



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
1600 EAST LAMAR BOULEVARD  
ARLINGTON, TEXAS 76011-4511

November 2, 2021

Mr. John Dent, Jr., Vice President  
and Chief Nuclear Officer  
Nebraska Public Power District  
72676 648A Avenue  
Brownville, NE 68321

SUBJECT: COOPER NUCLEAR STATION - NOTIFICATION OF NRC TRIENNIAL HEAT EXCHANGER/SINK PERFORMANCE INSPECTION 05000298/2022001 AND REQUEST FOR INFORMATION

Dear Mr. Dent:

The purpose of this letter is to notify you that U.S. Nuclear Regulatory Commission (NRC) staff will conduct the triennial portion of the heat exchanger/sink performance inspection at Cooper Nuclear Station from February 7, 2022, through February 10, 2022. The onsite phase of the inspection will consist of two reactor inspectors from the NRC's Region IV office for one week. The inspection will be conducted in accordance with NRC Inspection Procedure (IP) 71111, Attachment 07, "Heat Exchanger/Sink Performance," dated October 21, 2020.

The objectives of the inspection are to verify that: 1) any potential heat exchanger deficiencies which could mask degraded performance are identified, 2) any potential common-cause heat sink performance problems that have the potential to increase risk are identified, and 3) the licensee has adequately identified and resolved heat sink performance problems that could result in initiating events or affect multiple heat exchangers in mitigating systems and thereby increase risk.

To minimize the impact the inspection has on the site and to ensure an efficient inspection, we have enclosed a request for information needed for the inspection. It is important that these requests are fulfilled as completely and accurately as possible to minimize any additional requests during the preparation week or during the onsite inspection. The requests have been divided into three groups.

- The first group lists information necessary for our initial inspection scoping activities. This information should be available to the lead inspector no later than December 27, 2021. As soon as practicable, the lead inspector will communicate the selected 2-4 risk significant or safety-related heat exchanger and/or heat sink samples. The lead inspector will also communicate whether only a subset of the second group information requests is required.
- The second group of information requested includes those items needed to support our in-office preparation activities. This set of documents should be available no later than January 24, 2022. This information should be separated for each selected component.

Note that the inspector(s) may identify during the preparation week additional information needed to support the inspection and will communicate those requests as soon as practicable.

- The third group of information requested includes the additional documentation identified during in-office preparation activities as well as other resource requests necessary to support our onsite inspection activities. The additional information or resources should be available throughout the week of onsite inspection activities beginning on February 7, 2022.

All information requested is to be from the time of the last triennial heat exchanger/sink performance inspection until the present. If no documents addressing a request fall within that time, the request applies to the last applicable document. If a request does not apply (or there are no responsive documents) for any heat exchanger/heat sink sample, no response is necessary. Include all attachments, addendums, etc. to the requests.

We have discussed the schedule for this inspection with your staff and understand that our regulatory contact for this inspection will be Mr. Thomas Forland of your Licensing Organization. If there are any questions about this inspection or the documents requested, please contact the lead inspector, Fabian Thomas, by telephone at 817-200-1126 or by e-mail at [Fabian.Thomas@nrc.gov](mailto:Fabian.Thomas@nrc.gov).

#### PAPERWORK REDUCTION ACT STATEMENT

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Sincerely,

*Vincent Gaddy* Signed by Gaddy, Vincent  
on 11/02/21

Vincent G. Gaddy, Chief  
Engineering Branch 1  
Division of Reactor Safety

Docket No. 05000298  
License No. DPR-46

Enclosure:  
Request for Information

cc w/ encl: Distribution via LISTSERV®

COOPER NUCLEAR STATION – NOTIFICATION OF NRC TRIENNIAL HEAT EXCHANGER/SINK PERFORMANCE INSPECTION 05000298/2022001 AND REQUEST FOR INFORMATION – DATED NOVEMBER 2, 2021

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 By: FDT       Yes    No       Publicly Available       Sensitive      NRC-002

OFFICE	DRS/EB1	DRS/EB1			
NAME	FThomas	VGaddy			
SIGNATURE	/RA/	/RA/			
DATE	11/2/2021	11/2/2021			

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**Request for Information  
Triennial Heat Exchanger/Sink Performance Inspection  
Cooper Nuclear Station**

