

May 22, 2008

Vice President, Operations
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Waterford Steam Electric Station, Unit 3
17265 River Road
Killona, LA 70057-3093

SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 - GENERIC
LETTER 2004-02 "POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON
EMERGENCY RECIRCULATION DURING DESIGN BASIS
ACCIDENTS AT PRESSURIZED WATER REACTORS" APPROVAL
OF EXTENSION REQUEST (TAC NO. MC4729)

Dear Sir or Madam:

By letter dated May 12, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML081350231) Entergy Operations Inc. (Entergy, the licensee) requested for an extension of the Waterford Steam Electric Station, Unit 3 (Waterford 3) sump clogging corrective actions due date as specified in a U.S. Nuclear Regulatory Commission (NRC) letter dated December 10, 2007 (ADAMS Accession No. ML073390065).

The NRC staff has, for Waterford 3, evaluated the information provided in Entergy's letter dated May 12, 2008, and has determined that it is acceptable to extend the due date for completion of corrective actions and modifications, as described in the enclosure, until July 24, 2008.

A copy of our related Safety Evaluation is enclosed. Please contact N. Kalyanam at 301-415-1480 with any questions.

Sincerely,

/RA by CFLyon for/

Thomas G. Hiltz, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosure: As stated

cc w/encl: See next page

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Waterford Steam Electric Station, Unit 3
17265 River Road
Killona, LA 70057-3093

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*Minor editorial changes from staff SE

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DATE	5/22/08	5/22/08	5/21/08	5/22/08

OFFICIAL RECORD COPY

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(2/25/08)

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EVALUATION OF EXTENSION REQUEST TO COMPLETE CORRECTIVE ACTIONS

GENERIC SAFETY ISSUE-191, "ASSESSMENT OF DEBRIS

ACCUMULATION ON PWR SUMP PUMP PERFORMANCE" (GSI-191)/

GENERIC LETTER 2004-02, "POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON

EMERGENCY RECIRCULATION DURING DESIGN BASIS ACCIDENTS

AT PRESSURIZED WATER REACTORS"

WATERFORD STEAM ELECTRIC STATION, UNIT 3

DOCKET NO. 50-382

By letter dated May 12, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML081350231), Entergy Operations, Inc. (Entergy, the licensee), requested an extension to the U.S. Nuclear Regulatory Commission (NRC) Generic Letter (GL) 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors" corrective action due dates for Waterford Steam Electric Station, Unit 3 (Waterford 3). The stated intent of this extension was to allow Entergy additional time to perform the final analysis and all licensing activities to address Generic Letter 2004-02 (GL 2004-02).

Previously, by letter dated December 10, 2007 (ADAMS Accession No. ML073390065), the NRC staff approved an extension for completion of Waterford 3 sump clogging corrective actions, from the GL 2004-02 due date of December 31, 2007, until restart following completion of the Waterford 3 spring 2008 refueling outage.

Entergy stated in their letter dated May 12, 2008, that the request for an additional extension is due to availability of vendor resources for the analysis of chemical effects, downstream effects, hydraulic, and in-core aspects. The licensee explained that Waterford 3 factored the final technical issues from the GL 2004-02 audit report into the various calculations which are being finalized, including debris generation and transport, head loss, chemical effects, and downstream effects. Recent technical issues were found that required additional testing. These issues have been promptly addressed. The new chemical effects testing was performed in accordance with the methodology contained in WCAP-16530-NP, "Evaluation of Post- Accident Chemical Effects in Containment Sump Fluids to Support GSI-191," which resulted in more accurate results. The downstream effects analysis has identified limited areas that required additional analysis, such as high pressure safety injection (HPSI) pump vibration and hydraulic analysis.

The Waterford 3 licensee stated that it has had to compete for vendor resources to address these technical and testing issues. Waterford 3 has changed vendors on one contract and

has had weekly calls with others to track progress to address the technical issues from GL 2004-02 in as timely a manner as possible. These calls have kept the analyses on track for completion as soon as possible. These actions also reduce the amount of time needed for Entergy reviews of the draft calculations.

