



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION III  
2443 WARRENVILLE ROAD, SUITE 210  
LISLE, IL 60532-4352

January 8, 2010

Mr. Christopher R. Costanzo  
Vice President  
NextEra Energy Duane Arnold, LLC  
3277 DAEC Road  
Palo, IA 52324-9785

**SUBJECT: DUANE ARNOLD NUCLEAR POWER PLANT - NOTIFICATION OF AN NRC TRIENNIAL HEAT SINK PERFORMANCE INSPECTION AND GAS ACCUMULATION MANAGEMENT TEMPORARY INSPECTION; AND REQUEST FOR INFORMATION 05000331/2010002(DRS)**

Dear Mr. Costanzo:

On March 8, 2010 the NRC will begin the on-site portion of the Triennial Heat Sink Performance Inspection and the Gas Accumulation Management in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems Temporary Instruction at your Duane Arnold Nuclear Station. These inspections will be performed in accordance with NRC baseline inspection procedure (IP) 71111.07 and temporary instruction (TI) 2515/177 respectively.

In order to minimize the impact that the inspections have on the site and to ensure productive inspections, we have enclosed two requests for documents needed for the inspections. The documents have been divided into three groups for each inspection.

- The first group lists information necessary for our initial inspection scoping activities. This information should be available to the lead inspector no later than January 29, 2010. By February 5, 2010, the inspector will communicate the initial selected set of approximately 2-3 risk significant heat exchangers for IP 71111.07 and the initial selected samples for TI 2515/177.
- The second group of documents requested is those items needed to support our in-office preparation activities. This set of documents should be available at the Regional Office no later than February 25, 2010. This information should be separated by inspection and by component, especially if provided electronically (e.g., folder with component name that includes calculations, condition reports, maintenance history, etc). During the in-office preparation activities, the inspector may identify additional information needed to support the inspection.
- The last group includes the additional information above as well as plant specific reference material. This information should be available to the inspector on March 8, 2010. It is also requested that corrective action documents and/or questions developed during the inspection be provided to the inspector as the documents are generated.

Please send the information to the following e-mail address [nestor.feliz-adorno@nrc.gov](mailto:nestor.feliz-adorno@nrc.gov). A hard-copy with the required information is also an acceptable option.

It is important that these documents be as complete as possible, in order to minimize the number of documents requested during the preparation week or during the on-site inspection.

All requested documents are to be for the time period from the onsite inspection period back to the last Heat Sink Performance Inspection. If no activities were accomplished in that time period, then the request applies to the last applicable document in the previous time period.

The lead inspector for this inspection is Néstor J. Félix Adorno. If there are questions about the material requested, or the inspection, please call Néstor J. Félix Adorno at (630) 829-9739.

In accordance with 10 CFR 2.390 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 NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

This letter does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing information collection requirements were approved by the Office of Management and Budget, Control Number 3150-0011.

The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid Office of Management and Budget control number.

Sincerely,

**/RA**

Ann Marie Stone, Chief  
Engineering Branch 2  
Division of Reactor Safety

Docket Nos. 50-331  
License Nos. DPR-49

Enclosures:

1. Triennial Heat Sink Inspection Document Request
2. Management Of Gas Accumulation In Emergency Core Cooling, Decay Heat Removal, And Containment Spray Systems Temporary Inspection Document Request

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## TRIENNIAL HEAT SINK INSPECTION DOCUMENT REQUEST

**Inspection Report:** 05000331/2010002(DRS)

**Inspection Dates:** March 8 - 12, 2010

**Inspection Procedure:** IP 71111.07, Triennial "Heat Sink Performance Inspection"

**Lead Inspector:** Néstor J. Feliz Adorno  
(630) 829-9739  
[nestor.feliz-adorno@nrc.gov](mailto:nestor.feliz-adorno@nrc.gov)

### ***I. Information Requested By January 29, 2010***

1. List of the Generic Letter (GL) 89-13, "Service Water System Problems Affecting Safety-Related Equipment", heat exchangers in order of risk significance.
2. Copy of heat exchanger performance trending data tracked for each GL 89-13 heat exchanger.
3. List of corrective action program documents (with a short description) associated with GL 89-13 heat exchangers, heat sinks, silting, corrosion, fouling, or heat exchanger testing, for the previous two years or since the last Triennial heat sink inspection.
4. Copy of any self-assessment done on any of GL 89-13 heat exchangers.
5. System health report(s) and maintenance rule system notebooks for all the GL 89-13 heat exchangers.

### ***II. Information Requested By February 25, 2010***

1. For the specific heat exchangers selected:
  - a. Copies of the two most recent completed tests confirming thermal performance for those heat exchangers which are performance tested.
  - b. Copy of system description and design basis document for the heat exchangers (as applicable).
  - c. Copy of any operability determinations or other documentation of degradation associated with the heat exchangers or the systems that support the operation for the selected heat exchangers.

