Reactor Projects
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUSQUEHANNA STEAM ELECTRIC STATION
RESPONSE TO BULLETIN 88-08
THERMAL STRESSES IN PIPING CONNECTED
TO REACTOR COOLANT SYSTEMS
PLA-3087 FILE R41-1A

Docket Nos. 50-387
and 50-388

Dear Dr. Butler:

The subject bulletin requested licensees to review their reactor coolant systems (RCSs) to identify any connected, unisolable piping that could be subjected to temperature distribution which would result in unacceptable thermal stresses and take action, where such piping is identified, to ensure that the piping will not be subjected to unacceptable thermal stresses. The bulletin also specifies that the following actions be taken:

1. Review systems connected to the RCS for unisolable piping that could be subjected to thermal cycling phenomenon.

2. For identified piping, perform nondestructive examination of the welds, heat affected zones, and high stress locations.

3. Develop and implement a program to provide continuing assurance that the identified piping will not be subject to conditions that could cause fatigue failure during the remaining life of the plant.

The first action is required to be completed within 60 days of bulletin receipt; the remaining actions are required to be completed prior to the end of the next refueling outages.

In response to the subject Bulletin, we have reviewed the potential for cold water to leak into the RCS via the isolation valves at Susquehanna SES. We have determined that the Susquehanna design does not contain any unisolable sections of piping that are potentially subject to thermal cycling fatigue from cold water leaks into the RCS during normal operation.

During normal operation, the following systems contain relatively colder water than the reactor coolant, and are connected to, but isolated from, the reactor coolant system via isolation valves.

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High Pressure Coolant Injection

The HPCI system is capable of injecting cold water into the RCS while it is at normal operating pressure, via the Feedwater system; however, this can only occur when the HPCI system is operating, such as during system surveillance testing. Normally, the HPCI pump is not operating and the system is below RCS operating pressure.

Reactor Core Isolation Cooling

Like HPCI, RCIC is capable of injecting cold water to the RCS through leaking valves while it is at normal operating pressure via the feedwater system, but only when the RCIC system is in operation. It is normally below RCS operating pressure, and the system operates only during high pressure surveillance testing.

Standby Liquid Control System

While in operation during surveillance testing, the SLCS has the capability to inject cold water into the RCS however, during testing of the SLCS pumps, the squib valves isolate the system and prevent leakage to the RCS. Inadvertent actuation of the SLCS (and consequent firing of the squib valves) is an unlikely event and would not contribute to thermal cycling fatigue.

Residual Heat Removal System

Leakage past the RHR system injection valves into the RCS system could only occur when reactor pressure is below the shutoff head of the RHR pumps, and then only when the pumps are operating. Normally, the RHR pumps are not in operation except for testing or when auxiliary cooling is required for the suppression pool. This portion of the RCS piping is designed for the large injection temperature transient that occurs when the RHR system is actuated and the injection valves open.

Core Spray

Like RHR, leakage past the CS injection valves could only occur when the system is in operation and when reactor pressure is below the CS pump shutoff head. Normally, the CS system is only in operation for testing purposes, and otherwise is at a lower pressure than that of the RCS. This portion of the RCS piping is also designed for the large injection temperature transient that occurs when the CS system is actuated and the injection valves open.

Feedwater

The FW system is normally in operation and continuously injects comparatively cold water into the RCS system during normal operation. The RCS piping is designed for this, and no abnormal temperature transients or stratification that could contribute to thermal cycling fatigue have been observed during normal FW operation.

Reactor Water Cleanup System

The RWCU system is normally at a higher temperature and pressure than the RCS and injects into the RCS via the feedwater system. The RWCU system is not normally isolated from the feedwater system.

Control Rod Drive System

The CRD system injects cold water into the RCS via the CRD housing. This is normal during all modes of plant operation and is accounted for in the design. This injection is not isolated during normal system operation.

The CRD system also supplies cold water to the Recirc Pump Seals which could be a potential leakage path to RCS. Although this scenario is outside the scope of Bulletin 88-08 we have reviewed the impacts of a potential leak to RCS. Normal design is for the CRD system to provide cold water to the Recirc Pump Seals and pump in-leakage has been considered.

In summary, Susquehanna's design does not contain any normally isolated cold water systems connected to the RCS that are continuously pressurized to a level above the RCS normal operating pressure. Therefore it is not possible for any potentially leaking isolation valves to allow cold water to be injected into the RCS and cause thermal cycling fatigue in unisolable RCS piping.

This completes our response to Bulletin 88-08. If you have any questions, please contact D. J. Walters at (215) 770-6536.

Very truly yours,

H. W. Keiser

cc: NRC Document Control Desk (original)
NRC Region I
Mr. F. I. Young, NRC Sr. Resident Inspector
Mr. M. C. Thadani, NRC Project Manager

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA)
: SS
COUNTY OF LEHIGH)

I, HAROLD W. KEISER, being duly sworn according to law, state that I am Sr. Vice President - Nuclear of Pennsylvania Power & Light Company and that the facts set forth on the attached response to NRC Bulletin 88-08, are true and correct to the best of my knowledge, information and belief.

H Keiser

Harold W. Keiser
Sr. Vice President - Nuclear

Sworn to and subscribed
before me this 26th day
of September, 1988.

Martha C Barto

Notary Public

NOTARIAL SEAL
MARTHA C. BARTO, NOTARY PUBLIC
ALLENTOWN, LEHIGH COUNTY
MY COMMISSION EXPIRES JAN. 15, 1990
Member, Pennsylvania Association of Notaries

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