

December 22, 2000

Mr. Charles M. Dugger
Vice President Operations
Entergy Operations, Inc.
17265 River Road
Killona, LA 70066-0751

SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3, RE: COMPLETION OF LICENSING ACTION FOR GENERIC LETTER 96-06, "ASSURANCE OF EQUIPMENT OPERABILITY AND CONTAINMENT INTEGRITY DURING DESIGN-BASIS ACCIDENT CONDITIONS" (TAC NO. M96883)

Dear Mr. Dugger:

On September 30, 1996, the U.S. Nuclear Regulatory Commission (NRC) issued Generic letter (GL) 96-06 to all holders of operating licenses for nuclear power reactors, except those licenses that have been amended to possession-only status.

The purpose of the generic letter was to:

- (1) notify addressees about safety-significant issues that could affect containment integrity and equipment operability during accident conditions,
- (2) request that all addressees submit certain information relative to the issues that have been identified and implement actions as appropriate to address these issues, and
- (3) require that all addressees submit a written response to the NRC relative to implementation of the required actions.

The addressees were requested to determine:

- (1) if containment air cooler cooling water systems are susceptible to either waterhammer or two-phase flow conditions during postulated accident conditions;
- (2) if piping systems that penetrate the containment are susceptible to thermal expansion of fluid so that overpressurization of piping could occur.

With reference to the waterhammer/two-phase flow issue, Entergy Operations Inc. (EOI, or the licensee) provided its assessment for Waterford Steam Electric Station, Unit 3 (Waterford 3), in a letter dated January 28, 1997, and additional information was submitted in letters dated October 30, 1998, and November 15, 2000. The waterhammer and two-phase flow evaluation that has been completed by Waterford 3 was reviewed by the NRC contractor. You have selected a main steam line break as a bounding scenario for evaluating the responses of the containment cooling system. A conservative estimate of the heat transfer to the component cooling water (CCW) in the containment fan cooler coils and the resulting temperature was

performed and resulting CCW temperature rise was reported to be below the margin to saturation. Based on this, the staff concludes that waterhammer and two-phase flow will not pose a problem for the event scenarios discussed in GL 96-06 and the evaluations performed by EOI support this conclusion.

With reference to the susceptibility of piping systems that penetrate the containment to overpressurization resulting from the thermal expansion of the fluid, Waterford 3, by letters dated January 28, 1997, October 17, 1997, December 22, 1997, October 28, 1999, and April 5, 2000, identified seventeen penetrations as potentially vulnerable to a water solid volume that may be subjected to an increase in pressure due to heating of trapped fluid. EOI determined that the penetrations are operable based on piping plastic deformation. In addition, EOI provided a long term corrective action to resolve the overpressurization issue and committed to: (1) implement system configuration changes in four penetrations, providing a path for thermal expansion of trapped fluids, or maintain the penetrations in the drained condition to avoid any overpressurization; (2) perform physical modification on three penetrations, prior to startup from its fall 2000 refueling outage; and (3) implement as an interim resolution, administrative controls on five penetrations to ensure that they are flushed with hot fluids during plant heatup. EOI committed to resolve the issue for these five and the remaining five penetrations by detailed analysis or by installing physical modifications prior to startup from its spring 2002 refueling outage. In its submittal dated April 5, 2000, EOI clarified the assumptions it had stated in the December 22, 1997, letter and also determined that stresses in the carbon and stainless steel penetrations meet the allowable stress in Appendix F to Section III of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code and the final hoop strain resulting from the thermally-induced overpressurization is below 2.6%. The staff concludes that the licensee's evaluation and corrective action provide an acceptable resolution for the thermally-induced overpressurization of piping runs penetrating the containment.

In conclusion, the NRC staff has reviewed your response and finds that the evaluation and the corrective action, where applicable, for the two issues stated in GL 96-06 have been adequately addressed and are acceptable. Therefore, we consider GL 96-06 to be closed for your facility. This also closes TAC No. M96883.

If you have any questions regarding this matter, please contact N. Kalyanam at (301) 415-1480.

Sincerely,

/RA/

N. Kalyanam, Project Manager
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-382

cc: See next page

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