### **TRIENNIAL HEAT SINK INSPECTION DOCUMENT REQUEST**

- d. Copy of the Updated Final Safety Analysis Report (UFSAR) sections applicable for each heat exchanger.
- e. Provide a list of calculations with a description which currently apply to each heat exchanger.
2. A schedule of all inspections, cleanings, maintenance, or testing of any plant heat exchanger to be done during the on-site portion of the inspection.
3. Copies of procedures developed to implement the recommendations of GL 89-13, e.g., the GL 89-13 Heat Exchanger Program description.
4. Updated Final Safety Analysis Report pages for the GL 89-13 Heat Exchanger Program.
5. Maximum Cooling Water system inlet temperature limit that still allows full licensed power operation of the nuclear reactor. Please provide the document that states this limit (e.g., USAR or TRM) and the operating procedure that ensures this limit is not exceeded.

### ***III. Information Requested to be Available on First Day of Inspection, March 08, 2010***

1. For the specific heat exchangers selected:
  - a. Provide the Design Basis Documents and Updated Final Safety Analysis Report pages for the selected heat exchangers.
  - b. Copy of the design specification and heat exchanger data sheets for each heat exchanger.
  - c. Copy of the vendor manuals including component drawings for each heat exchanger.
  - d. Copy of the calculation which establishes the limiting (maximum) design basis heat load which is required to be removed by each of these heat exchangers.
  - e. Copy of the calculation which correlates surveillance testing results from these heat exchangers with design basis heat removal capability (e.g., basis for surveillance test acceptance criteria).
  - f. Copy of the calculations or documents which evaluate the potential for water hammer or excessive tube vibration in the heat exchanger or associated piping.
  - g. List of engineering-related Operator Workarounds/Temporary Modifications for these heat exchangers since the last Heat Sink Performance
  - h. Copy of the evaluations of data for the two most recent completed tests confirming the thermal performance of each heat exchanger.

## TRIENNIAL HEAT SINK INSPECTION DOCUMENT REQUEST

- i. Documentation and procedures that identify the types, accuracy, and location of any special instrumentation used for the two most recently completed thermal performance tests for the heat exchangers (e.g., high accuracy ultrasonic flow instruments or temperature instruments). Include calibration records for the instruments used during these tests.
  - j. Copies of those documents that describe the methods taken to control water chemistry in the heat exchangers.
  - k. Copies of the documents that verify the structural integrity of the heat exchanger, e.g., eddy current summary sheets, ultrasonic testing results, and visual inspection results.
  - l. The cleaning and inspection maintenance schedule for each heat exchanger for the next five years.
  - m. Copy of the document describing the inspection results for the last two clean and inspection activities completed on each heat exchanger.
  - n. Copy of the document which identifies the current number of tubes in service for each heat exchanger and the supporting calculation which establishes the maximum number of tubes which can be plugged in each heat exchanger.
  - o. Copy of the document establishing the repair criteria (plugging limit) for degraded tubes which are identified in each heat exchanger.
  - p. Information regarding any alarms which monitor on-line performance.
2. For the ultimate heat sink:
- a. The toe of the weir or embankment inspection procedures and results.
  - b. The inspection, procedures and results of rip rap protection placed on excavated side.
  - c. Dam inspections that monitor the integrity of the heat sink.
  - d. Inspections and/or maintenance related to preventing macrofouling (silt, dead mussel shells, debris, etc.) and aquatic life such as fish, algae, grass or kelp.
  - e. Inspections and/or maintenance related to preventing biotic fouling.
  - f. Copies of any design change performed on the system.
  - g. Copies of procedures for a loss of UHS.

## TRIENNIAL HEAT SINK INSPECTION DOCUMENT REQUEST

- h. Copies of calculations and surveillances that determine the UHS reservoir capacity and heat transfer capability.
  - i. Copies of surveillance procedures and testing results conducted on the level instrumentation relied upon to determine UHS reservoir capability.
3. For the safety related service water system (or equivalent):
- a. Copies of any design changes performed on the system.
  - b. Copies of procedures for a loss of service water system.
  - c. Copies of inspections and/or maintenance related to macrofouling (silt, dead mussel shells, debris, etc.) and aquatic life such as fish, algae, grass or kelp.
  - d. Copies of inspections and/or maintenance related to preventing biotic fouling.
  - e. Copies of procedures and/or test results to survey or monitor interface valves between the safety related section of the service water system and the non-safety related section.
  - f. History of any thru wall pipe leak on the system.
  - g. Copies of evaluations for strong-pump vs. weak-pump interaction.

If the information requested above will not be available, please contact Néstor J. Félix Adorno as soon as possible at (630) 829-9739 or email [nestor.feliz-adorno@nrc.gov](mailto:nestor.feliz-adorno@nrc.gov).

