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ACCESSION NBR: 9202060361      DOC. DATE: 92/01/31      NOTARIZED: YES      DOCKET #  
 FACIL: 50-315 Donald C. Cook Nuclear Power Plant, Unit 1, Indiana M      05000315  
       50-316 Donald C. Cook Nuclear Power Plant, Unit 2, Indiana M      05000316

AUTH. NAME                      AUTHOR AFFILIATION  
 FITZPATRICK, E.                American Electric Power Co., Inc.  
 RECIPIENT NAME                RECIPIENT AFFILIATION  
 MURLEY, T. E.                   Document Control Branch (Document Control Desk)

SUBJECT: Forwards response to NRC Bulletin 88-088, "Thermal Stresses in Piping Connected to RCSs." Data will be collected for 1 fuel cycle on possible fatigue cracking in PRZ auxiliary spray line by mounting RTDs near welds & bends.

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**AMERICAN  
ELECTRIC  
POWER**

AEP:NRC:1069D

Donald C. Cook Nuclear Plant Units 1 and 2  
Docket Nos: 50-315 and 50-316  
License Nos. DPR-58 and DPR-74  
NRC BULLETIN NO. 88-08, "THERMAL STRESSES IN PIPING CONNECTED  
TO REACTOR COOLANT SYSTEMS"

U. S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D. C. 20555

Attn: T. E. Murley

January 31, 1992

Dear Dr. Murley:

Reference

1. Letter, W. D. Long (NRC) to E. E. Fitzpatrick (AEPSC), "NRC Bulletin 88-08, "Thermal Stresses in Piping Connected to Reactor Coolant Systems" (TAC Nos M/69618 and M/69619), dated November 1, 1991.
2. Letter AEP:NRC:1069C, "NRC Bulletin No. 88-08: Final Response on Auxiliary Pressurizer Spray Line," dated November 1, 1989.

This letter responds to a November 1, 1991, letter from W. D. Long to E. E. Fitzpatrick (Reference 1) which requested that Indiana Michigan Power Company provide a method, other than in-service inspection, for ensuring that the pressurizer auxiliary spray line is not susceptible to fatigue cracking as described in NRC Bulletin No. 88-08.

In response to the Bulletin, I&M had previously proposed the use of non-destructive examination (NDE) each refueling outage to detect the presence of cracks (Reference 2). This proposal was based on a Westinghouse analysis which showed that a postulated 10% through-the-wall crack would require 30 months to propagate to 60% of wall thickness. Since a crack would require more than one fuel cycle to propagate to 60% of the wall thickness, the absence of a crack during NDE would provide assurance that failure of the auxiliary spray line would not occur during the following operational cycle. The NRC found this method unacceptable as a final resolution to the Bulletin's concerns because "the

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*JEH*

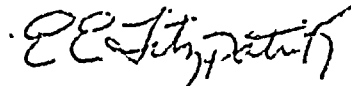
fundamental precept of the Bulletin is to prevent the initiation of cracks in piping, inservice inspection is not an acceptable technique identified in the Bulletin for preventing such cracks."

We have discussed the concern with Westinghouse, and, of the acceptable methods listed in the acceptance criteria attached to Reference 1, we are now proposing to monitor the Unit 1 auxiliary spray temperature. It is Westinghouse's position, as stated in the attachment, that the auxiliary spray line is not susceptible to high cycle thermal loads that produce fatigue cracks, and that the Unit 1 data will confirm this. The program will consist of mounting RTDs near appropriate welds and bends and taking data for one fuel cycle. Following the evaluation of the data, which will include the investigation of thermal hydraulic and structural response characteristics to determine susceptibility to fatigue-initiated cracks, we will inform you of the results and any further required actions.

Unit 1 was chosen for monitoring because installation of the instrumentation will require a unit outage, and sufficient time does not exist to install the instrumentation during the 1992 Unit 2 refueling outage. In addition, because of the similarities in the design and operation of both units, the Unit 1 data will be applicable to Unit 2. As an interim measure until the monitoring program is concluded, NDE will be performed on Units 1 and 2 during the 1992 refueling outages to confirm that no cracks have developed in the auxiliary spray line.