Inspection Report: 05000298/2022001  
Inspection Dates: February 7 – 11, 2022  
Inspection Procedure: IP 71111.07, Triennial “Heat Exchanger/Sink Performance”  
Lead Inspector: Fabian Thomas, Reactor Inspector, Lead

***I. Information Requested by December 27, 2021:***

1. Copy of any heat exchanger/heat sink program documents including Generic Letter (GL) 89-13 programs or aging management programs (AMPs)
2. Copy of any original and/or supplemental responses to GL 89-13
3. Copy of any current requirements and/or commitments related to GL 89-13 or AMPs
4. Copy of any heat exchanger/heat sink program self-assessments, audits, etc.
5. Copy of the updated final safety analysis report, technical specifications (and bases), technical requirements manual (and bases), and inservice inspection program document.
6. List of safety-related, risk-significant, or GL 89-13 program heat exchangers in order of risk significance
7. List of corrective action program documents related to heat exchangers/heat sinks

***II. Information Requested by January 24, 2022:***

1. For the selected heat exchangers that are directly cooled by the service water (or open water) system:
  - a. Documentation of performance testing (i.e., heat transfer, temperature effectiveness, etc.) and/or monitoring methods (i.e., pressure loss, temperature difference, etc.) such as technical reports, complete work orders, implementing procedures, etc.
  - b. Documentation of as-found/as-left periodic flow testing and/or flow balancing such as technical reports, complete work orders, implementing procedures, etc.
  - c. Documentation of visual inspections, non-destructive examinations (i.e., eddy-current, ultrasonic testing, etc.), and cleanings such as technical reports, complete work orders, implementing procedures, etc.

Enclosure

- d. Documentation of biotic fouling and/or macrofouling treatment such as technical reports, complete work orders, implementing procedures, etc.
  - e. Copy of the tube plugging map, tube plugging criteria, and heat exchanger margin if based upon tube plugging
  - f. Copy of any relevant design basis calculations including any evaluations of the potential for water hammer
  - g. Copy of the applicable system health report, design basis document, and/or system description
  - h. Copy of any relevant system piping and instrumentation diagrams
  - i. Copy of the heat exchanger design specification, heat exchanger data sheet, and any relevant vendor manuals
  - j. Copy of the heat exchanger (and motor/fan if an air-to-water heat exchanger) preventive maintenance (PM) schedule including the frequency of those PM activities and their bases
2. For the selected heat exchangers that are directly cooled by a closed loop cooling water system:
- a. Documentation of performance testing (i.e., heat transfer, temperature effectiveness, etc.) and/or monitoring methods (i.e., pressure loss, temperature difference, etc.) such as technical reports, complete work orders, implementing procedures, etc.
  - b. Documentation of as-found/as-left periodic flow testing and/or flow balancing such as technical reports, complete work orders, implementing procedures, etc.
  - c. Documentation of visual inspections, non-destructive examinations (i.e., visual, eddy-current, ultrasonic testing, etc.), and cleanings such as technical reports, complete work orders, implementing procedures, etc.
  - d. Copy of the tube plugging map, tube plugging criteria, and heat exchanger margin if based upon tube plugging
  - e. Results from chemical treatments such as technical reports, complete work orders, implementing procedures, etc.
  - f. Copy of any relevant design basis calculations including any evaluations of the potential for water hammer
  - g. Copy of the applicable system health report, design basis document, and/or system description
  - h. Copy of any relevant system piping and instrumentation diagrams

- i. Copy of the heat exchanger design specification, heat exchanger data sheet, and any relevant vendor manuals
  - j. Copy of the heat exchanger (and motor/fan if an air-to-water heat exchanger) PM schedule including the frequency of those PM activities and their bases
3. For the selected ultimate heat sink (UHS):
- a. Forced draft cooling tower or spray pond UHS:
    - i. Copy of any calculations that demonstrate sufficient reservoir capacity
    - ii. Documentation of periodic monitoring and trending of sediment such as technical reports, complete work orders, implementing procedures, etc.
    - iii. Documentation of any performance monitoring of heat transfer capability such as technical reports, complete work orders, implementing procedures, etc.
    - iv. Documentation of UHS structural integrity monitoring such as technical reports, complete work orders, implementing procedures, etc.
  - b. Operation of the service water system (SWS) and UHS:
    - i. List of modifications to the SWS and UHS
    - ii. Copy of procedures for a loss of SWS or UHS
    - iii. Copy of the applicable system health report, design basis document, and/or system description
    - iv. Documentation of biotic fouling and macrofouling treatments such as technical reports, complete work orders, implementing procedures, etc.
    - v. Documentation of chemistry monitoring such as technical reports, complete work orders, implementing procedures, etc.
    - vi. Copy of any evaluation of strong-pump to weak-pump interactions
  - c. Performance testing of the SWS and UHS:
    - i. Documentation of inservice testing of SWS/UHS pumps, valves, and fans such as technical reports, complete work orders, implementing procedures, etc.
    - ii. Documentation of SWS flow balance testing such as complete work orders, implementing procedures, etc.
    - iii. Documentation of diagnostic testing for valves that interface with safety-related service water and nonsafety-related or nonseismic piping systems such as complete work orders, implementing procedures, etc.