Entergy stated in its letter that the facility modifications described in the earlier extension requests remain as discussed in the extension approval letter dated December 10, 2007.

The NRC has based its reviews for granting extensions to the due date for completion of GL 2004-02 corrective actions on the criteria stated in SECY-06-0078. Specifically, an extension may be granted if:

- the licensee has a plant-specific technical/experimental plan with milestones and schedule to address outstanding technical issues with enough margin to account for uncertainties, and
- the licensee identifies mitigative measures to be put in place prior to December 31, 2007, and adequately describes how these mitigative measures will minimize the risk of degraded emergency core cooling system (ECCS) and containment spray system (CSS) functions during the extension period.

The SECY-06-0078 also states that for proposed extensions beyond several months, a licensee's request will more likely be accepted if the proposed mitigative measures include temporary physical improvements to the ECCS sump or materials inside containment to better ensure a high level of ECCS sump performance.

With regard to the first extension criterion, Entergy has provided a plant-specific technical/experimental plan, with milestones and schedules, to complete the GL 2004-02 corrective actions. The licensee's proposed plan for the remaining corrective actions is summarized below. Completed activities have been previously summarized and referenced in the previous Waterford 3 NRC extension approval letter dated December 10, 2007.

In light of the new developments, and in order to meet the regulatory requirements, Entergy stated that it has scheduled the following activities.

- Chemical, downstream, hydraulic, and in-core analyses, which are to be completed by July 24, 2008
- Update of the licensing basis to reflect the resolution of Waterford 3 GSI-191 issues, to be completed by September 24, 2008
- A complete response to the GL 2004-02 issues, to be provided to the NRC by October 24, 2008

With regard to the second extension criterion, the licensee has stated that modifications, mitigation measures, compensatory measures, and/or favorable conditions are in effect at Waterford 3, minimizing the risk of degraded ECCS and CSS functions during the extension period. The NRC staff evaluation of the previous extension request concluded that Entergy had put mitigation measures in place at Waterford 3 to adequately reduce risk for the

previously requested extension period (spring 2008), as stated in the NRC extension approval letter dated December 10, 2007.

In letter dated May 12, 2008, Entergy stated that the mitigation measures and unit-specific conditions evaluated by the staff in the previous extension requests, which include strainer replacement, have remained unchanged.

Entergy has previously noted that with the installation of the new strainers there has been a significant reduction in the vulnerability to debris blockage and downstream effects as compared to the original physical configuration. Waterford 3 has a new strainer in place with a smaller opening size and larger flow area to accommodate the loss-of-coolant accident generated debris load. The new strainer has 3/32-inch diameter perforations and a flow area of approximately 3699 square feet. The replaced screen had a flow area of 200 square feet. Entergy stated that the new strainer provides increased margin against blockage and excessive wear on downstream components caused by debris in the water. The small size selected for the perforations minimizes bypass of fibrous debris and reduces downstream effects.

The NRC staff believes that Entergy has a reasonable plan for Waterford 3 that should result in the completion of final GL 2004-02 corrective actions that provide acceptable strainer function with adequate margin for uncertainties. Furthermore, the NRC has concluded that Entergy has put mitigation measures in place at Waterford 3 to reduce vulnerability to debris blockage and downstream effects for the proposed extension period. The additional time requested in the letter dated May 12, 2008, is relatively small and considered to be of low safety concern given the mitigation measures and plant improvements already in place. Based on the licensee having satisfactorily addressed the NRC GL 2004-02 due date extension criteria as discussed above, the NRC staff finds it is acceptable to extend the completion date for GL 2004-02 corrective actions for Waterford 3 to July 24, 2008.

Entergy should complete its remaining GL 2004-02 corrective actions as discussed above, and update the Waterford 3 licensing basis by September 24, 2008. A complete response to GL 2004-02 should be provided to the NRC by October 24, 2008, as discussed in Entergy's May 12, 2008 extension request letter.

Principal Contributor: R. Torres

Date: May 22, 2008