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Kenny J. Christian
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Waterford 3

W3F1-2009-0004

February 26, 2009

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: RAI Response for Amendment Request NPF-38-278
Refueling Machine
Waterford Steam Electric Station, Unit 3 (Waterford 3)
Docket No. 50-382
License No. NPF-38

- References:
1. Entergy letter dated September 18, 2008, "License Amendment Request NPF-38-278 To Modify Technical Specification 3/4.9.6, Refueling Machine" (W3F1-2008-0063)
 2. NRC Letter from N. Kalyanam dated January 2, 2009, "Waterford Steam Electric Station, Unit 3 – Request for Additional Information RE: License Amendment Request (LAR) To Modify Technical Specification 3/4.9.6, Refueling Machine (TAC No. MD9670)"

Dear Sir or Madam:

By letter dated September 18, 2008, Entergy Operations, Inc. (Entergy), submitted a request to the U.S. Nuclear Regulatory Commission (NRC) for a license amendment in the form of changes to Technical Specification (TS) Action statements 'a' and 'b' of TS 3/4.9.6, Refueling Machine, to clarify acceptability of placing a suspended fuel assembly or control element assembly within the reactor vessel in a safe condition while restoring refueling machine operability.

The NRC staff reviewed the request and determined that additional information was needed to complete the NRC review. The NRC submitted a request for additional information (RAI) dated January 2, 2009 (Reference 2).

On December 3, 2008 and on February 18, 2009, Waterford 3 personnel discussed the Waterford 3 response to the RAI with NRC personnel and the NRR Project Manager. This letter provides the Waterford 3 response in accordance with the foregoing communications.

There are no new commitments contained in this submittal.

A001
LRR

If you have any questions or require additional information, please contact Robert J. Murillo, Manager, Licensing at (504) 739-6715.

I declare under penalty of perjury that the foregoing is true and correct. Executed on February 26, 2009.

Sincerely,

A handwritten signature in cursive script, appearing to read "Kenny J. Christa".

KJC/OPP/ssf

Attachment: RAI Response

cc: Mr. Elmo E. Collins, Jr.
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U. S. Nuclear Regulatory Commission
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NRC Senior Resident Inspector
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U. S. Nuclear Regulatory Commission
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Attachment
W3F1-2009-0004
RAI Response

1. In your response to this RAI, please provide information detailing:

- a) How does the lifting of the load manually and with interlocks bypassed constitute a safe condition rather than lowering the load?

Answer: With Refueling Machine interlocks by-passed, the preferred movement to place a fuel assembly / CEA (suspended in the reactor vessel) in a safe condition would be to lower that load onto its designated pin location in the reactor vessel. However, there could be circumstances that would not allow that preferred movement to be achievable. An example of that occurred during Waterford 3's Refuel 15 when the Refueling Machine became inoperable with a fuel assembly suspended in the reactor vessel. The fuel assembly could not be seated on the designated positioning pins due to an adjacent assembly being slightly off of its seating pins in the reactor vessel. The current Technical Specification wording requires suspending use of the fuel/CEA mast from operations involving the movement of fuel / CEA assemblies.

- b) What are the accuracy and response time of the visual indication of the load weight (which the operator would rely on)?

Answer: The accuracy of the refueling machine visual indication of load weight is ± 50 lbs with essentially no display time delay (instantaneous).

- c) Why could not the hypothetical refueling machine computer failure and re-boot be addressed by means other than manually lifting the current load to the up-limit?

Answer: Instructions will be added to the revised refueling equipment operation procedure that will provide for re-booting the computer without manually raising the mast to the up-limit.

- d) Explain the existence of any interlocks that would prevent translation of the refueling machine during a hoist and with an inoperable refueling machine computer.

Answer: There are no interlocks that would prevent translation of the refueling machine during a hoist with an inoperable refueling machine computer. However, because of the layout of the controls, it would require more than one individual to negotiate that kind of movement. Therefore, inadvertent translation of the refueling machine would not be likely.

- e) Why would any damage to a fuel assembly due to inadvertent operator failure to manually stop the refueling machine at an interlock set point be still bounded by the "fuel assembly drop" accident?

Answer: The worst fuel assembly drop accident for Waterford 3, evaluated by Westinghouse and described in the UFSAR, is the vertical drop of a single assembly that would drop the maximum possible distance to the spent fuel pool floor followed by rotation. The assembly is assumed to strike a protruding

structure. The fuel storage pool is designed without such protruding structures. The analysis has shown that the most severe impact location is between the top two spacer grids due to the higher impact velocity of the top of the fuel assembly. Since this impact area is within the fuel rod upper plenum region where no fuel pellets are located, the fuel pellets do not provide clad support, and maximum damage occurs. The analysis results show that for this event, no more than four rows of fuel rods (60 rods) would fail.

During manual operation of the refueling machine where a fuel assembly is being moved to a safe condition, the evolution would be controlled by approved procedure and administrative controls (to be completed prior to implementation) that will include provisions for evaluating for possible entanglement and for appropriate actions to address entanglement if it exists, to avoid damage to the fuel assembly/CEA or Reactor internals. Therefore, based on procedure precautions that would govern the manual operation of the refueling machine, it is not expected that any event during this evolution would be more severe (result in more than 60 fuel rod failure) than the current design basis assembly drop accident discussed above.

- f) How does the identified precedent (Limerick, Unit 1) constitute prior NRC approval of the type of operation described in your submittal.

Answer: As in the case of the Waterford 3 requested Technical Specification amendment, the Limerick Unit 1 Technical Specification had words prescribing placing the refueling machine load (fuel assembly / CEA) in a safe condition.