- iv. Documentation of performance testing of risk-significant nonsafety-related functions (or alignments) of the SWS such as complete work orders, implementing procedures, etc.
- d. Service water and/or closed cooling water system:
- i. Documentation of inaccessible pipe testing, inspection (i.e., visual, ultrasonic, etc.), and/or monitoring such as technical reports, complete work orders, implementing procedures, etc.
  - ii. Copy of any evaluations of active thru wall pipe leaks
  - iii. Copy of any corrective action documents related to thru wall pipe leakage including trend evaluations
  - iv. For closed cooling water systems, copy of any trend data on make-up to the system
  - v. Documentation of protective coatings inspections such as technical reports, complete work orders, implementing procedures, etc.
  - vi. For deep draft vertical pumps, documentation of diagnostic testing (or equivalent method) such as, technical reports, complete work orders, implementing procedures, etc.
- e. Service water intake structure (SWIS):
- i. Copy of the PM schedule for traveling screens and strainers the frequency of those PM activities and their bases
  - ii. Copy of any corrective action documents related to traveling screens, strainers, trash racks, etc.
  - iii. Copy of any SWS/UHS normal and abnormal operating procedures
  - iv. Documentation of SWIS inspections regarding structural integrity and silting such as technical reports, complete work orders, implementing procedures, etc.
  - v. Copy of any service water pump bay water level instrument documentation related to setpoints and calibrations such as calculations, complete work orders, implementing procedures, etc.
  - vi. Copy of any SWS/UHS water temperature instrumentation documentation related to setpoints and calibrations such as calculations, complete work orders, implementing procedures, etc.
  - vii. Copy of any evaluations of the potential for frazil ice formation
  - viii. For underwater weir walls, copy of any evaluations of potential of silt introduction



4. UHS Containment Device or Dam

- a. For an above-ground UHS encapsulated by embankments, weirs or excavated side slopes:
  - i. Copy of weir or embankment design documentation, specification, etc.
  - ii. Copy of any licensee or third-party dam inspection documentation used to monitor the integrity or performance of the heat sink
  - iii. Copy of any calculations for demonstrating sufficient reservoir capacity
  - iv. Documentation of significant debris or sediment build-up monitoring in the UHS such as any technical reports, complete work orders, implementing procedures, etc.
  - v. Copy of any corrective action program documents related to debris, structural integrity, seepage, settlement, rip rap, etc.
- b. For underwater UHS weirs, structures, or excavations:
  - i. Copy of any underwater weirs, structures, or excavations design documentation, specifications, etc.
  - ii. Documentation of settlement or movement related to structural integrity and/or capacity monitoring such as technical reports, complete work orders, implementing procedures, etc.
  - iii. Documentation of sediment intrusion monitoring such as technical reports, complete work orders, implementing procedures, etc.
  - iv. Copy of any calculations for demonstrating sufficient capacity
  - v. Copy of any corrective action program documents related to settlement, movement, structural integrity, sediment, etc.

**III. Additional Requests During Inspection Activities Beginning February 7, 2022:**

- 1. Supplemental requests identified during in-office preparation activities
- 2. Additional requests identified during onsite inspection activities
- 3. Discussions with relevant subject matter experts
- 4. Walkdowns of selected heat exchanger/heat sink samples
- 5. Corrective action program documents generated as a result of this inspection

If the information requested above will not be available, please contact Fabian Thomas as soon as possible.

Inspector Contact Information:

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