Public Service
Electric and Gas
Company

Stanley LaBruna

Vice President - Nuclear Engineering

Public Service Electric and Gas Company P.O. Box 236, Hancocks Bridge, NJ 08038 609-339-1700

APR 19 1994

NLR-N94071

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

Gentlemen:

RESPONSE TO NRC BULLETIN 93-02 SUPPLEMENT 1
DEBRIS PLUGGING OF EMERGENCY CORE COOLING SUCTION STRAINERS
HOPE CREEK GENERATING STATION
DOCKET NO. 50-354

The attachment to this letter provides Public Service Electric and Gas's (PSE&G) response to the subject bulletin concerning the potential for clogging the suction strainers of Emergency Core Cooling Systems (ECCS) at Hope Creek Generating Station.

As detailed in the attachment, procedure changes and operator briefings will be completed within 90 days of the date of Bulletin 93-02, Supplement 1. Other actions will be accomplished as described in the attachment.

If you have any questions regarding this response, please do not hesitate to contact us.

Sincerely,

S. LaBruna
Vice President -
Nuclear Engineering

Attachments (1)
Affidavit

JE11

C Mr. T. T. Martin, Administrator - Region I
U. S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Mr. J. C. Stone, Licensing Project Manager
U. S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

Mr. C. Marschall
USNRC Senior Resident Inspector

Mr. K. Tosch, Manager, IV
NJ Department of Environmental Protection
Division of Environmental Quality
Bureau of Nuclear Engineering
CN 415
Trenton, NJ 08625

REF: NLR-N94071

STATE OF NEW JERSEY)
) SS.
COUNTY OF SALEM)

S. LaBruna, being duly sworn according to law deposes and says:

I am Vice President - Nuclear Engineering of Public Service Electric and Gas Company, and as such, I find the matters set forth in the above referenced letter, concerning the Hope Creek Generating Station, are true to the best of my knowledge, information and belief.

S. LaBruna

Subscribed and Sworn to before me
this 19th day of April, 1994

Sherry L Cagle
Notary Public of New Jersey

SHERRY L. CAGLE
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires March 5, 1997

My Commission expires on _____

NLR-N94071

ATTACHMENT
RESPONSE TO NRC BULLETIN 93-02, SUPPLEMENT 1
HOPE CREEK GENERATING STATION

BACKGROUND:

The bulletin supplement discussed the most recent information available regarding the potential for ECCS pumps to lose the required net positive suction head (NPSH) due to strainer clogging in the torus from pipe insulation debris. This decrease in NPSH is postulated to occur during the recirculation phase of a loss of coolant accident (LOCA). The bulletin supplement further described ongoing NRC and BWR Owners Group investigations. Based on interim information, the NRC staff believes the following actions are warranted and prudent until further studies are completed.

RESPONSE:

Each "Action Requested" from Bulletin 93-02, Supplement 1 is listed in bold followed by PSE&Gs response for Hope Creek Generating Station. As directed by the bulletin supplement, each response describes our planned actions and schedule for completion.

1. **Provide training and briefings to apprise operators and other appropriate emergency response personnel of the information contained herein and in the referenced information notices regarding the potential for suppression pool strainer clogging.**

All operating shifts have been briefed during shift turnover on the information contained within this bulletin supplement.

With regard to training, the potential for suppression pool strainer clogging by debris entering the suppression pool (torus) has been covered in prior license operator requalification training. This training was incorporated into requalification training in response to recent NRC Information Notices received on this issue. Licensed operators have been exposed to this potential failure mode. Additional training will be conducted using the Hope Creek simulator to demonstrate the symptoms of ECCS strainer clogging. This training will be completed in normal requalification training scheduled to be completed by June 30, 1994.

The information in this bulletin supplement will also be covered in the second quarter Operational Experience Feedback (OEF) sessions provided to various Hope Creek station engineering support personnel. This will be completed by July 8, 1994.

Review of this information with the following emergency response personnel will be accomplished by May 19, 1994 via a read and sign document: Emergency Duty Officer, Emergency Response Manager, Site Support Manager, Technical Support Manager, Technical Support Supervisor, Technical Support Team Leader. This information will also be included in the lessons learned portion of the Emergency Preparedness management duties training pending final resolution of this issue.

