



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO NRC BULLETIN 95-02

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NO. 50-298, DPR-46

1.0 INTRODUCTION

NRC Bulletin 95-02, "Unexpected Clogging of a Residual Heat Removal (RHR) Pump Strainer While Operating in Suppression Pool Cooling Mode," was issued on October 17, 1995. The bulletin requested all holders of boiling-water reactor (BWR) operating licenses or construction permits for nuclear power reactors to take five actions to ensure that unacceptable buildup of debris that could clog strainers does not occur during normal operation. By letter dated November 16, 1995, the Nebraska Public Power District (NPPD, the licensee) submitted its response to NRC Bulletin 95-02 for Cooper Nuclear Station (Cooper). In its response, NPPD described its plans to comply with all of the requested actions in the bulletin.

2.0 DISCUSSION

The following describes the requested actions in NRC Bulletin 95-02 and the licensee's response to each requested action.

Action 1

Verify the operability of all pumps which draw suction from the suppression pool when performing their safety functions (e.g., emergency core cooling system [ECCS], containment spray, etc.), based on an evaluation of suppression pool and suction strainer cleanliness conditions. This evaluation should be based on the pool and strainer conditions during the last inspection or cleaning and an assessment of the potential for the introduction of debris or other materials that could clog the strainers since the pool was last cleaned.

Response

The Cooper suppression pool was drained and cleaned during the 1993 refueling outage. Additionally, during the period from October 17-25, 1995, the licensee inspected the ECCS and Reactor Core Isolation Cooling (RCIC) system suction strainers and torus and sampled the torus water. While the inspections identified a few items, (e.g., single pieces of string and a few small pieces of other unidentified material), the licensee determined that the strainers were clean. The torus water grab samples, taken from three separate locations, contained no fibers/threads which posed any potential for impacting pump operability. An inspection of the

torus floor area identified only one bagged flashlight and a small rubber band which were both retrieved.

A review of the existing programs to prevent the inadvertent introduction of material in the suppression pool was conducted and the licensee implemented an upgraded foreign materials exclusion (FME) program.

Action 2

Confirm the operability evaluation in requested Action 1 above through appropriate test(s) and strainer inspection(s) within 120 days of the date of this bulletin.

Response

Based on the satisfactory results of the inspections performed to address item 1, the licensee did not perform any special tests of strainer operation. The licensee has begun to trend the ECCS pump suction pressures during normal pump surveillance testing when suctions are aligned to the torus to identify any significant changes which could indicate suction strainer fouling.

Action 3

Schedule a suppression pool (torus) cleaning. The schedule for cleaning the suppression pool should be consistent with the operability evaluation in requested Action 1 above. In addition, a program for periodic cleaning of the suppression pool should be established, including procedures for the cleaning of the pool, criteria for determining the appropriate cleaning frequency, and criteria for evaluating the adequacy of the pool cleanliness.

Response

Based on the 1993 cleaning and the current satisfactory condition of the torus, the licensee did not identify an immediate need for an additional cleaning. The licensee committed to have a program implemented by the next scheduled refueling outage to ensure that the torus and the ECCS and RCIC system suction strainers are cleaned on an appropriate frequency.

Action 4

Review FME procedures and their implementation to determine whether adequate control of materials in the drywell, suppression pool, and systems that interface with the suppression pool exists. This review should determine if comprehensive FME controls have been established to prevent materials that could potentially impact ECCS operation from being introduced into the suppression pool, and that workers are sufficiently aware of their responsibilities regarding FME. Any identified weaknesses should be corrected. In addition, the effectiveness of the FME controls since the last time the suppression pool was cleaned and the ECCS strainers inspected, and the impact that any weaknesses noted may have on the operability of the ECCS should be assessed.

Response

The licensee recently revised its FME program and trained plant personnel. FME controls during torus work include FME monitors and equipment and material logging when the torus is open until protected using an FME device. Additionally, drywell and torus close-out inspections are performed, if these areas have been opened, prior to plant restart. The licensee will also review its FME program and revise it as appropriate to enhance its effectiveness.

Action 5

Consider additional measures such as suppression pool water sampling and trending of pump suction pressure to detect clogging of ECCS suction strainers.

Response

The licensee will develop a program to determine the appropriate frequency for cleaning the torus and ECCS suction strainers. As part of that program, the licensee will establish a periodic torus water sampling process to support determination of a required cleaning interval. In addition, the licensee will trend ECCS pump suction pressures during pump testing with suction aligned to the torus.

3.0 EVALUATION

The purpose of the requested actions in the bulletin is to ensure that ECCS and other pumps drawing suction from the suppression pool do not experience unacceptable buildup of debris that could clog strainers during normal operation, which could prevent them from performing their safety function. Action 1 requested licensees to evaluate the operability of their pumps based on the cleanliness of the suppression pool and strainers. Action 2 then requested a verification of the licensee's assessment through a pump test and strainer inspection. These two actions serve to ensure that the pumps are currently operable and are not experiencing unacceptable debris buildup. Requested actions 3, 4 and 5 serve to ensure that appropriate measures, such as cleaning of suppression pools and strengthening of FME practices, are taken in the long term to prevent debris accumulation in the pool.

The staff has concluded that the licensee's assessment of the ability of all pumps drawing suction from the suppression pool to perform their safety function has established a reasonable basis for concluding that all of the pumps evaluated are operable. The licensee conducted an inspection to confirm that the RCIC and ECCS systems were not affected by an unacceptable buildup of debris that could clog the pump strainers. Initial strainer cleanliness was considered good. The staff has concluded that the licensee's response meets the intent of requested actions 1 and 2 and is acceptable. The staff has also concluded that the licensee's evaluation of its FME program and suppression pool cleaning program meet the intent of requested actions 3 and 4, and are acceptable. The licensee's proposed programs to trend pump suction pressure data, sample torus water/sediment, and periodically inspect the strainers and torus provide additional opportunity for early identification of potential strainer fouling. The staff has concluded that these additional actions meet the intent of requested action 5 and are

acceptable. The staff has also concluded that the schedule for implementation of the actions proposed by the licensee is appropriate given the actions already taken.

4.0 CONCLUSION

Based on the staff's evaluation of the licensee's submittal, the staff finds the licensee's response to NRC Bulletin 95-02 to be acceptable for Cooper.

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