



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION II  
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200  
ATLANTA, GEORGIA 30303

June 2, 2017

Mr. Daniel G. Stoddard  
President and Chief Nuclear Officer  
Innsbrook Technical Center  
5000 Dominion Boulevard  
Glen Allen, VA 23060

**SUBJECT: NORTH ANNA POWER STATION – NOTIFICATION OF INSPECTION AND  
REQUEST FOR INFORMATION**

Dear Mr. Stoddard:

The U. S. Nuclear Regulatory Commission (NRC) will perform the baseline heat sink (HS) inspection at your North Anna Power Station from August 14 – 18, 2017. In order to minimize the impact to your onsite resources and to ensure a productive inspection, we have enclosed a request for documents needed for this inspection. These documents have been divided into two groups. The first group (Section A of the Enclosure) identifies information to be provided prior to the inspection to facilitate the selection of inspection samples, and ensure that the inspectors are adequately prepared. The second group (Section B of the Enclosure) identifies additional information needed during the onsite inspection week for the selected inspection samples. It is important that all of these documents are up-to-date and complete in order to minimize the number of additional documents requested during the preparation and/or the onsite portions of the inspection.

We have discussed the schedule for these inspection activities with your staff and understand that our regulatory contact for this inspection will be Dan McGinnis of your organization. Our inspection dates are subject to change based on your updated schedule of outage activities. If there are any questions about this inspection or the material requested, please contact the inspector, Robert Carrion, at (404) 997-4522 or [Robert.Carrion@nrc.gov](mailto:Robert.Carrion@nrc.gov).

In accordance with Title 10 of the Code of Federal Regulations 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the

NRC's Agencywide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Shakur A. Walker, Chief  
Engineering Branch 3  
Division of Reactor Safety

Docket Nos.: 50-338 and 50-339

License Nos.: NPF-4 and NPF-7

Enclosure:  
Heat Sink Inspection Document Request

cc: Distribution via Listserv

SUBJECT: NORTH ANNA POWER STATION – NOTIFICATION OF INSPECTION AND REQUEST FOR INFORMATION DATED: June 2, 2017

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NAME	R. Carrion	S. Walker				
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## HEAT SINK PERFORMANCE INSPECTION DOCUMENT REQUEST

Site: North Anna Power Station

Docket Nos.: 50-338 and 50-339

Inspection Dates: August 14 – August 18, 2017

Entrance Meeting: August 14, 2017

Inspection Procedure: IP 71111.07, "Heat Sink Performance," Triennial Review, dated December 8, 2016

Inspector: Robert Carrion, Senior Reactor Inspector

### A. Information Requested for the In-Office Preparation Week

Please provide the information requested in this section to the NRC Region II Office in care of the lead inspector by July 28, 2017, in order to facilitate the selection of specific items that will be reviewed during the onsite inspection week. The information can be provided in hard copy or electronic format; however, electronic format is preferred, either by digital data storage device (compact disk, flash drive, etc.), or web-based document management system.

The inspector will select specific samples from the information provided for items A.1 below and then request additional documents needed for the onsite inspection week as described in Section B of this enclosure. The specific documents selected for Section B should be available and ready for review on the first day of inspection. If requested documents are large and only hardcopies are available, please inform the inspector and provide the subject documentation during the first day of the onsite inspection. If there are any questions regarding this information request, please contact the inspector as soon as possible.

#### A.1 Heat Exchangers and Service Water Equipment

- a) List of heat exchangers and equipment cooled by service water (SW) directly or indirectly.
- b) For the heat exchangers listed in Item A.1(a) above, provide the program documents that govern the performance monitoring of these heat exchangers, including testing methods and frequency, inspection methods and frequency, maintenance, monitoring of biotic fouling and macro-fouling, and chemistry control, as applicable.
- c) As applicable, provide a list of risk-significant components in the SW system and Ultimate Heat Sink (UHS) with their respective risk ranking, including the heat exchangers listed for item A.1(a) above.
- d) List of risk-significant non-safety related functions supported by the SW system.

