



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005**

November 4, 2005

MEMORANDUM TO: John Hanna, Senior Resident Inspector
Division of Reactor Projects

FROM: Kriss M. Kennedy, Chief, Projects Branch C */RA/*
Division of Reactor Projects

SUBJECT: SPECIAL INSPECTION CHARTER TO EVALUATE SERVICE WATER
EVENT AT COOPER NUCLEAR STATION

In response to an event that led to the inoperability of the service water system at Cooper Nuclear Station on October 20, 2005, a Special Inspection is being chartered. You are hereby assigned to conduct the Special Inspection. Nick Taylor, Resident Inspector, Cooper Nuclear Station, has been assigned to assist you during this inspection.

A. Basis

On October 20 at 9:09 a.m. with service water Pumps A, B, and C running, operators started service water Pump D. Following the start of service water Pump D, at 9:10 a.m., the control room operators received a high differential pressure alarm on service water Strainer B followed by a high differential pressure alarm on service water Strainer A. Both service water cross-connect valves (SW-MO-36/37) closed on low service water header pressure. Operators observed that the service water header pressure in Loop A was approximately 42 psig and 15-20 psig in Loop B. The differential pressure across Service Water Strainer A peaked at 20 psid and recovered in approximately 3 minutes following the automatic initiation of strainer backwash. The differential pressure across service water Strainer B peaked at 20.9 psid; however, the automatic initiation of backwash did not result in a sufficient decrease in differential pressure and operators bypassed the strainer. Following these actions, the service water system header pressures returned to normal. During the event, operators declared both loops of service water inoperable due to exceeding the strainer differential pressure structural integrity limit of 15 psid. With both loops of service water inoperable, operators declared both emergency diesel generators inoperable.

The high differential pressure across the strainers was the result of debris (small rocks) which was introduced into the service water system following the start of service water Pump D. The high debris loading clogged the strainers. Cooper Nuclear Station experienced a similar event in November 2004 and has experienced other challenges to the proper operation of the service water system resulting from debris over the last several years.

Management Directive 8.3, "NRC Incident Investigation Program," was used to evaluate the level of NRC response for this event. In evaluating the deterministic criteria of MD 8.3, it was determined that introduction of debris into the service water system involved repetitive failures or events involving safety-related equipment or deficiencies in operations. Since the deterministic criteria was met, the service water event was

evaluated for risk. The preliminary Estimated Conditional Core Damage Probability was determined to be between $2.0E-6$ and $2.0E-5$. In accordance with MD 8.3, the results of the risk assessment indicates that NRC response to this event falls between the overlap region to conduct a Special Inspection and no additional inspection, and the region that requires a Special Inspection.

Region IV has reviewed the results of the MD 8.3 evaluation and determined that a Special Inspection is warranted. Based on previous inspections of these issues, and inspection that has occurred since the October 20 event, the following specific concerns have been identified that warrant further inspection and assessment:

- The timeliness and adequacy of corrective actions that Cooper Nuclear Station has already implemented or plans to implement to correct the cause of these events;
- The adequacy of Cooper Nuclear Station's interim compensatory measures to prevent challenges to the service water system while the longer term corrective actions are being implemented; and
- The assumptions and basis used by the licensee to evaluate the ability of the service water system to continue to meet design requirements.

This Special Inspection is chartered to identify the circumstances surrounding this event, determine if the licensee's long-term corrective actions are timely and adequate, and to determine if the licensee's interim compensatory actions are adequate.

B. Scope

The inspection is expected to perform data gathering and fact-finding in order to address the following:

1. Develop a complete description of the service water event that occurred on October 20, 2005, and a complete sequence of events, including operator and system response, related to the event.
2. Develop a list of similar challenges to the service water system resulting from debris and actions taken by the licensee to correct the problem.
3. Identify and evaluate the adequacy and timeliness of the licensee's long-term corrective actions established prior to the event on October 20, 2005, and any changes following the event, to address the adverse impact of debris on the service water system.
4. Identify and evaluate the adequacy of the licensee's compensatory measures established prior to and following the event on October 20, 2005, to address the adverse impact of debris on the service water system.

5. Identify and assess additional actions planned by the licensee in response to this event, including the timeline for their completion of these actions.
6. Evaluate the assumptions and basis used by the licensee to determine the ability of the service water system to continue to meet design requirements.
7. Assess the impact that the increased debris loading, and operation of the service water system with one or more strainers bypassed, has had on safety-related equipment cooled by service water.
8. Identify the changing conditions that have resulted in the increase in service water system debris loading in recent years.
9. Compare the results of your inspection with the licensing and design basis for Cooper Nuclear Station.
10. Evaluate pertinent industry operating experience to the event, including the effectiveness of any action taken in response to the operating experience.
11. Determine if there are any generic issues related to the service water event. Promptly communicate any potential generic issues to regional management.
12. Assess the safety significance of any inspection findings.

C. Guidance

Inspection Procedure 93812, "Special Inspection," provides additional guidance to be used by the Special Inspection Team. Your duties will be as described in Inspection Procedure 93812. The inspection should emphasize fact-finding in its review of the circumstances surrounding the event. It is not the responsibility of the team to examine the regulatory process. Safety concerns identified that are not directly related to the event should be reported to the Region IV office for appropriate action.

You will formally begin the special inspection with an entrance meeting to be conducted no later than November 7, 2005. The inspection will include a review of the results of the licensee's root cause analysis. You should brief Region IV management during the course of your inspections and prior to your exit meeting. A report documenting the results of the inspection should be issued within 30 days of the completion of the inspection.

This Charter may be modified should you develop significant new information that warrants review. Should you have any questions concerning this Charter, contact me at (817) 860-8144.

John Hanna

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cc via E-mail:

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SISP Review Completed: ____KMK____ ADAMS: / Yes ☐ No Initials: _KMK_
/ Publicly Available ☐ Non-Publicly Available ☐ Sensitive / Non-Sensitive
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RIV:SPE:DRP/C	C:DRP/D			
WCWalker	KMKKennedy			
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