2. **Assure that the emergency operating procedures make the operator aware of possible indications of ECCS strainer clogging and provide guidance on mitigation.**

An abnormal procedure will be developed to provide event specific direction to the operator for mitigating the effects of degraded ECCS performance. This abnormal procedure will be issued by May 19, 1994. The Hope Creek emergency operating procedures (EOPs) were developed using the NRC approved BWR Owners' Group Emergency Procedure Guidelines (EPGs), Revision 4. The EOPs provide symptom based guidance, i.e., the operator is directed and trained to respond to symptoms such as maintaining water level rather than specific events such as ECCS suction strainer blockage. Therefore, PSE&G believes at this time it is more appropriate to provide event specific guidance on responding to an ECCS degradation event in an abnormal procedure.

As investigations continue into this issue, changes to the EPG/plant specific EOPs recommended by the BWR Owners' Group Emergency Procedure Committee will be assessed for incorporation into the Hope Creek EOPs.

3. **Institute procedures and other measures to provide compensatory actions to prevent, delay, or mitigate a loss of available NPSH margin under LOCA conditions. Such measures should be consistent with providing the design basis emergency system functions for core and containment cooling. Actions to assure sufficient core and containment cooling may include:**

   Reduction of flow (consistent with delivering the required ECCS flow) through the strainers to reduce head loss and extend the time for debris deposition.

Procedure changes will be completed to address extension of ECCS capability as long as possible. Guidance from the BWR Owners Group will be utilized as a starting point. Required procedure changes will be completed by May 19, within 90 days of the date of this bulletin supplement.

It should be noted that a reduction in flow requires throttling of ECCS valves. For a postulated design basis LOCA, reactor pressure vessel water level may be below the top of active fuel. EOP guidance does and will continue to require that ECCS pumps be operated at maximum flow regardless of NPSH concerns while reactor vessel level is below the top of active fuel so that core cooling takes precedence.

Operator realignment of existing systems to allow backflushing of clogged strainers.

Currently there is no method to backflush ECCS strainers if the reactor building is inaccessible during an accident. Methods of backflushing when the reactor building is accessible will be identified in the abnormal procedure being developed. Hope Creek management is following this issue through the BWR Owners Group ECCS Strainer Committee. As further information is forthcoming from this Committee, procedures will be evaluated and revised as necessary to provide for implementation.

Operator realignment of existing systems to allow injection to the core from water sources other than the suppression pool.

The EOPs presently provide direction to the operator for realignment of existing systems from sources other than the suppression pool (torus). The Reactor Pressure Level (RPV) Control, Alternate Level Control, and Containment Flood EOPs instruct the operator in the use of alternate injection sources such as fire water, service water and standby liquid control system.

In addition procedure changes will be made by May 19 to incorporate the alignment of core spray systems to the Condensate Storage Tank (CST) for ECCS performance considerations.

Intermittent operation of the containment sprays, when possible, to reduce the transport of debris to the strainers.

Intermittent operation of spray systems is allowed by current procedure as long as the parameter(s) being controlled (drywell pressure and temperature) do not require continuous operation. Clarification of the flexibility in operation of drywell spray will be incorporated in procedures as necessary by May 19, 1994.

Other plant-specific measures which assure availability of sufficient core and containment cooling to meet the design basis of the plant.

Although it is a beyond design basis system, Hope Creek has installed a remotely operated hardened torus vent which would be available for use following a design basis accident LOCA. This vent is capable of providing long term decay heat removal.

Hope Creek has also taken action to minimize debris sources in the drywell. This bulletin supplement was received at the end of February as Hope Creek was completing final preparation for a scheduled refueling outage that commenced on March 5, 1994. As a

pro-active measure, the torus was inspected. The torus water inventory exhibited high clarity. Minor debris was found (on the order of a dozen pieces of tape or ty-rap) and, on average, a 1/64 inch layer of sediment was vacuumed from portions of the torus. The 1/64 inch layer of sediment is minimal considering it was deposited over a seven year period of operation without prior vacuuming of the torus.

Also prior to closing the drywell, walkdowns will be conducted with increased attention to removing all items that could be transported to the torus during a postulated design basis LOCA. These actions ensure that, outside of permanent insulation, there is no other debris source within the drywell.