- e) Response to NRC Generic Letter (GL) 89-13, including any regulatory commitments made to the NRC in response to this GL, or other regulatory commitments associated with SW system and UHS performance.
- f) Design Basis Documents associated with the SW system and the UHS. Please include a description of the UHS design for the site, particularly whether the UHS is above ground encapsulated by embankments, weirs or excavated side slopes, underwater weir or excavation, forced draft cooling tower, or spray pond.
- g) Latest version of the Updated Final Safety Analysis Report (UFSAR) Chapters addressing SW system design.
- h) Basic SW system flow diagrams.
- i) System Health Reports for the last three years associated with the SW system and systems that are cooled by SW.
- j) List of components or systems in Maintenance Rule a(1) status due to SW system interaction.
- k) List of corrective action documents (with a brief description) in the last three years for SW-related issues, including conditions adverse to quality that have received a Root Cause Analysis, or an elevated severity level in the site's Corrective Action Program (CAP).
- l) Industry Operating Experience events in the last three years related to SW system that have been evaluated through the site's Operating Experience or CAP.
- m) List of applicable Codes and Industry Guidelines currently used for the performance monitoring of heat exchangers and UHS.
- n) List of redundant or infrequently used heat exchangers.
- o) Provide the program documents that govern the performance monitoring of the UHS and its subcomponents like piping, intake screens, pumps, and valves; including testing methods and frequency, inspection methods and frequency, maintenance, monitoring of fouling, and chemistry control, as applicable.
- p) Provide flow diagrams indicating buried or inaccessible piping in the service water system and UHS.
- q) Program documents governing the inspection, testing, and monitoring of buried piping in the service water system and UHS.
- r) List of safety-related and non-safety related valve interfaces between safety-related SW and non-safety related, or non-seismic piping systems.
- s) List of design changes to the service water system and the UHS in the last three years.

- t) As applicable, provide a list of historical through-wall leaks in SW piping for the last three years. Please include the location of the leak(s) and corrective actions taken.
- u) Contact information for licensing and engineering staff supporting the inspection.

**B. Information to be provided onsite to the inspector at the entrance meeting (August 14, 2017):**

**B.1 Heat Exchangers and Service Water Equipment**

The inspector will select a sample of heat exchangers and/or UHS samples from the information provided for section A.1 above, as required by inspection procedure (IP) 71111.07, during in-office preparation. For the samples selected, the inspector will request the items listed below, as applicable.

- a) Updated list of technical and licensing point of contacts.
- b) Copies of selected corrective action documents, including supporting documents such as cause evaluations, corrective action plans, work orders, etc.
- c) Copies of evaluations and associated corrective actions for selected Operating Experience Events.
- d) For the selected heat exchangers or equipment cooled by SW directly or indirectly, provide documentation associated with:
  - Performance testing methodology and results for the last three years.
  - Inspection/cleaning methods and results of performance inspections for the last three years, including eddy current test inspections to determine the structural integrity of the heat exchanger. For eddy current testing results, please include eddy current examination reports, examiner qualification records, and associated corrective action documents.
  - Operating data demonstrating that the heat exchanger's condition and operation is consistent with design assumptions in heat transfer calculations, and as described in the UFSAR.
  - Periodic flow test results at/or near maximum design flow.
  - Engineering evaluations addressing heat exchanger susceptibility to water hammer and measures in place to address potential water hammer concerns.
  - Plant operating procedures showing the controls and operational limits in place to prevent heat exchanger degradation due to excessive flow-induced vibration during operation.
  - Current number of plugged tubes relative to the pre-established plugging limits in design calculations.
  - Results of chemistry control program for the last three years.

- e) For selected above-ground UHS encapsulated by embankments, weirs, or excavated side slopes, provide documentation for the last three years associated with:
- Licensee or third party dam inspections for monitoring the integrity of the HS sink.
  - Monitoring results for verification of sufficient reservoir capacity.
  - For selected underwater UHS weirs or excavations, provide documentation for the last three years associated with results of visual or other inspections performed to check for any possible settlement or movement indicating loss of structural integrity and/or capacity, including sediment intrusion that may reduce capacity.
- f) For selected UHS such as a forced draft cooling tower or spray pond, provide documentation for the last three years associated with the methods and results to verify:
- Reservoir capacity.
  - Periodic monitoring and trending of sediment buildup.
  - Periodic performance monitoring of heat transfer capability.
  - Performance monitoring of the UHS structural integrity.
- g) For selected operational samples of the SW system and UHS, provide documentation for the last three years associated with:
- Selected design changes to the SW system and the UHS.
  - Licensee procedures for a loss of the SW system or UHS.
  - Licensee controls to prevent clogging due to macro-fouling through monitoring and trending.
  - Results of biocide treatments for biotic control.
  - For fixed volume UHS, provide results of chemistry monitoring to ensure that adequate pH, calcium hardness, etc. are maintained.
  - Results of pump performance monitoring for potential strong-pump weak-pump interaction in the SW system.
- h) For selected performance testing samples of the SW system and UHS, provide documentation for the last three years associated with:
- Performance tests, such as American Society of Mechanical Engineers (ASME) inservice tests, of selected components.
  - Performance testing of isolation capabilities for interface valves between safety-related SW and non-safety related or non-seismic piping systems
  - SW flow balance test results.
  - Performance of selected risk-significant non-safety related functions.
- i) Please have knowledgeable staff available during the onsite inspection to support walkdowns of selected plant structures, systems, and components associated with the SW system and UHS.

**Inspector Contact Information:**

Robert Carrion  
Sr. Reactor Inspector  
Engineering Branch 3  
Division of Reactor Safety  
404-997-4522

**Mailing Address:**

US NRC Region II  
Attn: Robert Carrion  
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