This letter is submitted pursuant to 10 CFR 50.54(f) and, as such, an oath of affirmation is enclosed.

Sincerely,



E. E. Fitzpatrick  
Vice President

tjw

Attachment

cc: D. H. Williams, Jr.  
A. A. Blind - Bridgman  
J. R. Padgett  
G. Charnoff  
NFEM Section Chief  
A. B. Davis - Region III  
NRC Resident Inspector - Bridgman

STATE OF OHIO)  
COUNTY OF FRANKLIN)

E. E. Fitzpatrick, being duly sworn, deposes and says that he is the Vice President of licensee Indiana Michigan Power Company, that he has read the forgoing Response to NRC Bulletin 88-08, "Thermal Stresses in Piping Connected to Reactor Coolant Systems," and knows the contents thereof; and that said contents are true to the best of his knowlege and belief.

*E. E. Fitzpatrick*

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Subscribed and sworn to before me this 31st  
day of January, 1992.

*L. D. Hill*

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NOTARY PUBLIC

L. D. Hill  
NOTARY PUBLIC, STATE OF OHIO  
MY COMMISSION EXPIRES 6-28-94

ATTACHMENT TO AEP:NRC:1069D,



Westinghouse  
Electric Corporation

Energy Systems

Box 355  
Pittsburgh Pennsylvania 15230-0355

AEP-92-003

Ref: MT-DMT-449(91)  
WCAP-12143, Supp. 1

Mr. R. A. Kadlec  
American Electric Power Service Corporation  
P. O. Box 16631  
One Riverside Plaza  
Columbus, OH 43216

Dear Mr. Kadlec:

AMERICAN ELECTRIC POWER SERVICE CORPORATION  
DONALD C. COOK UNITS 1 AND 2  
TECHNICAL REVIEW OF WCAP-12143, SUPPLEMENT 1

In accordance with your request, a review of the technical basis of WCAP-12143, Supplement 1, has been performed. The purpose of this review was to determine the amount of conservatism in the transient loads postulated for an 88-08 type valve leakage scenario in the Donald C. Cook auxiliary spray valves. After completing that review, it is judged that a considerable amount of conservatism exists in the postulated valve leakage transients. Specifically, the transient postulated is considered conservative for the following reasons:

- a) Spray flow in the main spray line is considerably less energetic than primary loop flow; hence, turbulent penetration produced by normal spray flow would be relatively small and is considered to have an insufficient energy level to promote thermal cycling in the branch line.
- b) The fact that flow will exist in the main spray line will promote mixing of any cooler fluid that enters the main spray line from the auxiliary spray line for low to moderate leak rates. Hence, for low to moderate leak rates no significant thermal stratification of the main spray line is expected.
- c) For moderate to large leak rates, the available cold water source would be quickly depleted and replaced with water heated by the regenerative heat exchanger. Hence, the cold water source would run out before any significant cycles could be experienced by the spray line.

In summary, the spray lines at Donald C. Cook units one and two are considered not susceptible to high cycle thermal loads of the type that produced thermal fatigue cracks in the plants mentioned in NRC Bulletin 88-08. This position can be verified with an appropriate temporary monitoring program on one unit.

Mr. R. A. Kadlec

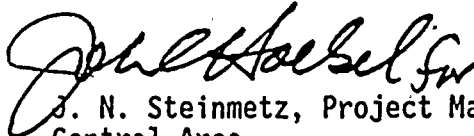
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AEP-92-003  
January 6, 1992

It is judged that monitoring, along with a detailed investigation into the potential for a cycling mechanism in the spray line, would result in the conclusion that the spray lines structural integrity would not be violated even if a cyclic leak occurred in the auxiliary spray valve. It is therefore our recommendation that the Donald C. Cook units consider a program of temporary monitoring on one unit along with an investigation into the thermal hydraulic and structural response characteristics of their spray lines to determine the susceptibility of said lines to fatigue initiated cracks induced by cyclic thermal stratification loads.

If you have any questions please contact E. L. Cranford (412) 256-6486.

Very truly yours,



J. N. Steinmetz, Project Manager  
Central Area  
Domestic Customer Projects Department

cc: ~~T. S. Satyan-Sharma~~