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

March 8, 2011

Mr. Michael J. Pacilio
Senior Vice President, Exelon Generation Company, LLC
President and Chief Nuclear Officer (CNO), Exelon Nuclear
4300 Winfield Road
Warrenville IL 60555

SUBJECT: CLINTON POWER STATION NOTIFICATION OF NRC TRIENNIAL HEAT SINK PERFORMANCE INSPECTION AND THE MANAGEMENT OF GAS ACCUMULATION IN EMERGENCY CORE COOLING, DEACY HEAT REMOVAL, AND CONTAINMENT SPRAY SYSTEMS INSPECTION AND REQUEST FOR INFORMATION INSPECTION REPORT 05000461/2011003

Dear Mr. Pacilio:

On Monday April 18, 2011, 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 Clinton Power Station. This inspection will be performed in accordance with NRC baseline inspection procedure (IP) 71111.07T and NRC temporary instruction (TI) 2515/177.

In order to minimize the impact that the inspection has on the site and to ensure a productive inspection, we have enclosed a request for documents needed for the inspection. The documents 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 March 21, 2011. By March 28, 2011, the inspector will communicate the initial selected set of approximately 2-3 risk-significant heat exchangers.

- The second group of documents requested is those items needed to support our in-office preparation activities. This set of documents, including the calculations associated with the selected heat exchangers, should be available at the Regional Office no later than April 7, 2011. This information should be separated for each selected 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 onsite to the inspector on Monday, April 18, 2011. 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.

The lead inspector for this inspection is Andrew Dunlop. If there are questions about the material requested, or the inspection, please call Andrew Dunlop at (630) 829-9726. Please send the information to the following e-mail address Andrew.Dunlop@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 documents that were provided in response to the previous 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.

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.

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).

Sincerely,

/RA by A. Dunlop for/

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

Docket No. 50-461
License No. NPF-62

Enclosure: TRIENNIAL HEAT SINK PERFORMANCE INSPECTION AND GAS ACCUMULATION MANAGEMENT DOCUMENT REQUEST

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TRIENNIAL HEAT SINK PERFORMANCE INSPECTION AND GAS ACCUMULATION MANAGEMENT DOCUMENT REQUEST

Inspection Report: 05000461/2011003

Inspection Dates: April 18, 2011 – April 22, 2011
May 2, 2011 – May 6, 2011

Inspection Procedures: IP 71111.07, "Heat Sink Performance"
TI 2515/177, "Management of Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems"

Lead Inspector: Andrew Dunlop, Senior Reactor Inspector
(630) 829-9726
Andrew.Dunlop@nrc.gov

Michael A. Jones, Reactor Inspector
(630) 829-9745
Michael.Jones@nrc.gov

I. Information Requested By March 21, 2011

Heat Sink Performance

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 three years or since the last corrective action program document list was sent to the NRC for the previous heat sink performance inspection. The list should include all corrective action program documents not on the last corrective action program document list.

4. Copy of any self-assessment done on any of GL 89-13 heat exchangers.

5. Last two System health report(s) and maintenance rule system notebooks for all the GL 89-13 heat exchangers.

6. List of engineering-related operator workarounds (with a short description) associated with GL 89-13 heat exchangers. The requested documents are to be for the time period from the onsite inspection period back to the documents that were provided in response to the previous heat sink performance inspection.

7. List of permanent and temporary modifications (with a short description) associated with GL 89-13 heat exchangers. The requested documents are to be for the time period from the onsite inspection period back to the documents that were provided in response to the previous heat sink performance inspection.

Management of Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems

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 pressure transients 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. List of calculations associated with GL 2008-01 (with a short description of the calculation and the change), including calculations that have been changed or created in response to GL 2008-01.

II. Information Requested By April 7, 2011

Heat Sink Performance

1. Copy of the UFSAR section applicable to the GL 89-13 Heat Exchanger Program.

2. Copies of procedures developed to implement the recommendations of GL 89-13 (e.g., the GL 89-13 Heat Exchanger Program description).

3. For the specific heat exchangers selected:

    a. Copies of the Updated Final Safety Analysis Report (UFSAR) sections applicable for each heat exchanger.

    b. Copy of system description and design basis document for the heat exchangers (as applicable).

    c. Provide a list of calculations (with a short description), which currently apply to each heat exchanger.

    d. 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.

4. For the ultimate heat sink (UHS) and the safety-related service water system (or equivalent):

    a. Copies of the applicable Updated Final Safety Analysis Report (UFSAR) sections;

    b. Copy of system description and design basis document (as applicable);

    c. Copy of any operability determinations or other documentation of degradation associated with the UHS and the safety-related service water system; and

    d. Copy of the document (e.g., UFSAR or Technical Requirements Manual) that states the maximum cooling water system inlet temperature limit that still allows full licensed power operation of the nuclear reactor.

5. A schedule of all inspections, cleanings, maintenance, or testing of <u>any</u> safety-related plant heat exchanger to be performed during the on-site portion of the inspection.

<u>Management of Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems</u>

1. Copies of program documents and procedures developed to implement the resolution of GL 2008-01.

2. Copies of the selected corrective action program documents.

3. Copies of the selected licensing and design basis document changes.

4. Copies of isometric drawings of the subject systems (hard-copies are preferred).

5. Copies of piping and instrumentation diagrams (P&IDs) of the subject systems (hard-copies are preferred).

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 and the affected system locations (e.g., identify the source, conditions, and expected void locations).

