



# Nebraska Public Power District

COOPER NUCLEAR STATION  
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NSD940316  
April 18, 1994

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

Subject: Response to NRC Bulletin 93-02, Supplement 1, Debris Plugging of  
Emergency Core Cooling Suction Strainers - 50.54(f)  
Cooper Nuclear Station  
Docket No. 50-298/DPR-46

- References:
- 1) Letter (NSD930738), G. R. Horn (District) to the U.S. NRC Document Control Desk, dated June 10, 1993, Response to NRC Bulletin 93-02, "Debris Plugging of Emergency Core Cooling Suction Strainers"
  - 2) Letter, L. A. England (Boiling Water Reactors Owners' Group) to Ashok C. Thadani (NRC), dated March 24, 1994, "Submittal of BWROG Interim Safety Assessment and Operator Guidance in Response to NRC Bulletin 93-02, Supplement 1"

Gentlemen:

On February 18, 1994, the Nuclear Regulatory Commission (NRC) issued Supplement 1 to Bulletin 93-02. This bulletin supplement has been issued in order to:

1. Inform Action and Information addressees about the vulnerability of emergency core cooling system (ECCS) suction strainers in boiling-water reactors (BWRs) and containment sumps in pressurized-water reactors (PWRs) and clogging during recirculation phase of a loss-of-coolant accident (LOCA).
2. Request that Action addressees take the appropriate actions to ensure reliability of the ECCS in view of the information discussed in this bulletin supplement regarding the vulnerability of the ECCS strainers to clogging.
3. Require that Action addressees report to the NRC whether, and to what extent, the requested actions will be taken and to notify the NRC when actions associated with this bulletin supplement are complete.

As directed by NRC Bulletin 93-02, Supplement 1, the Nebraska Public Power District (District) provides the following response to the requested actions contained in the bulletin supplement. This response is submitted under oath pursuant to the provisions of 10 CFR 50.54(f).

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Actions Requested and District Response

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

Direct Response

NRC Bulletin 93-02, Supplement 1, has been routed to operations personnel to ensure they are aware of the concerns of this bulletin. A lesson plan including simulator discussion and demonstrations has been developed. The objectives of this training are to recognize the potential for, and indications of, ECCS suction strainer clogging; execute EOP contingency steps for use of alternate injection systems by taking suction outside the primary containment; and to take action to economize the use of ECCS.

This training is being provided to Licensed Operators, Shift Technical Advisors, STAs, Licensed Certs, and Station Operators. Expected completion date is May 4, 1994. Also, this bulletin was added to the Emergency Plan Industry Events Training for Operators on April 4, 1994. In addition, because CNS Engineering personnel would provide TSC support during Emergency Plan implementation, Engineering Department personnel will be briefed on the concerns of this bulletin during meetings to be held prior to May 19, 1994.

2. Assure that the Emergency Operating Procedures make the operator aware of possible indications of ECCS strainer clogging and provide guidance on mitigation.

Direct Response

The Cooper Nuclear Station Emergency Operator Procedures (EOPs) are based upon, and consistent with, the Boiling Water Reactor Owners' Group (BWROG) Emergency Procedure Guideline, Revision 4, and provide operator guidance regarding the utilization of ECCS pumps. Their symptomatic basis and structure already provide direction for utilization of alternate injection systems which take suction from outside the primary containment (PC). The operator is directed to utilize these alternate injection systems to restore the critical parameter, RPV water level to the specified band. EOPs provide contingency actions for loss of ECCS due to any cause (pump failure, piping failure, valve failure, etc...) utilizing alternate injection systems from outside PC. If RPV level can not be restored above Top of Active Fuel (TAF), then PC flooding would be performed. PC flooding aligns ECCS pumps to sources outside the PC, and is augmented by various alternate injection systems.

In addition, the BWROG, of which the District is a member, promulgated operator guidance for potential blockage of ECCS pump suction strainers. This guidance was submitted to the NRC in Reference 2 for information.

This guidance discusses how the Emergency Procedure Guidelines and EOPs address the issues raised by the ECCS suction strainer blockage including mitigative actions such as minimizing ECCS division flow, and shifting of ECCS suction. The information contained in this guidance is included in the training to be given to operations as discussed in Response to Action No. 1 above. These actions will assure that operators are aware of possible indications of ECCS strainer clogging and of mitigating actions.

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

Operator realignment of existing systems to allow backflushing of clogged strainers

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

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

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

#### District Response

Present procedures at CNS have been reviewed and determined to provide adequate compensatory actions for NPSH. The separate actions listed above are addressed as follows:

- a. The existing CNS EOPs economize ECCS operation by providing guidance for securing ECCS pumps not required to assure adequate core cooling.
- b. Current CNS design does not allow for backflushing of ECCS strainers.
- c. The existing CNS EOPs provide guidance for control of drywell sprays for control of PC pressure and temperature. Current CNS design requires manual operation of RHR pumps to perform containment spray. Following a LOCA peak containment pressure, drywell sprays would be initiated to lower containment pressure. Due to high drywell spray capacity and a small Mark I containment volume, drywell sprays would

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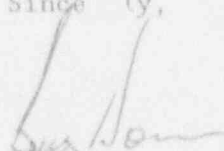
quickly lower containment pressure until they automatically secure at 2 psig. Subsequently, residual heat from RPV out-leakage would raise containment pressure to 10 psig, where upon the operator would again initiate drywell sprays. The overall activity results in the operator controlling containment pressure between 2 and 10 psig. Thus, plant design and EOPs result in post-LOCA drywell spray operation during a relatively narrow control band which effectively minimizes their operation.

In summary, current CNS control and reduction of fibrous insulation, combined with existing EOPs, assures availability of ECCS for both design basis and beyond design basis events.

As stated in Reference 2, the BWROG is continuing to review this issue including identification of any need to revise the BWROG Emergency Procedure Guidelines. Any such changes identified by the BWROG will be evaluated and changes will be made to the CNS EOPs as determined necessary.

If you have any questions regarding this response, or require additional information, please contact me.

Since ly,



G. R. Horn  
Vice President - Nuclear

GRH/dwb/dum/ya  
Attachment

cc: U.S. Nuclear Regulatory Commission  
Region IV  
Arlington, TX

NRC Resident Inspector  
Cooper Nuclear Station

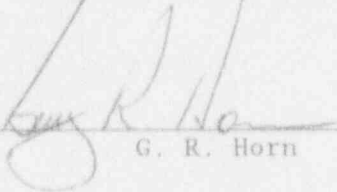
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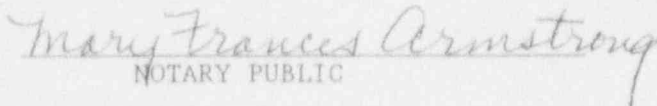
STATE OF NEBRASKA)

NEMAHA COUNTY)

G. R. Horn, being first duly sworn, deposes and says that he is an authorized representative of the Nebraska Public Power District, a public corporation and political subdivision of the State of Nebraska; that he is duly authorized to submit this response on behalf of Nebraska Public Power District; and that the statements contained herein are true to the best of his knowledge and belief.

  
G. R. Horn

Subscribed in my presence and sworn to before me this 18<sup>th</sup> day of  
April, 1994.

  
NOTARY PUBLIC

