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RECIP. NAME RECIPIENT AFFILIATION
MURLEY, T.E. Document Control Branch (Document Control Desk)

SUBJECT: Forwards response to NRC Bulletin 93-002, "Debris Plugging
of ECC Suction Strainers." Review concluded that no
temporary components exist in containment which would end up
in containment sump.

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Donald C. Cook Nuclear Plant Units 1 and 2
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74
BULLETIN NO. 93-02: DEBRIS PLUGGING OF EMERGENCY
CORE COOLING SUCTION STRAINERS

AEP:NRC:1188

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

Attn: T. E. Murley

June 11, 1993

Dear Dr. Murley:

NRC Bulletin 93-02 was issued on May 11, 1993. The bulletin addresses the potential loss of net positive suction head for the emergency core cooling system (ECCS) for light water reactors during the recirculation phase of a loss-of-coolant accident (LOCA) due to clogging of the recirculation sump screen. The concern stems from an event at Perry Nuclear Plant where filter fibers were deposited on the residual heat removal strainers in March 1993. Bulletin 93-02 specifically requires licensees to: 1) identify fibrous air filters or other temporary sources of fibrous material, not designed to withstand a LOCA, which are stored in the primary containment, 2) take any immediate compensatory measures which may be required to assure the functional capability of the ECCS, and 3) take prompt action to remove any such material. The purpose of this letter is to identify the actions taken at Cook Nuclear Plant pursuant to the above requirements. Details of the review activities are included in the attachment to this letter.

This letter is submitted pursuant to 10 CFR 50.54(f) and, as such, an oath statement is attached.

Sincerely,

S. J. Brewer
S. J. Brewer
Group Manager

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Dr. T. E. Murley

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AEP:NRC:1188

Attachments

cc: A. A. Blind - Bridgman
J. R. Padgett
G. Charnoff
NFEM Section Chief
J. B. Martin - Region III
NRC Resident Inspector - Bridgman

Introduction

The purpose of this letter is to respond to NRC Bulletin No. 93-02 dated May 11, 1993. The bulletin addresses the potential loss of net positive suction head (NPSH) for the emergency core cooling system (ECCS) for light water reactors during the recirculation phase of a loss-of-coolant accident (LOCA) due to clogging of the recirculation sump screen. The concern stems from an event at Perry Nuclear Plant where filter fibers were deposited on the residual heat removal strainers in March 1993. This event resulted in the issuance of Information Notice 93-34 and its Supplement 1 on May 6, 1993. The source of the debris was from temporary drywell cooling filters that had been inadvertently dropped into the suppression pool, and corrosion products that had been filtered from the pool by the glass fibers adhering to the surface of the strainers.

The requested actions of the bulletin are to: 1) identify fibrous air filters or other temporary sources of fibrous material, not designed to withstand a LOCA, which are stored in the primary containment, 2) take any immediate compensatory measures which may be required to assure the functional capability of the ECCS, and 3) take prompt action to remove any such material. The NRC staff considers removal of this material at the next shutdown, or within 120 days, whichever comes first, to be necessary.

Plant Description

Cook Nuclear Plant has ice condenser containments. The containments are essentially separated into three compartments: upper containment, lower containment, and ice condenser. The ECCS pump suction source for the recirculation phase is located in the basement of the lower containment. The water source for ECCS recirculation is the recirculation sump whose primary purpose is to provide a collection point for the water discharged to the containment from the reactor coolant system (RCS), ECCS, containment spray system (CTS), and ice condenser following a LOCA. While the entire lower containment serves as a reservoir, the recirculation sump prevents debris from flowing into the residual heat removal (RHR) and CTS pump suctions when used for recirculation following a LOCA. A vertical screen designed to protect the recirculation and CTS pumps from debris is provided. The total area of this screen is approximately 88 square feet. A trash rack, which protects the inner screen from missiles and other large debris, is installed outside of the screen. The trash rack and screen are designed to withstand the vibratory motion of a seismic event without loss of structural integrity.

By design, ECCS operability is assured even with 50% blockage of the sump. The Perry Nuclear Plant suction strainers are located in the suppression pool, which always has a standing head of water. This is different from the configuration of the ice condenser containment which is dry in the lower compartment until after the occurrence of a LOCA or steam line break.

Review Actions Taken

To identify the existence of the filter material of concern, an extensive review was performed of photographs, videotape, job orders, design specifications, drawings, and contracts for the containment building ventilation units. Numerous interviews were also conducted with persons who have familiarity with the plant ventilation units during previous refueling outages. The review revealed only two possible sources per unit of the fibrous material specified in the bulletin. This material is housed within the intake of the containment auxiliary clean-up ventilation units which are located in lower containment between steam generators Nos. 1 and 4 and Nos. 2 and 3. A review of the existing configuration of these ventilation units revealed that roughing filters are mounted on the inlet to HEPA filters within the ventilation units. These filters are held in place by a wire attaching them to the inlet frame of the HEPA and are enclosed by a screen door on the inlet side of the ventilation units. Additional investigation is required to determine the capability of these ventilation units to contain the filters following a LOCA.

A review was also conducted to identify any temporary ventilation components in containment that could contain fibrous materials. The review concluded that no temporary components exist in containment which would end up in the containment sump. It is a practice at Cook Nuclear Plant to remove any equipment from containment that is not designed to be there per approved plant drawings. Any equipment not permanently installed must be approved per the plant's temporary modification process. The temporary modification process ensures, by approved plant procedures, that proper safety reviews have been completed for items left in containment following an outage. Reviews of existing temporary modifications revealed no such material in containment. Extensive containment closeout tours are also performed prior to startup, per procedure, by operations department personnel to ensure containment cleanliness and removal of any equipment not properly approved and installed.

As part of this review, examination of our earlier investigation of NRC Information Notice No. 88-28: Potential for Loss of Post-LOCA Recirculation Capability due to Insulation Debris Blockage, that was completed in 1988 was also performed. The conclusions from that investigation were that insulated surfaces are either jacketed or are of mirror construction with an exterior surface 10-mils thick. Any insulation inside containment at Cook Nuclear Plant would have been installed under the same specifications addressed within the response for the aforementioned information notice and would not pose a concern for insulation accumulation in the recirculation sump.

Conclusions

In summary, there is one source of fibrous air filters or other temporary sources of fibrous materials installed or stored in the containments of Cook Nuclear Plant. We are in the process of investigating the capability of the ventilation unit to contain the filters following a LOCA. This investigation is expected to be completed soon with the results forwarded to the NRC by August 6, 1993. Should additional actions be necessary to meet the intentions of the bulletin as a result of the investigation, they will be specified in that letter. Further, the filters have been found to be unnecessary for the functionality of the units. Current plans are to remove the filters during the next refueling outages. The projected dates for the start of Unit 1 and Unit 2 refueling outages are February 1994 and August 1994, respectively.

STATE OF OHIO)
COUNTY OF FRANKLIN)

S. J. Brewer, being duly sworn, deposes and says that he is the Group Manager of Nuclear Safety, Licensing, and Assessment of American Electric Power Service Corporation that he has read the forgoing response to Bulletin 93-02: Debris Plugging of Emergency Core Cooling Suction Strainers and knows the contents thereof; and that said contents are true to the best of his knowledge and belief.

S. J. Brewer

Subscribed and sworn to before me this 11th

day of June, 1993.

Rita D. Hill
NOTARY PUBLIC

RITA D. HILL
NOTARY PUBLIC, STATE OF OHIO
MY COMMISSION EXPIRES 6-23-94