10. Design basis documents of the subject systems (i.e., emergency core cooling, decay heat removal, and containment spray systems).

11. Design basis documents of keep-full systems of the subject systems.

12. Copies of self-assessments associated with the implementation of the GL 2008-01 program.

13. Copies of Corrective Action Program implementing procedures.

14. If available, electronic copies of the current Technical Specifications, Technical Specifications Basis, Final Safety Analysis Report, and Technical Report Manual

III. Information Requested to be Available on First Day of Inspection, April 18, 2011

Heat Sink Performance

1. For the specific heat exchangers selected.

   a. 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);

   b. Copies of the two most recent completed tests and evaluation data confirming thermal performance for those heat exchangers which are performance tested;

   c. 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;

d. Information regarding any alarms which monitor on-line performance;

e. Copy of the document describing the inspection results of each heat exchanger. The requested documents are to be for the time period from the onsite inspection period back to the documents that were provided in response to the previous heat sink performance inspection;

f. The cleaning and inspection maintenance schedule for each heat exchanger for the next 5 years;

g. Copy of the design specification and heat exchanger data sheets for each heat exchanger;

h. Copy of the vendor manuals including component drawings for each heat exchanger;

i. 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;

j. Copy of the operating procedure that ensures that the maximum cooling water system inlet temperature limit is not exceeded;

k. Copy of the calculations or documents which evaluate the potential for water hammer in each heat exchanger or associated piping;

l. Copy of the calculations that evaluate excessive tube vibration in each heat exchanger and the documents that describe the controls that prevent heat exchanger degradation due to excessive flow induced vibration during operation;

m. Copy of the periodic flow testing at or near maximum design flow. The requested documents are to be for the time period from the onsite inspection period back to the documents that were provided in response to the previous heat sink performance inspection;

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. 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); and

q. Copies of those documents that describe the methods taken to control water chemistry in the heat exchangers.

2. For the review of the operation of the safety-related service water system (or equivalent) and the UHS:

   a. Copies of any design change performed on the UHS. The requested documents are to be for the time period from the onsite inspection period back to the documents that were provided in response to the previous heat sink performance inspection;

   b. Copies of any design change performed on the safety-related service water system. The requested documents are to be for the time period from the onsite inspection period back to the documents that were provided in response to the previous heat sink performance inspection;

   c. Copies of procedures for a loss of UHS;

   d. Copies of procedures for a loss of service water system;

   e. Inspections and/or maintenance related to preventing macrofouling (e.g., silt, dead mussel shells, or debris) and biotic fouling (e.g., fish, algae, grass, or kelp). The requested documents are to be for the time period from the onsite inspection period back to the documents that were provided in response to the previous heat sink performance inspection;

   f. Copies of chemistry procedures that monitor for pH, calcium hardness, etc. Also, provide copies of the associated results. The requested documents are to be for the time period from the onsite inspection period back to the documents that were provided in response to the previous heat sink performance inspection; and

   g. Copies of documents associated with the monitoring of pump performance for potential strong-pump vs. weak-pump interaction.

3. For the review associated with the system walkdown of the service water system (or equivalent) provide the following:

   a. Copies of the testing, inspection, or monitoring program procedures for buried or inaccessible piping and the associated results. The requested documents are to be for the time period from the onsite inspection period back to the documents that were provided in response to the previous heat sink performance inspection;

b. Copies of the procedures to monitor, assess, and disposition active thru wall pipe leaks, including structural evaluations and/or planned corrective actions; and

c. History of any thru wall pipe leak on the system. The requested documents are to be for the time period from the onsite inspection period back to the documents that were provided in response to the previous heat sink performance inspection.

Management of Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems

1. Copies of surveillance procedures associated with the resolution of GL 2008-01 and the results of the last two surveillances for the subject systems.

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 procedures use for detecting and determining void volumes.

5. Copies of procedures use for filling and venting.

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 identified voids.

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. 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).

13. Basis for horizontal pipe acceptance criteria (e.g., calculation).

14. Copy of vortexing and water hammer calculations associated with systems under the scope of GL 2008-01.

15. 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 Andrew Dunlop as soon as possible at (630) 829-9726 or email Andrew.Dunlop@nrc.gov.

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Sincerely,

/RA by A. Dunlop for/

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

Docket No. 50-461
License No. NPF-62

Enclosure: TRIENNIAL HEAT SINK PERFORMANCE INSPECTION AND GAS ACCUMULATION MANAGEMENT DOCUMENT REQUEST

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Letter to Mr. Michael Pacilio from Ms. Ann Marie Stone dated March 8, 2011.

SUBJECT: CLINTON POWER STATION NOTIFICATION OF NRC TRIENNIAL HEAT SINK PERFORMANCE INSPECTION AND THE MANAGEMENT OF GAS ACCUMULATION IN EMERGENCY CORE COOLING, DEACY HEAT REMOVAL, AND CONTAINMENT SPRAY SYSTEMS INSPECTION AND REQUEST FOR INFORMATION INSPECTION REPORT 05000461/2011003

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