**MANAGEMENT OF GAS ACCUMULATION IN EMERGENCY CORE COOLING, DECAY  
HEAT REMOVAL, AND CONTAINMENT SPRAY SYSTEMS TEMPORARY INSPECTION  
DOCUMENT REQUEST**

**Inspection Report:** 05000331/2010002(DRS)

**Inspection Dates:** March 8–12, 2010 and March 22–26, 2010

**Inspection Procedure:** TI 2515/177, Management of Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems

**Lead Inspector:** Néstor J. Félix Adorno  
(630) 829-9739  
[nestor.feliz-adorno@nrc.gov](mailto:nestor.feliz-adorno@nrc.gov)

***I. Information Requested By January 29, 2010***

1. Copy of the station response to Generic Letter (GL) 2008-01 and any supplemental report.
2. Copies of all the requests for additional information (RAIs) and the associated responses.
3. List of corrective action program documents (with a short description) associated with GL 2008-01, voids in piping, and waterhammer for the previous three years.
4. List of the suction piping sections identified as susceptible to gas accumulation (the list should identify the corresponding system).
5. List of the discharge piping sections identified as susceptible to gas accumulation (the list should identify the corresponding system).
6. List of changes (with a short description and tracking number) to the Final Safety Evaluation Report (FSAR), Technical Specifications, Technical Specification Bases, and Technical Requirement Manual associated with the resolution of GL 2008-01.
7. List of calculations that have been changed or created (with a short description of the calculation and the change) in response to GL 2008-01.
8. List of physical modifications (with a short description) performed in response to GL 2008-01.

**MANAGEMENT OF GAS ACCUMULATION IN EMERGENCY CORE COOLING, DECAY  
HEAT REMOVAL, AND CONTAINMENT SPRAY SYSTEMS TEMPORARY INSPECTION  
DOCUMENT REQUEST**

***II. Information Requested By February 25, 2010***

1. Copies of procedures developed to implement the resolution of GL 2008-01.
2. Copies of the modification packages for hardware modifications as part of the resolution of GL 2008-01.
3. Copies of the selected calculations.
4. Copies of the selected corrective action program documents.
5. Copies of the selected licensing and design basis document changes.
6. List of commitments (with a description) done in response to GL 2008-01.
7. List of actions that were completed in response to GL 2008-01.
8. Copies of all the corrective actions identified in the nine-month response and supplemental reports.
9. List (with a short description) of gas intrusion mechanisms that apply to the plant.
10. Basis for the void acceptance criteria (e.g. calculation). If applicable, provide the justification for any deviation from the void acceptance criteria established by the Office of Nuclear Reactor Regulations (NRR).
11. Basis for horizontal pipe acceptance criteria (e.g. calculation).
12. Design basis documents of the subject systems (i.e., emergency core cooling, decay heat removal, and containment spray systems).
13. Design basis documents of keep-full systems of the subject systems.

***III. Information Requested to be Available on First Day of Inspection, March 08, 2010***

1. Copies of surveillance procedures associated with the resolution of GL 2008-01 and the results of the last two surveillances.
2. Copies of procedures use for detecting and determining void volumes.
3. Copies of procedures use for filling and venting.
4. Copies of isometric drawings of the subject systems.
5. Copies of piping and instrumentation diagrams (P&IDs) of the subject systems.



**MANAGEMENT OF GAS ACCUMULATION IN EMERGENCY CORE COOLING, DECAY  
HEAT REMOVAL, AND CONTAINMENT SPRAY SYSTEMS TEMPORARY INSPECTION  
DOCUMENT REQUEST**

6. Subject systems walkdown work documents associated with the resolution of GL 2008-01 and the results of these walkdowns.
7. Copies of the engineering evaluations performed for all voids found since 2008.
8. Copies of trends of periodic venting results.
9. Copy of the design change review checklist that establish if a design change introduces or increases the potential for gas accumulation beyond established acceptance criteria.
10. Copies of training documents that ensure that personnel are aware of gas-related concerns.
11. Copy of the void transport analysis.
12. If applicable, provide a list of inaccessible locations where plant walkdowns of the subject systems have not been completed. Include an explanation of why each area is considered inaccessible.

If the information requested above will not be available, please contact Néstor J. Félix Adorno as soon as possible at (630) 829-9739 or email [nestor.feliz-adorno@nrc.gov](mailto:nestor.feliz-adorno@nrc.gov).

R. Anderson

-2-

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Sincerely,  
*/RA/*  
Ann Marie Stone, Chief  
Engineering Branch 2  
Division of Reactor Safety

Docket Nos. 50-331  
License Nos. DPR-49

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NAME	NFeliz-Adorno		AMStone				
DATE	01/08/2010		01/08/2010				

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Letter to Richard Anderson from Ann Marie Stone dated January 8, 2010.

SUBJECT: DUANE ARNOLD NUCLEAR POWER PLANT - NOTIFICATION OF AN NRC  
TRIENNIAL HEAT SINK PERFORMANCE INSPECTION AND GAS  
ACCUMULATION MANAGEMENT TEMPORARY INSPECTION; AND  
REQUEST FOR INFORMATION 05000331/2010002(DRS)

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